HARMAN

CONFERENCE ROOMS
Audio Visual System Solutions for Education

AKG AMX BSS crown dbx DigiTech JBL PROFESSIONAL lexicon Martin Soundcraft STUDER

CONFERENCE ROOMS

Conference rooms are a great place for collaboration, found in many buildings across campuses. These are smaller rooms, where users hold administrative meetings, make presentations and conduct video conferences. The AV systems in conference rooms must be designed with users in mind, so a wide variety of staff, instructors and students feel comfortable operating the technologies. In addition, technology managers need systems they can easily manage from a central help desk, so if problems occur, they are proactively notified. HARMAN Professional has a comprehensive portfolio of AV technologies that can transform conference rooms into state-of-the-art collaboration environments. We invite you to learn about our AV solutions and discover how we are the perfect partner for developing professional-quality AV systems.

COMMON ACTIVITIES

Conference rooms vary in size (a medium to large one is roughly 300 square feet/30 square meters) and generally accommodate approximately 4–12 meeting participants. Common activities include:

• Connecting computers to one or more displays to view multimedia content
• Sharing content wirelessly from tablets, smartphones or laptops
• Adjusting audio, video, lighting and temperature controls from an intuitive user interface
• Presenting and collaborating with remote participants via web conference
• Reserving a room remotely through scheduling software, such as Microsoft Exchange or Google Calendar
• Monitoring, maintaining and troubleshooting AV technology in real time from a central help desk

HARMAN HAS A DIVERSE PORTFOLIO OF AV TECHNOLOGY FOR CONFERENCE ROOMS

HARMAN is a leading manufacturer of professional audio, video and control technologies found in modern conference rooms. Our solutions seamlessly combine different AV systems under one platform that can be centrally managed to ensure the best conference room functionality. These comprehensive systems improve the quality of information delivery and lead to more effective meetings.

Sound Reinforcement

Room Scheduling & AV Asset Management

Collaboration & Conferencing

AV Control & Automation

TYPES OF AV SYSTEMS OUR TECHNOLOGY CAN BUILD

- AV Control & Automation System
- Sound Reinforcement System
- Collaboration & Conferencing System
- Room Scheduling & AV Asset Management System

WHAT IS AN AV CONTROL & AUTOMATION SYSTEM?

In a conference room, the most common need is to connect a laptop to a video display and present information. The AV control and automation system centralizes the input and output signals from different audio, video and computer devices. With the aid of a user interface, it simplifies the selection and operation of various sources, so users feel comfortable operating the room's technology.

THE CORE BUILDING BLOCKS OF AN AV CONTROL & AUTOMATION SYSTEM WITH AMX BY HARMAN

Modero® Touch Panel   Massio™ ControlPad

THE USER INTERFACE
The User Interface (UI) is the remote control for the AV system. A UI can be as simple as a keypad to as sophisticated as a full-color touch panel. The purpose of the UI is to simplify the operation of the AV system with intuitive controls and automated functions (such as powering on/off several devices simultaneously or changing lighting presets). AMX by HARMAN offers a wide variety of UIs, including Modero® Touch Panels and the Massio™ ControlPad.

HydraPort®

ARCHITECTURAL CONNECTIVITY
Bring Your Own Device (BYOD) has become a standard practice throughout many schools. Connecting personal devices to a conference room AV system requires different types of cables, because many devices have their own unique outputs. The AMX HydraPort® consolidates all of the cables and ports needed to connect to the AV system inside a sleek enclosure that mounts into furniture. HydraPorts are customizable with swappable input modules, power outlets, keypads and retractable cables.

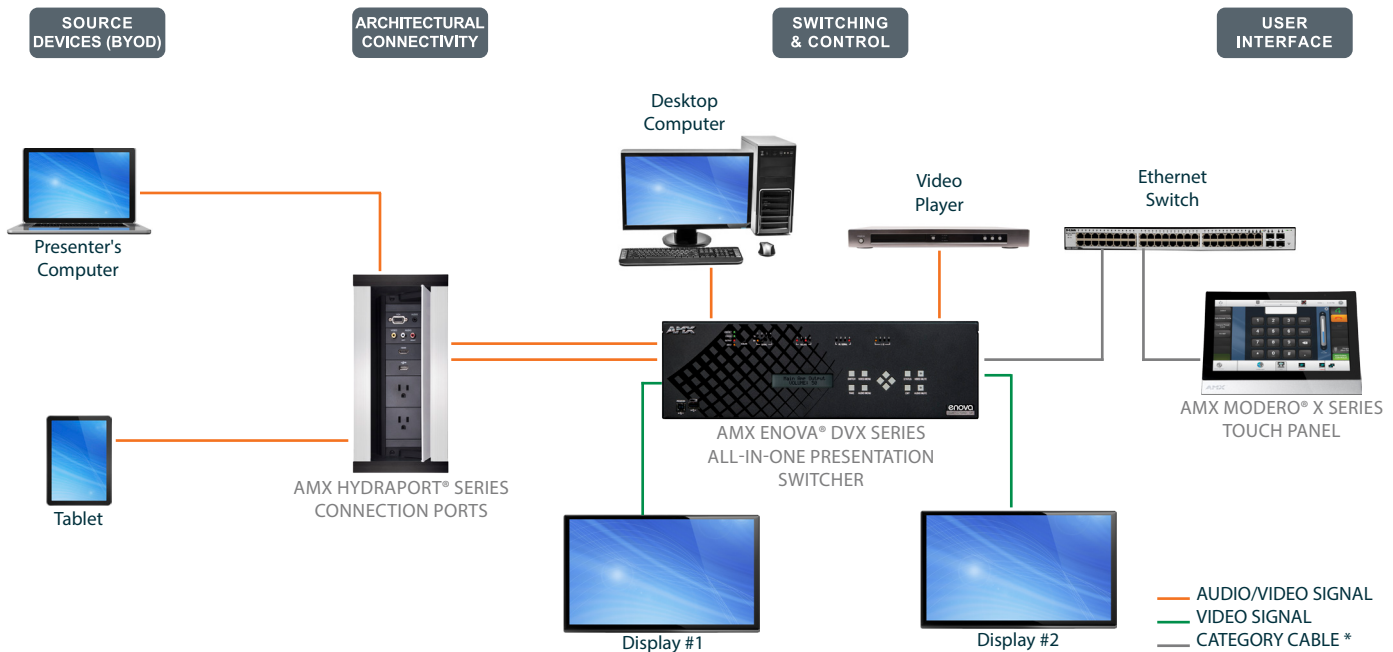

Enova® DVX

SWITCHING & CONTROL
The Audio Video Switcher and Master Controller are the central hub of conference room AV systems. The AV Switcher brings in all audio and video sources, manages the signals, automatically scales the video to the optimum resolution and routes them to displays or other devices. The Master Controller is the brain of the system, which coordinates functionality with the user interface and communicates to other AV devices. The AMX Enova® DVX series of AV Switchers combines the Master Controller, video scaling, microphone mixer and AV Switcher into one box, making it the perfect core for an AV system.

TIPS FOR DESIGNING THE AV CONTROL & AUTOMATION SYSTEM

- Make a list of all the necessary source devices in the AV system, including each device's inputs and outputs. This defines the minimum size of the Audio Video Switcher and Master Controller needed to serve the conference room.
- Determine the functions users require to operate each source device in the system. This determines the minimum number of buttons the user interface requires and the presets to program.
- Decide where users connect their devices to the switcher. For example, will the connection be at a HydraPort in the conference room table or an AV plate in the wall? Consider the cable types needed for connectivity, the length of these cables and any potential tripping hazards.
- Decide if you want to have the help desk accessible from the user interface. Being able to call the help desk directly from the user interface alleviates users' fears if they need assistance while using the system.

For more resources on AV Control & Automation Systems, please visit www.amx.com/education.

AMX AV CONTROL & AUTOMATION SYSTEM CONCEPT FOR CONFERENCE ROOMS

* Download our whitepaper, "Cabling for Success with DXLink."

RAPID PROJECT MAKER HELPS YOU BUILD THE PERFECT AV CONTROL & AUTOMATION SYSTEM

RAPID PROJECT MAKER

Rapid Project Maker, or RPM, is a cloud-based software application that guides you through the process of selecting, configuring and connecting your devices, such as switchers, touch panels and displays. With RPM, you can program your AV controller and create an elegant user interface with no programming skills, and save hours of time versus traditional code-based programming. This software is free to our registered users.

To learn more about RPM, visit www.amxrpm.com.

WHAT IS SOUND REINFORCEMENT IN A CONFERENCE ROOM?

The Sound Reinforcement system is a means to control the volume of speech or music and distribute the sound, so it can be heard intelligibly by seated listeners. In conference rooms, this is typically a simple system that supports video conferencing and video playback.
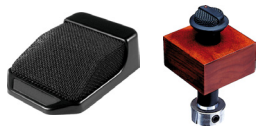
USERS want a sound system that is effortless to use, where video conferencing participants can hear everyone speaking without a lot of extra noise. The system needs to sound good enough for playing videos, watching television and hearing participants in a video conference.

TECHNOLOGY MANAGERS want a Sound Reinforcement system that is "set it and forget it." These managers depend on a setup that can't be tampered with and know when a dedicated sound engineer is required to operate the system.

For a more in-depth discussion on Sound Reinforcement systems design, we recommend AUDIO ENGINEERING FOR SOUND REINFORCEMENT, by John Eargle and Chris Foreman.

Find more information on this textbook here: http://www.jblpro.com/press/audeng_book/book.html.

THE CORE BUILDING BLOCKS OF A HARMAN SOUND REINFORCEMENT SYSTEM

Boundary Layer Microphones

MICROPHONES
In a conference room, boundary microphones are traditionally used to support video conferencing activities. AKG by HARMAN is a leading manufacturer of a broad range of high-quality boundary microphones.
For more information, visit www.akg.com.

Soundweb London Series DSP

DIGITAL SIGNAL PROCESSORS
Digital Signal Processors (DSP) aid in pre-configuring loudspeakers in a room. DSPs are useful in conference rooms, because they provide automatic echo cancellation for voice conferencing applications. BSS Audio by HARMAN is a leader in DSP technology.
For more information, visit www.bssaudio.com.

ComTec DriveCore™ Series Amplifiers

AMPLIFIERS
To power passive loudspeakers, you need a reliable amplifier. Crown by HARMAN manufactures a broad range of two-, four- and eight-channel amplifiers, which include models that are networkable and have onboard DSP.
For more information, visit www.crownaudio.com.

CBT Series Column Array Loudspeakers

LOUDSPEAKERS
Conference rooms may have several different loudspeaker requirements, such as ceiling speakers for distributed audio and front of house speakers for music/voice. JBL by HARMAN is trusted by professionals around the world for manufacturing high-quality, installed sound loudspeakers.
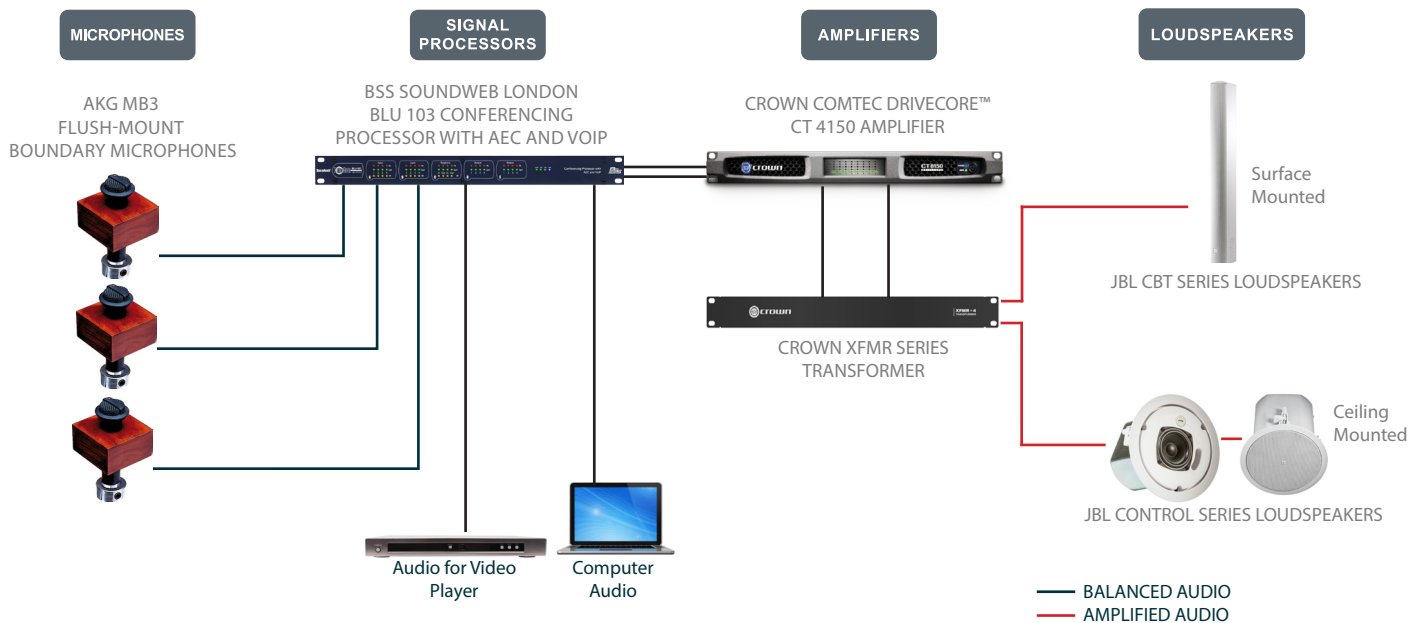For more information, visit www.jblpro.com.

TIPS FOR SOUND REINFORCEMENT SYSTEMS IN CONFERENCE

- Boundary microphones can be mounted into AV furniture or installed flush-mount into the ceiling. Consider the room acoustics, noise factors and the microphone pickup pattern before installing into these surfaces.
- Loudspeakers should provide high intelligibility and thorough coverage for all seated listeners.
- Basic control of volume and audio source selection should be available for conference room users.
- An assisted listening system should be available and compatible with the Sound Reinforcement system.
- Emergency Paging System should be capable of muting room PA system.
- Sound Reinforcement system should be expandable to provide future input and output connections.

For more help on finding resources for HARMAN audio brands, visit http://info.harmanpro.com.

HARMAN SOUND REINFORCEMENT SYSTEM CONCEPT FOR CONFERENCE ROOMS

MICROPHONES

AKG MB3
FLUSH-MOUNT
BOUNDARY MICROPHONES

SIGNAL PROCESSORS

BSS SOUNDWEB LONDON
BLU 103 CONFERENCING
PROCESSOR WITH AEC AND VOIP

Audio for Video Player

Computer Audio

AMPLIFIERS

CROWN COMTEC DRIVECORE™
CT 4150 AMPLIFIER

CROWN XFMR SERIES
TRANSFORMER

LOUDSPEAKERS

Surface Mounted

JBL CBT SERIES LOUDSPEAKERS

Ceiling Mounted

JBL CONTROL SERIES LOUDSPEAKERS

— BALANCED AUDIO
— AMPLIFIED AUDIO

SOUND REINFORCEMENT SYSTEM RESOURCES

AKG Installed Sound Application Guide: http://www.akg.com/media/db/10249/1308_akginstalledsoundcatalogue_en.pdf

Audio Architecht Guide to Audio Networking: http://audioarchitect.harmanpro.com/en-US/audio-architect-networking

Crown Amplifier System Design Tools: http://www.crownaudio.com/en-US/tools/calculators

JBL Professional Speaker Selector Tool: http://www.jblpro.com/www/product-support/speaker-selector

JBL Speaker System Design Software: http://www.jblpro.com/www/products/installed-sound/system-design-software

WHAT IS A COLLABORATION & CONFERENCING SYSTEM?

Collaboration and Conferencing Systems facilitate a presentation through screen mirroring of wireless devices, access to cloud-based services, file sharing and web conferencing.

FOR PRESENTERS, the presentation system provides secure access to content. Files can be stored in the cloud and pulled down onto a local computer (like Enzo by AMX) in the conference room. When a meeting concludes, the presenter can share content by posting a QR code on the screen for others to scan. This removes the need for printed handouts, because participants have instant access to the document digitally. Conferencing systems allow presenters to connect with people on other campuses or in distant locations through a video camera and a web conferencing application.

PARTICIPANTS benefit from the presentation system, because it empowers them to collaborate proactively with the rest of the group through their own wireless devices, using screen mirroring software. Thanks to QR code sharing, participants can instantly pull presentation content from the presenter to their personal devices by scanning a QR code, using a QR code scanning application.

TECHNOLOGY MANAGERS like collaboration systems, because they can replace the room PC. This reduces energy use, software license costs and maintenance/startup time. The collaboration system can also be managed remotely through the help desk.

THE CORE BUILDING BLOCKS OF A HARMAN COLLABORATION & CONFERENCING SYSTEM

Enzo®

CONTENT SHARING PLATFORM
Enzo® by AMX is a PC replacement that allows users to present directly from their devices through wireless screen mirroring. Enzo includes onboard web-based applications, like a web browser, Skype®, MirrorOp® and document viewers.

Sereno™
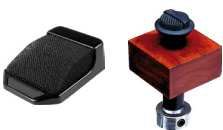
VIDEO CONFERENCING CAMERA
The AMX Sereno™ Video Conference Camera is designed for web conferencing in smaller meeting rooms, like conference rooms. The Sereno has a 120-degree field of view, a retractable shutter and USB connectivity.

Alero

WEB CONFERENCING AUDIO MIXER
The AMX Alero Web Conferencing Audio Mixer is a dedicated microphone mixer for up to eight microphones, designed specifically for web conferencing applications, such as Lync® or Skype®. It also supports video teleconferencing (VTC) and audio conferencing systems.
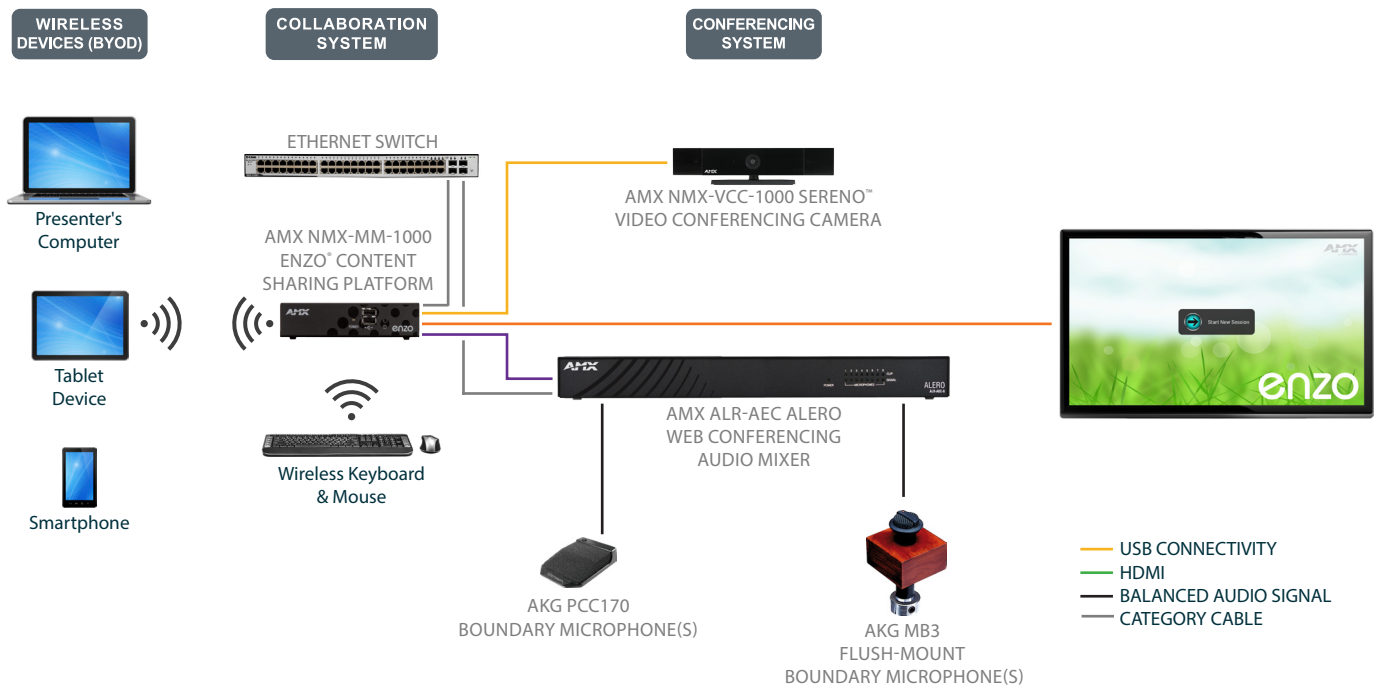

Boundary Layer Microphones

BOUNDARY MICROPHONES
Boundary microphones are excellent for audio conferencing applications. Boundary microphones provide a wide pickup pattern for picking up multiple people seated close to each other. AKG by HARMAN has a diverse offering of Boundary microphones that are perfect for conferencing systems.

TIPS FOR COLLABORATION & CONFERENCING SYSTEMS IN CONFERENCE ROOMS

- Provide at least one Boundary microphone for every two seats.
- If using a camera for video conferencing, note line-of-site issues.
- If using a Pan-Tilt-Zoom camera, provide a button on or near the Boundary or Gooseneck microphone for a presenter to push, so the camera can zero-in on their location.
- Plan network permissions before installing Enzo, so presenters and students have access to files and can use the onboard applications.
- Provide appropriate AV cables for collaboration system at student tables if wireless screen-sharing capabilities are prohibited.

COLLABORATION & CONFERENCING SYSTEM CONCEPT FOR CONFERENCE ROOMS

WIRELESS DEVICES (BYOD)

COLLABORATION SYSTEM

CONFERENCING SYSTEM

ETHERNET SWITCH

Presenter's Computer

Tablet Device

Smartphone

AMX NMX-MM-1000 ENZO® CONTENT SHARING PLATFORM

AMX NMX-VCC-1000 SERENO™ VIDEO CONFERENCING CAMERA

Wireless Keyboard & Mouse

AMX ALR-AEC ALERO WEB CONFERENCING AUDIO MIXER

AKG PCC170 BOUNDARY MICROPHONE(S)

AKG MB3 FLUSH-MOUNT BOUNDARY MICROPHONE(S)

— USB CONNECTIVITY
— HDMI
— BALANCED AUDIO SIGNAL
— CATEGORY CABLE

MORE RESOURCES:

ENZO® by AMX: http://www.amx.com/products/NMX-MM-1000.asp

SERENO™ by AMX: http://www.amx.com/products/NMX-VCC-1000.asp

ALERO by AMX: http://www.amx.com/products/ALR-AEC-8.asp

AKG Boundary Microphones: http://www.akg.com/pro/microphones/speech-spoken-word/boundary-layer-microphones
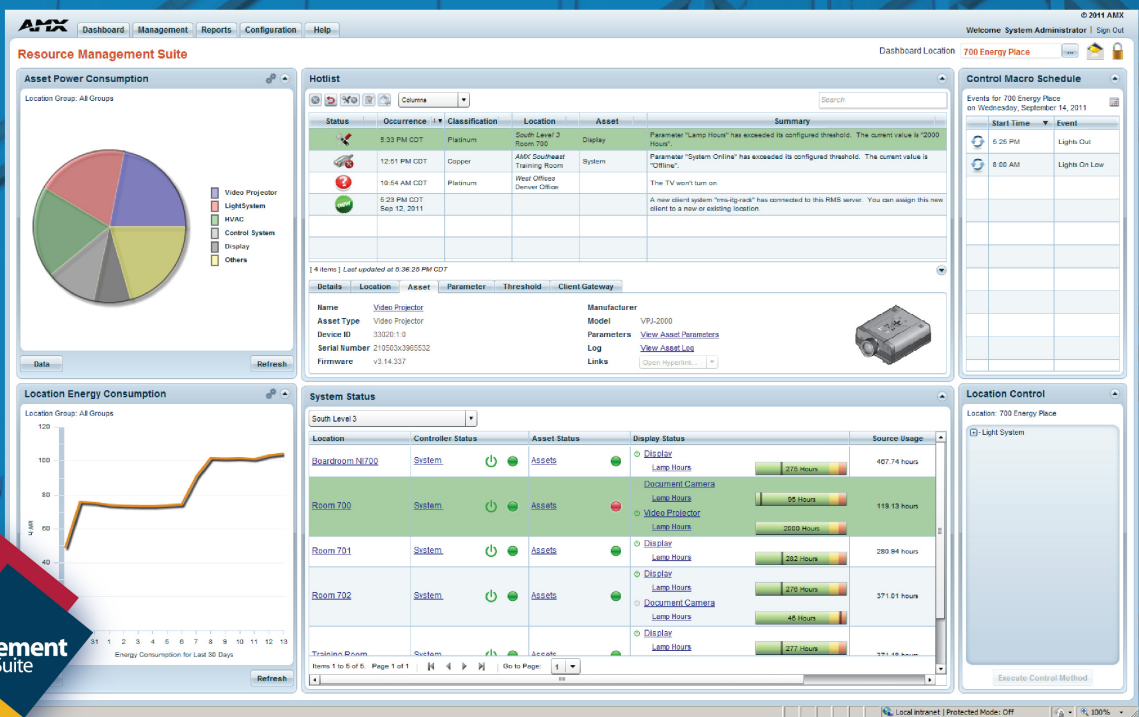
RESOURCE MANAGEMENT FOR CONFERENCE ROOMS: AV ASSET MANAGEMENT

It happens far too often. The institution invests in AV equipment, only to find that they are constantly chasing issues due to the lack of a centralized system for monitoring and managing the equipment. Even more frustrating, support personnel must visit each room in person to troubleshoot problems, since they have no way to communicate remotely with the AV equipment.

Resource Management Suite (RMS) Enterprise is scalable client/server-based software for IT and AV managers that provides remote management and scheduling capabilities for AV assets and building systems. The software features a user-friendly dashboard, making it easy to centralize the management and monitoring of AV equipment, lights, HVAC and other building functions. This allows IT and AV managers to proactively maintain AV displays before a bulb burns out and receive immediate notification when a device goes offline.

The RMS Dashboard

WIDGET-BASED GUI
RMS Enterprise includes a fully customizable dashboard layout for each secure user, including visual bar graphs, user-defined status and notifications, and hotlists displaying all current system exceptions and issues.
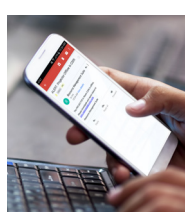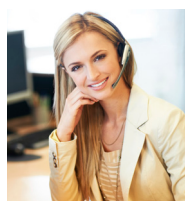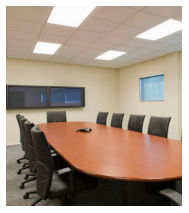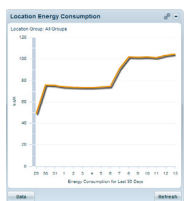
GO GREEN WITH ENERGY MANAGEMENT
Save money and the environment by remotely turning off equipment when the conference room is empty or on weekends. Track and run reports on energy usage for monitored assets.

CENTRALIZE THE AV SUPPORT DESK
Centrally monitor AV technology problems right from your IT support desk and remotely control AV devices in the lecture hall when users call in for help.

SOLVE TECHNOLOGY ISSUES PROACTIVELY
With active monitoring of AV technology in the conference room, AV support staff can setup automatic email alerts that give them the ability to proactively respond to issues as soon as they arise.

RESOURCE MANAGEMENT FOR CONFERENCE ROOMS: SCHEDULE MANAGEMENT

A college campus runs on classes and meetings, which are allocated facility resources through a master calendar. Schedule management systems, like Exchange, Lotus Notes or Google Calendar, provide a platform to centrally create and change schedules, so campuses can efficiently manage their conference rooms. Once this schedule is created, however, how do students and instructors know if there is a room change, time change, cancellation or if that space is available for the next hour?

AMX's RMS Enterprise Scheduler is a comprehensive room schedule module that assists students and instructors in locating rooms by displaying the scheduled events on a touch panel adjacent to room entrances. It eliminates delays in meeting start times by automating the room technology, thereby eliminating the time typically spent on equipment setup.

CORE SCHEDULE SOLUTION PRODUCTS

RESOURCE MANAGEMENT SUITE ENTERPRISE SCHEDULER
Schedule rooms from any touch panel or PC. Integrate RMS with many popular scheduling platforms and display the room schedule on touch panels.

QUICK RESPONSE SCHEDULING
An alternative to a touch panel, this sleek acrylic wall panel displays the room schedule on mobile devices by scanning a QR code. It is elegant looking and simple to install without wires.

MODERO S SERIES TOUCH PANEL
Modero is a cost-effective way to display schedules outside any room. Mount on virtually any surface, including glass, and easily view red/green room availability lights to determine occupancy.

For more information about Resource Management Suite, please visit: http://www.amx.com/resourcemanagementsuite/

BRINGING TOGETHER THE HARMAN CONFERENCE ROOM AV SYSTEM

Our diverse catalog of audio, video and control technology builds comprehensive audio visual systems for conference rooms.

In this diagram, we demonstrate an approach to merging AV Control & Automation, Collaboration & Conferencing, Sound Reinforcement, and Room Scheduling & AV Asset Management systems together to create one unified system.

For more technical resources on our brands and product families featured in this diagram, we suggest the following websites:
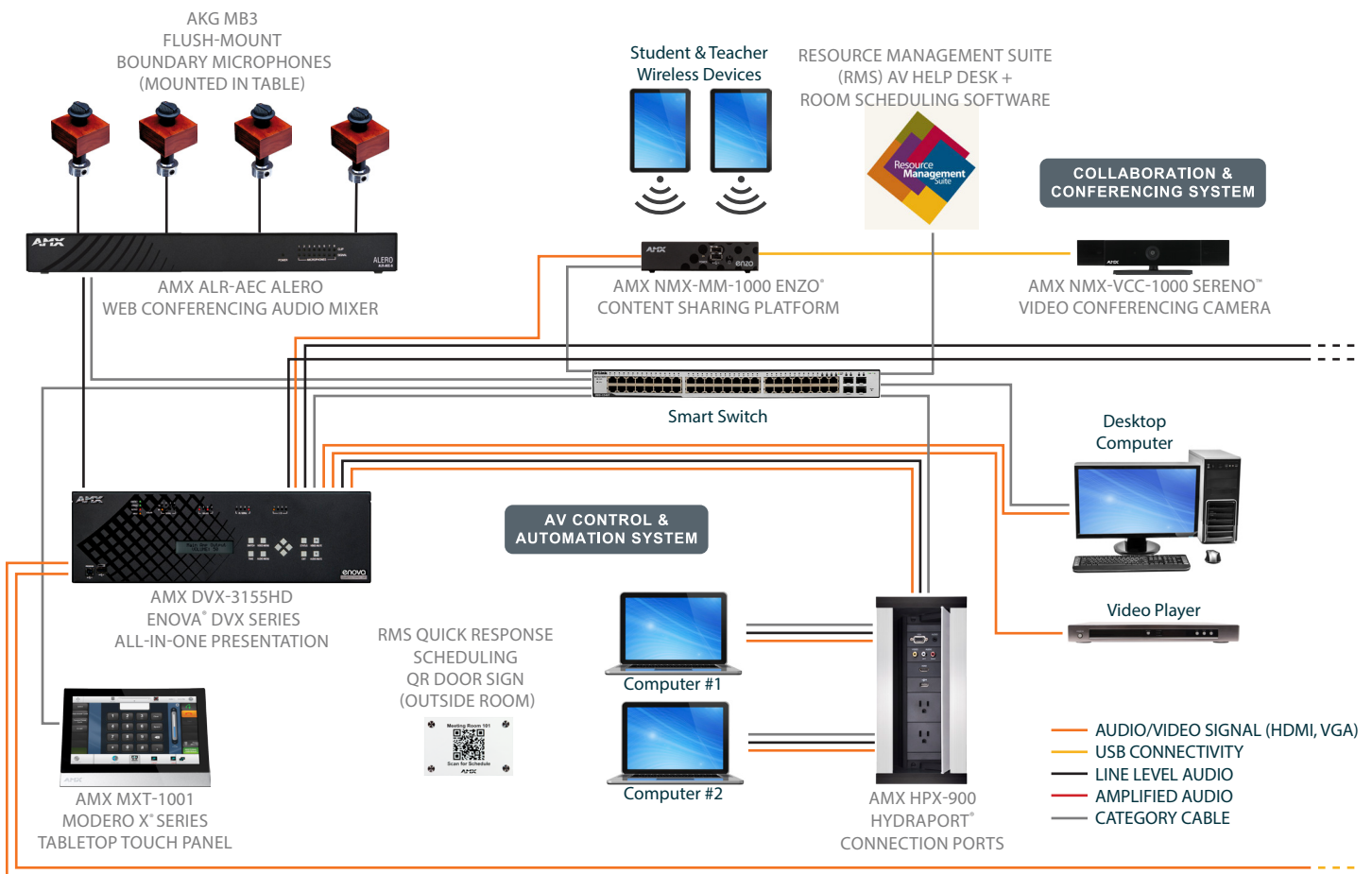
AKG http://www.akg.com/pro/microphones/speech-spoken-word

AMX http://www.amx.com/productinfo/

crown http://www.crownaudio.com/en-US/product_families/comtech-drivecore

JBL PROFESSIONAL http://jblpro.com/www/products/installed-sound/cbt-series
http://jblpro.com/www/products/installed-sound/control-40-series

HARMAN CONFERENCE ROOM AV SYSTEM CONCEPT

AKG MB3
FLUSH-MOUNT
BOUNDARY MICROPHONES
(MOUNTED IN TABLE)

Student & Teacher
Wireless Devices

RESOURCE MANAGEMENT SUITE
(RMS) AV HELP DESK +
ROOM SCHEDULING SOFTWARE

COLLABORATION &
CONFERENCING SYSTEM

AMX ALR-AEC ALERO
WEB CONFERENCING AUDIO MIXER

AMX NMX-MM-1000 ENZO®
CONTENT SHARING PLATFORM

AMX NMX-VCC-1000 SERENO™
VIDEO CONFERENCING CAMERA

Smart Switch

Desktop
Computer

AV CONTROL &
AUTOMATION SYSTEM

AMX DVX-3155HD
ENOVA® DVX SERIES
ALL-IN-ONE PRESENTATION

RMS QUICK RESPONSE
SCHEDULING
QR DOOR SIGN
(OUTSIDE ROOM)

Computer #1

Computer #2

Video Player

AMX MXT-1001
MODERO X® SERIES
TABLETOP TOUCH PANEL

AMX HPX-900
HYDRAPORT®
CONNECTION PORTS

— AUDIO/VIDEO SIGNAL (HDMI, VGA)
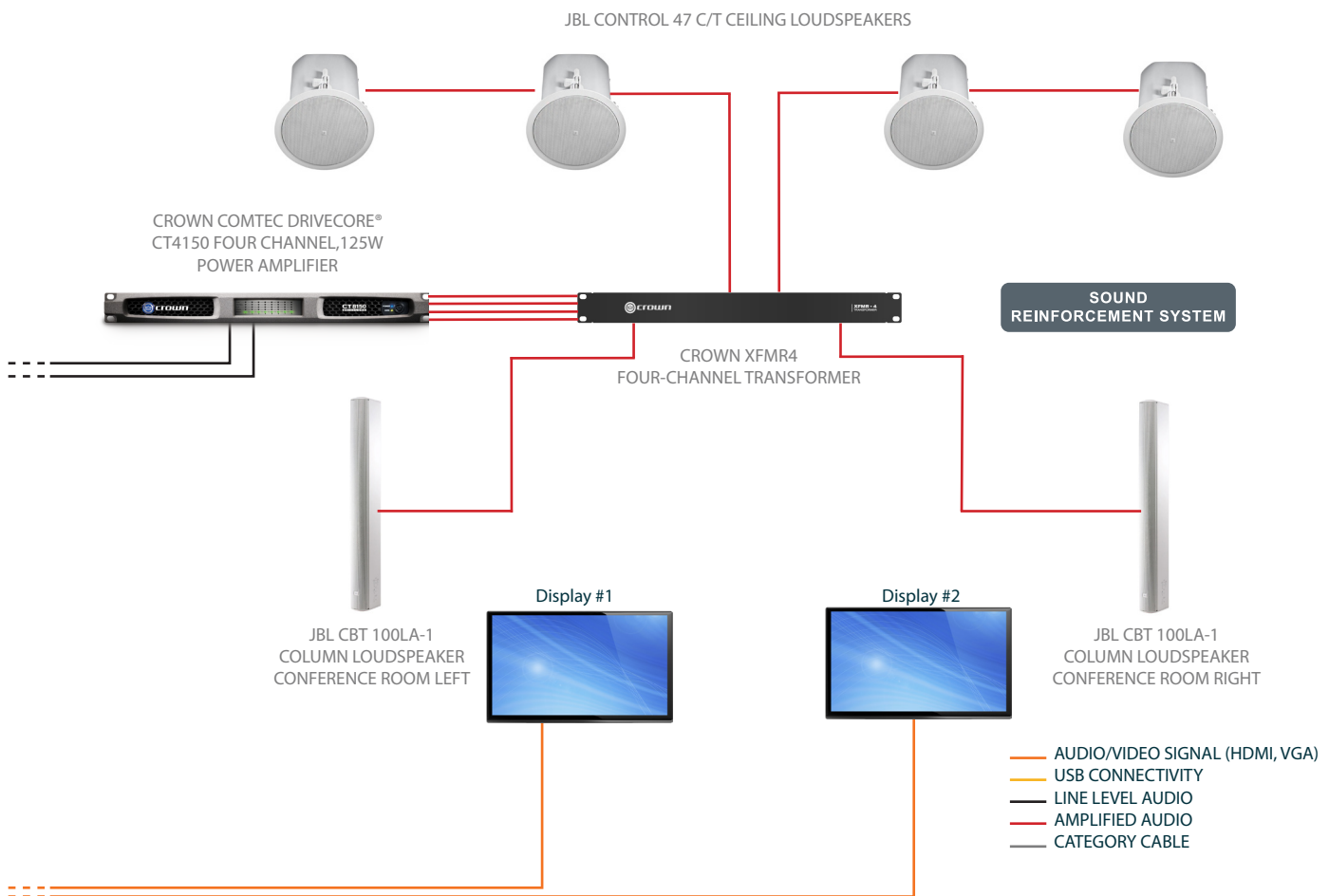— USB CONNECTIVITY
— LINE LEVEL AUDIO
— AMPLIFIED AUDIO
— CATEGORY CABLE

FOR MORE INFORMATION

Email us: education@harman.com

To contact a member of our Education Business Development Team,
visit: http://www.amx.com/automate/contactamx/

HARMAN CONFERENCE ROOM AV SYSTEM CONCEPT (continued)

JBL CONTROL 47 C/T CEILING LOUDSPEAKERS

CROWN COMTEC DRIVECORE®
CT4150 FOUR CHANNEL,125W
POWER AMPLIFIER

CROWN XFMR4
FOUR-CHANNEL TRANSFORMER

SOUND
REINFORCEMENT SYSTEM

Display #1

Display #2

JBL CBT 100LA-1
COLUMN LOUDSPEAKER
CONFERENCE ROOM LEFT

JBL CBT 100LA-1
COLUMN LOUDSPEAKER
CONFERENCE ROOM RIGHT

AUDIO/VIDEO SIGNAL (HDMI, VGA)
USB CONNECTIVITY
LINE LEVEL AUDIO
AMPLIFIED AUDIO
CATEGORY CABLE

About HARMAN Professional Solutions

HARMAN Professional Solutions is the world's largest professional audio, video, lighting, and control products and systems company. We serve the entertainment and enterprise markets with comprehensive systems, including enterprise automation and complete IT solutions for a broad range of applications. Our brands comprise AKG Acoustics®, AMX®, BSS Audio®, Crown International®, dbx Professional®, DigiTech®, JBL Professional®, Lexicon Pro®, Martin®, Soundcraft® and Studer®. These best-in-class products are designed, manufactured and delivered to a variety of customers, including tour, cinema and retail as well as corporate, government, education, large venue and hospitality. In addition, our world-class product development team continues to innovate and deliver groundbreaking technologies to meet our customers' growing needs. For scalable, high-impact communication and entertainment systems, HARMAN Professional Solutions is your single point of contact.