INTEGRATION GUIDE TO

MEETING SPACES

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CONTEMPORARY WORKPLACE TRENDS THAT FAVOR OPEN-PLAN OFFICES, COMBINED WITH A HIGHLY MOBILE AND COMMUNICATIONS-DEPENDENT WORKFORCE, ARE REDEFINING MEETING SPACES.

Desks and dedicated offices are fading away at the precise moment when productivity depends on the need to meet, discuss, and collaborate on projects in a dynamic and visually rich way.

Moreover, as the number of millennials increase in the work force, the style preference during meetings is gravitating towards one of engaging, informal, smaller meetings to interact and collaborate through work projects.

Meanwhile, gigantic conference rooms remain unoccupied, perpetually reserved but unused by the smaller groups that need to meet quickly and conduct regular check-ins.

This combination of factors, coupled with rising real estate costs that place square footage at a serious premium, are increasing demand for a variety of audiovisual presentation, collaboration and communication tools in every nook and cranny where a spontaneous or planned meeting might occur.

For AV integrators tasked with outfitting these meeting spaces with user-friendly and effective tools for collaboration and communication, this is a step-by-step guide to building effective conference rooms and huddle spaces. Guidelines for needs analysis, room sizing, furniture selection and placement & technology optimization are provided to ensure that clients can easily meet with success.

Middle Atlantic Products

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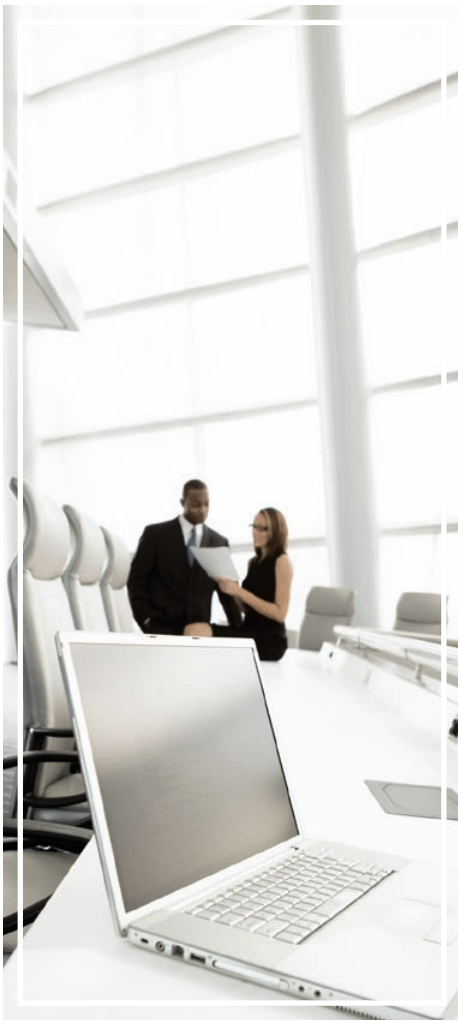


NEEDS ANALYSIS

In order to build a meeting space that is easy to use and produces effective results for the client, start by asking users to take a look at their day-to-day workflow. Then find out more about how meetings will be conducted and attended and whether a majority are formal, planned sessions or more quick collaboration huddles. Lastly, be sure to talk through the use of technology in the space and any regulations that you will need to abide by when designing a solution. If need be, spend time watching and sitting in on meetings to fully understand the needs of the client.

Some considerations and questions to start with to uncover the needs of the space include

WORK FLOW

Meeting styles vary from organization to organization, and even from department to department. Agendas differ for small groups who gather frequently compared to large, formal gatherings.

In order to design the layout of a room and outfit it with the appropriate technology, it's important to determine what elements make up the work-flow in the space. Knowing whether an individual leads each meeting from a lectern or a group participates as a whole will determine table and seating styles. Tthe frequency of meetings will dictate whether people are familiar with the room elements or if technology has to be learned again every time.

- How do they work as a team?
- How often do smaller teams meet?
- How frequently do larger groups gather?
- Do presenters stand at the front of the room?
- Will presenters use a lectern? When?

Lecterns, like the L5 Series shown here, provide a presentation area that can match the aesthetics of the rest of the meeting space with finishes in veneer, high-pressure laminate and thermolaminate.

MEETING STYLE

After the overall workflow has been identified, digging in to the specifics of day-to-day room use will be vital to establishing an effective set-up. Asking members of departments how their meetings transpire helps to paint a picture of how work gets done or what may be inhibiting progress.

Meeting types are also defined by conferencing needs, and by the number of remote and local participants and how often they connect.

- Which types of meetings are led by one person, and which are more collaborative?
- How often do they need to connect visually with remote participants?
- What size are the groups on either end of videoconferences?
- Who in the room needs to be seen remotely via video?
- What do they feel is missing from their current meeting experience?
- Is the space a multipurpose space? If so, what are the different functionalities?

CONTENT TYPE

Gone are the days of simple slide-advancing software and here is an influx of audiovisual information from a multitude of sources. In-room presentation technology, online content and material from mobile devices are just some of the potential inputs for a meeting.

Find out if a regular meeting is spread-sheet-centric or a multimedia extravaganza in order to deliver the level of detail or advanced support to promote a more productive gathering.

- Is there a centralized source to drive content such as a computer for participants to sign in and use?
- What types of groups will be using the room?
- Is the group (or groups) to use the room more number and data driven or visual?

TECHNOLOGY USE

With so many technological tools in play whenever meetings happen, specifics are critical to the success of AV support. Get to know the source types and resolutions that may be displayed via a flat panel or projector. Take a look at how whiteboards or their interactive equivalent are used. And don't forget those PCs, laptops, mobile phones and tablets. All those gadgets need power and secure connectivity to displays and networks, and possibly audio systems for sharing and collaboration in the room and beyond to remote meeting participants.

- Do meeting participants walk in with a mobile device and expect to share visual information from it?
- Is their mobile device usually nearing end of battery life when they start a meeting?
- Which technologies do they currently use to share visual information?
- Which tools are effective, which are lacking?
- Do they use wall charts or white boards?
- How are meeting notes and data recorded and shared?
- What security and privacy concerns exist?
- Have you standardized on specific technologies that should be considered for a meeting space install?

COMPLIANCE

Beyond the functionality and desired form of the meeting space, the client may prefer or even need certain compliances. Consider asking about these but also research any ratings, regulations, and other local, state, or federal legislation that may dictate the type of system deployed including ADA compliance.

- Do you want/need Greenguard certified products?
- Is there any governmental restriction when determining what solution to select?

DEFINE THE ROOM

Meeting spaces differ for many reasons-in particular due to type of function and size but also the prescribed design finishes and technological flourishes. At present, workplace trends tend to divide collaborative spaces up into two major types based on the number of participants:

CONFERENCE ROOM

FOR LARGER GROUPS AND FORMAL GATHERINGS

6-30 PEOPLE

Deployed in many areas throughout a company to support visual communication needs, conference rooms and board rooms work best when they provide consistent, reliable and predictable operation. In a standard-sized setup, these rooms seat anywhere from six to 30 or more participants at a central table, with additional seating available for larger groups.

Audiovisual technology enables presenters to share information with local and remote meeting attendees via video display, audio and videoconferencing technologies, and white boards or other digital collaboration tools.

OR

HUDDLE SPACE

FOR QUICK COLLABORATION ON THE FLY

3-7 PEOPLE

Smaller in size than standard conference rooms, huddle rooms are defined spaces either in isolated rooms or simply partitioned off from a department in an open-plan office space. These rooms typically accommodate three to seven people, and average around 85-170 square feet.

Huddle rooms are dense with technology to allow quick, seamless communication and collaboration, with a video display setup to share images from mobile devices, internal servers or the web, and videoconferencing technology to bring in remote participants. In some cases, white boards are specified for analog collaboration.

HUDDLE SPACE VS. HUDDLE ROOM

The industry usually refers to huddle rooms as those smaller meeting spaces for quick, informal pow-wows that are enclosed by four walls, whereas huddle spaces provide the same functionality, just in open areas. In this guide, we will be using the term huddle space to refer to both walled and open huddle areas.

SIZING UP THE SPACE

MEASURE ROOM DIMENSIONS

- Measure the room's length and width to establish square footage. Note door locations and provide 48" clearance for these entrances. Include any obstructions such as columns and other furniture.

TYPICAL SIZES AND CAPACITIES FOR MEETING SPACES		
ROOM TYPE	AVERAGE DIMENSIONS	CAPACITY
Board Room	30' x 20'	20-22 around a table with space for additional seating
Meeting Room	15' x 30'	14 people around a table with space for additional seating
Large Conference Room	20' x 15'	10-12 around a table with space or additional seating
Medium Conference Room	12' x 15'	6-8 at a table
Huddle Space	12' x 10'	4-5 at a table
Training Room	30' x 20'	16 in a standard classroom layout with space for presentation materials or displays

- For lecterns, allow for at least an extra three square feet of space at the front of the room.

ACTUAL FURNITURE SIZE		
FURNITURE PIECE	AVERAGE WIDTH	AVERAGE DEPTH
Credenza	55" – 65"	24" – 32"
Lectern	20" – 45"	24" – 34"
Chairs	22" – 30"	18" – 24"
Video Cart	36"	20" – 26"

- Allow extra space for circulation in front of whiteboards or touch screens if participants stand to present.

HOW TO SIZE A MEETING ROOM

The appropriate size for a conference room depends on a multitude of factors (i.e., Audio Visual needs, maximum group size vs. typical group size, frequency of use, video and teleconference requirements); however if you allocate 20-25 square feet per seat in the early planning stages you will be allowing sufficient space which can then be fined-tuned in the Space Planning or design phase later on.

CALCULATE THE AMOUNT OF SPACE PER INDIVIDUAL

- Establish the average number of people who will be meeting in a room and allocate 20-25 square feet per person.
- Huddle spaces generally require a minimum of 24" of linear table space per user
- Meeting rooms average 24-32" of table space per user depending on the chairs selected.

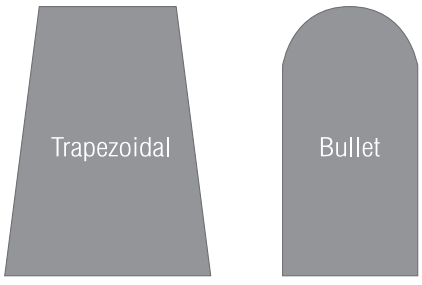
DETERMINE TABLE DIMENSIONS

- Establish a meeting room table's maximum dimensions by adding up the clearances from the wall and subtracting that from the length and width of the room.
- For huddle spaces, subtract only one clearance from room length, as the table usually will be positioned up against a wall.
- Ensure at least 48" between the table and the wall, though 60" is recommended especially for main aisle space.

*The 48" is indicative of 24" clearance behind the chair, and the average of 24" for chair depth. However, if absolutely necessary due to limited space, you can allocate 40" at the very minimum as part of the chair will more than likely be pushed under the table. That leaves 16" of chair still left out with 24" behind the chair.

MEETING SPACE CAPACITY CHART			
MINIMUM ROOM SIZE	OPTIMUM ROOM SIZE	SEATING CAPACITY	TABLE SIZE
13'L X 12'W	15.5'L X 13'W	4 - 6	60"L X 30"W
14'L X 12'W	15.5'L X 13'W	4 - 6	72" X 48"W
15'L X 12'W	16.5'L X 13'W	4 - 6	84" X 48"W
16'L X 12'W	17.5'L X 13'W	6 - 8	96"L X 48"W
18'L X 12'W	19.5'L X 13'W	8 - 10	120"L X 48"W
20'L X 12'W	21.5'L X 13'W	10 - 12	144"L X 48"W
21'L X 12'W	22.5'L X 14'W	10 - 12	150"L X 48"W
22'L X 12'W	23.5'L X 14'W	12 - 14	168"L X 58"W
23'L X 12'W	24.5'L X 14'W	12 - 14	180"L X 58"W
24'L X 12'W	25.5'L X 14'W	14 - 16	192" X 58"W
28'1L X 12'W	29.5'L X 14'W	18 - 20	240"L X 58"W
32'L X 12'W	33.5'L X 14'W	22 - 24	288"L X 58"W

BEST TABLE SHAPES FOR VIDEOCONFERENCING AND COLLABORATION



Videoconferencing Collaboration

CONSIDER VIDEOCONFERENCING NEEDS

- For videoconferencing applications, plan for additional clearance at the front of the table so that the nearest seat is placed in accordance with the viewing angle width of the camera.
- For videoconferencing applications, select a table shape that tapers in a trapezoidal or V shape to allow the camera to capture all participants' faces. Rectangular tables will cause participants further from the camera to be blocked by those ahead of them along the table's edge. And boat-shaped tables present the same visibility challenge.

CONFERENCE ROOM QUICK MATH

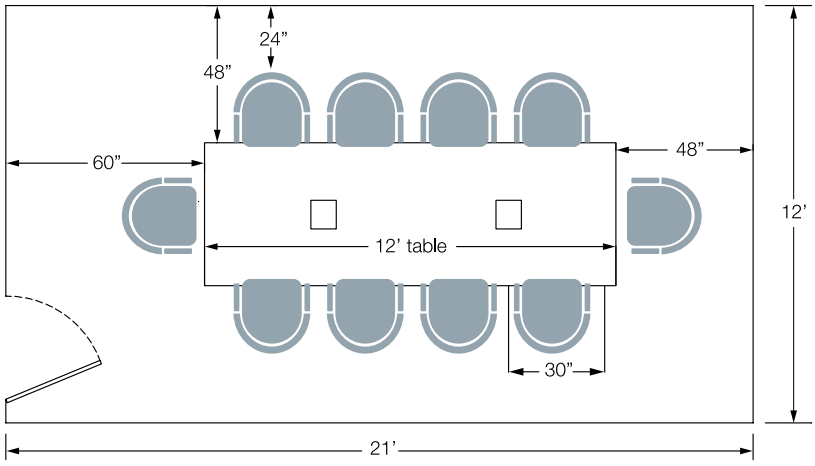
ROOM LAYOUT EXAMPLE

Determine the maximum table dimensions: First, measure the room dimensions and multiply for the total square footage:

- 21' x 12' = 252ft²

Determine the number of people that can fit in the room comfortably:

- 252 ft². ÷ 25 ft² per person = 10.08 or 10 person capacity



Subtract clearances for potential table dimensions:

- 21' room length x 12"=252" long – (60" + 48")* = 144"
- 12' room width x 12"=144" wide – (48" x 2)* = 48"
- Remember, 48" is the minimum clearance between table and chair, but 60" is recommended especially for main aisles.

The 144" by 48" or 12'x4' is the potential surface area for a table.

To verify the table will accommodate the room occupancy limit, take the length of the table and divide by the 24-32" table space per user:

- 144" ÷ 30" in this case = 4.8 or 4 people/seats per side of the table with one seat on each end for a total of ten spots. This matches our 10 person occupancy level that we solved for earlier.

HUDDLE SPACE QUICK MATH

ROOM LAYOUT EXAMPLE

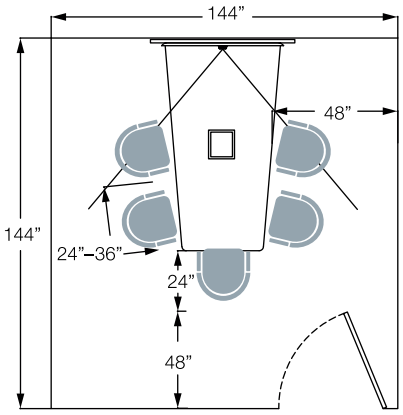
Here's an example of a huddle space, assuming the table is up against a short wall:

Room Width:

- 144" - 96" (48" clearance x 2) = 48"

Room Length:

- 144" - 48" (door/walk in clearance) - 24" (seat space) = 72"



From this, we see that we can have a 48" x 72" table in this room, where we have adequate space for 5 persons plus a few seats for additional participants along the back wall.

DISPLAY SIZING AND POSITION

Determine the size of a flat panel display or projection screen by establishing the maximum comfortable video viewing distance, which by rule of thumb is a factor of eight times the image height. For detailed viewing, plan for a factor of six times the image height or four times image height in cases of close inspection of complex information.

FLAT PANEL DISPLAYS

NUMBER OF DISPLAYS

- Larger meeting rooms accommodating up to 20 participants sharing presentation content and/or videoconferencing may be served by one or two 55”-80” flat panel displays.
- Smaller meeting rooms or huddle spaces typically need a single 32”-55” flat panel display with digital signal inputs.

WHERE TO MOUNT

- Meeting Rooms: Wall-mounted or mounted to meeting space furniture with the display’s bottom edge at 48” above the finished floor, providing viewing clearance above standard 30” high table.
- Huddle Spaces: Wall-mounted or hung on a display stand directly on the wall abutting the meeting table. Table viewing clearance is not as critical for close viewing by smaller groups.

PROJECTION SCREENS

WHERE TO MOUNT

- In many instances, the display height should be between 4 to 8 times the length from the furthest seat at the table. For instance if viewing charts and data in a meeting space, multiply the height of the screen by 4 to determine maximum distance.
- For widescreen format projection screens, the formula recommended for height calculation is 1/3 the distance from projection screen to the furthest seat in the room.
- For HDTV formats, determine screen width by multiplying the height by 1.78.
- Place the projector at a distance 1.5 times the width of the screen.

VIDEOCONFERENCING

- Cameras should be placed as close and centralized to the display as possible so local participants appear to be lookin directly at remote participants as they view them through the screen. The optimal camera height is based on the 95th percentile seated eye height, which is 42-52", but generally 42-46" works for most applications.
- Seating placement should accommodate for a generous distance between the display/camera setup and the first seated in-room participant, so the video image of those in the room appears even and natural.
- A PTZ camera mounted at the front of the room beneath the video display or between two displays can be augmented with a second camera providing a lectern shot where needed.

DISPLAY PLACEMENT QUICK MATH

HEIGHT OF A TYPICAL CONFERENCE TABLE:
30" above finish floor

TYPICAL CEILING HEIGHT: 96"
Comfortable Viewing Height for Video Display: 18" above tabletop height, or 48" from floor to bottom edge of the screen in most meeting rooms

MAXIMUM SCREEN HEIGHT:
Most displays or projection screens will be mounted so the bottom edge is 48" above the floor, so maximum screen height is the difference between ceiling height and 48". In a room with 96" ceiling and the bottom edge of the display at 48" above the floor, maximum screen height is 48".

WALL WIDTH:
Maximum Screen Height is actually limited by the factor of room width. To continue with the example above, a typical 16:9 format display in a room with a 96"-high ceiling and a maximum screen height of 48", the width of the image would be 85.3". That works fine for a video projection setup in a large meeting room, but a smaller meeting room will likely have a narrower width, and be served by a flat panel video display.

ROOM DEPTH:
For viewing of detailed images, such as those containing charts and data, screen height should be at least 1/4 the distance from the screen to the furthest seat. If the screen is expected to deliver full resolution HDTV projection (16:9), the screen height should equal or exceed 1/3 the distance from the screen. In this case with a 48" maximum screen height, the furthest seat would be 144" (or 12') away.

AV INFRASTRUCTURE CONSIDERATIONS

ALL-IN-ONE FURNITURE

Trending now are all-in-one furniture solutions that meet the aesthetic demands of meeting room designers while providing discreet equipment mounting close to the point of use. Store AV equipment in purpose-built collaboration furniture, credenzas, table pedestals and lecterns with integrated cable management and cooling for the most aesthetically-pleasing and streamlined install without cable clutter and equipment strewn about.

In conference room spaces, specifically consider pedestals that support the tabletop but also house and mount technology within as well as provide cable management. With these options, less space can be dedicated to technology placement and more to additional conference room needs or user personal space. To complement technology pedestals, workstation cable management solutions can be integrated into the table directly placed over the pedestal to extend AV, power, and networking signals via cables to the point-of-use. If more storage and counter space is required, credenzas are also a nice touch and can serve as multipurpose furniture housing equipment plus provide storage for supplies, recycling receptacles, and more.

Additionally, many conference rooms will incorporate a presentation area that includes a lectern at the front of the room. As discussed previously, ensuring appropriate footage for clearance is important; other considerations include ability to support equipment within and appropriately regulate temperature to protect said equipment.

Other options for conference rooms and even more well-suited for huddle spaces are collaboration furniture stations. Bullet shaped collaboration furniture encourages group interaction and productivity within in-person huddles; however, for spaces where teleconferencing is required, an angled shape will ensure that all individuals in-room can be seen and participate. Remember to look for solutions that incorporate storage for small device mounting and power as well as cable and thermal management directly in the furniture piece as well as mounting capability for displays.

Finally, where there's a need for flexible, mobile presentation functions, look for high-capacity display carts that also include equipment mounting.

Hub is a technology-ready, all-in-one furniture solution for collaborative meeting spaces.

MATERIAL MATTERS

Many office furniture manufacturers choose to make products with laminate material because of its durability in the workplace, lower cost for the customer and wide variety of finishes. However, a common misconception is that all laminate products are the same. This is not the case. So what's the difference? Is one better than the other? Let's take a few minutes to dig into the details of each:

- Thermolaminate (also known as TLAM)
- High Pressure Laminate (HPL)
- Veneer

C5 in Café Noir
thermolaminate finish

THERMOLAMINATE

Thermolaminate is a Polyvinyl Chloride (PVC) laminate that ranges from 8mm to 16mm in thickness. It is applied using a combination of glue, heat and pressure to a wood substrate, typically Medium Density Fiberboard (MDF). It provides a cost-effective, durable surface that can adapt to a variety of shapes, making it quite versatile in allowing for smooth contours and transitions. These laminates are available in a growing number of finish styles and colors.

Thermolaminate is a good option where there is a need for a cost-effective surface with medium wear and abrasion properties, and where smooth, curved shapes and a comfortable edge profile are preferred.

HIGH PRESSURE LAMINATE

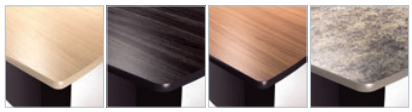
HPL is the most commonly used laminate. It is comprised of multiple layers of resin-treated paper fused together during manufacturing. HPLs can be adhered to a variety of substrates, have a dimensional behavior similar to wood, and expand and contract with humidity.

High Pressure Laminate
with T-Molding

They are recommended for any application in which durability and impact resistance are concerns, may be used for both vertical and horizontal surfaces, and have a low initial cost and a lifespan of five to fifteen years. HPL is also available in hundreds of designs and multiple finishes.

Because HPL is generally laminated only to the flat sections of the furniture, there is a need to cover the edges of the wood. This is done in several ways, depending on the application:

- PVC Edgebanding: This is the most widely used edge treatment, and it comes in thicknesses of 0.5mm, 2mm, and up to 3 mm. It is applied using an edgebanding machine for both straight and rounded edges.
- T-mold: A good option for rounded corners, T-mold comes in different thicknesses and shapes. It is pounded into place using an air hammer along a slotted edge of the board. Wood-grain colors and solid color options are limited compared to PVC edgebanding.



- Self Edge: Strips of HPL are applied to the edge using an edgebanding machine.
- Post-Formed Edge: The laminate on the top surface is wrapped around the edge. It is used on some kitchen counter tops and desks, but is considered to be an obsolete style.

VENEER

Veneer is a decorative covering using real wood skin that is glued to a substrate, and then finished with stain and clear-coat. Veneer is typically laminated over a substrate of MDF, plywood or particle board. Because the process of laminating with real wood involves more expensive material and considerably more labor, it is considered the most expensive of the popular laminate types. It is also considered the closest thing to using solid wood products, at a lower price-point than solid wood.

Given the vast range of wood species available, the various methods for laminating and the possibilities for stain colors, the visual possibilities are almost endless. However, since the surface is real wood, the overall durability of a wood veneer surface is considered lower than other laminates.

Veneer is a good choice when considering more sophisticated environments, such as formal board rooms, customer-facing meeting rooms, and anywhere that a more polished look is required.

MILLWORK KITS

Unique design specifications from an architect or designer don't take you out of the game. Some manufacturers offer millwork kits for their furniture products that allow wood shops to create custom wood finishing that is then fastened

COMPARING WOOD FINISHES

	Price	Lead Time	Durability	Wood-Like Appearance	Designer Preferred
Veneer	$$$$	○	○	●	●
HPL	$$$	◒	●	◒	●
Thermolaminate	$	●	◒	◒	○

Key ○ Acceptable ◒ Favorable ● Very Favorable

CHECK FOR CERTIFICATION

If the client said "yes" to Greenguard during the needs analysis, here is what you need to know. Greenguard established standards that define the products and processes with low chemical and particle emissions for use indoors. The standards are primarily for building materials, finishes, interior furnishings, furniture, cleaning products and electronic equipment & help contribute to healthier internal environments within office spaces. Ask the manufacturer of your meetingspace solutions, in particular furniture solutions, if they are Greenguard certified.

EQUIPMENT ENCLOSURES AND CABLE MANAGEMENT

Rack Enclosures used to be the primary solution for meeting space installations. Today, floor standing enclosures are still prevalent for large-scale conference rooms with a plethora of high end and sensitive equipment; however, now there are new equipment mounting solutions. Rackmounting is now available on the wall, under the table or in furniture.

Complementing the rack at the other end of the install, at the point-of-use, table boxes flush-mounted to the work surfaces and even wall or floor boxes extend power, communication and AV to displays or dedicated areas throughout a room. If cable-runs are necessary and under-floor, in-ceiling or in-wall pathways are not accessible or are full, surface raceway systems such as ADA-compliant overfloor cable raceways and surface mounting raceways can turn cable trip hazards into safe, aesthetically-pleasing solutions for delivering signals to and from endpoints.

DON'T FORGET THERMAL MANAGEMENT

Smaller systems still require thermal management. Consider active or passive options to cool your system. Active thermal management is available with thermostatic controls- meaning it only turns on when needed and only as fast as needed- to ensure minimal noise disruption. Check your units db rating to determine the number of noise decibels emitted. Anything higher than 50 dB could be a hindrance to conversation.

AUDIO/VIDEO CONNECTIVITY

An essential enabler of communication and collaboration, an AV system will only perform as well as the connectivity behind the scenes. Between all the connections on the display and those on the source devices including users' various mobile devices, it's difficult to determine exactly what signal is needed to extend. Since it is the most prevalent connection on modern devices and you can always adapt from this particular signal to accommodate other connection types, let's talk HDMI.

When considering what solution is best for delivering HDMI signals, design for bandwidth and reliability, select options that feature appropriate scalability, implement connectivity that meets user expectations for convenience and ruggedness, and specify those solutions with an eye on meeting budget demands and leveraging existing infrastructure where that is an issue.

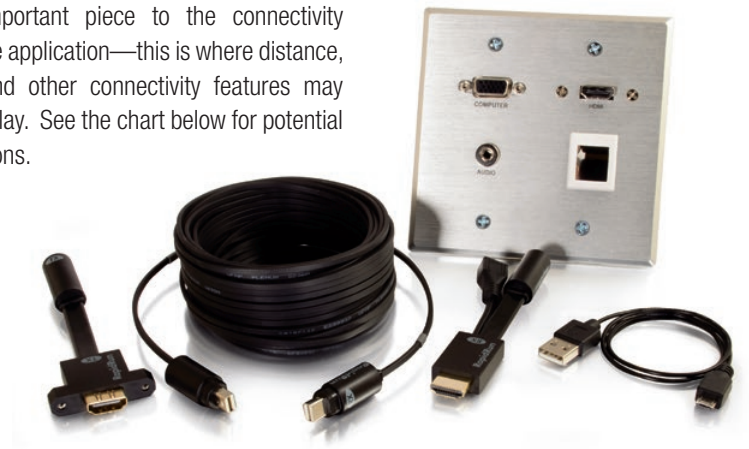
An easy way to begin though is with resolution needs and for this, we will need to discuss the industry buzz word—4K. 4K is AV "shorthand" for video content that offers approximately an 8-million-pixel image and has the proper name UltraHD (UHDTV or UHD). 4K displays and content feature twice as much information as the former best 1080p along each axis. That is to say that a typical 4K LCD display delivers a picture by painting 2160 (1080 x 2) horizontal lines of picture elements. Each line consists of 3840 (1920 x 2) discrete pixels for a total of 8,294,400 pixels or nearly four times the pixel density (picture "quality") of the more traditional 1080p displays.

TAKE ADVANTAGE OF ADDITIONAL RESOLUTION

A typical medium-sized conference room for a dozen or so people needs to employ a 60 inch or larger screen if 4k is the desired resolution in order to truly take advantage of the additional resolution. This will allow viewers to digest the details of a presentation. Or, if meeting goers want to review excel files or even multiple documents on screen at once, and are within recommended viewing distance, the added resolution will add clarity to the collaboration efforts.

But wait, there is one more thing you need to know about digital video images and 4K before you can make a connectivity decision. Not all High Definition video is the same. We have to incorporate "color space" into our thinking. The most common you will see are 4:2:0 and 4:2:2. 4:4:4 full bandwidth UltraHD 4k signals support the uppermost level of 4k content and require a more advanced cable topology such as a fiber-based extension solution.

Another important piece to the connectivity puzzle is the application—this is where distance, location, and other connectivity features may come into play. See the chart below for potential considerations.



The award-winning RapidRun® Optical pictured above is a fiber-based modular cabling system designed to support 4k up to the very limits of 4:4:4:4 RGB UltraHD 4096x2160 video.

	ULTRA FLEXIBLE HDMI	GRIPPING HDMI	IN-WALL HDMI	ACTIVE COPPER CABLE	ACTIVE OPTICAL CABLE	HDBASET 1.0	FIBER-BASED MODULAR SOLUTION
Length	1-6ft	1.5-50ft	1.5-50ft	35-100ft	33-100ft	Up to 328ft	35-1000ft
Jacket Rating	PVC	CL2, In-Wall Rated 15ft-50ft	CL2, In-Wall Rated	CL3, In-Wall Rated	CMP/FT6, Plenum Rated		OFNP, Plenum
Resolution	4k	4k up to 25ft, 1080i 35-50ft	4k up to 25ft, 1080i 35-50ft	1080p	4k	1080p	4k to the very limits of 4:4:4:4 UltraHD
Powering Options	Passive	Passive	Passive	No External Power	No External Power	Flexible Power at Either End	USB Powered at Rx End
Application	Component-to-Compenent Patching & Short Distance Connection	Component-to-Compenent Patching, Short and Mid Distance Secure Connection	Short and Mid Distance Connection	Extension	Extension	Extension	Extension

*These specifications are relevant to the C2G portfolio of HDMI solutions. See the manufacturer-specific specs to understand the capabilities of your chosen HDMI solutions.

ACOUSTICS & SOUND REINFORCEMENT

Background ambient noise can interfere with meeting attendees' ability to hear. This type of noise within the space can be generated from internal sources such as coughing, talking, computers, HVAC systems, ceiling fans and projectors, as well as external sources such as traffic, lawn mowers or playgrounds. These can disrupt the productivity of a meeting. The space and acoustics of a room should be taken into account and a quality microphone and speakers should be included so that meeting participants are easily understood. Choose between table-top mics, goosenecks or ceiling mics, keeping in mind factors of aesthetics and ambient noise.

While huddle rooms often rely solely on video display loudspeakers or soundbars, wall-mount or ceiling speakers should be designed into larger rooms. For videoconferencing purposes, ceiling speakers are the best for sending sound disbursement to all meeting attendees.

An audio amplifier is the heart of a sound reinforcement system in a conference room. The amplifier takes the line level signal produced by the source device, amplifies and distributes it to the speakers throughout the room. The amp can also assist in mixing multiple inputs and even sensor during announcements. It is important to note that an amplifier will only be required for speakers that are not self-amplified. Self-amplified speakers will typically have line level audio inputs, such as RCA or 3.5mm. Speakers that require an audio amplifier will typically have speaker wire connection as inputs. Selecting the proper amplifier helps to ensure that the audio system performs to its maximum potential.

Complete your sound reinforcement system with Plenum Rated Amplifiers that include PA sensors, remote control, and standby mode for energy savings and plenum-rated drop-in ceiling speakers.

POWER

With the proliferation of AV devices, providing reliable, accessible, safe power distribution for personal devices and the AV system is required to keep meetings running smoothly and all endpoints powered up.

Most modern conference rooms are bursting with technology that must be connected and/or controlled with devices powered by DC voltage like room controllers, HDBaseT extenders and small switchers. These DC powered devices would typically be housed under a table, behind a display or in a credenza, completing a smaller-sized system. A centralized DC distribution would remove the wall warts and power clutter in a system where there is limited room and power outlet availability.

Another small footprint power solution ideal when space is at a premium is compact surge devices that provide protection even behind those flat panel displays that are the cornerstone of most huddle space layouts and many conference room designs.

Many meeting space systems, especially conference rooms, may incorporate high end, sensitive equipment to facilitate the collaboration among co-workers both on locale and remote. If a power disruption were to happen, this equipment could experience irreparable damage. The need for assurance comes in the form of reliable backup power including line-interactive and online, double conversion models.

USB is another means of power, and not just for BYOD equipment. Plan for the arrival of USB 3.1 gen 2, which increases data transfer rates to 10Gbit/s (SuperSpeed+) while retaining full backwards compatibility with USB 1.1, 2.0 and 3.0. The power delivery is enhanced up to 20 volts, 5 amps, and 100 watts for power and charging. This will allow for support of traditional mobile device charging, but will also allow a laptop to power a computer monitor or a computer monitor with a power supply to charge a laptop through the new symmetrical, high bandwidth connector in the USB 3.1 spec's USB C connector.

Beyond power charging, protection, and back-up,make sure that electrical conduit, raceway, junction boxes, and floor boxes are sized for the AV system's cabling and connectors. The diameter of cabling used in conferencing systems is larger than data network and telephone cables, and the connectors don't typically fit in standard electrical floor boxes.

Eliminate wall warts and other power clutter in your AV installation with DC Power Distribution, the perfect universal power solution for most DC powered devices like extenders, scalers, converters, and media players.

NETWORK

When installing an AV system in a meeting space, the least complicated design and safest from a security standpoint is to simply wire AV connectivity from the source device(s) to a display—keeping it completely off the network. However, with trends in IP-enabled devices, videoconferencing and AV presentation software, building-wide Wi-Fi is increasingly common and necessary for seamless collaboration in meeting spaces. Hopping from the building Wi-Fi to special AV Wi-Fi networks by incorporating VLANs for isolated access is less convenient, but works well with various wireless AV collaboration tools. When leveraging LANs, users won't be able to access data off the corporate network.

A tiered access networking approach can provide designated access and security points. This will allow for huddle spaces that are closer to the office entrance to use the guest Wi-Fi, and not connect to the company network. As huddle spaces move further into the office, that's when each type of space might be granted different levels of network access.

The ability to integrate meeting space technologies into the broader information and communications infrastructure is critical to maximizing productivity and investments in existing technologies. No matter the approach to networked AV, the building backbone, as in the network infrastructure, needs to be able to support all of this. It may be time to update with newer, higher bandwidth networking hardware, software, and cabling or to install a dedicated AV network to assure performance.

CONCLUSION

The landscape for meeting spaces is evolving to incorporate the burgeoning technological advances that the AV industry continues to discover and to accommodate the expectations of the changing demographics in the workplace with the increase of millennials. With space at a premium, meeting places need to be tech-packed but also designed in smaller packages and definitely need to facilitate both in-person and remote collaboration.

This provides opportunities for AV integrators, beginning with all-in-one furniture to house and properly manage the AV system needs. Meeting space design can promote collaboration and productivity while still maintaining an aesthetically-pleasing, professional look if furniture and other infrastructure needs are selected wisely—appeasing the users but also ensuring higher returns for the integrator.

Additionally, offices will need to install even more meeting spaces in the forms of smaller to mid-size conference rooms and huddle spaces, increasing potential number of installs thus opportunities for AV integrators.

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