The Modern Workspace

Wired and Wireless AV Collaboration

-Karl Rosenberg-

“Build me a Unified Collaborations Space”

JPEG

VTC

skype™

SUPER UHD TV 4K

BlueJeans

4K HDR
HIGH DYNAMIC RANGE

MPEGLA
The Standard for Standards®

POLYCOM®

FaceTime

Bluetooth®

COLLABORATION
SUCCESS
KNOWLEDGE
LEARNING
TOGETHER
PRODUCTION
MANAGEMENT
GROUPS
WORK
PROJECT
COLLABORATIVE
LEADERSHIP
CORPORATION
PEOPLE
GROUP
SOFTWARE
INTERNET
TOOLS
HELP
SOCIAL
ORGANIZATION
IMPROVE
CITATIONS

zoom

Cisco
webex

HEVC
H.265 - HIGH EFFICIENCY VIDEO CODING

4K UHD
COMPATIBLE

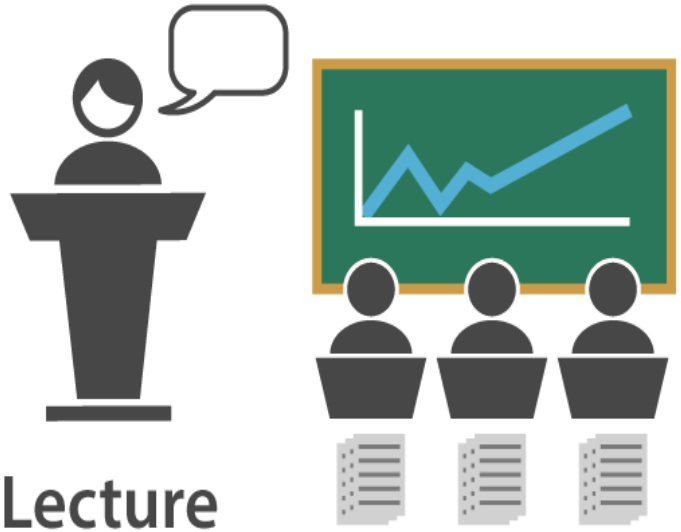
4K 30
ULTRAHD

Vidyo
Personal Telepresence

YouTube

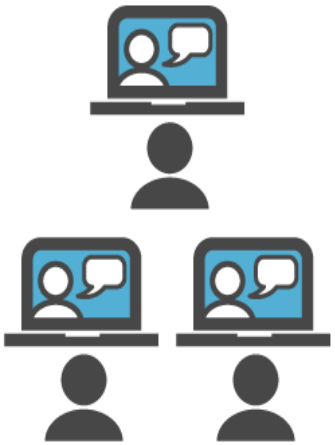
VP9

TRADITIONAL



Lecture

FLIPPED



Lecture

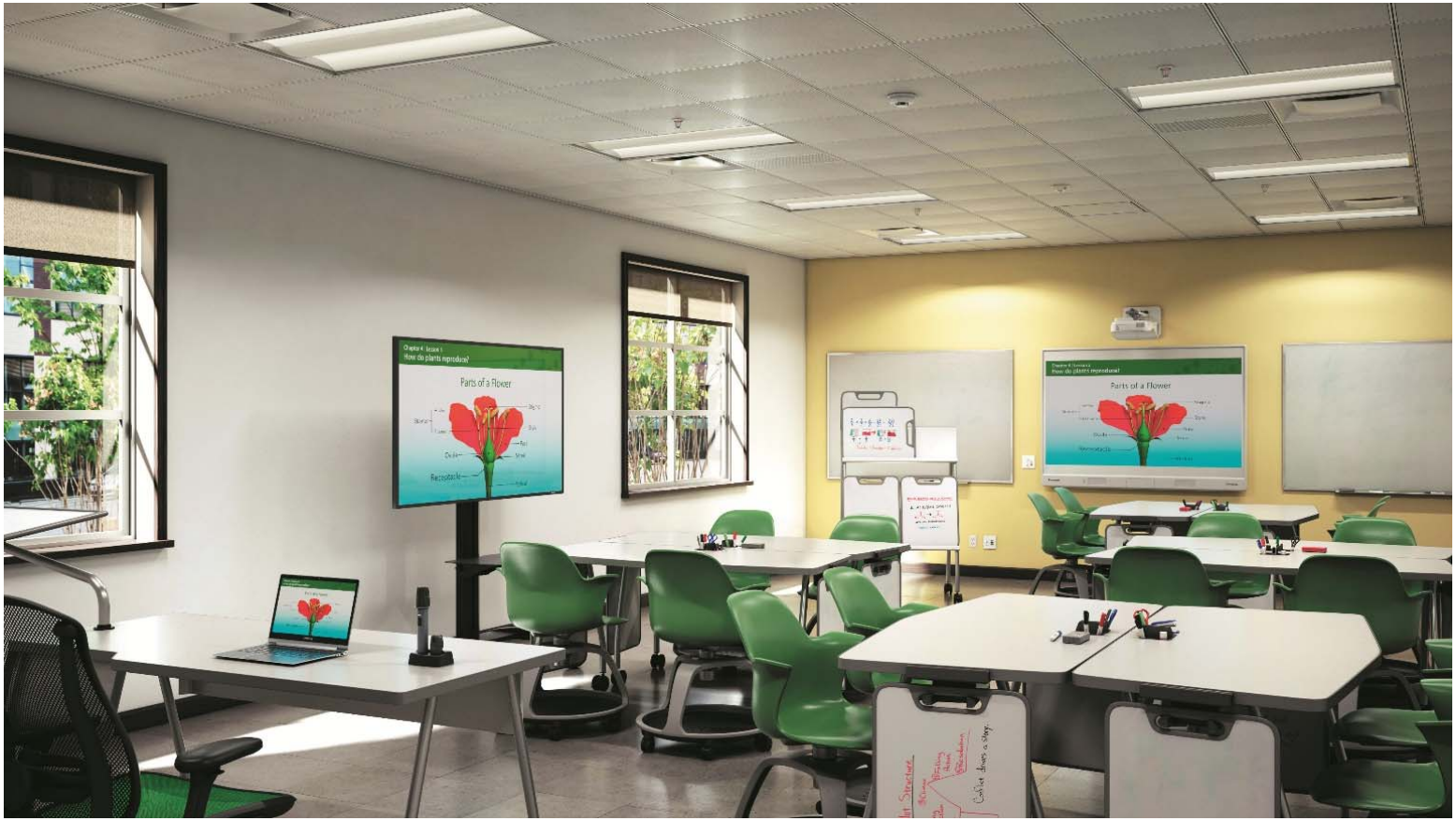
Discussion

Huddle Room

Huddle Room with Soft VTC

Classrooms and Boardrooms are changing

Classrooms are Changing



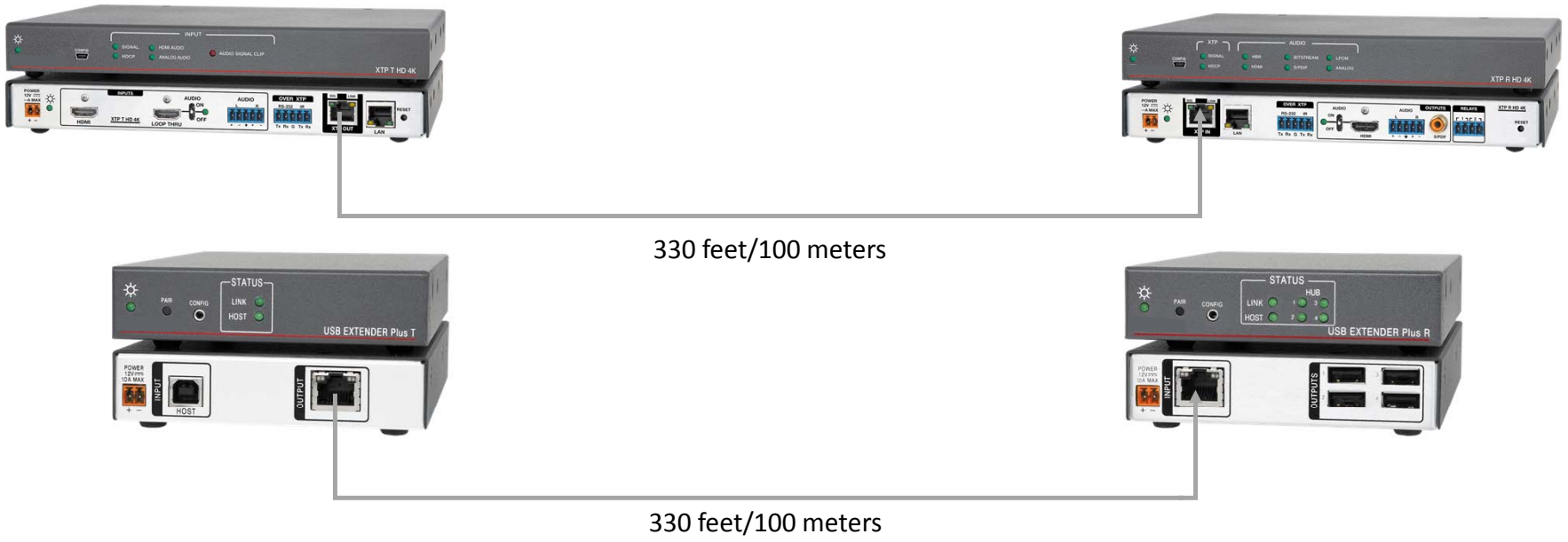
Classrooms are Changing

AV Technology Deployment

4 types

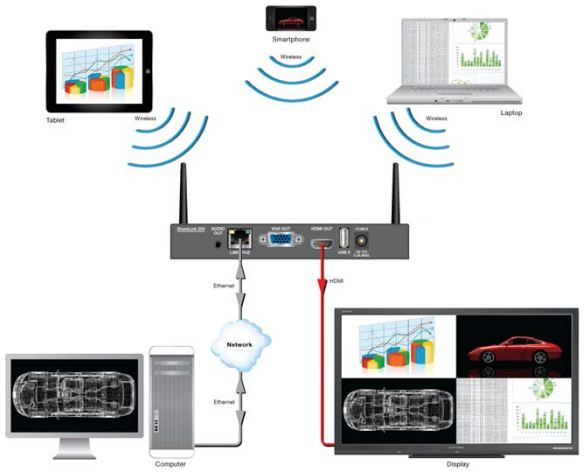
Hard Wired AV Infrastructure using CATx

- Wired AV connections offer benefits related to reliability
- To INCLUDE a CATx for USB

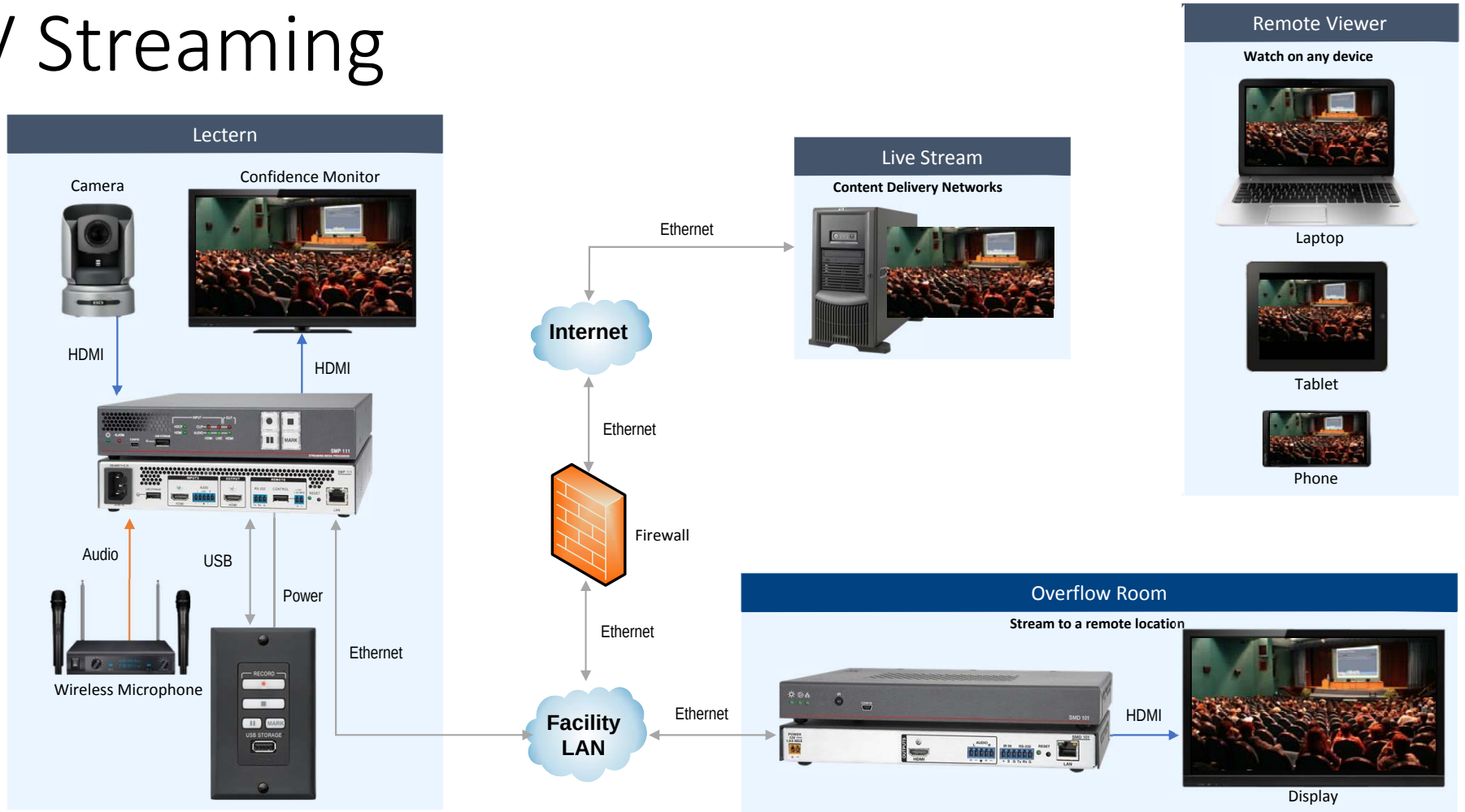


Wireless AV

- Wireless AV offers flexibility, mobility, and benefits for installations that have architectural challenges
- Network reliability, access, coverage, and congestion can effect performance

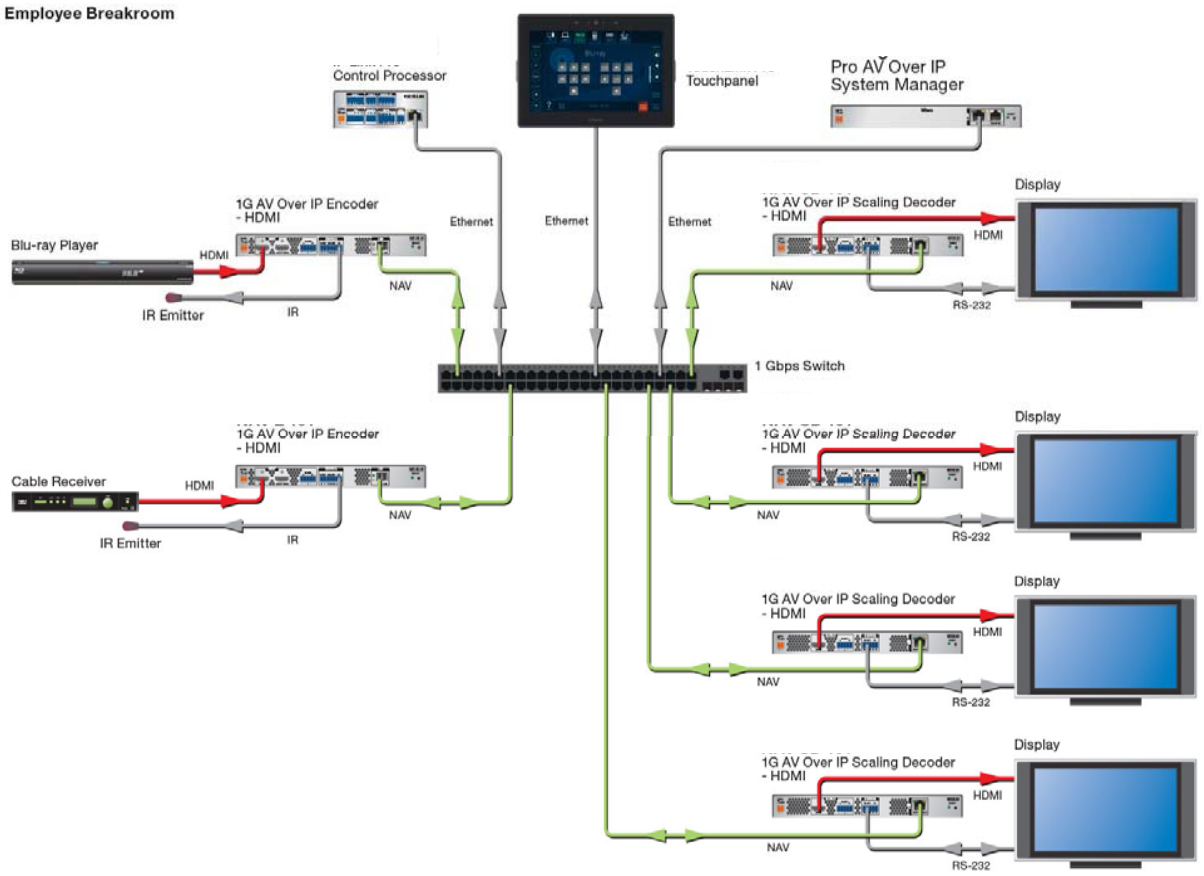


AV Streaming



AV over IP

- Control?
- Audio distribution?
- Bandwidth/Data rate?
- Compression…yes
- Client Network?
- Your Network?
- 1G
- 10G



AV over IP Considerations

AV over IP – AES 67 Audio Distribution

- AES 67 Standard allows audio transportation over IP based systems
- Interoperability between network audio over IP protocols
- Adds audio networking technology into a variety of applications
- Supports both multicasting and unicasting

+

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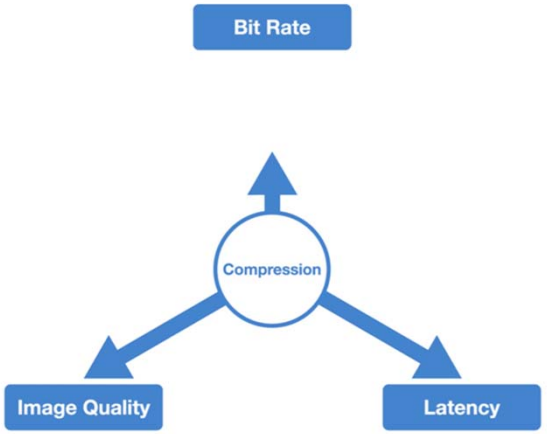
AES 67

AV over IP – Compression

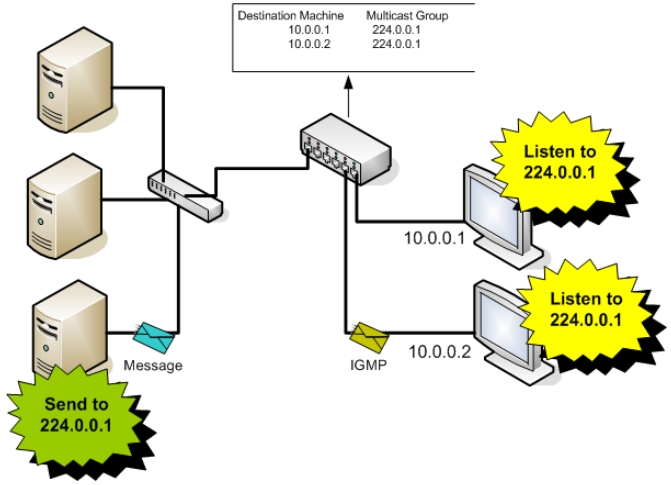
- Compression – Three factors
  - Bit Rate
  - Image Quality
  - Latency



Video Rate	Uncompressed Bit Rate @ 24 bpp	1G Compression @ 880 Mbps	10G Compression @ 4 Gbps
480p60 (SD)	422	1:1	1:1
720p60 (HD)	1,330	2:1	1:1
1080p60 (HD)	2,990	3:1	1:1
2160p60 (UHD)	11,940	14:1	3:1
4096x2160 @ 30 (4K/30)	6,370	7:1	2:1
4096x2160 @ 60 (4K/60)	12,740	14:1	3:1

AV over IP – Network

- Layer 3 Protocols
  - Multicasting
  - IGMP Snooping
- Client Network?
- Private Network?



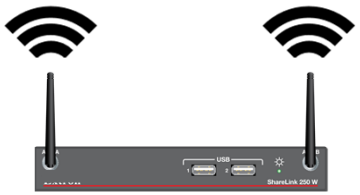
Collaboration Space Considerations

Your Goals for the Room?

- What is the budget for this space?
- Who will be using the space?
- VTC?
- How will the space be managed?
- How will the space be operated?

Keys to success in this Collaboration arena (three C's)

- **C**onnectivity
  - CATx , Wireless and USB
- **C**onferencing Interface
  - Zoom..Skype…your laptops or phones
  - Phone interface
  - VOIP
- **C**ontrol
  - Simple
  - Push button
  - Motion sensor
  - Touchpanel with Interface



VoIP zoom

Connectivity

Video Signals

Resolutions

- Old Resolutions
- New standard 1080p
- Headed to 4K/UHD and 8K

Digital Signals – HDMI

- HDMI is an uncompressed digital video signal
  - Designed for the consumer market

USB

Universal Serial Bus

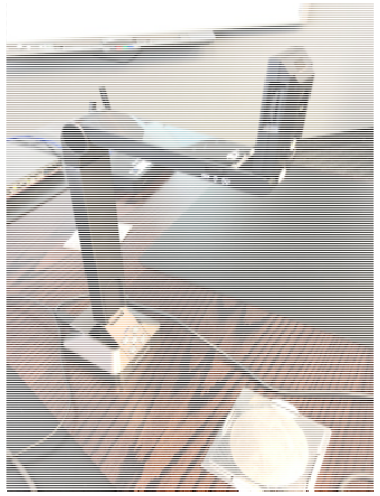
HDMI and USB

Digital Signals – USB

- A standard for communication protocols that includes cables and connectors
- Historically used for attaching peripheral devices to computers
- Maximum length of USB 2.0 cable: The 2.0 specification limits the length of a cable between USB 2.0 devices (Full Speed or Hi-Speed) to **5 meters** (or **about 16 feet** and 5 inches).

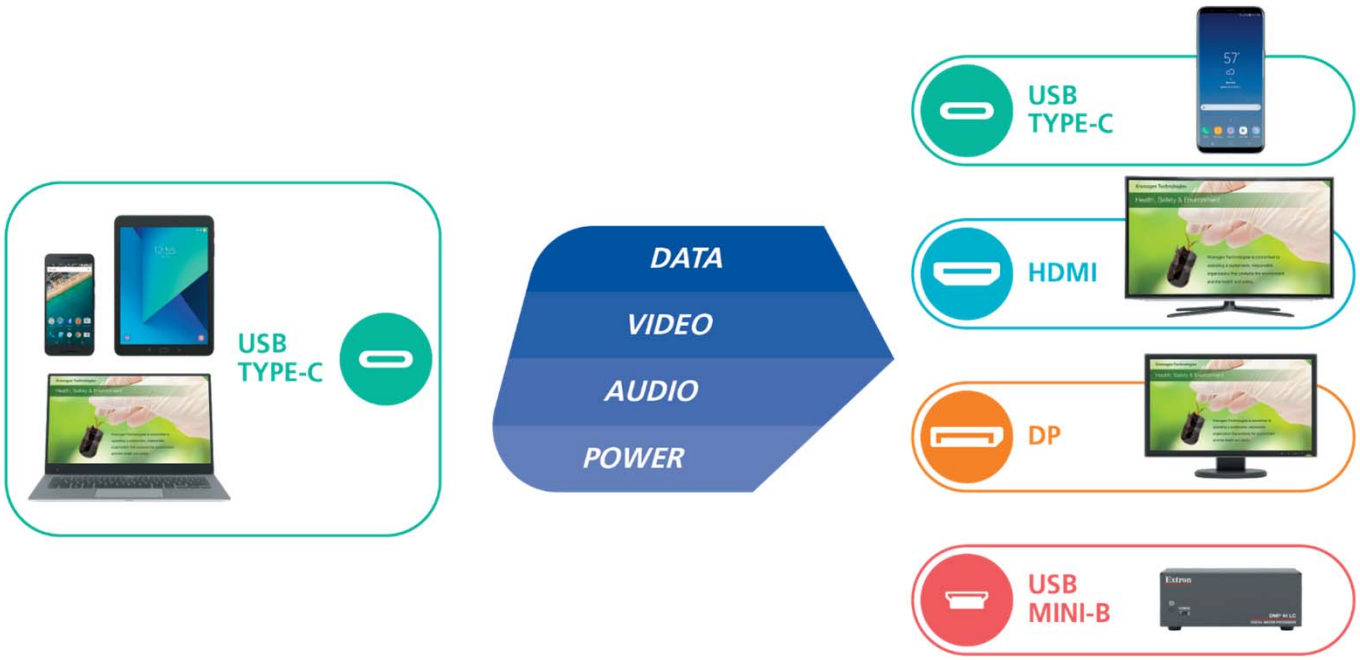
Digital Signals – USB

- Over the years speeds have increased and USB supports video and audio transfer
  - USB 2.0 - 480 Mbps
  - USB 3.0 - 5 Gbps
- Providing additional options for transporting video and audio



USB-C Solutions

USB-C Connectivity for ProAV



USB Type-C

- Send Data, Video, Audio, and Power
- Latest, high speed, reversible USB
- 10Gbps data rate (V3.1), V3.0 = 5Gbps
- Deliver up to 100 watts! Devices negotiate…
- "…beyond 20 Gbps in the future."
  – Pres. USB-IF

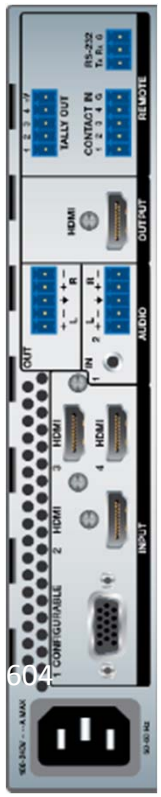
Example 5 (Video Only)

USB-C

HDMI

VGA

MDP



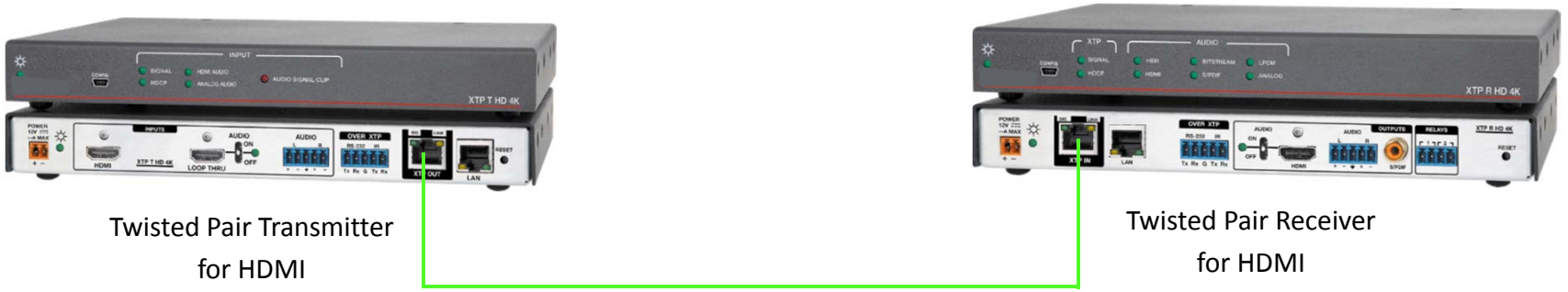
Uncompressed Video Over Twisted Pair

HDBaseT

- HDBaseT Alliance, is a consumer electronic (CE) and commercial connectivity standard for transmission of uncompressed high-definition video (HD), audio, power, home networking.

Twisted Pair Transmission

- Distance
  - 328 feet (100 meters) between endpoints



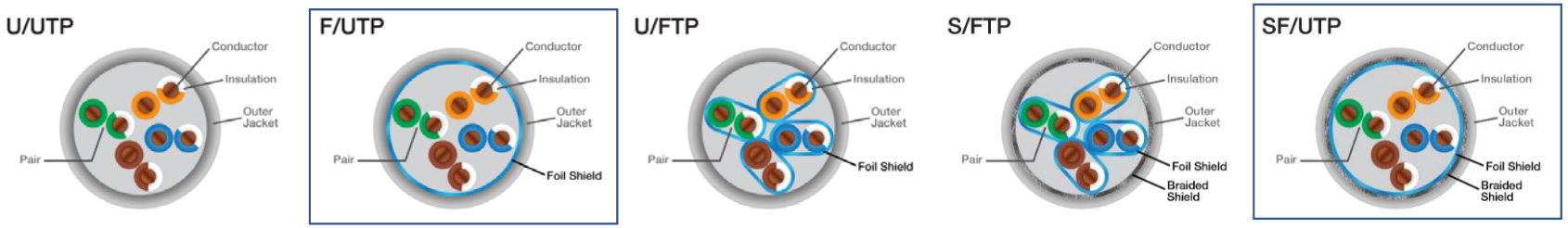
Why Use Twisted Pair?

- One twisted pair cable can carry multiple signals

Twisted Pair Shielding

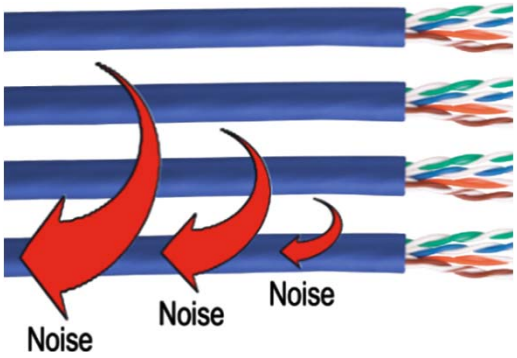
- Different types of twisted pair shielding

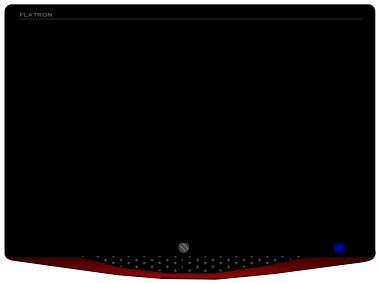
Cable Name	Outer Shielding	Individual Pair Shielding
U/UTP	None	None
F/UTP	Foil	None
U/FTP	None	Foil
S/FTP	Braided	Foil
SF/UTP	Braided & Foil	None



Twisted Pair Signal Transmission

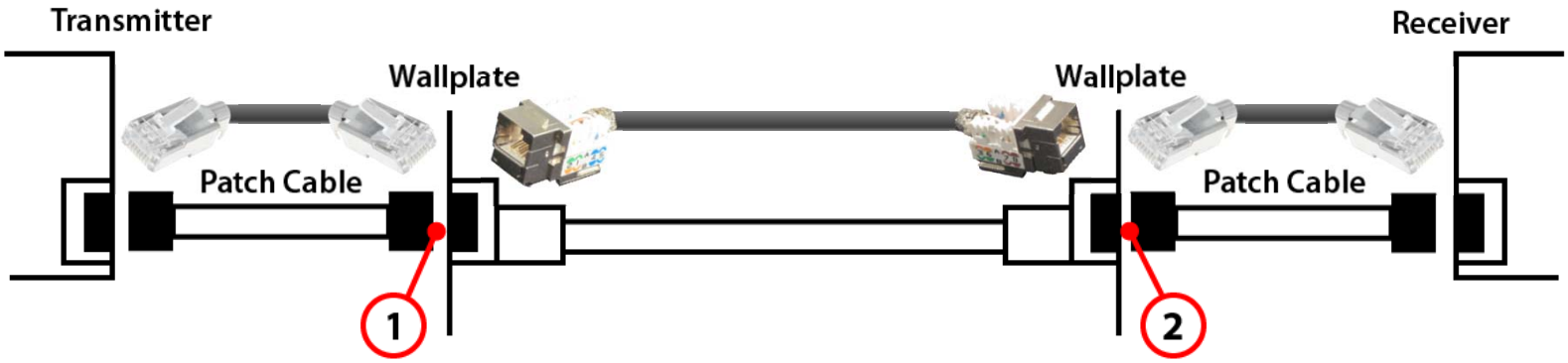
- Shielded cable protects against outside interference from:
  - Air conditioning units
  - Power from adjacent cabling
  - Crosstalk from other cables or within the same cable
  - Radio interference from walkie-talkies





Twisted Pair Installation

- Cable infrastructure and patch points
  - Up to 2 patch points recommended

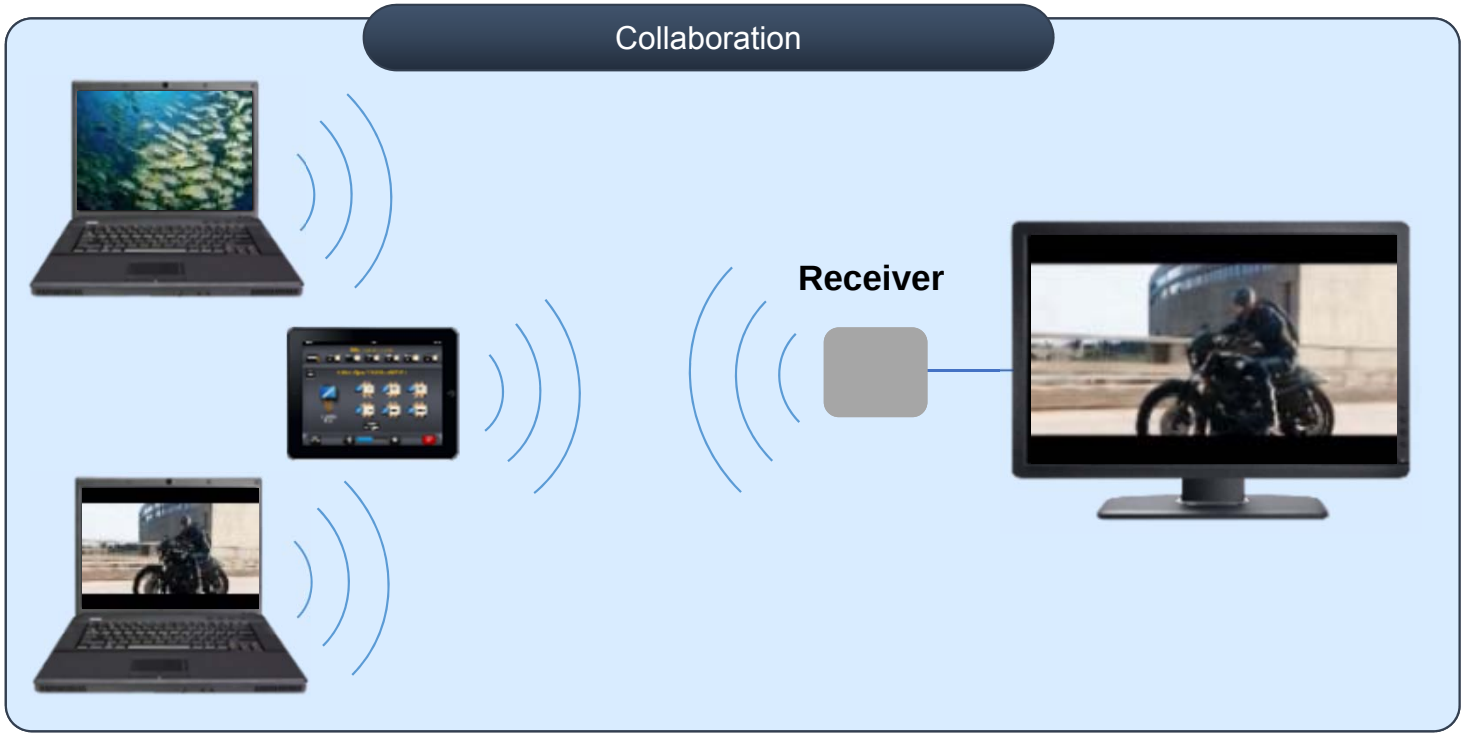


Typical scenario for AV connectivity

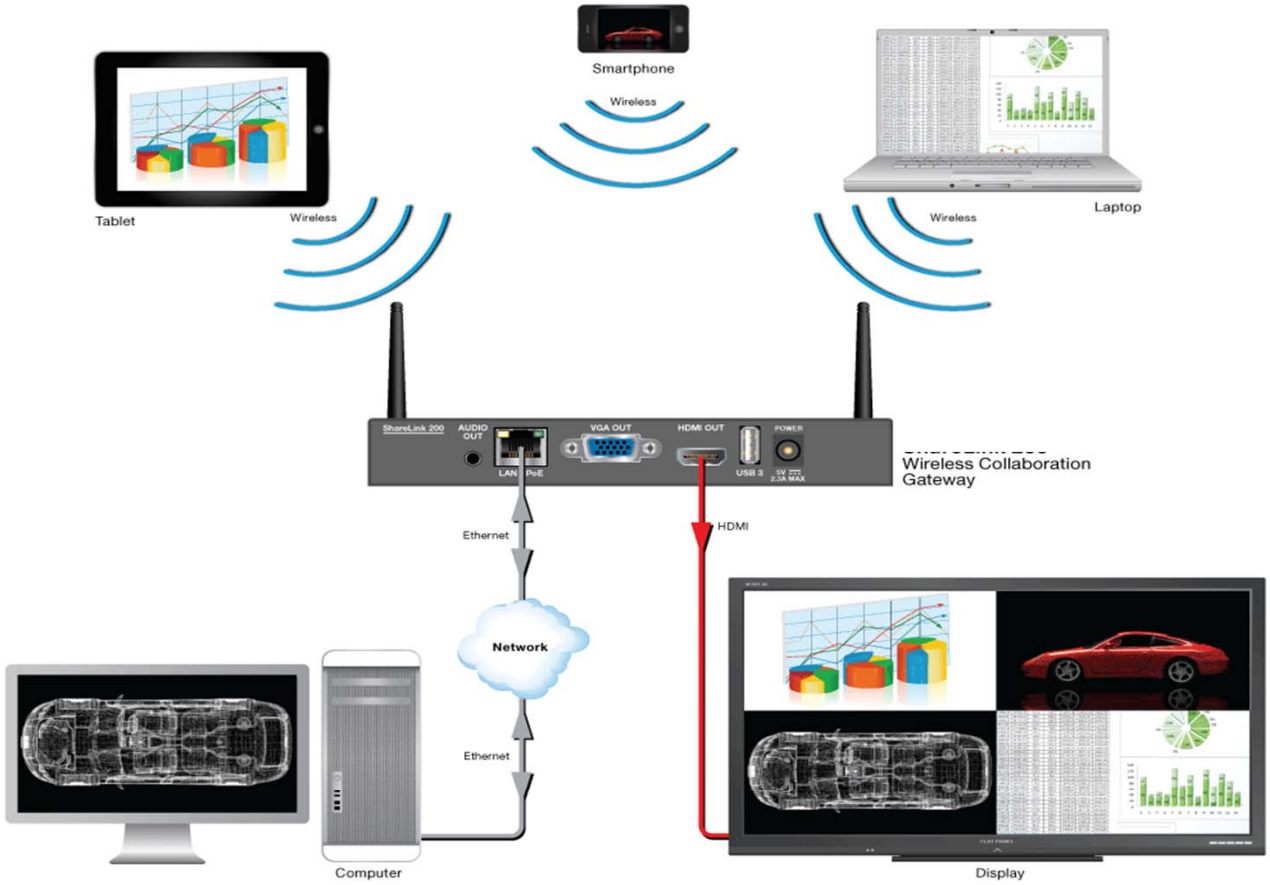
Wireless Technologies

Compression

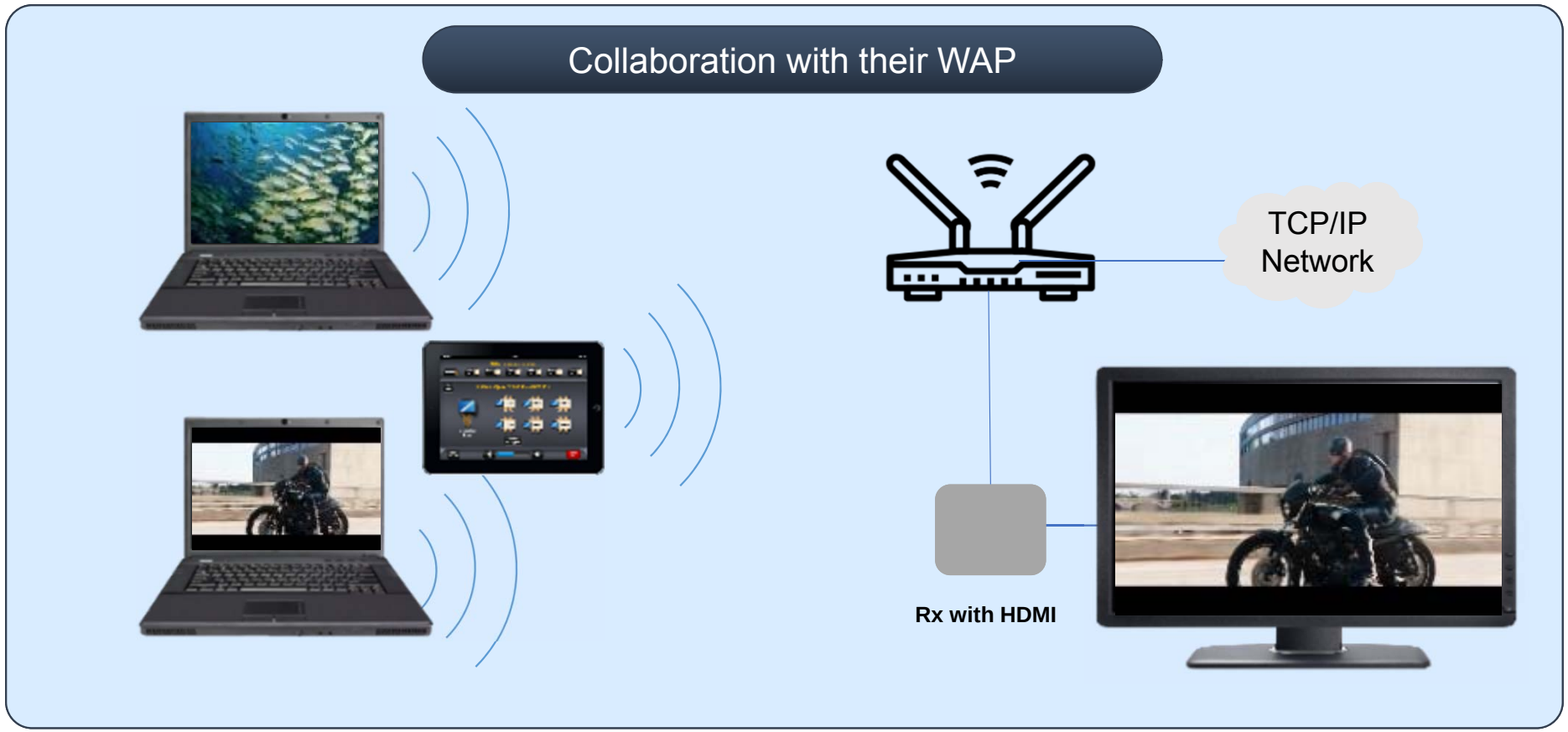
Wireless Video Application

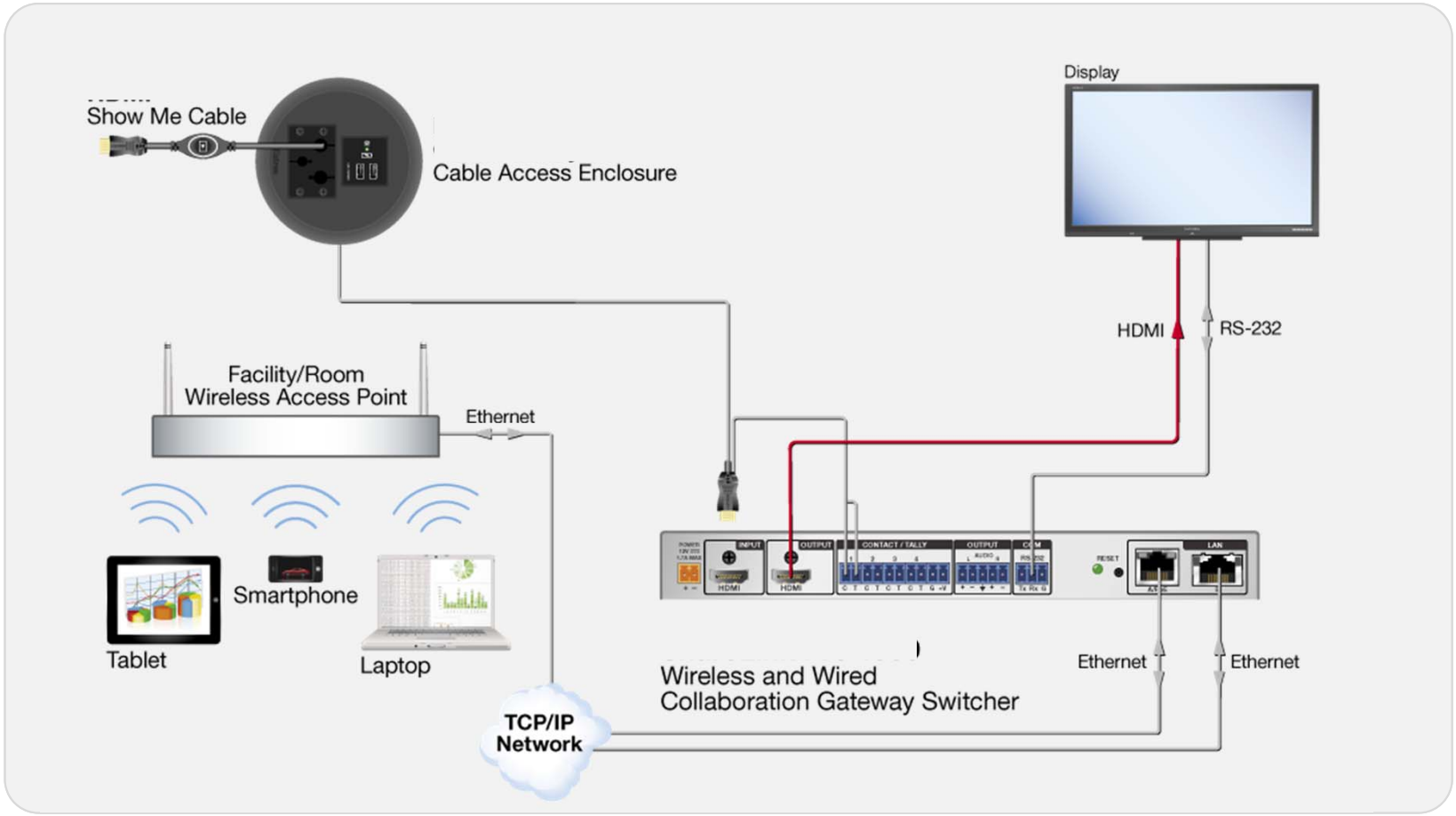


Using Your Own WAP


Smartphone
Wireless
Tablet
Wireless
Laptop
Wireless
ShareLink 200
AUDIO OUT
LAN PoE
VGA OUT
HDMI OUT
USB 3
POWER
Wireless Collaboration Gateway
Ethernet
HDMI
Network
Ethernet
Computer
Display

Using Their WAP


Collaboration with their WAP
TCP/IP
Network
Rx with HDMI


Show Me Cable
Cable Access Enclosure
Display
HDMI
RS-232
Facility/Room
Wireless Access Point
Ethernet
Smartphone
Tablet
Laptop
TCP/IP
Network
Wireless and Wired
Collaboration Gateway Switcher
Ethernet
Ethernet

Key Features to have in a Wireless Video Platform

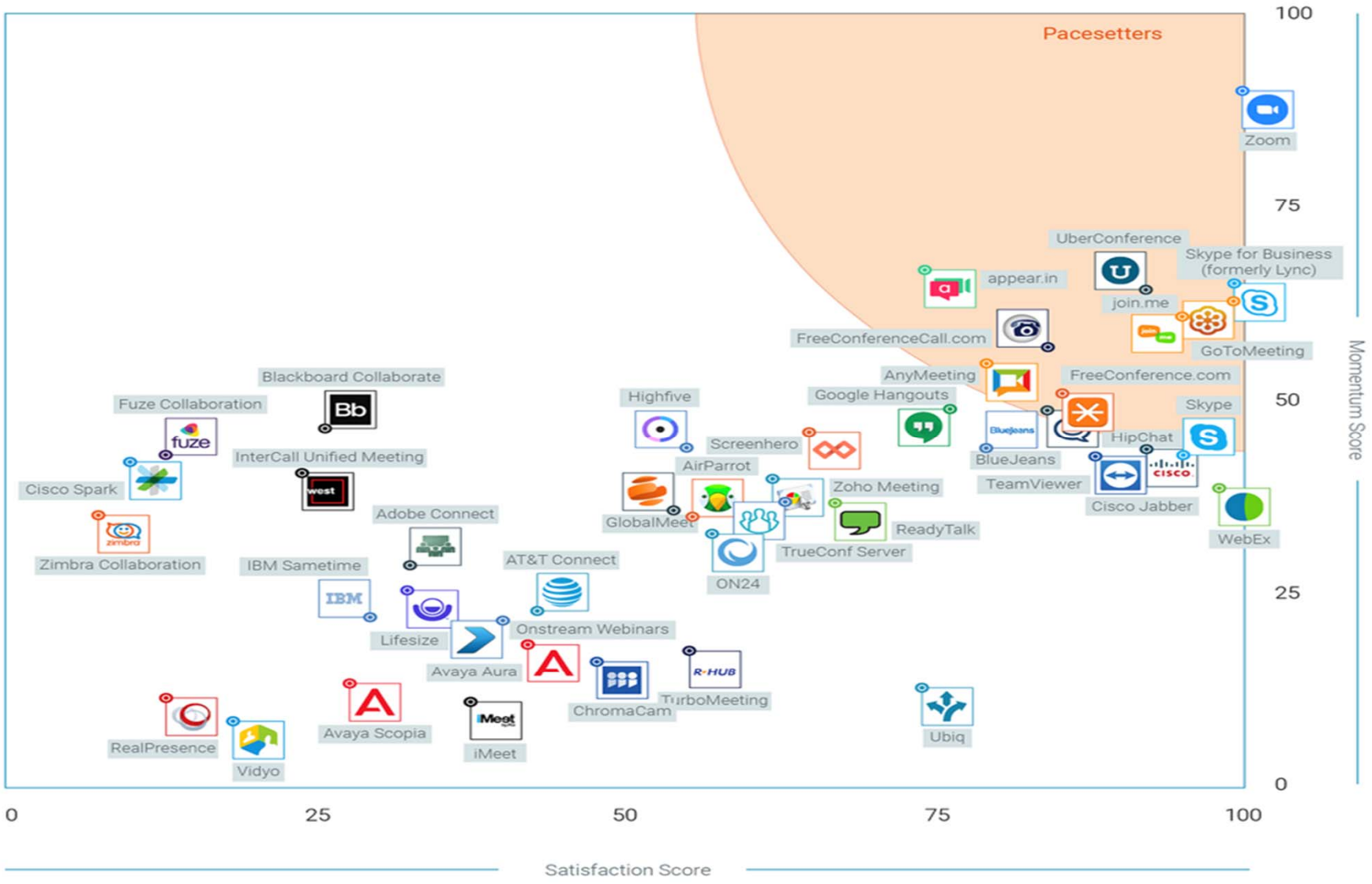
- Easy Wireless and Wired Collaboration
  - Wireless connections via OS mirroring or app
  - Wired connections via HDMI Input
- Multi-Platform Support
  - Mac / Windows runtime or installed app
  - Android / iOS app
  - Apple & Android mirroring

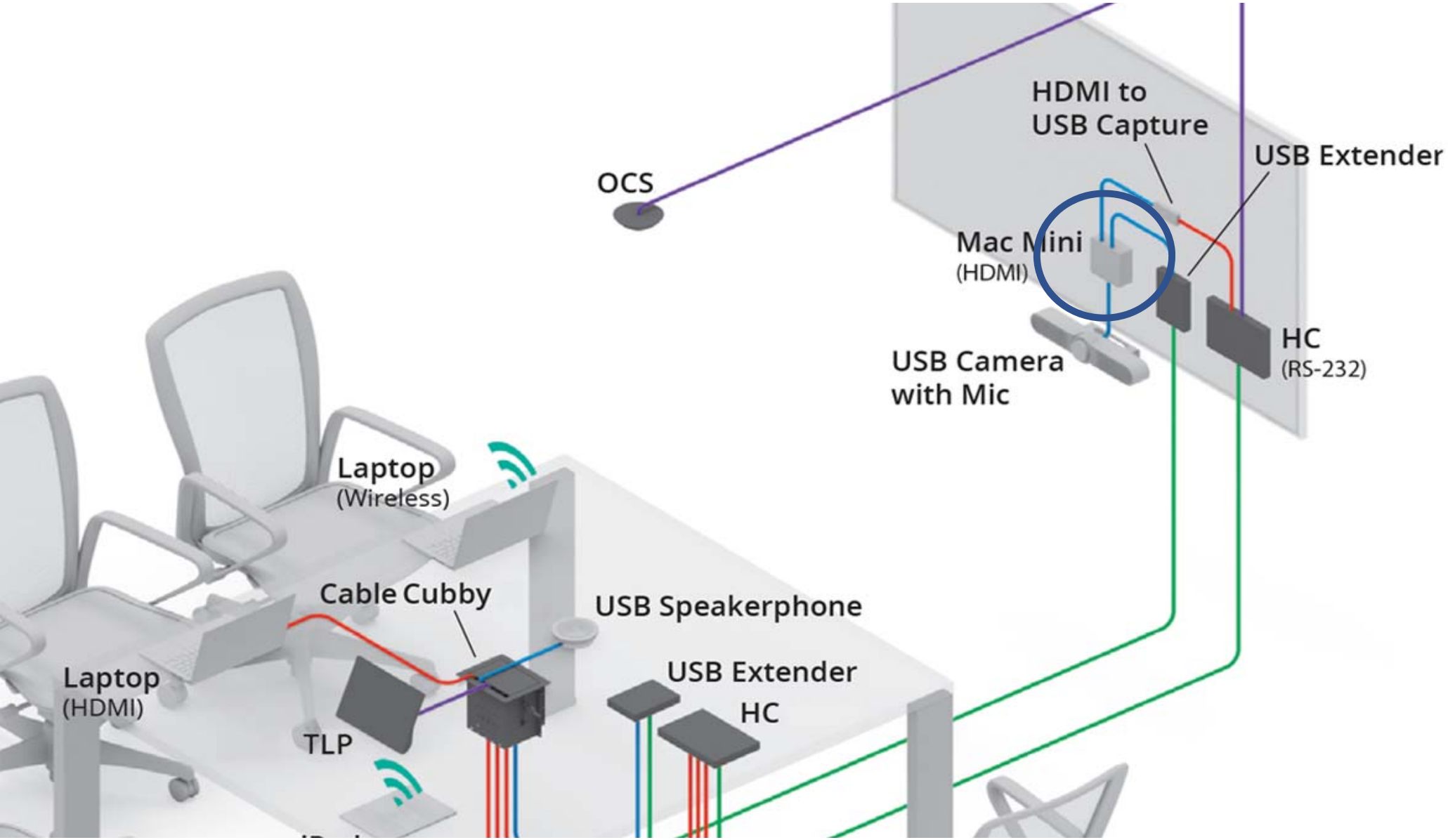
Conference Interface

Multiple Types of Devices

Table connectivity including Power and USB charging

Seamless Conferencing Experience


Pacesetters
Zoom
UberConference
Skype for Business (formerly Lync)
appear.in
join.me
GoToMeeting
FreeConferenceCall.com
AnyMeeting
FreeConference.com
Google Hangouts
Skype
HipChat
BlueJeans
TeamViewer
Cisco Jabber
WebEx
Highfive
Screenhero
AirParrot
Zoho Meeting
ReadyTalk
TrueConf Server
ON24
GlobalMeet
Blackboard Collaborate
Fuze Collaboration
InterCall Unified Meeting
Cisco Spark
Zimbra Collaboration
Adobe Connect
IBM Sametime
AT&T Connect
Onstream Webinars
Lifesize
Avaya Aura
ChromaCam
TurboMeeting
Avaya Scopia
iMeet
RealPresence
Vidyo
Ubiq
100
75
50
25
0
Momentum Score
0
25
50
75
100
Satisfaction Score


HDMI to
USB Capture
USB Extender
OCS
Mac Mini
(HDMI)
HC
(RS-232)
USB Camera
with Mic
Laptop
(Wireless)
Cable Cubby
USB Speakerphone
Laptop
(HDMI)
USB Extender
HC
TLP

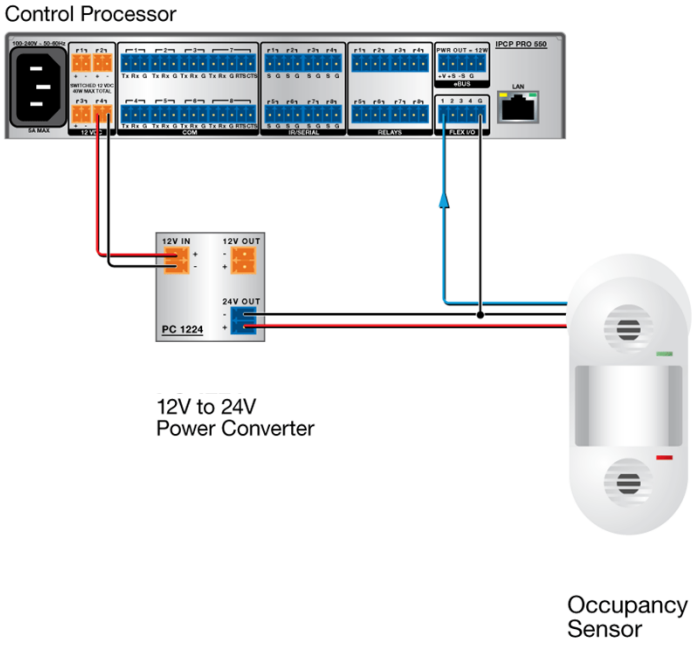
Control

Motion Sensor or Timed System

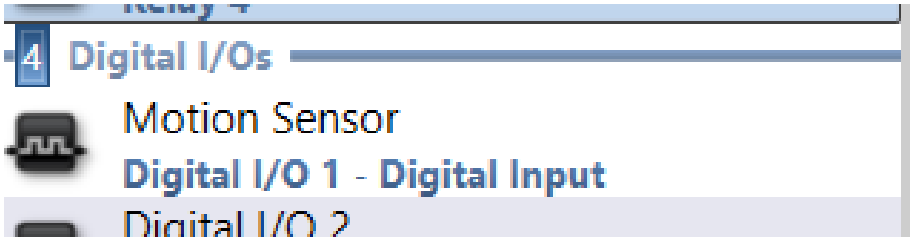
Meeting Space Collaboration System

Simple Motion Sensor

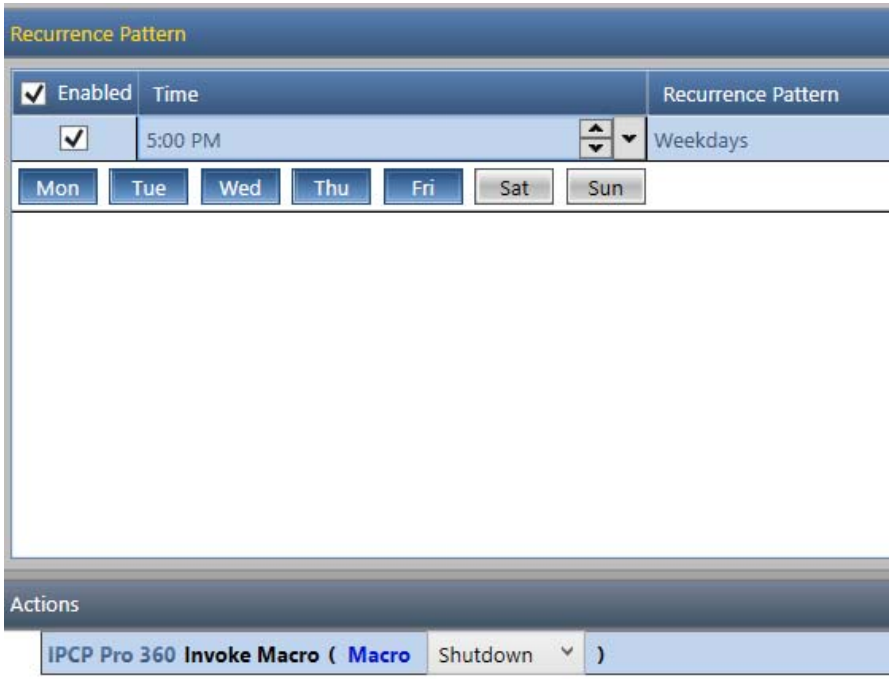
- Motion Sensor wiring



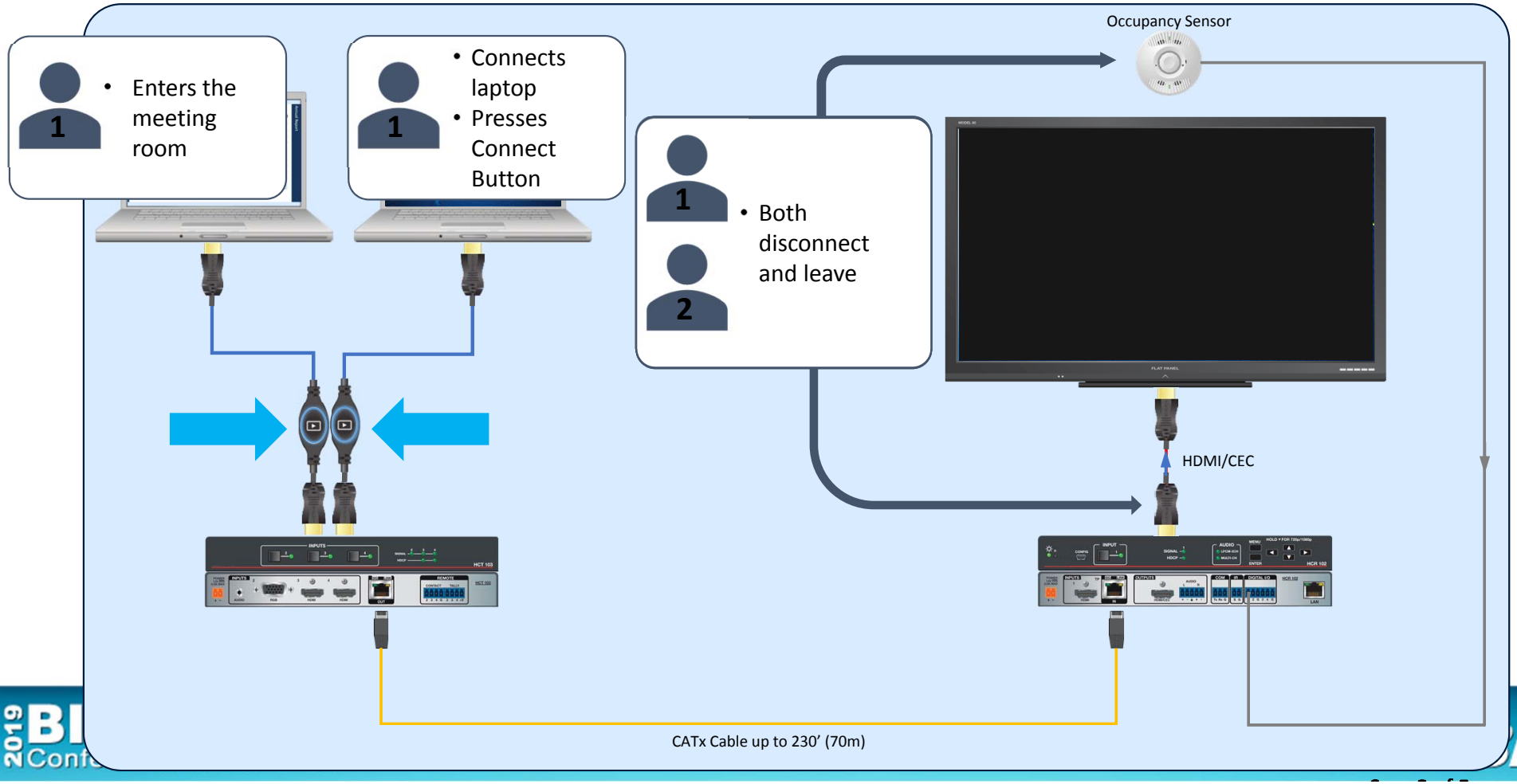
- Control system module for Motion Sensor configuration



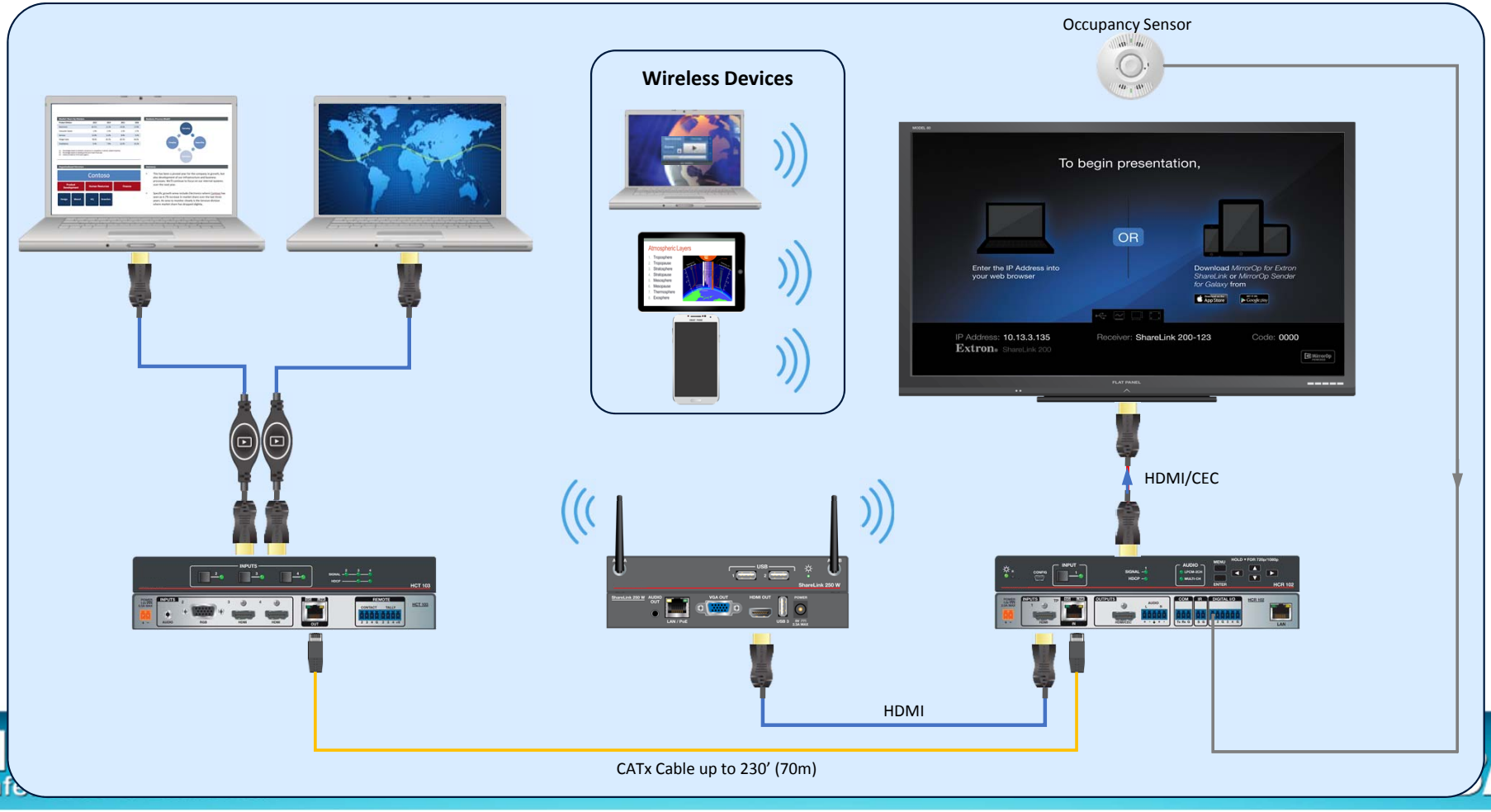
How a timer works



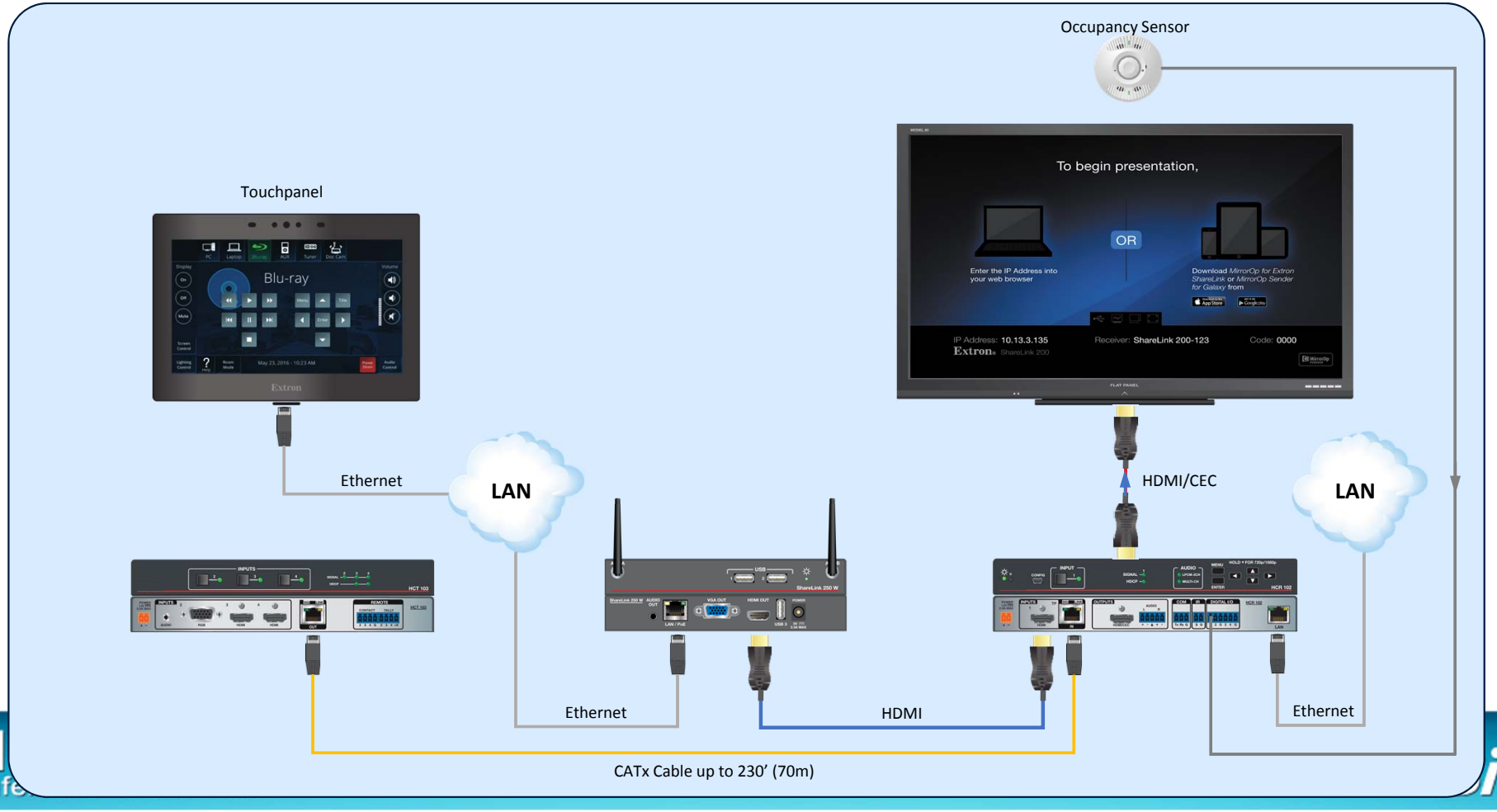
System with Show Me Cables



Upgrade Options – Wireless Connectivity



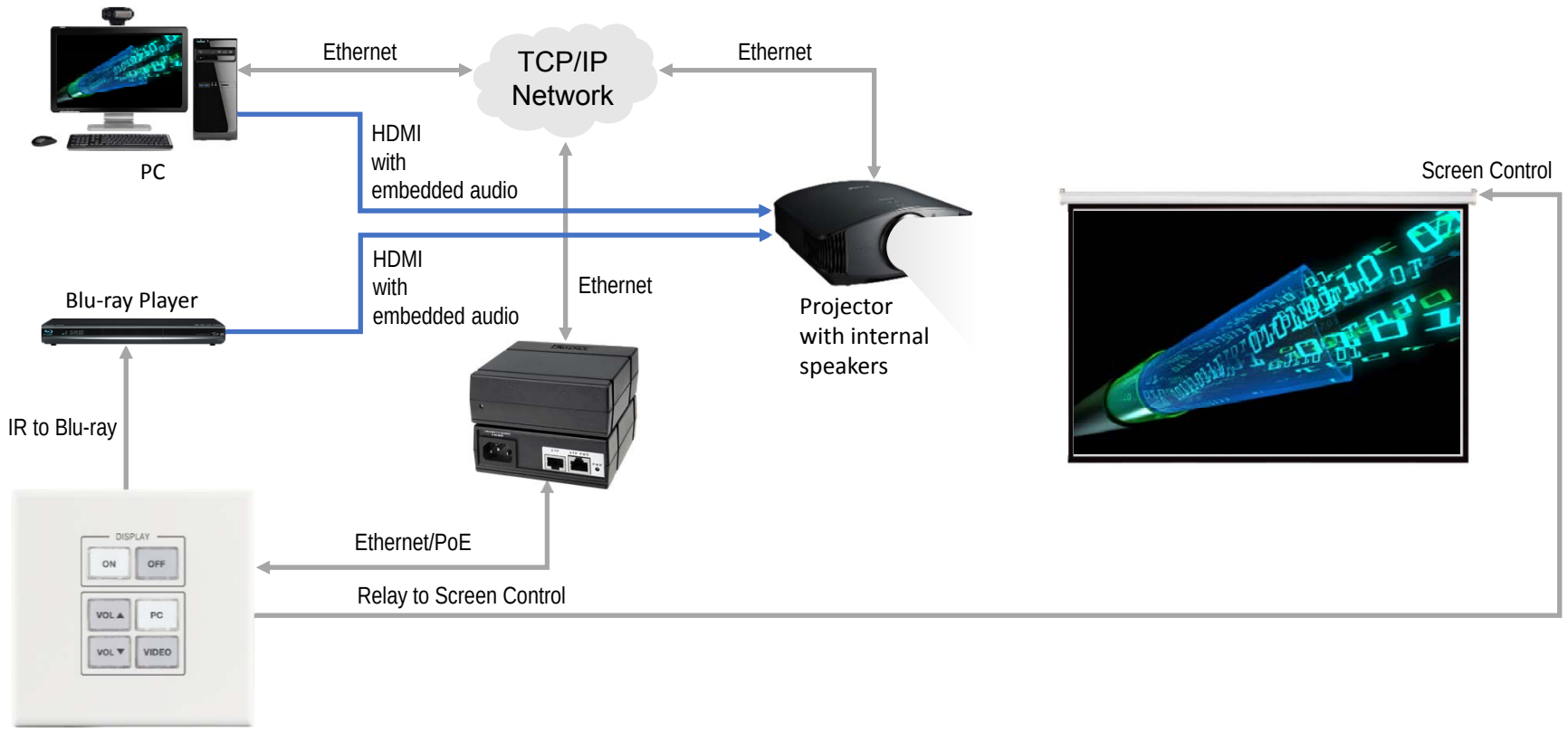
Upgrade Options – Touchpanel Control



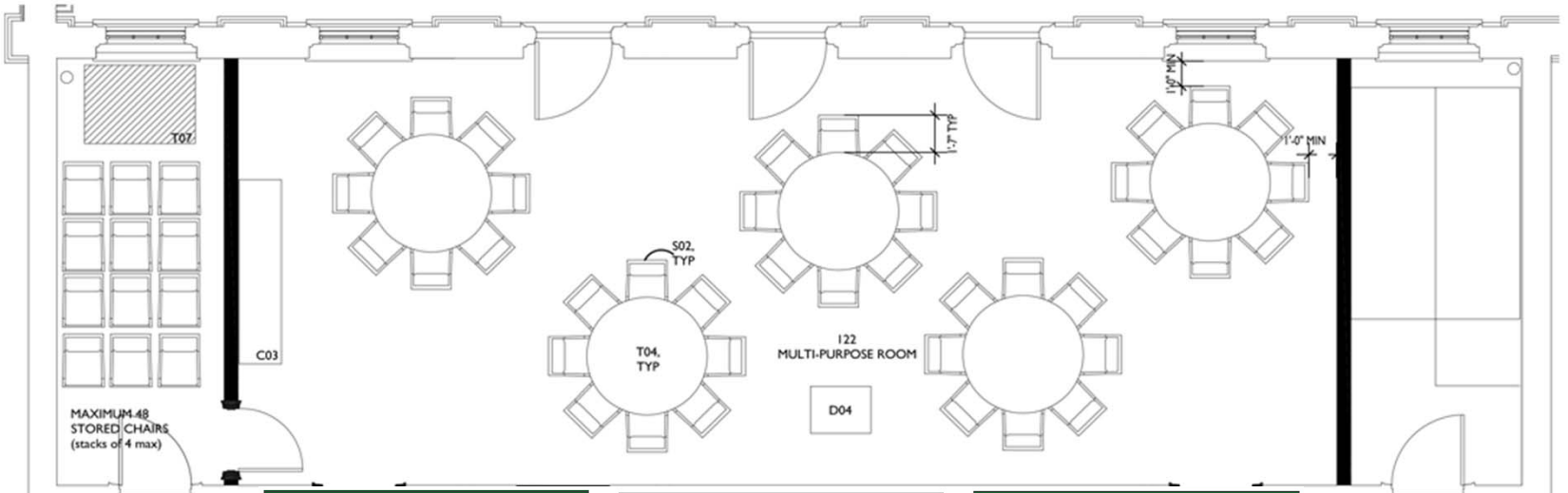
Push Button Controllers

These do NOT count!

Single Display Application



Final Design Thought



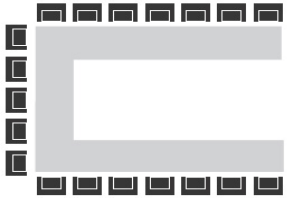
CLASSROOM

Ideal for groups that do not have much discussion but have a need to take notes.

CONFERENCE

Ideal for groups under 20, with heavy discussion and a need to write or refer to materials.

U SHAPE

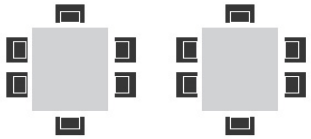


Ideal four groups under 30, with a designated speaker, heavy discussion, and a need to write or refer to materials.

HOLLOW SQUARE

Ideal for groups under 40, with heavy discussion and a need to write or refer to materials.

MEETING SQUARES

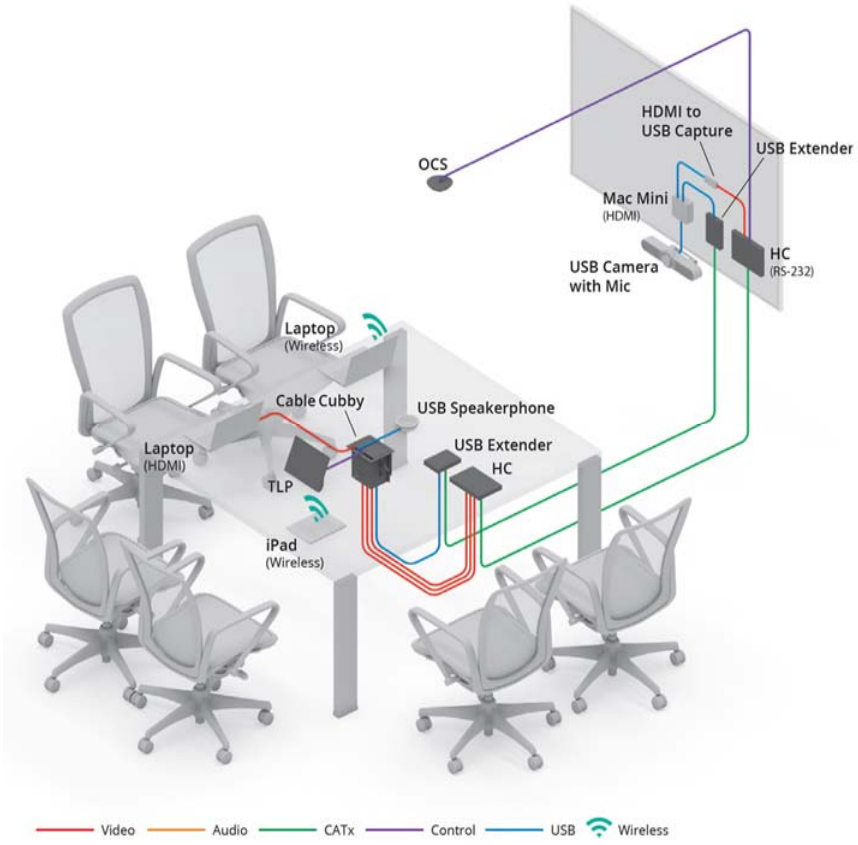


Ideal for any size group that needs to break into smaller groups.

THEATER

Ideal for any size group that does not have much discussion or does not need to refer to material.

Equipment



zoom logitech cisco

Google Microsoft DOLBY

StarLeaf Polycom lifesize

The Modern Workspace

-Thank You-

Karl Rosenberg