Educational Workspace Application Design Guide
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The A+ Educational Partner Program was established to support the needs of the academic community. Colleges, universities and K-12 schools benefit by facilitating learning using the latest classroom technology built and designed by Crestron. This A+ design guide was created in order to help educational sales teams working with A+ Partners help understand A+ designs and specific use cases for each design in different types of spaces. We have taken highly technical line drawings designed by our Sales Support Services team and reconstructed them into something that can be viewed and used a bit easier in the field for our sales teams to help them sell and communicate better with our A+ Partners. For any questions or inquiries please reach out to the Sales Strategy & Communication team at SSC@crestron.com

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**Overview**

The A+ Educational Partner Program was established to support the needs of the academic community. Colleges, universities and K-12 schools benefit by facilitating learning using the latest classroom technology built and designed by Crestron. This A+ design guide was created in order to help educational sales teams working with A+ Partners help understand A+ designs and specific use cases for each design in different types of spaces. We have taken highly technical line drawings designed by our Sales Support Services team and reconstructed them into something that can be viewed and used a bit easier in the field for our sales teams to help them sell and communicate better with our A+ Partners. For any questions or inquiries please reach out to the Sales Strategy & Communication team at SSC@crestron.com

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**Features Overview**

- **Crestron XiO Cloud™ Solution**
  - Zero touch provisioning and management utilizing Crestron XiO Cloud™ service with direct connection to Microsoft® Azure® IoT Hub

- **.AV Framework™ Web Based Configuration**
  - Web-based configuration with zero programming utilizing .AV Framework™

- **DM NVX™ AV Over IP Solution**
  - Pixel perfect processing with zero latency AV over IP utilizing DM NVX™ endpoints

- **DM Lite™ AV Solution**
  - A ecosystem of low cost interchangeable signal extenders utilizing DM Lite AV Solution

- **DigitalMedia™ AV Platform Distribution**
  - A complete end-to-end traditional video distribution system utilizing a Crestron DigitalMedia switcher

- **AirMedia® Wireless Presentation Platform**
  - Wireless collaboration presentation using a laptop, tablet or smartphone utilizing Crestron AirMedia wireless technology

- **Dante® Network Audio**
  - Complete media networking solution that enables digital audio distribution via standard ethernet networks that delivers ultra low latency audio

- **Digital Signage**
  - Digital signage content creation using Appspace® software utilizing NME-100 digital signage endpoints
.AV Framework™
With Crestron .AV Framework web based configuration you can deploy simple, scalable Crestron Enterprise Room Solutions without any programming. If you know how to use a web browser, then you can deploy a Crestron system using .AV Framework web based configuration. You can open the .AV Framework setup and management tool in your favorite web browser to easily select sources and displays, configure device control for Blu-Ray Disc® players, cable TV and video servers. Easily add a TSW-X60 series touch screen and automatically generate the GUI for single of multiple display systems. Easily add an MP-B10 button panel for simple control of single display systems. With .AV Framework web based configuration you can also add a Cresnet® occupancy sensor for additional system automation. Easily deploy to multiple rooms by saving your configuration to a standard XML file and then push it out to hundreds or even thousands of rooms at once over the network! With .AV Framework web based configuration you get a consistent user experience in every room by automatically generating a consistent GUI so every room works the same and anyone can easily use it, all with NO PROGRAMMING!
Microsoft Azure®

- 100% Direct Cloud Solution
- No Additional Hardware/Software/Infrastructure
- Hyperscale Bandwidth & Global Availability
- Bidirectional Data Monitoring/Management
- AV, UC, VC, IT, Environmental, Scheduling Reporting
- Enterprise Grade Security Down To The Device Level

Crestron Xio Cloud Service
XiO Cloud Service

Native support built into dozens of models, covering all workspace functionality

- AV over IP
- AV Distribution & Control
- IoAV Alliance/OPS Slot Displays
- Native Integrated UC/VC systems
- Audio/DSP
- Wireless Presentation
- Touchscreens
- Open-Platform Room Scheduling
- Digital Signage
- Whiteboard Capture
- 3rd Party Devices (via API/SDK)
- Zero Fees for Maintenance & Updates

**XiO Cloud Supported Devices**

End-to-End Azure IoT Security and Management:

- Per Device Certificates
- Per Device Enable/Disable
- TLS Security
- X.509 Support
- HTTPS, AMQP, MQTT over webSockets
- IP Whitelisting/Blacklisting
- Device Provisioning Service
- Firmware/Software Updates
- Device to Cloud/Cloud to Device Messaging
- File Upload from Device
- Device Twin Management
- API/SDK Support for 3rd Party Device/Driver Integration

The Crestron XiO Cloud™ service is Crestron’s unifying IoT based platform for remotely provisioning, monitoring, and managing Crestron devices across an enterprise or an entire client base. Supports a direct device-to-cloud connection via the Microsoft® Azure® software IoT Hub without requiring any additional hardware.
Standard Classroom

Use Case

Ease of install with simple design, less parts, connections and clutter providing a consistent user experience that is scalable as part of the complete Crestron® EcoSystem.

100% IoT Cloud Solution in Crestron XiO Cloud™ service that is simple for IT to manage and monitor across any sized campus with access to the Crestron Help Desk.

Open Platform/Open Architecture. Hardware is decoupled, instructors and students can use whatever software they would like or are already using.

Integrated in the DMPS unit, use AirMedia® wireless presentation from laptops, tablets and smartphones for seamless collaboration and sharing.

Easily control all room devices and displays from a button panel and control devices via RS-232, CEC or IR.

Easily configure with no programming using .AV Framework™ web-based configuration.

Supports standard network security policies that Universities already have in place including 802.1x authentication and Active Directory® Credential Management.

Features

- XIO Cloud™
- AV Framework
- DigitalMedia
- AirMedia 2

BOM Example

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Use Case

- A simple, yet cost effective design on a single platform with less SKU’s providing for a simple install
- Commercial grade and purpose built equipment offering enterprise grade security at the device level making for an IT friendly design
- Utilize low cost and high performance signal extension using Crestron DM Lite™ as part of the entire Crestron® ecosystem
- Securely present wirelessly using a laptop, tablet or smartphone using the AM-200 featuring enterprise grade security
- 100% IoT cloud solution using Crestron XiO Cloud™ service with a direction connection to Microsoft® Azure® IoT hub with access to the Crestron Help Desk
- Listen to crystal clear audio using native brand speakers as part of a single platform solution

Features

- DM® Lite
- XiO Cloud
- inMedia
- AV Framework

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</table>
Sample System Drawing

Room PC - OFE

Laptop - OFE

Laptop - OFE

Lectern Monitor - OFE

HD-TX-301-C-E

HD-RX-201-C-E

AM-200

MPC3-101-B

Projector - OFE

Saros Speakers

HD-TX-301-C-E

HD-RX-201-C-E

AMP-150-70

Apple® iPad® Tablet

Wire Legend

- CAT5/6
- HDMI® Cables
- DM Lite™ Cables
- VGA
- Speaker
- Audio
- RS-232

Note: All information shown is subject to change; Please check the Crestron website and/or contact Crestron Sales Support Services for the latest updates and pricing.
Scalable solution ideal for rooms ranging from 30 to 300 students. Featuring the Crestron DMPS3-4K-350-C DigitalMedia™ Presentation System with built-in AirMedia™ wireless presentation, provides up to nine inputs including AirMedia wireless connectivity.

100% IoT Cloud Solution - Easy to Deploy, Manage and Monitor with easy access to the Crestron Help Desk

Open Platform/Open Architecture. Hardware is decoupled, end user can use whatever software they would like or are already using

Flexible and scalable and easy to deploy across any sized campus

High level enterprise grade security down to the device level using protocols that are already instilled at Universities

A/V/USB/Control multi layer technology to control displays

Hear crystal clear audio through distributed speakers

Preview at the lectern with an optional video monitor

Simple configuration and simply make changes with no programming using .AV Framework web-based configuration

### Use Case

### Features

### BOM Example

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### Tiered Classroom

**Use Case**

- Scalable solution ideal for rooms ranging from 30 to 300 students. Featuring the Crestron DMPS3-4K-350-C DigitalMedia™ Presentation System with built-in AirMedia™ wireless presentation, provides up to nine inputs including AirMedia wireless connectivity.

- 100% IoT Cloud Solution - Easy to Deploy, Manage and Monitor with easy access to the Crestron Help Desk

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- A/V/USB/Control multi layer technology to control displays

- Hear crystal clear audio through distributed speakers

- Preview at the lectern with an optional video monitor

- Simple configuration and simply make changes with no programming using .AV Framework web-based configuration

### Features

- **100% IoT Cloud Solution - Easy to Deploy, Manage and Monitor with easy access to the Crestron Help Desk**

- **Open Platform/Open Architecture. Hardware is decoupled, end user can use whatever software they would like or are already using**

- **Flexible and scalable and easy to deploy across any sized campus**

- **High level enterprise grade security down to the device level using protocols that are already instilled at Universities**

- **A/V/USB/Control multi layer technology to control displays**

- **Hear crystal clear audio through distributed speakers**

- **Preview at the lectern with an optional video monitor**

- **Simple configuration and simply make changes with no programming using .AV Framework web-based configuration**

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Sample System Drawing

Lectern

Microphone - OFE
LAN

Display

DMPS3-4K-350-C-AIRMEDIA

LAN

DM-RMC-4KZ-SCALER
Projector

DM-RMC-4KZ-SCALER
Projector

Laptop - OFE

FlipTop

TSW-1060

LAN

Lectern

Room PC - OFE

Blu-Ray Player - OFE

Doc Cam - OFE

Camera - OFE

DM-TX-4K-100-C-1G

Apple® iPad® Tablet

Saros Speakers (x4)

LAN

Wire Legend

CAT5/6
CAT5/6

HDMI® Cables
HDMI® Cables

DM® Cables
DM® Cables

Audio
Audio

Speaker
Speaker

RS-232
RS-232

Note: All information shown is subject to change. Please check the Crestron website and/or contact Crestron Sales Support Services for the latest updates and pricing
Use Case

Streaming flawless video with lossless audio distributed to multiple monitors

Zero latency 4K video with minimal infrastructure required

Hyperscale global Crestron XiO Cloud™ service in Microsoft® Azure® IoT Hub with worldwide availability and access to the Crestron Help Desk

Lowest total cost of ownership with future expansion and scalability and simply upgrade existing DM chassis to 4K/60 via DM® 4KZ

Source and control content with a commercial grade and purpose built touch screen

Manage and integrate different technologies into the space utilizing a CP3 control processor powered by a 3-Series® control engine

Hear crystal clear audio with native brand speakers all on a single platform

Features

BOM Example

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Auditorium
Sample System Drawing

Associated CAD Diagram Coming Soon

Wire Legend
- CATS/6
- HDMI® Cables
- Speaker
- Audio
**Use Case**

- IT-Friendly and network compliant design that is easy to manage and service
- Enterprise grade security at the device level that Universities are already using
- Present wirelessly using an AM-200
- Zero latency 4K video distribution to multiple projector so no matter where you are seated you can see content
- Utilizing an AMP-1200-70, hear the presenter with full clarity through the native brand speakers in the lecture hall
- Easy to deploy, manage and monitor using Crestron XiO Cloud™ service solution and accessibility to the Crestron Help Desk
- The 3 Series® CP3N processor handles seamless integration into existing 3rd party features such as occupancy sensing

**Features**

- Present wirelessly using an AM-200
- Zero latency 4K video distribution to multiple projector so no matter where you are seated you can see content
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Sample System Drawing

Wire Legend
- CAT5/6
- HDMI® Cables
- DM® Cables
- VGA
- Speaker
- Audio
- RS-232

Associated CAD Diagram Coming Soon

Note: All information shown is subject to change; Please check the Crestron website and/or contact Crestron Sales Support Services for the latest updates and pricing.
Use Case

Simply deploy, manage and monitor all of the devices anytime/anywhere

Run full motion video signage 24/7 with the purpose built commercial grade NME-100 digital signage player. Providing a consistent branding and experience on all monitors

Easily create and manage digital signage content utilizing implemented AppSpace® software, does not require BYOD

Broadcast messaging across the building or entire campus

Crestron NVX-D80 drops into native OPS slots in the back of professional displays from manufacturers like LG, NEC, Philips, Avocor, Samsung, Smart, and many more

- Based on OPS (Open pluggable Specification) which is the Intel spec industry-wide digital signage standard, instantly transforms a display into a native DM NVX endpoint
- OPS standardizes slot size, display connection and power supply specifications
- OPS simplifies device installation, usage, and maintenance while making it easier to upgrade or swap digital signage equipment
- NVX/D80 combines 4K/60/444 over 1GB networks with multi-layer technology, enterprise grade security, and 100% IoT-Cloud provisioning and management

Features

All provisioned and managed on Crestron XiO Cloud™ service solution

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Use Case

Flexible, multi purpose space that can be utilized for different events and town halls

Utilizing DM NVX™ endpoints, distribute flawless 4K60 4:4:4 HDR video throughout the space to multiple displays

Enterprise grade security at the device level makes for a network compliant and IT-friendly solution

Zero-Touch/Zero-Programming provisioning and data gathering in Microsoft® Azure® IoT Hub

Simple and consistent user experience for presenters

Integrate seamlessly into existing equipment in the space such as ceiling mics and displays

Distribute presentations and Town Hall’s throughout an entire building as part of the Crestron® IoT EcoSystem

Features

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Sample System Drawing

Associated CAD Diagram Coming Soon

Wire Legend
- CAT5/6
- HDMI® Cable
- USB
- Audio
- Speaker
- RS-232

Note: All information shown is subject to change. Please check the Crestron website and/or contact Crestron Sales Support Services for the latest updates and pricing.
Use Case

Flexible space for instructional trainings and simulations such as different medical fields

Simple collaboration for students and instructors with simple content routing from anywhere utilizing a familiar device such as a tablet

Route unique sources such as a medical mannequin

Distribute impeccable 4K60 4:4:4 HDR video throughout the space utilizing DM NVX™ AV over IP

Turn any static screen into digital signage using the commercial grade NME-100 digital signage unit utilizing Appspace® software

Simple integration into existing owner furnished equipment such as IP cameras, monitors and mics

Enterprise grade security at the device level such as 802.1x and Active Directory® credential management

Lowest total cost of ownership using DM NVX™ AV over IP and Crestron XiO Cloud™ service with the ability to expand the system in the future

Features

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Sample System Drawing

Observation Room
- Monitor - OFE
- Keyboard/Mouse - OFE
- Desktop Mic - OFE
- TSW-1060
- Sim Computer - OFE
- DM-NVX-352
- AMP-225
- Saros Speakers (x4)

Equipment Room
- Network Switch - OFE
- CP3N
- DSP-1283 (w/ Dante)
- DM-XIO-DIR-160
- NME-100
- DM-NVX-350
- LAN & Dante®
- Network Audio

Simulation Room (ex. Patients Room, Operation Room, etc.)
- IP Cameras - OFE
- Ceiling Mic - OFE
- Tablet - OFE
- Laptop - OFE
- Medical Mannequin - OFE
- Display - OFE
- AMP-150-70
- AMP-225
- LAN
- LAN
- LAN

Wire Legend
- CAT5/6
- HDMI
- Speaker
- Audio
- RS-232
- USB

Observe that all information shown is subject to change; Please check the Crestron website and/or contact Crestron Sales Support Services for the latest updates and pricing.
Crucial lag free game play allows for gamers to play without compromise utilizing DM NVX™ AV over IP with 4K60 4:4:4 HDR video

Use existing 1Gb/Cat5e cabling so universities do not need to change their network infrastructure

Using a DSP-860, AMP-2100-70 and Saros® Speakers, hear gameplay audio distributed loud and clear

Seamless integration with Xbox® consoles, Playstation® consoles and others for the ultimate gaming experience

Multi-layer technology including control and routing of USB devices

As part of the Crestron® IoT Ecosystem, devices enable a simple system design with less SKU’s

Use Case

Features

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BOM Example
Use Case

- Easily control content in the room from multiple sources using a commercial grade touch screen with enterprise grade security.
- Flexible 4K60 HDR video distribution using DM NVX and wirelessly present with an AM-200.
- Simply output final content from the DMPS into a broadcast feed for distribution.
- Manage and monitor all devices with direct connection to Crestron XiO Cloud™ service running in Microsoft® Azure® IoT hub.
- A standards based IT friendly design with no additional infrastructure needed.
- Save time and money by easily configuring using .AV Framework™ web-based configuration with no programming needed.

Features

- Easily control content in the room from multiple sources using a commercial grade touch screen with enterprise grade security.
- Flexible 4K60 HDR video distribution using DM NVX and wirelessly present with an AM-200.
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BOM Example

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Collaborative Learning Classroom

Sample System Drawing

Instructor Station
- TSW-1060
- DM-NVX-350
- Laptop - OFE
- AM-200
- PC - OFE
- DOC CAM - OFE

Tablet - OFE
Laptop - OFE

LAN

DM-NVX-350
Projector - OFE
AMP-150-70
Saros Speakers (x4)

Network Switch - OFE
CP3

Collaboration Table (x3)
- AM-200
- DM-NVX-350
- Laptop - OFE
- Display - OFE

Wire Legend
- CAT5/6
- HDMI Cables
- Speaker
- Audio

Associated CAD Diagram Coming Soon

Note: All information shown is subject to change; Please check the Crestron website and/or contact Crestron Sales Support Services for the latest updates and pricing
**Use Case**

A multi-purpose space to host numerous different kinds of events all within the Crestron® IoT EcoSystem

Control content from anywhere using a purpose built, commercial grade wireless touch screen with enterprise grade security

Simple design with less SKU’s all on a single platform

Seamlessly collaborate with students and colleagues with a smart camera, microphone and speaker all on a single device using the UC-SB1-CAM soundbar

Display content on multiple displays

Award winning 24/7 Global Tech-Support with Crestron True Blue support

Save time, labor and money with no programming and easily configure using .AV Framework™ web based configuration

**Features**

**BOM Example**

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UC-SB1-CAM-FLEX
UC-ENGINE
TSW-1060
TSW-1060-TTK
Sample System Drawing

Associated CAD Diagram Coming Soon

Wire Legend
- CAT5/6
- HDMI® Cables
- USB
- Cresnet® Cables
**Use Case**

- Easily control all sources with a C2N-CBD keypad
- Creates an easy to use and consistent user experience
- Simple design with less SKU's as part of a full end to end Crestron® EcoSystem
- Integrates seamlessly with existing products the customer wants to use or already has
- Commercial grade and purpose built devices with Crestron XiO Cloud™ provisioning with no additional infrastructure, hardware or software needed
- Simple install with less parts, cables and connections

**Features**

**BOM Example**

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Use Case

- Versatile space offering fully integrated audio and video into an existing space utilizing owner furnished equipment
- Easily control content using the remarkable TSR-310 remote with voice activation and a touch screen
- Display up to 4K/60 4:4:4 HDR video to the projector
- Experience a true 7.1 surround sound for fully immersive audio experience
- Lowest total cost of ownership using Digital Media with the ability to change and expand the system in the future as needs change for the space
- Commercial grade and purpose built equipment offering enterprise grade security at the device level making for an IT friendly design

Features

BOM Example

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Sample System Drawing

Laptop - OFE
DM-TX-200-C-2G
DMPS3-4K-150-C
Projector - OFE
DM-RMC-4KZ-SCALER-C
USB-EXT-DM-REMOTE (x2)
Controller - OFE (x2)
Surround Sound Processor - OFE
DSP/Amp/Speakers OFE

Gaming Console - OFE (x2)
TSW-1060
CEN-SW-POE-5

USB-EXT-DM-LOCAL (x2)
TSR-310

LAN

USB
Audio

CAT5/6
HDMI Cables
DM Cables
USB

Wire Legend

Associated CAD Diagram Coming Soon

Note: All information shown is subject to change; Please check the Crestron website and/or contact Crestron Sales Support Services for the latest updates and pricing
Use Case

- Multi purpose space with simple content routing utilizing a commercial grade and purpose built touch screen
- Distribute flawless 4K60 HDR content anywhere in the divisible space using DM NVX™ AV over IP
- Multi-layer/native technology using less SKU’s all on a single platform
- Lowest total cost of ownership utilizing DM NVX™ AV over IP with the ability to change or expand the system
- Multiple form factor options scalable to all workspace types across the enterprise
- Native room and AV control capabilities
- Enterprise grade security at the device level such as 802.1x and Active Directory™ credential management
- Easily display content securely and wirelessly using AirMedia® wireless presentation

Features

BOM Example

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Sample System Drawing

Associated CAD Diagram Coming Soon

Divisible Room

Divisible Room A

- Lectern A
- PC - OFE
- Laptop - OFE
- DM-NVX-352

- Syncs/Outputs
- DM-NVX-0350
- AMP-150-70
- Saros Speakers (x4)
- Display - OFE
- Projector - OFE

Divisible Room B

- Lectern A
- PC - OFE
- Laptop - OFE
- TSW-760
- DM-NVX-352

- Syncs/Outputs
- DM-NVX-0350
- AMP-150-70
- Saros Speakers (x4)
- Display - OFE
- Projector - OFE

Divisible Room C

Equipment Room

- CP3
- DSP - OFE
- DM-XD-DR-80

- Syncs/Outputs
- DM-NVX-0350
- AMP-150-70
- Saros Speakers (x4)
- Display - OFE
- Projector - OFE

Wire Legend
- CAT5/6
- HDMI
- Speaker
- Audio
- RS-232

Note: All information shown is subject to change; Please check the Crestron website and/or contact Crestron Sales Support Services for the latest updates and pricing.
Use Case

Simple all in one classroom design featuring DM Lite™ 4K multi-format 5x1 AV switch and receiver with local power supply

Flexible and scalable design with no programming using .AV Framework™ web based configuration

Customers can choose from up to 7 different types of transmitters

Built in Crestron® scaler that is superior to projector and display scalers

PoE+ control processor using the MPC3-302

Single platform design from transmitters to processor and native brand speakers

Enterprise grade security at the device level such as 802.1x and Active Directory™ credential management

Customers have the option to purchase what they want, integrates seamlessly with plenum enclosures and projector mounts from 3rd party top industry providers

Zero touch deployed and managed from a 100% Cloud solution in Azure® IoT Hub

Features

BOM Example

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Sample System Drawing

Laptop

HD-TX-301-C-E

PC- OFE

HD-TX-201-C-2G-E

MPC3-302

HD-RX-4K-510-C-E-SW4

Projector

Saros Speakers

LAN

Wire Legend

CAT5/6

HDMI Cables

DM™ Lite Cables

Speaker

Note: All information shown is subject to change. Please check the Crestron website and/or contact Crestron Sales Support Services for the latest updates and pricing.

Associated CAD Diagram Coming Soon
Additional Resources

Application Drawings
Revit® Files
CAD Blocks
CSI Specs