General Purpose Classrooms

Typical Signal Flow, Wiring, and Installation Detail Diagrams for CTec Designated GPC Technology Facility Upgrades

Classroom Designations (by Type):
1. Dual-Projector HD Auditorium Diagrams
2. Single-Projector HD Auditorium Diagrams
3. Dual-Projector HD Classroom Diagrams
4. Single-Projector HD Classroom Diagrams
5. Small HD Classroom Diagrams

Additional Installation Details:
6. Above Ceiling Projector Lift Install for Auditoriums
7. Above Ceiling Projector Plate Install for Classrooms
8. Multimedia Lectern Floor Box Plate Allocation

Note: This is only a guide with examples. Each classroom space has characteristics that could necessitate adapting the “typical” design to meet that room’s needs. Contact CTec for more information.
Dual-Projector HD Auditorium Signal Flow Example:

- **Wireless Presenter**: @Lectern, @Ceiling, @Floor, @Wall, @Mobile
- **Webcam**: @Lectern, @Ceiling, @Floor, @Wall, @Mobile
- **PC w/ Dual DV Output**: @Floor Box
- **AMX Touch Panel**: @Lectern, @Ceiling, @Floor, @Wall, @Mobile
- **AMX POE**: @Lectern, @Ceiling, @Floor, @Wall, @Mobile
- **Document Camera**: @Lectern, @Ceiling, @Floor, @Wall, @Mobile
- **Network Switch**: @Lectern, @Ceiling, @Floor, @Wall, @Mobile
- **Cable Cubby Enclosure**: @Floor Box
- **Cabled Laptop Inputs (Cat6, HDMI & VGA w/3.5mm)**: @Floor Box
- **Cabled Mic Input (XLR female)**: @Floor Box
- **Boundary Mic**: @Lectern, @Ceiling, @Floor, @Wall, @Mobile
- **Gooseneck Mic**: @Lectern, @Ceiling, @Floor, @Wall, @Mobile
- **Wireless Lapel Mic**: @Lectern, @Ceiling, @Floor, @Wall, @Mobile
- **Wireless Handheld Mic 1**: @Lectern, @Ceiling, @Floor, @Wall, @Mobile
- **Wireless Handheld Mic 4**: @Lectern, @Ceiling, @Floor, @Wall, @Mobile
- **Audio Mixer w/ DSP (ex. Nexia CS)**: @Floor Box Plate 1
- **Multi-Touch Display (Primary Monitor)**: @Floor Box Plate 1
- **Multi-Touch Display (Secondary Monitor)**: @Floor Box Plate 2
- **Left DV Extender 1**: @Floor Box Plate 1
- **Left DV Extender 2**: @Floor Box Plate 1
- **Right DV Extender 1**: @Floor Box Plate 1
- **Right DV Extender 2**: @Floor Box Plate 1
- **Audio Amplifier**: @Floor Box Plate 1
- **Lectern ADA Output Connection Plate**: @Floor Box Plate 1
- **Lectern ADA Output Connection Plate**: @Floor Box Plate 1
- **Lectern Floor Box (pass-thru to seats)**: @Floor Box Plate 1
- **Right Personal ADA Monitor 1**: @Floor Box Plate 1
- **Right Personal ADA Monitor 2**: @Floor Box Plate 1
- **Left Large Display**: @Floor Box Plate 1
- **Right Large Display**: @Floor Box Plate 1
- **Audio Recorder**: @Floor Box Plate 1
- **HDBaseT Capable Left Projector**: @Floor Box Plate 1
- **HDBaseT Capable Right Projector**: @Floor Box Plate 1
- **Left Projector Lift**: @Floor Box Plate 1
- **Right Projector Lift**: @Floor Box Plate 1
- **Left Motorized Projection Screen**: @Floor Box Plate 1
- **Right Motorized Projection Screen**: @Floor Box Plate 1
- **Light Dimming System**: @Floor Box Plate 1
- **Wall Switches**: @Floor Box Plate 1
- **Ceiling Speakers**: @Floor Box Plate 1
- **Personal Assistive Listening System Tx**: @Floor Box Plate 1
- **PALS Rx**: @Floor Box Plate 1

Notes: See equipment list for more info. Power requirements not shown.
Dual Projection Example using DVX-3250HD with Nexia in HD Auditorium
(without Personal ADA Monitors)

Note: When wiring DVX Audio Output 2 & 3 as “Left” only, also configure those to Mono in DVX settings.
When wiring DVX Audio Input 11 for PC audio (from 3.5mm jack), jumper the grounds.
Dual-Projector HD Auditorium Wiring Paths Example:

(Featuring Motorized Projection Screens and Projector Lifts)

Type #1

- Lights
- Power
- Additional Speaker(s)
- Lighting System
- Speaker
- Screen Control Switches
- Ceiling Mount Power
- Projector Lift
- Motorized Projection Screen
- Front Wall (Behind Lectern)
- Front Wall (By Door)
- Chalkboard
- Floorbox
- Building Power
- Building Data Closet

LEGEND:
- AV Cat6a STP cabling
- Data Cat6 UTP cabling
- Speaker cabling
- Misc. Control cabling
- Power cabling

Classroom Technology Diagram
West Virginia University
Sept 27, 2023

Type #1

- Lights
- Power
- Additional Speaker(s)
- Lighting System
- Speaker
- Screen Control Switches
- Ceiling Mount Power
- Projector Lift
- Motorized Projection Screen
- Front Wall (Behind Lectern)
- Front Wall (By Door)
- Chalkboard
- Floorbox
- Building Power
- Building Data Closet

LEGEND:
- AV Cat6a STP cabling
- Data Cat6 UTP cabling
- Speaker cabling
- Misc. Control cabling
- Power cabling

Classroom Technology Diagram
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Sept 27, 2023
Dual-Projector HD Auditorium Wiring Paths Example:

- Lighting System
- Speaker(s)
- Ceiling Mount Power
- AV Cat6a STP cabling
- Data Cat6 UTP cabling
- Speaker cabling
- Misc. Control cabling
- Power cabling

**LEGEND:** (Does not indicate sole number of cables per run)

- AV Cat6a STP cabling
- Data Cat6 UTP cabling
- Speaker cabling
- Misc. Control cabling
- Power cabling

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Single-Projector HD Auditorium Signal Flow Example: (Featuring Webcam, Multiple Mic Types, Lift, and Personal ADA Monitors)

Optional: Personal ADA’s only needed in rear-entry auditoriums without ADA access to front.

Notes: See equipment list for more info. Power requirements not shown.

LEGEND
@Lectern
@Ceiling
@Floor
@Wall
@Mobile

HDMI or DVI
VGA/RGB
Stereo-Audio
Speaker
Radio Frequency
Network (Cat6)
AV (Cat6a STP)
Control Cabling
USB Cabling

Item Provided (TYP)

Document Camera
Network Switch
AMX Touch Panel
Multi-Touch Display (Primary Monitor)

PC w/ DV Output
Lectern

Cabled Laptop Inputs (Cat6, HDMI & VGA w/3.5mm)
Cabled Mic Input (XLR female)

Gooseneck Mic

Wireless Lapel Mic

Wireless Handheld Mic 1

Wireless Handheld Mic 4

Cabled Mic Input (XLR female)

AMX POE

LED

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Oct 19, 2023

Notes: See equipment list for more info. Power requirements not shown.
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Single Projection Example using DVX-2250HD with Nexia in HD Classroom

Note: When wiring DVX Audio Output 2 as “Left” only, also configure it to Mono in DVX settings.
When wiring DVX Audio Input 11 for PC audio (from 3.5mm jack), jumper the grounds.
Single-Projector HD Classroom Wiring Paths Example:

- Lectern
- Motor
- Speaker(s)
- Ceiling Plate Mount for 2x2 Drop-Ceilings
- Additional Speaker(s)
- Chalkboard
- Front Wall (Behind Lectern)
- Floorbox
- Side Wall
- Floor
- Data Closet
- RS232 Control Interface
- Lighting System
- Power
- Light Switch (on/off)
- Light Preset Switches
- Screen Control Switch
- Motor
- Power (Does not indicate sole number of cables per run)
- Ceiling
- Front Wall (By Door)
- Classroom
door

Legend:
- AV Cat6a STP cabling
- Data Cat6 UTP cabling
- Speaker cabling
- Misc. Control cabling
- Power cabling

Classroom Technology Diagram
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Type #4 (Featuring Motorized Projection Screens)
Small HD Classroom Signal Flow Example:

(Featuring Webcam, Multiple Mic Types, and DVX Used as Amplifier*)

Notes: See equipment list for more info.

Power requirements not shown.
Example Signal Flow When DVX Used as Audio Amplifier in Small HD Classroom (Most Wiring Same As Previous Diagrams Until Final Output)

Note: Go back through DXV, but this time act as amplifier only

Type #5

These are the same device, just shown how being used for different functions.

Classroom Technology Diagram
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Above Ceiling Projector Lift Install Detail for HD Auditorium

- AV Conduit (≥1") to lectern floor box
- Cat6aSTP AV cable & projector control cable
- Power connectivity for projector
- Power Conduit (¼")

Auditorium Ceiling Height

Lift Control cable

Scissor Lift Motor Control

Power cable

Represented scissors of scissor lift

Power connectivity for projector

Cat6aSTP AV cable & projector control cable

Projector lift is installed so that the daily use is the lift’s “closed” (full up) position, with projector mounting pole extending through the finish plate to within 6 inches of the top of the screen so the projector lens is lined up with the top of the image when the screen is deployed.

Lift operation is only needed for technician access to the projector.

Appropriately-sized Chief extension column “projector pole” extending down through projector lift’s “finish plate” into classroom for attaching the projector.
Above Drop-Ceiling Install Detail for Projector in HD Classroom

Conduit to junction box and lectern floor box (1" TYP)

AV signal cabling to projector routed through mounting pole

Power conduit (typ ¾")

Projector Mounting Pole

Power for standard 110V duplex outlet (faces down to connect projector's power cable below ceiling)

Appropriately-sized (typically 6" long for 11' ceiling) extension column "projector mounting pole" extending down into classroom for attaching to the projector mount adapter and to the projector.
Multimedia Lectern Floor Box Plate Typical Allocation:

**Concrete Recessed With Cover**

- **To Network Closet:**
  - 1¼" conduit typical
- **With Cover**
  - ¾" conduit typical
  - 1¼" conduit typical (or 2" for dual-projection rooms)

**To Ceiling for Distribution:**

- ¼" conduit typical

**To Power Circuitry:**

- ¾" conduit typical

**Shown Without Cover**

**AV** cabling typically consists of:
- Cat6a-STP cable for signal and control to each display
- Belden 8723 cable for control to the lighting system interface
- Belden 8451 cable for control to each projector screen interface
- Belden 1309a cable for speaker audio to each speaker set
- Manufacturer-specific cable for control to each projector lift

Recessed floor box by GC/EC able to accommodate up to 8 plates:

1. **Data Plate** (six total RJ45 jacks, run to IT network closet) by WVU
2. **Duplex Power** (each duplex outlet on separate circuit) by Electrical Contractor

Up to 4 gangs available for AV & speaker pass-thru (see notes above)