

Room combining systems can become difficult and expensive to accomplish, especially when providing both video and audio. The number of rooms to combine can also add to the complexity of the system. When video is added to a room combining system, it is necessary to add a control system with a fairly sophisticated program. How well the system works and how easy it is to use depends on the designer and experience of the programmer.

The typical room combining system consists of a control system, digital signal processor (DSP), and HDMI matrix. When there are only two rooms to combine, the designer may want to just make a Master / Slave room where the presenter's room (Master) feeds the Slave room. This was acceptable with old analog rooms, but with HDMI there are delays which may cause the audio in the slave room to be delayed by as much as 70 milliseconds. The best method is to connect all rooms to an HDMI matrix and then switch the video and audio to the desired rooms. One of the most difficult issues when combining is the volume control. When combined, volumes need to be grouped, and this requires volume level feedback at the touch panels to follow the new grouping.

When designing a room combining system, the following questions need to be asked:

- How many rooms?
- Are there video displays?
 - What are the displays?
 - Are both HDMI and VGA video needed?
 - Are there any shared video sources such as a Blu-ray or CD?
 - Is there any need to be in combined mode and have different video at the displays?
 - Are there podiums or just wall plates, and how many per room?
 - If Podium, is there a Blu-ray in the podium?
- Are microphones required and do they need to be assigned to rooms?

The answers to these questions will determine the complexity of the room, and if it will require custom software, or can a TEKVOX Room Combining Drop-In be used. If the room requires shared video sources, different video at the displays, multiple wall plates or podiums in a room, or microphones are assigned, the system will require custom design and software. Otherwise, it is possible to use a TEKVOX Room Combining Drop-In.

For rooms requiring specialized products and soft software, TEKVOX can help with design, supply products, and software services.

Room Combining Drop-In

The standard TEKVOX Drop-In systems for Room Combining are designed to provide solutions for up to four rooms. These systems use the TEK 1201-HD or TEK 51T-HD to provide the room's video and audio sources, including program and microphone level control. Unlike other room combining systems requiring a DSP to provide all of the audio control at the matrix, the TEKVOX Drop-In system does all of the audio control before the matrix. This means raising and lowering the volume at the podium will also raise and lower the volume in all combined rooms.

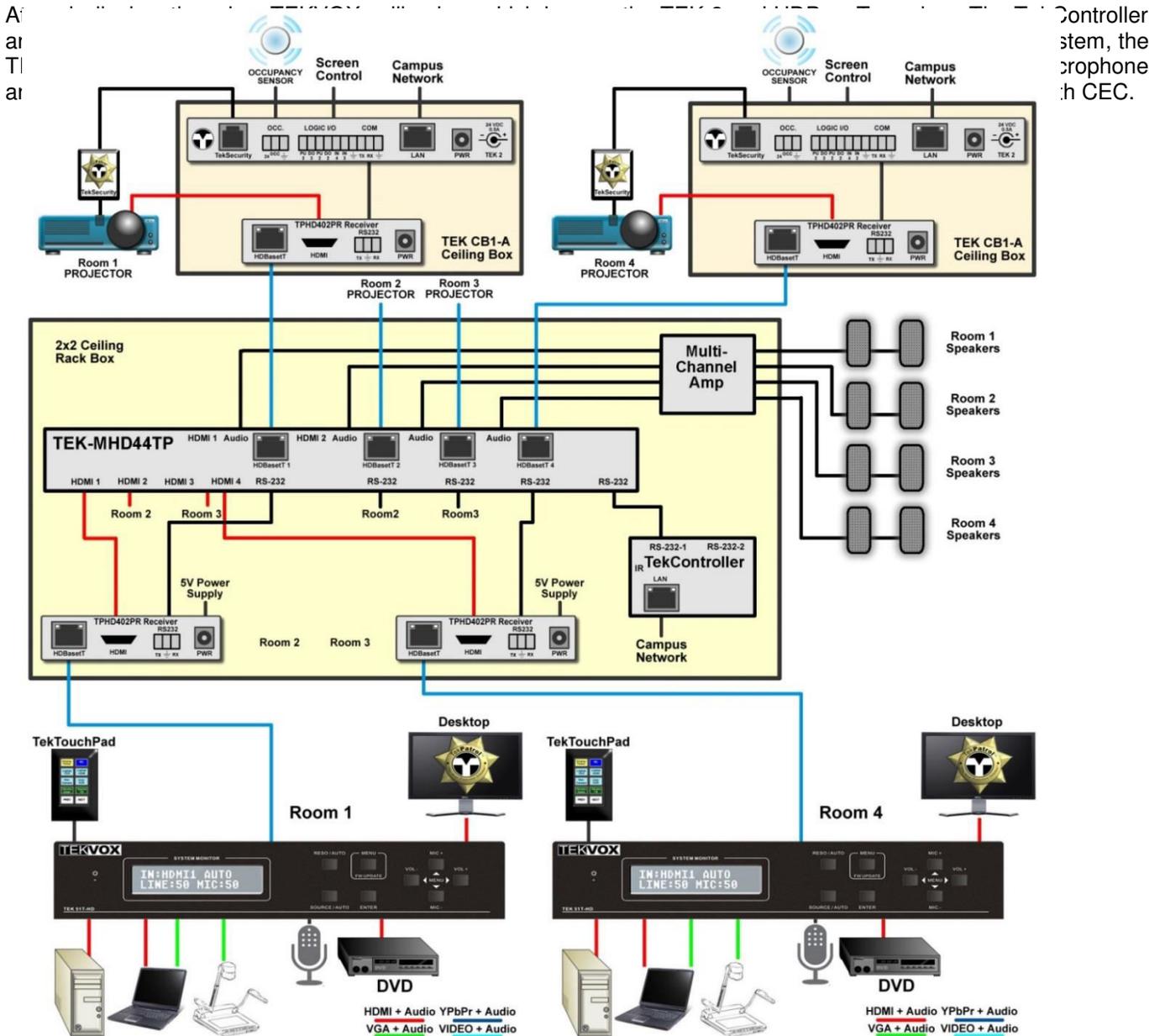
When ordering a TEKVOX Drop-In system, you can specify how you want it to operate by using a TEKVOX Drop-In Worksheet. TEKVOX uses this information to preconfigure a system before shipping.

Included with all TEKVOX control products you get full remote system management and control over the campus network using TekManager. To provide cloud based management, TEKVOX offers TekManager Enterprise. One of the great features of a TEKVOX Drop-In is the ability to swap out displays without having to rewrite control software. This has the potential to save thousands of dollars in the future when video projectors are changed.

Operation

At each podium, there is a TekTouchPad and either a TEK 1201 or TEK 51T presentation switcher. If a wall plate is desired instead of a podium, it is possible to mount the TEK 51T into a wall box such as the Chief PAC525FW, and mount the TekTouchPad on the wall. The reason either of these units are required instead of just a wall plate is to provide volume control of both the program and microphone sources. The TekTouchPad even offers a method to invert the screen and install it upside down. This improves the viewing angle and makes it easier to read.

The TEK MHD44TP and TekController can be mounted in a 2x2 ceiling box such as the FSR CB-224S or even in an equipment rack. The Main operation of the system is provided by the TekController which is located with the TEK MHD44TP HDBaseT matrix switcher. This TekController determines the routing of sources and control of the displays during combining.



For the user interface, a TekTouchPad is mounted at the podium or wall. The TekTouchPad is a simple-to-use color touchscreen resembling a keypad. This unit sends RS-232 commands to the TEK 51T. Commands are then passed

to the TEK 2 via HDBaseT through the TEK MHD44TP matrix. The TEK 2 has two drivers; one for the Display and the other for the TEK 51T. Commands received by the TEK 2 execute macros and can then be passed back to the TEK 51T to switch inputs and via IP to the TekController for main system operation.

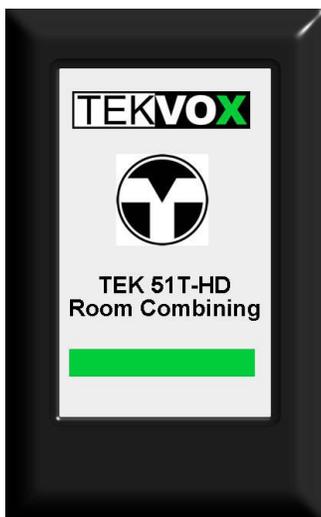
The system is designed to be extremely energy efficient by the use of occupancy sensors. When the rooms are vacated, a system off timer is activated. After this timer expires, the combined rooms shut down automatically. If someone walks back into the room, the system will partially power itself back up. This allows for the system to be ready for the user at all times.

A logo screen is displayed when someone first walks into the room or touch the screen when it is blank. Touching the logo screen selects the first button page. This page allows for powering on the Display, selecting sources, and controlling the program audio. Pressing the Display On button powers on the display in the room and all displays the room it is combined with. Use the NEXT button to go to the next page and the PREV button to go to the previous page.

On the second button page, the user can mute the screen and freeze the image on the display and control both the microphone and program volume. The Display, Mute, and Freeze buttons mute and freeze all displays the room is combined with. When playing a DVD with CEC control, the Stop and Play/Pause buttons operate the player.

To combine and separate the rooms, the third button page allows for the selection of these configurations. Once these are set, it is not necessary to make changes until the rooms are reconfigured. Combine All, Separate All, Combine 1-3, Combine 2-4, and Combine 2&3 clears all buttons. Buttons Combine 1&2 and Combine 3&4 can be set together. These buttons will provide feedback of the current state.

When rooms are combined, selecting a source in a room routes to all combined rooms with this room. Pressing the Display On button powers on all displays combined with this room. Without turning on the displays, the system can provide for audio only from the sources and microphones. The occupancy sensor is also grouped with the room combining. This keeps displays from powering off if only one of the occupancy sensors goes off. Only one of the room's microphones and audio sources can be heard while rooms are combined. The source last pressed at a TekTouchPad is the room that is heard.



Logo Page



First Button Page



Second Button Page



Third Button Page

Installation

The TEKVOX Drop-In Room Combining system requires only one Cat 5e cable from the Podium to the equipment rack for the matrix switcher. If there is a storage room nearby, then the TEK MHD44TP 4x4 matrix switcher and

speaker amplifiers can be installed in a wall rack. Another solution is to use a ceiling rack such as the FSR CB-224S 4-RU to mount the equipment in.

Since all HDBaseT outputs on the TEKVOX products used in the Drop-In have Power over Cable (PoC), there is no need for power supplies at the receivers. Both the TEK 1201 and TEK 51T have an HDBaseT output with PoC to power their receiver. Furthermore, the TEK MHD44TP HDBaseT output has PoC to power its receivers. The main difference between the TEK 1201 and the TEK 51T is the size and the number of inputs. The TEK 1201 has 4 HDMI and 4 VGA and video inputs while the TEK 51T has 3 HDMI and 2 VGAs inputs. The TEK 51T also includes CEC control for its HDMI sources.

At the Displays, the TEK CB1-A ceiling box is used to provide easy installation for the equipment and power if needed. The ceiling box provides power, HDMI, and control below the ceiling which eliminates the need for expensive plenum cables.

TEKVOX equipment used in this system includes:

- 78034 TekTouchPad
- 78035 Wedge
- 79062 TEK 51T-HD Small Presentation switcher/scaler
- 79055 TEK MHD44TP 4x4 HDBaseT Matrix switcher
- 79040 TEK TPHD402PR HDBaseT receiver with PoC
- 70001 TEK 2 TekMonitor
- 78036 TEK TSC7 Table Top Cubby
- 78038 TEK CB1-A Ceiling box

TEKVOX Room Combining Drop-In Systems using TEK 51T-HD and TekTouchPad:

- 71036 Two Room Combining System MSRP \$14,006
 - 71037 Three Room Combining System MSRP \$21,171
 - 71038 Four Room Combining System MSRP \$26,655
- TEKVOX Room Combining Drop-In Systems using TEK 51T-HD and iPad:
- 71032 Two Room Combining System MSRP \$15,686
 - 71033 Three Room Combining System MSRP \$18,651
 - 71038 Four Room Combining System MSRP \$23,295



TekTouchPad 78034



Wedge 78035



TEK 51T-HD 79062



TEK TPHD402PR 79040

TEK 2 70001



TEK TSC7 78036



TEK CB1-A Ceiling box 78038



TEK 1201-HD 79033

Conclusion

When designing room combining systems, it is important to know what is required. Does the system only require basic room combining, or will it need extensive programming? For most system, the end user only needs the basics and a system that is functional and easy to operate. With the TEKVOX Drop-In Room Combining system, you get an easy-to-install system that won't take out your budget. If you require more complexity in the system, TEKVOX will gladly support you with the expertise in design support and programming.