



kaleidescape

Programming Crestron Controllers for a Kaleidescape System

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Section 1

Overview

Kaleidescape provides both control modules and touch panel templates for Crestron controllers. This manual provides information for Crestron programmers to integrate modules and templates into any Crestron project.

Kaleidescape Modules

Kaleidescape provides four Crestron control modules.

▶ **OSD module (onscreen display) for controllers with and without video**

- **OSD Video** template – Displays the Kaleidescape System onscreen display on the touch panel, along with other controls.
- **OSD No Video** template – Shows text-based details, replicating the details pages for movies or albums.

▶ **SATP module (standalone touch panel)**

Provides text-based music controls on touch panels in rooms without video displays.

▶ **Keypad Presets module**

▶ **Keypad Music Collections module**

All modules can use either RS-232 or TCP/IP for control. These modules are available on the **Support** page of Kaleidescape website.

Note: Always download the latest versions of the modules before beginning a project or revising an existing program.

Touch panel controls are an integral part of the Kaleidescape experience. Kaleidescape touch panel control templates can be incorporated into Crestron projects without major modifications. These templates are complex and any modification can remove important functions or introduce bugs.

Kaleidescape modules are designed to provide the flexibility required for many types of installations. System control can be as simple as using a single RS-232 port to control a single movie zone, or as complicated as a large system using multiple TCP/IP clients with complex signal routing to control several movie and music zones.

It is important that the programmer be familiar with the Crestron SIMPL Windows programming environment, Crestron VisionTools Pro-e, and Kaleidescape products.

Note: All string examples in this document are formatted for a Crestron program, i.e., \r = hex 0D = carriage return.

Basic Integration Sequence

1. Create project.
2. Import Kaleidescape modules.
3. Set up modules to control the appropriate device.
4. Verify control.
5. Connect user interface to the modules.

The following Kaleidescape templates are available for touch panels:

- OSD Video
- OSD No Video
- SATP

Section 2

Touch Panels and Keypads

Touch Panels

Kaleidescape modules use the full screen on a touch panel and incorporate a large video window to provide complete consistency even when a separate video display is unavailable. Only the buttons required for a particular feature are displayed. For example, the keyboard is displayed only when alphanumeric input is required. After text entry is complete, the keyboard vanishes. Pop-up windows are used sparingly to simplify the user experience and to manage secondary and tertiary controls. The upper right corner of the layout is intentionally left open so a programmer can add buttons to tie into other whole-house sources and controls.

Kaleidescape recommends programming the **MAIN MENU** button to return the user to the whole-house source selection page and use the **VOLUME** control buttons for control as well as volume level feedback.

Touch Panel Variations

Kaleidescape offers three types of touch panel controls.

- OSD control WITH a video window
- OSD control WITHOUT a video window
- Standalone touch panel (SATP)

OSD with a video window provides the richest user experience and is the Kaleidescape preferred implementation. When choosing which variation to use for a particular installation, consider whether or not a video display is present, what the technical capabilities of the touch panel are, and whether a movie or music zone is to be controlled. Most installations need to implement several touch panel variations to provide quality control in every zone.

Refer to [Appendix A on page 59](#) for sample screen shots for all three variations.

These touch panel variations are packaged separately and available as downloadable VTP files. Each file is constructed as a single page with sub-

pages to manage secondary and tertiary controls within each variation. The appropriate Kaleidescape module must also be downloaded.

The touch panel variations in [Figure 2-1](#) through [Figure 2-3](#) are screen shots taken from the 1024 × 768 pixel solution for the Crestron TPS-15.

OSD Control with a Video Window

OSD Video displays the Kaleidescape System onscreen display on the touch panel which simplifies user operation. Kaleidescape strongly recommends that installers use this interface configuration to deliver a superior user experience for both movies and music.

This solution has the following requirements:

- A touch panel that supports a video window
- A Kaleidescape movie zone to provide video output to the panel

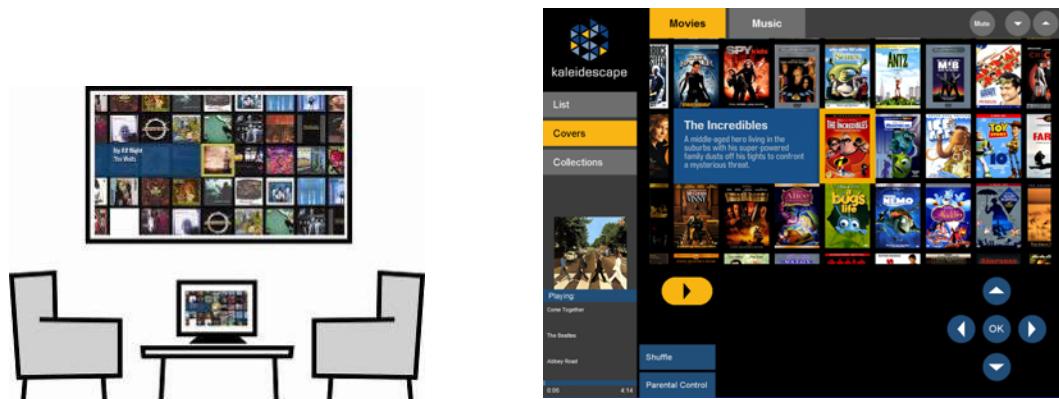


Figure 2-1 OSD Control with a Video Window

OSD Control without a Video Window

Instead of the video window, the OSD No Video delivers text-based details for the content currently selected in the OSD. The touch panel replicates the details page for each movie or album when browsing the List, Covers, and Collections views. Use this variation only when the touch panel cannot support a video window or when the touch panel has too little area to display the OSD video image clearly.

This solution has the following requirements:

- A Kaleidescape movie zone
- A video display in the same room as the touch panel

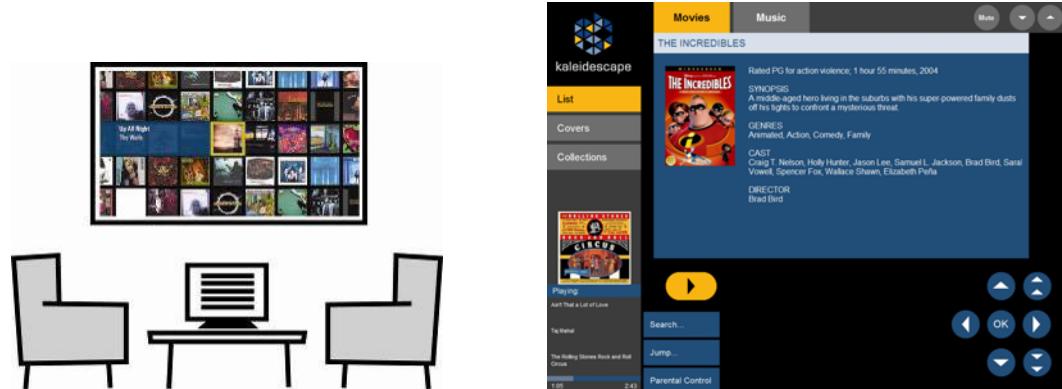


Figure 2-2 OSD Control without a Video Window

Standalone Touch Panel (SATP) Control

The standalone touch panel (SATP) control provides music controls on touch panels in rooms without video displays (e.g., hallway, patio, garage) or touch panels with display areas too small to support a large video window. This simple, text-based interface is a powerful browsing tool, ideal for small LCD displays (320×240 pixels). Although this configuration is an effective way to browse a library and make selections, the experience is not as rich nor as powerful as the previous two touch panel variations. This solution works with any zone on any Kaleidescape player.

Kaleidescape provides control panels on the Kaleidescape browser interface identical to this standalone touch panel.

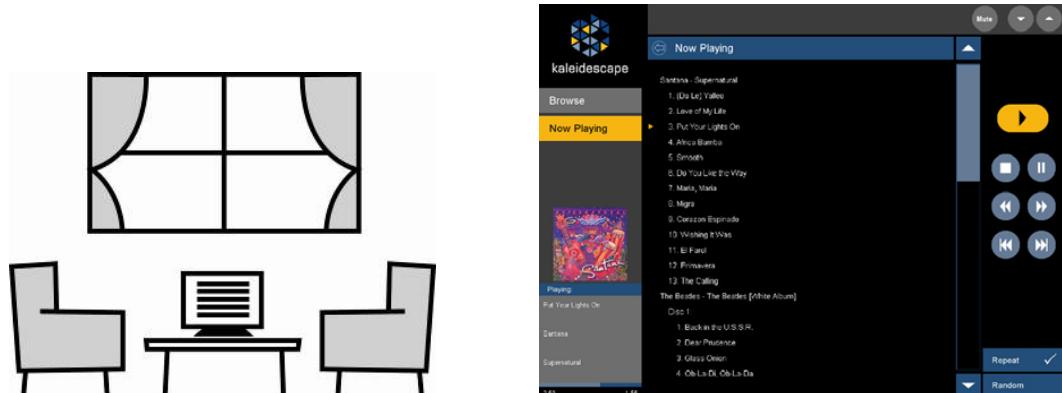


Figure 2-3 Standalone Touch Panel Control

Layout for Touch Panel User Interface

[Figure 2-4](#) outlines the organization of the Kaleidescape touch panel user interface. This layout complements the Kaleidescape onscreen display and provides an intuitive method to control the Kaleidescape System. Using a

consistent implementation of this grid layout across all panel sizes and control platforms improves overall system usability.

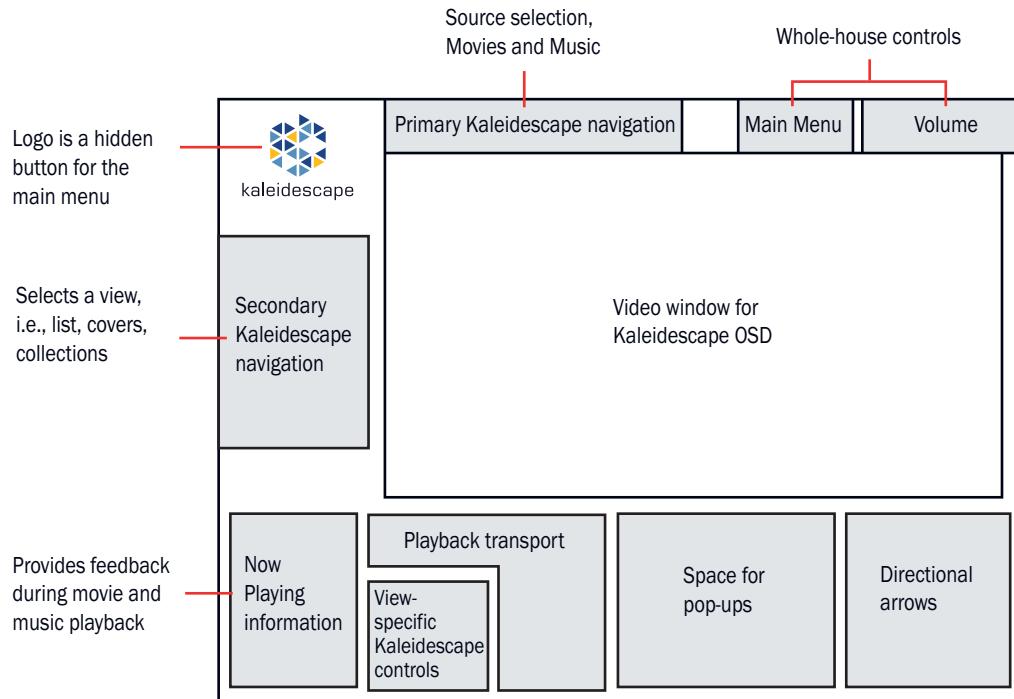


Figure 2-4 Layout for Touch Panel User Interface

Selecting the Kaleidescape logo accesses the Kaleidescape menu.

Programmers can integrate whole-house controls with the appropriate **MAIN MENU** and **VOLUME** buttons located in the upper right.

The secondary Kaleidescape navigation area (located along the left side), has the views for browsing content. These views are the same for both movie and music: List, Covers, and Collections. **Now Playing** is always visible in the music space, but in the movie space, **Now Playing** only appears when a movie is playing.

Playback transports, directional arrows, pop-ups and other view-specific Kaleidescape controls are on the lower section of the screen.

Keypads

Keypad commands provide a method for controlling music playback from any zone on any Kaleidescape player without requiring control feedback. Although keypad commands were created for keypads, these commands can use any button-like input, an actual button on a keypad, a button on a touch panel, a motion sensor, or any other input device.

Kaleidescape provides two different types of keypad commands.

- Presets
- Music collections

With the keypad presets commands, a keypad can be programmed to play a predetermined music item that can be easily changed by the user.

With the music collections commands, a keypad can be programmed so users can cycle through music items within a music collection.

Music Items in the Kaleidescape System

The Kaleidescape System treats several different music items as playable.

[Table 2-1](#) defines these items and the effect of the random and repeat settings on each item.

Table 2-1 Music Items

Item	Description	Example	Random	Repeat
Single track	Any single track on any album	Hey Bulldog by the Beatles	Only the single track plays	Can be repeated
Album	Any single album	Abbey Road by The Beatles	Tracks can be played in random order	Can be repeated
Mix album	User-defined album that can contain any tracks or albums	My Favorite Jazz	Can be played in random order	Can be repeated
Artist	All music tracks performed or composed by the artist no matter what album the track is on. Plays randomly until stopped.	The Beatles	Always random	Always repeats
Classical composer	All music tracks composed by the artist, no matter what album the track is on. Plays randomly until stopped.	Maurice Ravel	Always random	Always repeats
Classical work	Single classical work, incorporates all tracks into a single music item.	Piano Concerto in G Major by Maurice Ravel	Can be played back in random order	Can be repeated
User-defined collection	All tracks from any albums, mix albums, artists, genres, or classical composers in a user-defined collection. Plays randomly until stopped.	Mom's favorites	Always random	Always repeats
Genre	All music tracks in the genre, plays randomly until stopped	Rock	Always random	Always repeats
All music	All music on all albums, plays randomly until stopped		Always random	Always repeats

Random and Repeat

In the Kaleidescape System, certain music items always play in random order and repeat. These music items include any genre, any artist, any composer, any user-defined collection, and **All Music**. When any of these items are saved to a preset and played, the item plays in random order starting with a random track.

If the preset is selected again, a new random track plays. This behavior removes the requirement to use a “next track” button to skip a track within the selection. For example, suppose a **Jazz** button is programmed to play the Jazz genre. Every time that button is pressed, a randomly selected Jazz track starts playing. If the user does not care for the current track, the user can simply press the **Jazz** button again to hear a different track. A **Beatles** button, a **Mozart** button, a **Mom’s Music** button, or an **All Music** button would behave the same way.

Presets are played with the zone's last repeat and random settings.

Presets

A preset ties a music item in the Kaleidescape System to a keypad button or other input trigger. Any music item can be saved as a preset, and there is no limit to the number of presets that can be used in a system. The same music presets can be used throughout an installation, or each zone can have a separate set of presets. Presets can be set in any manner useful for the installation. For example, a button designated **HIS MUSIC** can be set in the family room that plays the same music preset as any other **HIS MUSIC** button in the installation.

Alternately, every keypad in an installation can have unique presets assigned to each individual button. In this scenario, setting a music preset to the first button in the family room does not affect buttons on the kitchen keypad. These approaches can be combined. A set of rooms can share a set of presets. For example, the breakfast nook, hallway, and entryway can all share one set of presets, while each child’s room has unique presets.

Tags and the Preset ID

Most radio tuners have presets, typically using numbered buttons to define each one. For instance, **Button 1** can be WKRP, **Button 2** can be WNPR, and so forth. The Kaleidescape System uses a text tag instead of a physical button. Each preset is defined by a tag associated with a music item in a system-wide table.

To simplify creating of presets, the keypad presets module uses a **Preset ID** parameter to generate tags. A Preset ID can refer to a location or function. For instance, a Preset ID like “Kitchen” can be used to create presets for the kitchen music zone. A module with a Preset ID like “Country” can be used to program the same button on all keypads in the installation to play country music. For example, a Preset ID called “John’s Music” can be used to create a **John’s Music** button on multiple keypads. This means John can set the type of music the button plays. John can set the preset himself to play the genre Jazz, the sub-genre Dixieland Jazz, or even a favorite Mix Album.

The Preset ID is appended with the module preset channel number, to create the final tag used by the module. In other words, if the module is programmed with the Preset ID “Kitchen,” the module’s first preset channel uses the tag “Kitchen1,” the second preset input uses “Kitchen2” and so forth. For two virtual devices to share the same presets, simply give the virtual devices the same Preset ID. To create separate presets for each virtual device, assign different Preset IDs.

Tags are currently not visible to end users, but might be displayed on the onscreen display or browser interface someday, so be sure to name Preset ID appropriately.

Zones

Presets are shared between all zones on all players in the system. A preset saved on one music zone can be used anywhere in the system. The keypad presets module must to be tied to a specific zone. A CPID and a Zone ID must be assigned in the module to associate the presets with a player and zone in the system. See [Programming on page 18](#) for more information.

Saving Presets

To save a preset, the music item must be played. The music can be played from any control interface — the OSD with an IR remote, an SATP touch panel, or even the control panels available through the browser interface. Once the music is playing, press and hold the **KEYPAD** button for a few seconds to set the preset. The playback will mute briefly to acknowledge that the preset has been saved. Preset modification can be disabled (locked out) through the module.

Any discrete music item can be saved as a preset. An individual track, album, mix album, genre, artist, classical work, classical composer, user-defined collection, or all music can be saved to a preset. If more than one item is set to play (for example, if three albums are cued up in **Now Playing**) only the item currently playing is saved to the preset. Presets do not have to

be resaved when new content is added to a genre, artist, classical composer, user-defined collection, or mix album.

Preset Browsing

The module also provides the ability to browse through the presets in numerical order. There are three controls provided for this activity: **First**, **Next**, and **Previous**. If a specific preset has not been defined, that preset is skipped and the next defined preset is activated.

Preset Feedback

Each preset in the module is associated with a descriptive text label identifying what is saved to that preset. For example, if the user saves the “Jazz” genre to a preset, then “Jazz” becomes the preset label. If the user saves music by Queen or the Alice in Chains album **Facelift** to a preset, then the preset label becomes “Queen” or “Alice in Chains – Facelift” respectively. These labels can be used on keypad character displays or touch panels to identify the status of a preset button.

The module also reports information about the currently selected music entity using the “Now Playing Item” output. If a preset is currently playing, the label associated with that preset is displayed.

Collection Browsing

A set of buttons can be programmed to browse through the items in a music collection. Any music collection (Albums by Artist, Albums by Title, Artists, Genres, Mix Albums, Classical Composers, Classical Works, New, or any user-defined collection) can be specified. The module provides three controls for browsing: **First**, **Next**, and **Previous**. These controls step through the collection in the order displayed on the OSD.

[Table 2-2](#) describes the music collections currently available in the Kaleidescape System.

Table 2-2 Current Kaleidescape Music Collections

Item	Description	Alphabetical Sort Order	First Item
Albums by Artist	All albums	Artist name, then album title	All music
Albums by Title	All albums	Album name	All music
Artists	All artists	Artist name	All music
Classical composers	All classical composers	Composer name	All classical music
Classical works	All classical works	Work name	All classical music

Table 2-2 Current Kaleidescape Music Collections

Item	Description	Alphabetical Sort Order	First Item
Genres	Top 40 genres	Genre name	All music
Mix Albums	All user-defined mix albums	Mix album name	First mix album
New	Most recently imported albums. The time period for considering an album new can be set in the browser interface.	Album name	First new album
User-defined	Collection of any music items defined by the user	Item name	All in this collection

As more music collections are added to the Kaleidescape System, the keypad commands will also be able to browse them.

Example

If the user wants to step through every album in the Kaleidescape System, define a set of buttons to step through the **Albums by Artist** collection.

When the user presses the **FIRST ALBUM** button, all music plays. This is because the first item on the **Albums by Artist** collection is **Play all music**. If the user subsequently presses the **NEXT** button, the first album by the first artist plays, since the collection is sorted alphabetically by artist name.

The controls in the keypad music collections module operate independently from other methods for choosing music to play. When a user presses the **NEXT** button for a collection, the next item relative to the last item played from the keypad, always plays. For example, suppose the system has three artists, ABBA, The Beatles, and The Cars. While listening to ABBA, the user presses the **NEXT ARTIST** button on the keypad to skip from ABBA to The Beatles. A little while later, the user selects ABBA from the onscreen display. The next time the user presses **NEXT ARTIST** on the keypad, The Cars starts playing, even though the user might expect The Beatles to start playing.

Section 3

Programming

Kaleidescape Command Protocol

Kaleidescape System control is based on bidirectional ASCII string commands. All Kaleidescape components respond to commands from a Crestron controller and provide feedback in ASCII format. Although understanding the details of Kaleidescape command protocol is not required for Crestron programming, it is important to understand how these commands are routed in the Kaleidescape System.

The first field in the command string identifies the Kaleidescape component to which the command is being sent or from which feedback is being received. This device field can have two variables that also appear in module settings and settings made in the browser interface.

- ▶ The first variable is the Control Protocol Device ID (**CPDID**), which identifies the Kaleidescape component.
- ▶ The second is **Zone ID** which identifies which movie or music zone to be controlled.

Note: There are a few commands intended for a 1U, 3U or 5U Server, but these commands are generally limited to IP address recovery commands, and are not useful for the Crestron system.

Control Protocol Device ID (CPDID)

Every command and response begins with a Control Protocol Device ID (CPDID). In installations that do not require command routing, the default CPDID None (01 in the ASCII command) is used for all Kaleidescape components. Do not change the default CPDID (None) unless the installation requires command routing.

The CPDID routes commands to the intended zone. The Kaleidescape module verifies receipt a valid response from the targeted zone by comparing the CPDID of the command and response.

For example, if CPDID **02** is assigned to an M500 Player, the **PLAY** command has the following format.

02/1/PLAY:\r

A command beginning with CPDID **01** (None) always controls the component that receives the command directly, either via the RS-232 port or TCP/IP, regardless of the CPDID setting of the component.

If the installation requires command routing, a unique CPDID for each controlled component must be set on the installer pages of the browser interface. Kaleidescape modules include a field for entering corresponding CPDIDs.

Kaleidescape Music Zones

Some Kaleidescape components have more than one music zone. For example, the Kaleidescape Music Player incorporates a CD/DVD reader and four music zone outputs, each of which must be controlled independently.

To control the four music zones, the device field includes a Zone ID (01–04) that identifies the music zone to which the command is targeted. Each music zone behaves as a separate endpoint. Commands that target music zone **1** do not usually affect music zone **2** and so on. (Power on/off commands affect all four zones.)

For example, if CPDID **06** is assigned to a Music Player, the PLAY command intended for music zone **3** has the following format.

06 . 03 /PLAY:\r

Music commands addressed to the single zone of a M500 Player always use Zone ID **01**.

Kaleidescape modules that control music zones include a field for entering a CPDID and a field for entering the Zone ID.

Kaleidescape Modules

Kaleidescape provides different types of control modules for a player.

- Onscreen display (OSD) modules
- Standalone touch panel (SATP) modules
- Keypad Presets modules
- Keypad Music Collections modules

All modules can use either RS-232 or TCP/IP for control. (See [Appendix B](#) for RS-232 pinout.) These modules are available on the **Support** page of Kaleidescape website. Always download the latest versions of the modules before beginning a project or revising an existing program.

OSD, SATP, and Keypad Presets modules each contain a set of transports: PLAY, STOP, PAUSE, FAST FORWARD, REWIND, NEXT, and PREVIOUS.

These commands behave differently with the SATP and Keypad Presets module than with the OSD module. For example, in the OSD module, the STOP input clears the screen saver if running, clears a pop-up if showing, or stops music when **Now Playing** is shown on the active screen. With the SATP or Keypad Presets modules, the STOP input always stops the music no matter what is shown on the OSD.

Basically, transport commands in the OSD module control the OSD, which then controls movies and music. Transport commands in the SATP and Keypad Presets modules only control the music currently playing.

OSD Module (Onscreen Display Control)

The Kaleidescape OSD module works with either the OSD Video or the OSD No Video template and is used to control a Kaleidescape movie zone.

Kaleidescape recommends using a video feed for control for the best user experience. For more information on the inputs, outputs, and parameters of the OSD module, see [Appendix C on page 66](#).

SATP Module (Standalone Touch Panel Control)

The Kaleidescape SATP module provides standalone touch panel control when an OSD is not available or visible to the user. In these cases, the touch panel provides a standalone interface for a music zone. When used with a zone that supports both movies and music (for example, the single zone from an M500 Player) this module does not affect the OSD and provides a completely independent method for controlling the zone. The SATP module is designed to work with the SATP template.

The Kaleidescape SATP module does not control movie selection or playback. For more information on the inputs, outputs and parameters of the SATP module, see [Appendix D on page 85](#).

Keypad Presets Module

The Keypad Presets module provides simple control for music playback from a keypad. The Keypad Presets module associates music items in the system with keypad buttons. Although designed for keypads, any input can be used to trigger a preset and presets can be incorporated into touch panel designs. For more information on the inputs, outputs and parameters of the Keypad Presets module, see [Appendix E on page 92](#).

Keypad Music Collections Module

The Keypad Music Collections module allows a user to browse through a collection with three simple controls: FIRST, NEXT, and PREVIOUS. For more information on the inputs, outputs and parameters of the Keypad Music Collections module, see [Appendix F on page 95](#).

Importing a Kaleidescape Module

Module Contents

Each module consists of three files.

- SIMPL Windows UMC file
- SIMPL+ USP file
- SIMPL+ USH file

The SIMPL+ files are not intended for direct use in a program, but are used as a processor for the accompanying UMC file.

Note: Kaleidescape modules for Crestron are designed to be used with the latest version of SIMPL Windows. Verify that the most recent version of SIMPL Windows is installed.

File names indicate the current version of the module, indicated by **Xs** in the file names below.

The Kaleidescape **OSD module** consists of three files.

- Kaleidescape OSD vX.X.X.umc
- Kaleidescape OSD Processor vX.X.X.usp
- Kaleidescape OSD Processor vX.X.X.ush

The Kaleidescape **SATP module** consists of three files.

- Kaleidescape SATP vX.X.X.umc
- Kaleidescape SATP Processor vX.X.X.usp
- Kaleidescape SATP Processor vX.X.X.ush

The Kaleidescape **Keypad Presets module** consists of three files.

- Kaleidescape Presets vX.X.X.umc
- Kaleidescape Presets Processor vX.X.X.usp
- Kaleidescape Presets Processor vX.X.X.ush

The Kaleidescape **Keypad Music Collections** module consists of one file.

- Kaleidescape Music Collections vX.X.X.umc

It is not necessary to import the module to use the sample program.

Automatic Import

The Import mechanism in SIMPL Windows can be used without unzipping the file. Select **File**, then **Import an Archived Program**. See [Figure 3-1](#).

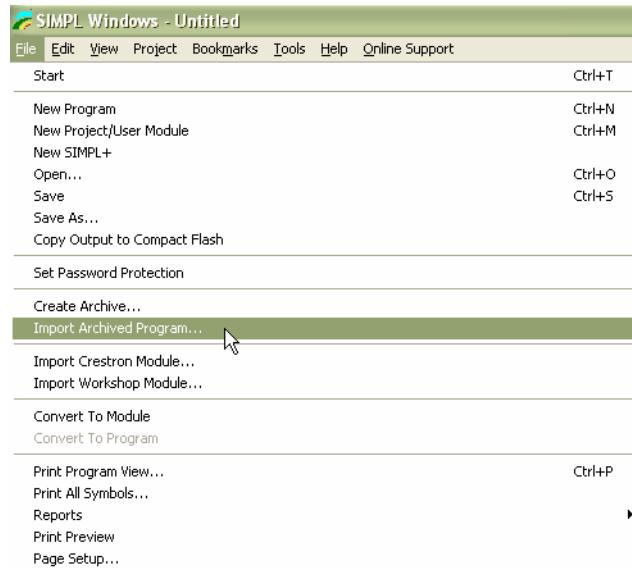


Figure 3-1 SIMPL Windows Import Mechanism

The User Module and SIMPL+ Program must be copied to the same directory. See [Figure 3-2](#).

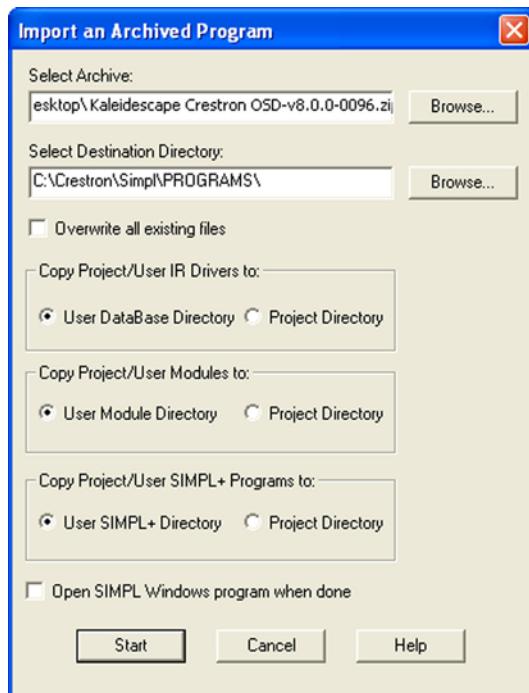


Figure 3-2 Module Location

Module Version Number

The module version number describes changes in the interface and internal changes. The version number of a modules is presented in the following format:

(major).(minor).(patch)

The **major** version number references major API changes, such as the removal or addition of signals to the module.

The **minor** version number changes with any change to the behavior of the module, or if there are minor modifications to the interface. Changes in the minor version number indicate that the program might need modification when updating to this module.

Changes to the **patch** number indicate that there are no outward changes to the module and updating the module should not require any program changes.

Example

If using a module with the version number of **9.2.0**. This module can have a different interface from versions 8 or earlier, and will probably require changes in the program if updating from an earlier version. If version **9.2.1** were released, upgrading from **9.2.0** should be easy and there should be no outward changes. If version **9.3.0** were released, updating from either **9.2.0** or **9.2.1** might require program changes.

Kaleidescape strives to minimize interface changes. Most changes are new inputs or outputs or slight name changes on existing inputs or outputs.

Updating Modules

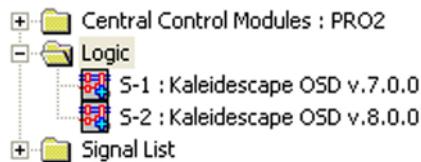
Changes in the major or minor revision number are likely to have interface changes that can affect an existing program, and new inputs and outputs might need reconciling. Depending on the subset of the signals used in the installation, these new controls can often be ignored.

After updating, open up the program in SIMPL Windows and choose **Project** and **Re-Synch Program** to get the new changes.

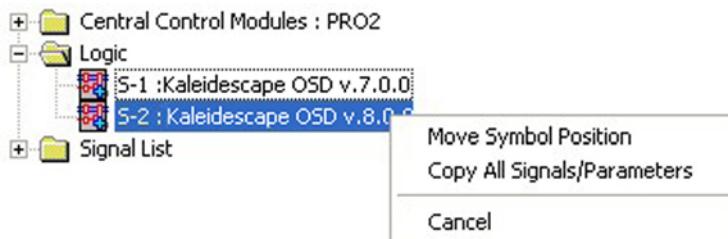
To update old modules, copy the signals from the existing modules to an instance of the new module. Use the following procedure to update OSD modules. The same process can be used to update SATP and keypad modules.

1. Open the Crestron Project and `OSD Demo.smw` with the new OSD module.

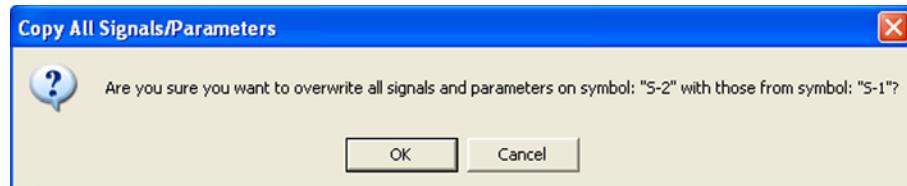
2. Use the Copy and Paste commands to add a new OSD module for every OSD module in the project.



3. Right-click on the module to be updated and drag the module over the new OSD module.



4. Select **Copy All Signals/Parameters** from the pop-up menu.
5. Click **OK** in the confirmation dialog box.



6. Delete the old module.
7. Repeat Steps 3 through 6 for all the OSD modules to be updated.

Scalability

The complexity of the Kaleidescape modules is demanding on a Crestron processor. A single, dedicated Crestron CP2E can support the following modules:

- Up to 15 OSD modules OR
- Up to 15 SATP modules with five users actively browsing OR
- Over 90 keypad modules

System Builder

Imported modules are not currently compatible with System Builder. To be used in System Builder, the modules and templates must be modified. To

make this process easier, virtual connection logic and device support definitions have been included in the modules.

Connection Methods

All Kaleidescape players can be controlled via a TCP/IP connection over Ethernet; most can also be controlled via an RS-232 connection. The M300 Player does not have an RS-232 port and must be controlled via a TCP/IP connection. In a Crestron control system, the Kaleidescape modules cannot distinguish between these two connection methods; the protocol is identical.

Kaleidescape recommends using TCP/IP over Ethernet for control connection in most cases. TCP/IP over Ethernet offers several advantages over RS-232:

- Very high bandwidth compared to RS-232
- Error detection and correction
- Standard Cat5/5e/6 cable and pinout (simple standard termination) usage
- Longer cable runs possible
- Only a single network port required
- No extra COM port cards needed

Bandwidth can be a key issue, especially in multi-zone systems. Text-based feedback from several zones can cause noticeable response latency over an RS-232 connection. This is especially critical when using command routing to control multiple Kaleidescape components through a single RS-232 port.

There are some installations that require RS-232. If controlling the power state of an older Movie Player is an issue, RS-232 might be the only option. (M-Class players and the 1080p Player, 1080p Mini Player, Movie Player 2, and Music Player can be powered on from TCP/IP over Ethernet commands.) For more information on controlling power states, see [Power Control on page 37](#).

RS-232 control can be used if the Crestron processor does not have an Ethernet port or the optional Ethernet card has not been purchased.

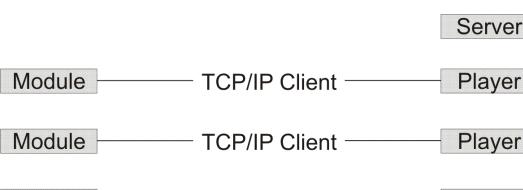
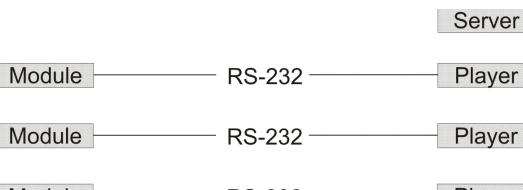
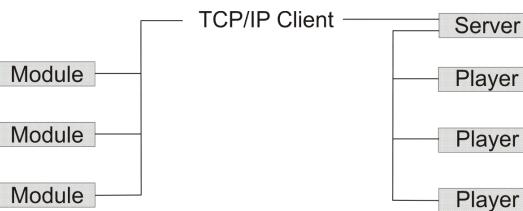
Programming Options

In addition to direct physical connections through RS-232 or Ethernet ports, there are other methods of combining Crestron programming with Kaleidescape commands. There are several methods of connecting Kaleidescape module signals to other device modules. The Kaleidescape

control protocol also allows for routing commands indirectly, through a single physical connection, to any Kaleidescape player or server (command routing).

Table 3-1 illustrates how physical connections work with Crestron and Kaleidescape programming options (listed in order from highly recommended to least recommended).

Table 3-1 Connections between Crestron and Kaleidescape

Method	Diagram	Description
Single Ethernet port with multiple TCP/IP clients	Recommended 	Each player is associated with the Kaleidescape module through the player's individual TCP/IP client. Pros: Good control flexibility and throughput Cons: Several TCP/IP clients to manage. Cannot power on the older KPLAYER-2000 or KPLAYER-2500.
Multiple RS-232 ports		Each player has a direct connection to an RS-232 port on the controller. Pros: Best control flexibility and fair throughput. Cons: Limited distances, might require additional RS-232 ports.
Command routing with a single Ethernet port and single TCP/IP client		Kaleidescape module signals are jammed together through a single TCP/IP client. Pros: Easier to program, good throughput. Cons: Places extra load on Crestron processor. Cannot power on a player.
Command routing with a single RS-232 port		Kaleidescape module signals are jammed together through a single RS-232 port. Pros: Single RS-232 connection. Cons: Places extra load on Crestron processor. Poor throughput and limited distances. Cannot power on a player.

All of these methods can be used in the same installation depending on factors such as the cable run length to players, the Crestron processor, and the number of players in the installation.

Using Command Routing

Command routing allows control of multiple Kaleidescape players with only one connection to the controller. This can be either a TCP/IP or an RS-232 connection to almost any player or server in the system. While command routing can be the best solution for some installations, there are also inherent limitations and should be used only if required by the installation.

- ▶ If the Crestron controller has a dedicated RS-232 port for each Kaleidescape player or if direct TCP/IP communication can be established with each player, command routing is not required.
- ▶ If several players must be controlled through a single RS-232 port or a single IP address must be used for Crestron communications with the Kaleidescape System, command routing is required.

Command Routing via TCP/IP

In some installations, it is impossible to make a TCP/IP connection to each player. For example, the network administrator may have isolated the Kaleidescape System on a separate network behind a NAT router and only a single IP connection is available. Or, maybe the network administrator has only provided for a single static IP address, and all other components are using dynamically assigned IP addresses (addresses potentially changing with each power cycle or power outage).

For these types of installations, it is possible to route all communications through a single TCP/IP client. This forces the Crestron processor to work harder than necessary and can slow down the system – especially if the program uses multiple SATP modules. Using a single IP address and command routing introduces a single point of failure. If the Kaleidescape component with connection to the controller loses power or if replaced by a new component with the wrong IP address, control of the entire Kaleidescape System is lost. These network topologies are not recommended for Kaleidescape Systems and should be avoided if possible.

If a single IP address must be used, change the TX\$ of every module to use the same signal name (jamming them together). Do the same for the RX\$ and Connection-F signals of every module. Then configure one TCP/IP client to use the same TX\$, RX\$, and Connection-F signals. This change routes all the TX\$ and RX\$ signals through that one TCP/IP client.

Although the TCP/IP client can connect to any Kaleidescape player to control any or all zones in the system, control of those zones is lost if that player is turned off. To avoid this potential problem, connect directly to a server when using command routing because the server generally stays

powered on all the time. If there are multiple servers in the system, the additional servers can be left out of the control programming.

Command Routing via RS-232

Instead of using a TCP/IP client, all the communications can be routed through a single RS-232 port. As above, connecting through the Kaleidescape server is recommended. However, command routing through the RS-232 control port can cause latency in some cases because of the limited bandwidth of the RS-232 port and is not recommended.

If a single RS-232 connection must be used, change the TX\$ of every module to use the same signal name (jamming them together). Do the same for the RX\$ and signals of every module. Then configure one RS-232 port to use the same TX\$ and RX\$ signals. This routes all the TX\$ and RX\$ signals through that one RS-232 port.

Setting the Control Protocol Device ID

CPDIDs are set for Kaleidescape components on the installer pages of the browser interface. The CPID of the OSD or SATP module must also be set to match the player being controlled. Do NOT assign the same CPID to more than one device. Valid CPID numbers for command routing range from **02** to **99**. Setting CPID **None** in the browser interface means that command routing is not being used for that device. Kaleidescape players set to CPID **None** must have a direct connection to the controller (via RS-232 or TCP/IP). The Crestron module must then be set to CPID **01** to communicate with the device directly connected.

For example, if using command routing via an RS-232 connection to a 3U Server, the server responds to requests sent to CPID **None (01)** and routes commands with other CPDIDs to the components with assigned unique CPDIDs.

Use the following procedure to assign a CPID to a Kaleidescape component.

1. Open the installer pages of the Kaleidescape browser interface.
<http://my-kaleidescape/installer> (Windows) or
<http://my-kaleidescape.local/installer> (Mac)
2. Click the **SETTINGS** button on the **COMPONENTS** tab for the component.
See [Figure 3-3](#).

**Figure 3-3 Component SETTINGS Button**

3. Select the **CONTROL** tab from the **Settings** page.
 4. Select the **Control Protocol Device ID** (None, 02 through 99) from the drop-down menu.
- Select **None** only if command routing is NOT used for this device. See [Figure 3-4](#).

**Figure 3-4 CONTROL Tab**

5. Click **OK**. The device does not have to be rebooted.

CPDID Addressing Example

In the example illustrated in [Figure 3-5](#), a Crestron controller is connected to a 1U Server either via Ethernet or the RS-232 control port. Unique CPDIDs are assigned in the installer pages of the browser interface to four M500

Players and one Music Player. The Music Player has four music zones controlled independently with the addition of Zone IDs. Because the 1U Server connected to the Crestron controller is the local device, the server uses the default CPDID **None**. The second 1U Server does not have to be controlled, so that CPDID is left at the default CPDID **None**.

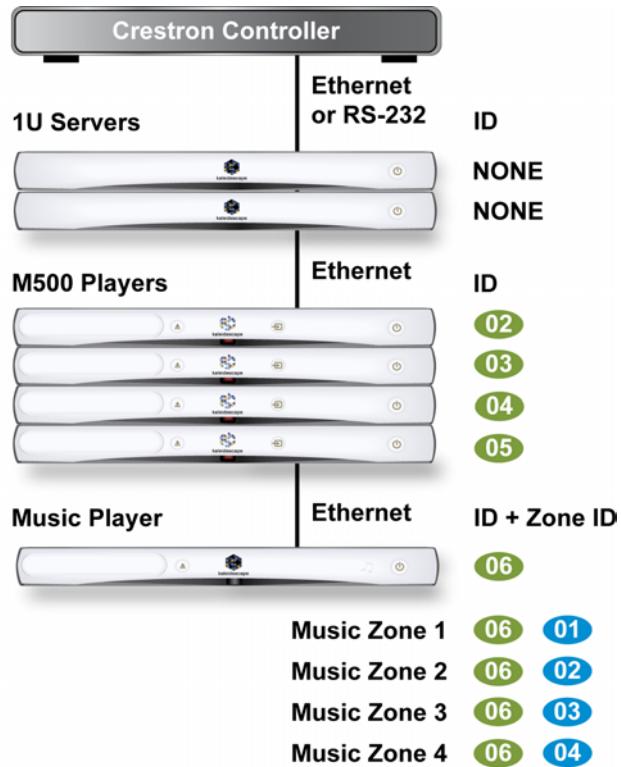


Figure 3-5 CPDID Addressing Example

Each of the M500 Players is controlled from a Kaleidescape OSD module. The OSD modules must be configured to match the CPDIDs assigned to the players in the browser interface. The field for the CPDID is at the bottom of the module. See [Figure 3-6](#).

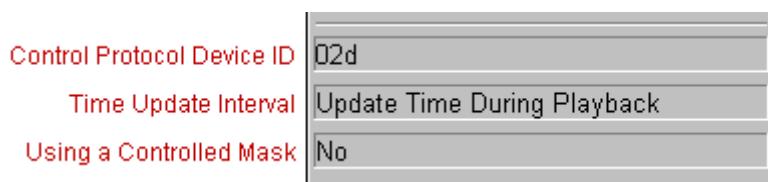


Figure 3-6 Configuring the Module CPDID

If the controller directs the M500 Player to play a selected movie, the OSD module sends the following text command to the server:

```
02/1/PLAY:\r
```

The server receives the command and reroutes the command to the player with the CPID **02** via TCP/IP over Ethernet. The response from the player is directed through the server back to the OSD module with the CPID **02**.

With the Music Player, a separate SATP or keypad module must be used for each controlled zone. See [Figure 3-7](#). All SATP and keypad modules for the same player are assigned the same CPID (**06** in the example) but the Zone ID parameter (**01** through **04**) must also be set. The SATP and keypad modules send every command with the CPID followed by the Zone ID. This identifies each music zone as a separate, routable endpoint.

Control Protocol Device ID	06d
Zone ID	03d
Time Update Interval	Update progress during playback
List Window Length	20d

Figure 3-7 Configuring the Module CPID with Zone ID

If the controller directs the Music Player to play the selected music in zone 3, the SATP module sends the following text command:

06.03/1/PLAY:\r

The 1U Server receives the command and reroutes the command to the Music Player (CPID **06**) via TCP/IP over Ethernet. The Music Player identifies the Zone ID of the command and plays back music in zone 3. The response is directed through the 1U Server back to the SATP module for zone 3.

Note: If command routing is not used, the Zone ID must still be set for the zone that the SATP or keypad module will be controlling.

This example has the Crestron processor connected to the 1U Server, but this process works just as well if the Crestron processor is attached to one of the M500 Players.

Note that a CPID of **01** always sends commands to the directly connected device. If the Crestron processor were connected to the M500 Player with CPID **02**, any messages sent with CPID **01** are captured by that player and not routed to any others. In this case, both **01** and **02** are correct values for the module CPID parameter. A direct connection to the controller is the only way to communicate with a component whose CPID is set to **None**.

For more information, see the *Kaleidescape System Control Protocol Reference Manual* on the Support page of the Kaleidescape website.

Music Zone Control

Music zone control provides control for any music zone in the system from the OSD for a movie zone. Setting music zone control in the browser interface allows the user to select any zone from the movie zone onscreen display. **Now Playing** shows what is playing in the currently selected zone.

Use the following procedure to set music zone control.

1. Open the installer pages of the Kaleidescape browser interface and select the **COMPONENTS** tab.
2. Name the zones in the system **Zone # Name (for music)** text boxes. See [Figure 3-8](#). Click **OK** to save changes. Repeat for all components with music zones.

Give the zones names easily understood by the user such as Sunroom, Dining Music, John's Music, or Baby's Music. These are the names listed in the OSD for users to choose from when they pick a zone to control the music.

Note: If a zone is named **Unused**, that zone does not appear as an option on the OSD selection.

The screenshot shows the Kaleidescape Components tab interface. At the top, there are tabs for HOME, PREFERENCES, COMPONENTS (which is selected), GROUPS, and DIAGNOSTICS. Below the tabs, there is a message: "There are additional Kaleidescape components on your network that are not displayed below. [Click here](#) to manage the grouping of your Kaleidescape components." The main area is divided into sections for different components:

- Server**: Shows details like Device Type (1U Server), Capacity (3978 GB), and Front Panel Lights (Bright). A temperature gauge shows 41°C.
- 2 Players**: Shows two entries:
 - Movie Player 2**: Device Name is "Family Room" (highlighted in yellow). The Zone 1 Name (for music) field contains "Children's Zone" and is circled in red with the label "Control music on zone 1".
 - M500 Player**: Device Name is "Master Bedroom" (highlighted in yellow). The Zone 1 Name (for music) field contains "Music Zone" and is circled in red with the label "Control music on zone 1".

Each component entry includes fields for Device Type, Device Name, Serial Number, IP Address, MAC Address, Front Panel Lights, Import settings, When Import Finishes, Preferred Movie Format, Screen Saver Timeout, and a temperature gauge.

Figure 3-8 **COMPONENTS Tab**

3. Select the **PREFERENCES** tab. See [Figure 3-9](#).

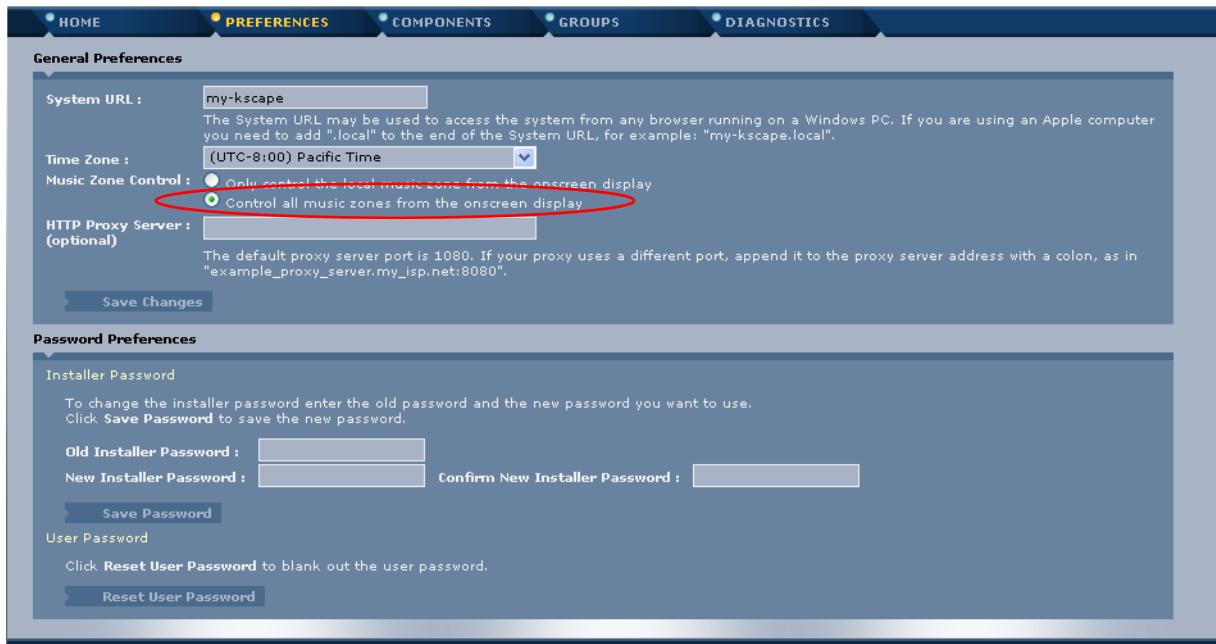


Figure 3-9 **PREFERENCES** Tab

4. Then select **Control all music zones from the onscreen display** radio button.
5. Click **SAVE CHANGES**.

Music Zone Selection

On the movie zone onscreen display, the user can select the **Control Zone ...** option in the **Now Playing** view on the display. See [Figure 3-10](#).

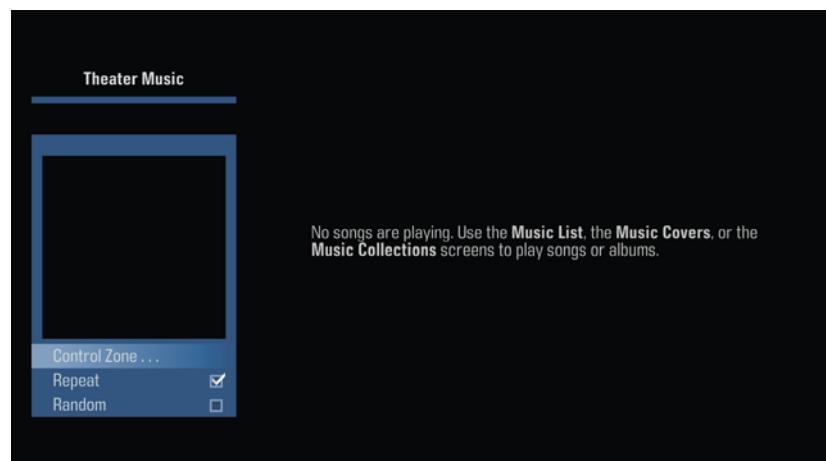


Figure 3-10 **Control Zone ... Option**

When the user selects **Control Zone ...**, the **Select Music Zone** dialog box appears with all the available zones in the system according to the names assigned in the Kaleidescape browser interface. See [Figure 3-11](#).

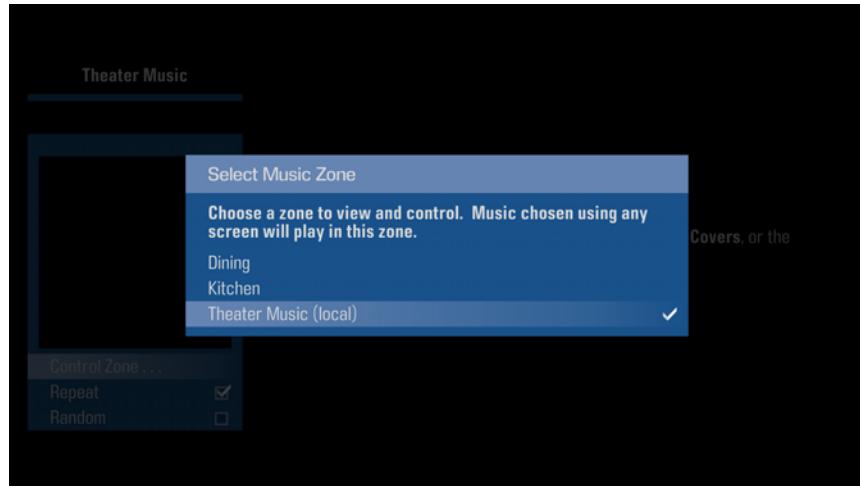


Figure 3-11 Select Music Zone Dialog Box

When the user selects new music, a prompt appears with a reminder that a different music zone is being controlled. The user then has the option to select another zone.

OSD Module Music Zone Selection

The zone that the onscreen display is controlling can be set in the Kaleidescape OSD module. Control can be specified by using either the CPID or serial number of the component. Note that this feature functions whether or not the CPID is set. Because either CPID or serial number can be used, the module also provides feedback using both CPID and serial number when stating which music zone the OSD is currently controlling. See [Figure 3-12](#).

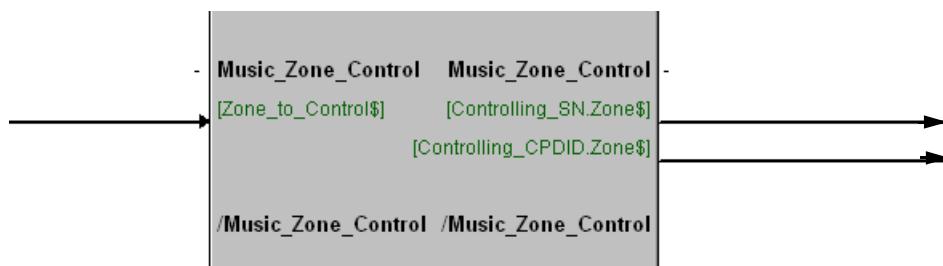


Figure 3-12 OSD Module Music Zone Control

Serial Number Control

To use this feature with serial numbers, setup a Serial I/O with the serial numbers and Zone ID of the music zones that the onscreen display is to control. [Figure 3-13](#) shows how to use a component serial number to initiate control.

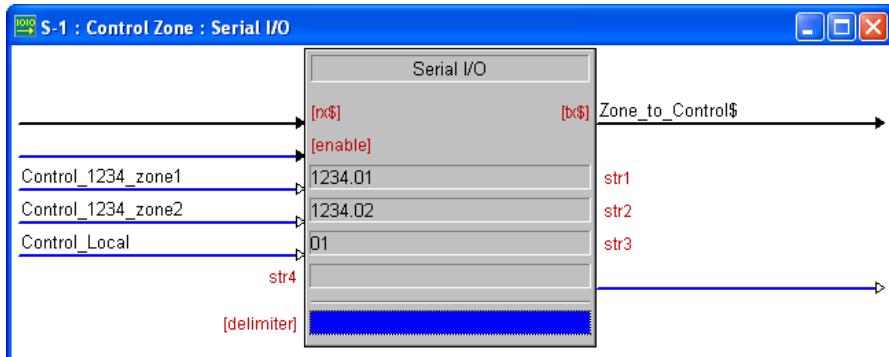


Figure 3-13 OSD Music Zone Control using a Serial Number

On the rising edge of the signal **Control_1234_zone1**, the onscreen display begins controlling music of the first zone of the component with serial number **1234**. On the rising edge of the signal **Control_1234_zone2**, the onscreen display begins controlling the second zone of the component with serial number **1234**. On the rising edge of **Control_Local**, the local movie zone is controlled again. Note that **01** always refers to the local zone.

To obtain feedback as to which serial number and zone the onscreen display is currently controlling, use the **[Controlling_SN.Zone\$]** output. See [Figure 3-14](#).

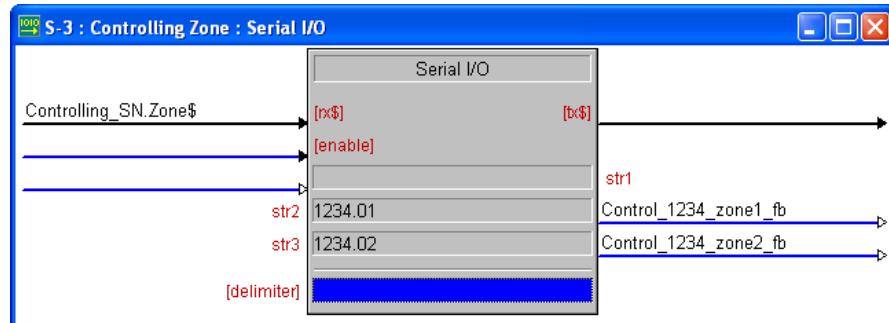


Figure 3-14 Serial 1/O Feedback

The **Control_1234_zone1_fb** signal is high while the onscreen display is controlling zone 1 of component 1234 and the **Control_1234_zone2_fb** signal is high while the onscreen display is controlling zone 2 of component 1234.

In an actual program, these functions are usually combined into a single Serial I/O symbol. See [Figure 3-15](#).

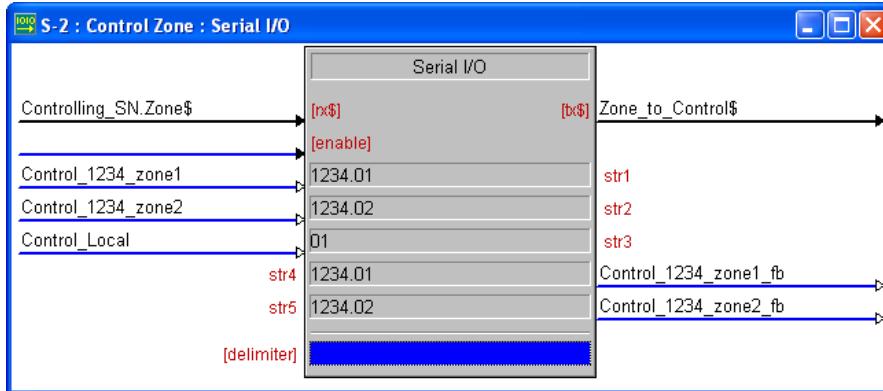


Figure 3-15 Serial I/O Control and Feedback Functions Combined

CPDID Control

To select which zone to control using the component CPDID instead of the serial number, simply substitute the CPDID for the serial number in the strings, and take the feedback from the **[Controlling_CPDID.Zone\$]** output of the module. For instance, if to control zones 1 and 2 of a Music Player with a CPDID of **05**, use the numbers in Figure 3-16.

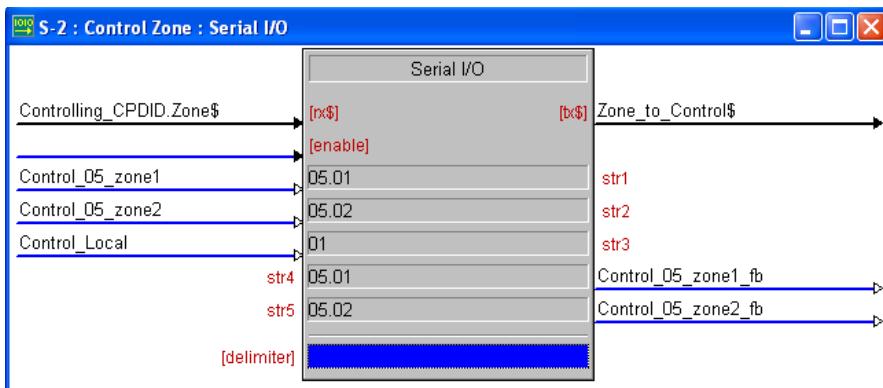


Figure 3-16 OSD Music Zone Control using a CPDID

Controlling a Movie Zone with both SATP and OSD Control

If a user wants to use both the standalone touch panel (SATP) and the onscreen display (OSD) interface to control a movie zone, for example, the single zone output of a 1080p Player, the user can select music from a touch panel without turning on the video display. The best approach for this scenario is to imagine that the single zone is actually two different devices: one is an OSD-controlled movie zone which can play movies or music, and the other is an SATP-controlled music-only zone. Both SATP and OSD No Video templates must be loaded onto the touch panel. These templates are designed as a single page to allow the templates to reside on the same

touch panel. The single page design makes it easier to integrate Kaleidescape templates into a larger user interface file on the touch panel.

Both modules can use the same connection with TX\$ and RX\$ signals jammed together, but the better method is to isolate the two different modules into individual TCP/IP clients. In this case, the two TCP/IP clients use the same IP address, and the modules use the same CPDID.

Use buffers or other methods to separate devices on a touch panel. Remember to add a **Make String Permanent** symbol to keep the serial strings that are not routed in memory.

Calibrating the Touch Interface

If using the OSD template with video, the touch panel interface must be calibrated to enable the user to touch the video feed. This calibration is in addition to the calibration of the Crestron touch panel itself.

Once the system is functioning, press the Kaleidescape logo in the upper left corner of the OSD touch panel to bring up the **Kaleidescape menu** and select **System Status**. Use the left/right arrows to select the **System Setup** menu. From there, select **Calibrate Touch Panel** and follow the onscreen instructions.

The calibration information is stored in the player itself.

Note: Each zone used for OSD Video control must be calibrated.

Power Control

Whether to connect to a component via RS-232 or TCP/IP might be determined by how the power state of the component is managed. Both connection types support power off (`ENTER_STANDBY`) commands, but some older components cannot respond to a power on (`LEAVE_STANDBY`) command over TCP/IP. Power on works for all M500, 1080p, Music and Movie Players receiving the command from an RS-232 connection.

Note: Mini players do not have an RS-232 control port.

Power Control for the Movie Player (KPLAYER-2000, KPLAYER-2500)

Early model Movie Players cannot be powered on over a TCP/IP connection. When the Movie Player is put in standby mode, the Ethernet port shuts down and the player cannot receive TCP/IP communications. Movie Players connected directly to the controller via the RS-232 control port can be powered on.

With command routing, a serial connection can be made to one player and issue commands that route to a second player. Routed commands travel over the network to the second player. If the second player is in standby mode in this scenario, power on commands routed through the first player will not cause the second player to leave standby.

In some situations, this limitation is not an issue. The Movie Player remembers the last power state and resumes that last power state after a power outage. For example, if the Movie Player is fully powered on when the power is lost, the player automatically returns to the fully powered on state when the power is restored. Additionally, the Movie Player is very quiet (not completely silent because the fan runs as needed) and the noise is usually not noticeable when the player is in a cabinet. In many installations, the Movie Player is always fully powered on.

If the Movie Player has to be power cycled from the Crestron controller, there are two power options.

- Use RS-232 control without command routing (cable directly connected to the player).
- Use an infrared (IR) emitter to send the `IR POWER ON` command, but use TCP/IP for all other commands.

Power Control for the 1080p Player, 1080p Mini Player, Music Player, and Movie Player 2

The Ethernet port for the 1080p Player, 1080p Mini Player, Music Player, and Movie Player 2 is powered while in standby — but in a limited mode.

If the `ENTER STANDBY` command is sent to the component over TCP/IP, initially there is no response. After a moment, the network connection drops, and is then re-established. The component is now in limited mode and responds only to a limited set of commands. When a `LEAVE_STANDBY` command is received, the component powers on. The network connection drops momentarily and then reconnects. The component is now ready to respond to commands normally. Command routing cannot be used to power on these components. When using TCP/IP, a direct connection must be made to the component to turn the component on.

`ENTER/LEAVE_STANDBY` commands sent to the Music Player affect all four music zones.

Power Control for the Cinema One

The standby mode on the Kaleidescape Cinema One only affects the movie zone and the first music zone of the component. Standby does not affect the second and third music zones. When in standby mode, commands that

affect the movie zone or first music zone return error code **020**, indicating that the component is in standby mode.

When the `ENTER_STANDBY` command is sent to the Cinema One, the Cinema One responds with a `DEVICE_POWER_STATE` event message indicating the new power state and turns off the movie zone and first music zone. Similarly, the Cinema One responds to the `LEAVE_STANDBY` command by immediately returning to the fully powered-on state and sending another `DEVICE_POWER_STATE` message.

Unlike the components listed in the previous section, the Cinema One does not drop the TCP/IP connection when entering or leaving standby mode.

Power Control for the M-Class Players

The standby mode on the Kaleidescape M-Class players is similar to that of the Cinema One. If the `ENTER_STANDBY` command is sent to an M-Class player, the player responds with a `DEVICE_POWER_STATE` event message indicating the new power state and shuts off.

Similarly, the player responds to the `LEAVE_STANDBY` command by immediately returning to the fully powered-on state and sending another `DEVICE_POWER_STATE` message. Like the Cinema One, an M-Class player does not drop the TCP/IP connection when entering or leaving standby mode.

Section 4

Sample Installation

This section contains a step-by-step implementation of a sample installation that uses direct control, without command routing, via TCP/IP over Ethernet. Although a single TCP/IP client can be used to control the entire system with command routing, this configuration puts an unnecessary load on the Crestron processor. Connecting all modules to one TCP/IP client is inefficient because each module must process all incoming messages.

Figure 4-1 shows the layout of the sample installation.

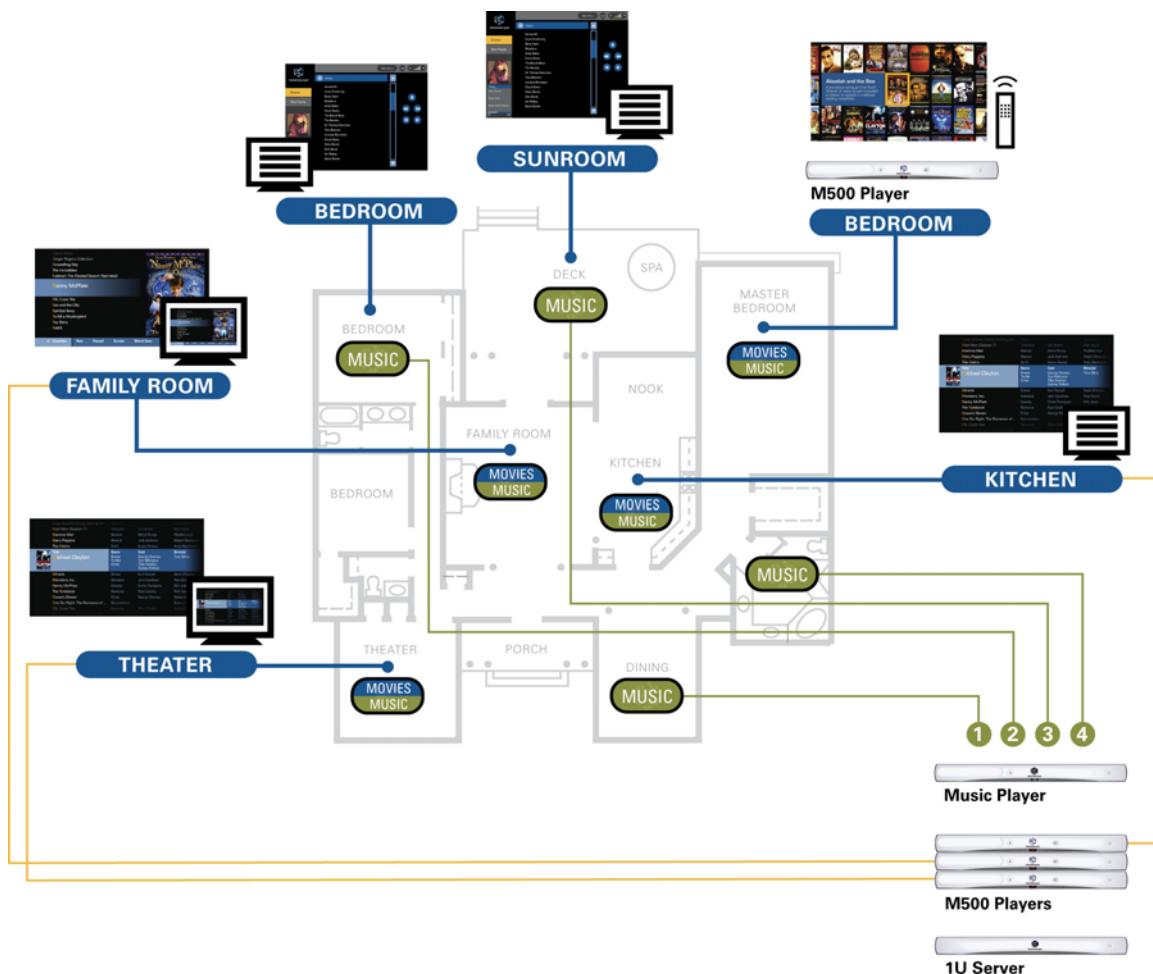


Figure 4-1 Layout for Sample Installation

Theater	The theater has a TPS-15 with video capabilities. The theater contains a projector, an adjustable screen masking system, controlled lighting, and shades. The M500 Player will be controlled using the OSD module and OSD Video template.
Family Room	The family room also has a TPS-15 and controlled lights but no masking or shades. The M500 Player will be controlled using the OSD module and OSD Video template.
Bedroom and Sunroom	The bedroom and sunroom each have a TPS-4L to control music zones 3 and 4 of the Music Player. Each music zone will be controlled with a separate SATP module.
Master Bedroom	The master bedroom uses a universal remote to control the local M500 Player.
Kitchen	The kitchen has a TPS-12, but a video cable could not be wired to that location, so the OSD No Video template will be used. The M500 Player will be controlled using the OSD module and OSD Video template. The kitchen touch panel will also control the dining room music using the music zone control feature.

Music zone **1** from the Music Player is unused in this installation.

Assigning Static IP Addresses

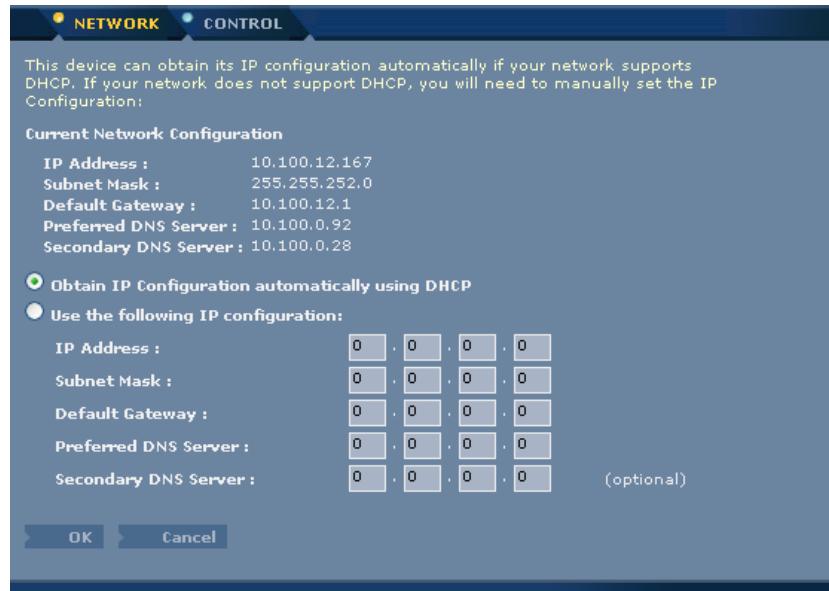
For Crestron processor TCP/IP communications, each player is given a separate static IP address using the Kaleidescape browser interface. Be careful not to assign an IP address already used by some other device in the network or that is in the dynamic range of addresses being assigned by the DHCP server. [Figure 4-2](#) shows an example list of IP addresses.

**Figure 4-2** Sample IP Address list

The Crestron processor does not need to control the M500 Player in the Master Bedroom or the 1U Server, so these two components are left to obtain a dynamic address from the DHCP server. These Kaleidescape components are set by default to obtain an IP address from a DHCP server.

Use the following procedure to set static IP addresses.

1. Open the installer pages of the browser interface.
<http://my-kaleidescape/installer> (Windows) or
<http://my-kaleidescape.local/installer> (Mac)
2. Click the **SETTINGS** button on the **COMPONENTS** tab for the component.
3. Select the **NETWORK** tab. See **Figure 4-3**.

**Figure 4-3** NETWORK Tab

4. Click the **Use the following IP configuration** radio button.
5. Enter the appropriate IP information and click **OK**.

Configuring TCP/IP Clients

Five TCP/IP clients have to be added to the Crestron program: two for connecting to music zones 3 and 4 of the Music Player and three for connecting to each of the M500 Players controlled from touch panels.

Each of these clients must be named and have an IP address assigned corresponding to a M500 Player or Music Player. The M500 Player in the Master Bedroom will be controlled with the IR remote and does not require Crestron programming.

Note: The Kaleidescape sample Crestron programs must be imported BEFORE continuing. See [Importing a Kaleidescape Module on page 21](#) for details.

1. Open SIMPL Windows and click the **CONFIGURE** button to enter the **Configure View**. See [Figure 4-4](#).



Figure 4-4 **CONFIGURE** Button

2. Drag five TCP/IP clients into the program from the Device Library **Ethernet Control Modules/Ethernet Intersystem/Device Communications** folder. See [Figure 4-5](#).

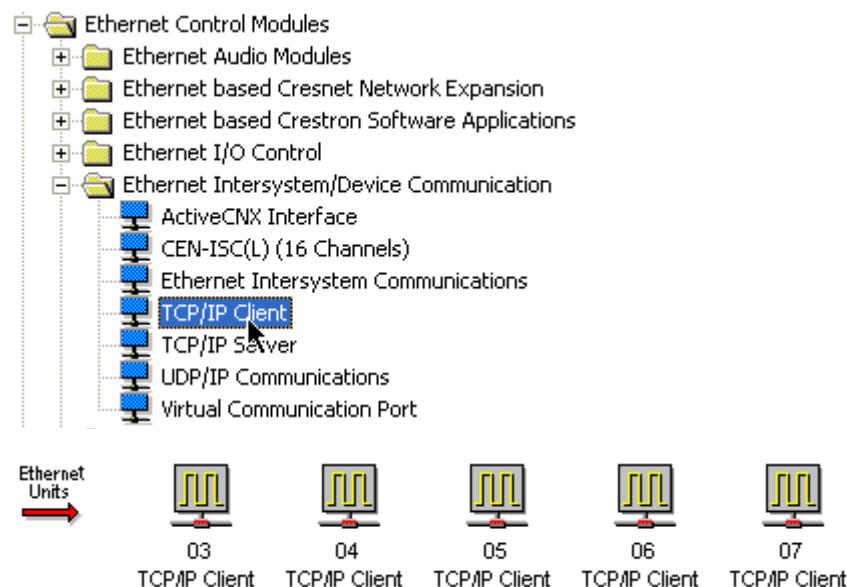


Figure 4-5 **Device Communications Folder**

3. Double click the first TCP/IP client icon. The **Device Settings: Crestron TCP/IP Client** window appears. See Figure 4-6.

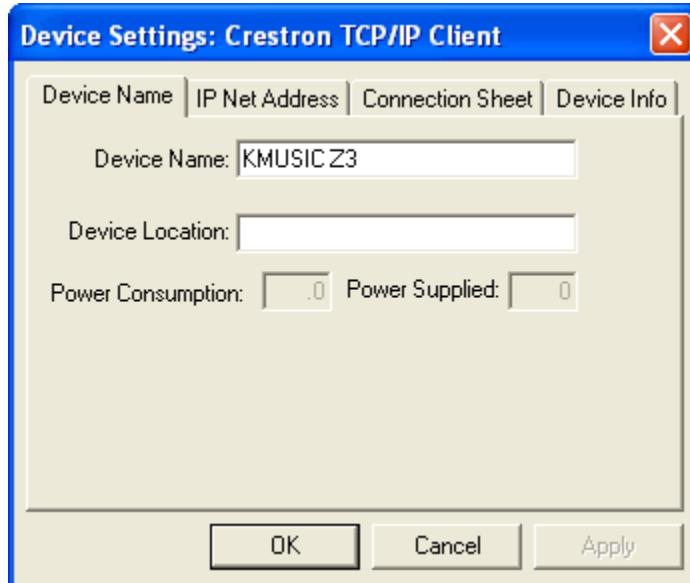


Figure 4-6 Device Settings: Crestron TCP/IP Client Window

4. Enter a descriptive name of the music zone or movie zone for the TCP/IP client in the Device Name text box, for example, **KMUSIC Z3**. Enter a descriptive name of the location the zone in the Device Location text box, for example, **KMusic-bedroom** and **KPlayer-family room**.
5. Select the **IP NET ADDRESS** tab and enter the first IP address defined in [Assigning Static IP Addresses on page 41](#). See Figure 4-7.

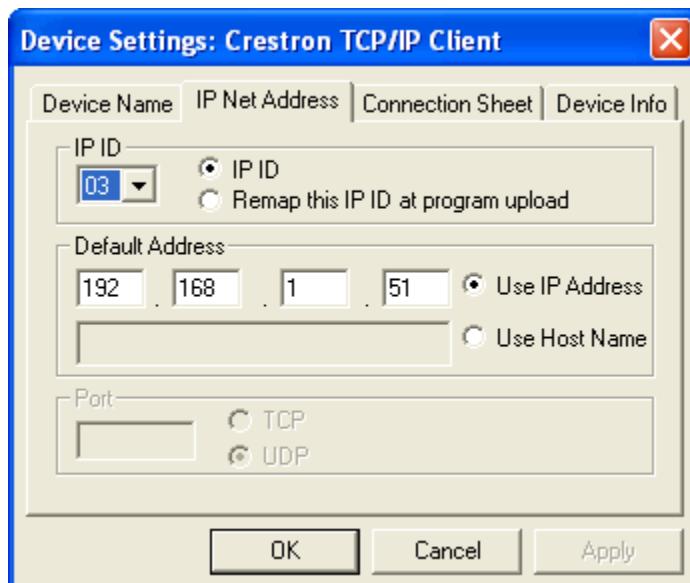


Figure 4-7 IP Net Address

6. Click **OK** to save settings.
7. Repeat Step 3 through Step 6 for each TCP/IP client. Remember that music zones **3** and **4** share the IP address of the Music Player (192.168.1.54). The TCP/IP clients are now labeled with the device names. See [Figure 4-8](#).



Figure 4-8 Named Devices

Configuring Touch Panels

Touch panels have to be added to the program and named. The signal names from the TPS-15 samples in the Kaleidescape OSD Demo and Kaleidescape SATP Demo programs are copied later.

Use the following procedure to add and name touch panels.

1. While still in the **Configure View**, open the Device Library **Touchpanels/ Touchpanels (Cresnet)** folder and find the touch panel symbols. See [Figure 4-9](#).

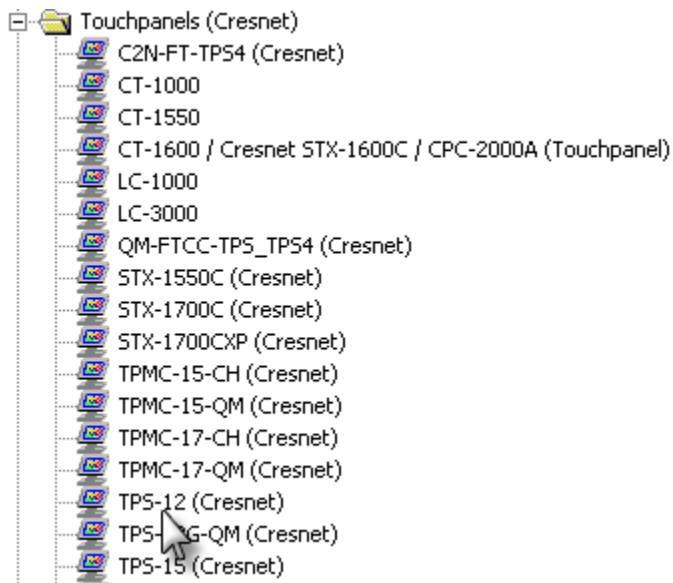
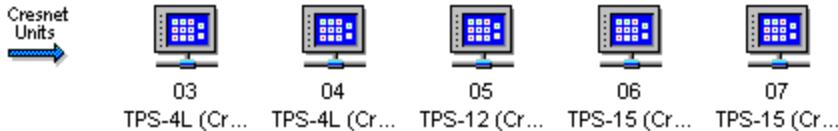


Figure 4-9 Touch Panel Symbols

2. Click and drag two TPS-4L, one TPS-12, and two TPS-15 symbols into the **System View**. See [Figure 4-10](#).

**Figure 4-10 Selected Touch Panel Symbols**

3. Click on each icon and rename the touch panels in the same manner as the TCP/IP clients. See [Figure 4-11](#).

**Figure 4-11 Renamed Touch Panels**

Programming TCP/IP Clients

The communication port must be set and the TX\$ and RX\$ signals renamed for each TCP/IP client.

Use the following procedure to connect the ports and rename the TX\$ and RX\$ signals.

1. Click the **PROGRAM** button. See [Figure 4-12](#).

**Figure 4-12 PROGRAM Button**

2. Open the **Central Control Modules** folder in the **Program View**.
3. Find the TCP/IP client in the Ethernet slot list.
4. Open each of the TCP/IP clients and set **Port** to **10000**.
5. Set the Connect input to **1**.
6. Name the Connect-F, TX\$, and RX\$ connections. Use the names shown in [Figure 4-13](#), **_Connect-F**, **_TX** and **_RX**, so that the signals correspond to the signals copied and pasted from the Demo program modules as described in the following section.

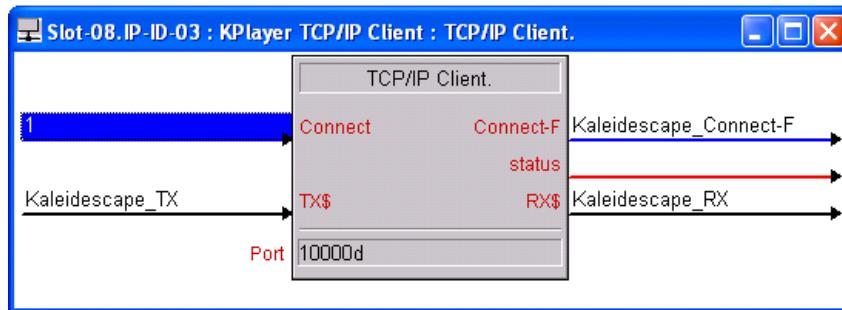


Figure 4-13 Naming the TX\$ and RX\$ Signals

Programming Touch Panels

Copy the signal names from the generic TPS-15 in the Kaleidescape OSD Demo and Kaleidescape SATP Demo program modules. Then copy the TPS-12 and TPS-15 signals from the OSD Demo program and the TPS-4L signals from the SATP Demo program.

The signals from the TPS-15 in the Kaleidescape OSD Demo program can be applied to any touch panel symbol with video capabilities. In this example, the TPS-15 signals from the OSD Demo program are used for both the TPS-15 and the TPS-12 touch panels. The signals from the TPS-15 symbol in the Kaleidescape SATP Demo program are for touch panels controlling music in zones without video displays.

In this example, the TPS-15 signals from the SATP Demo program are used for the TPS-4L touch panels.

Use the following procedure to copy signal names from the TPS-15 in the demo modules.

1. Open a new instance of SIMPL Windows.
2. From the **File** menu, open the Kaleidescape OSD Demo program.
3. Click the **PROGRAM** button. See [Figure 4-14](#).



Figure 4-14 PROGRAM Button

4. In the **Detail View**, scroll to the TPS-15 symbol. Copy the digital input signals.
5. Select all the digital input signals by highlighting the first input signal and press **SHIFT-END**.
6. Press **CTRL-C** to copy.

7. Return to the program and open the **Kitchen** touch panel in the **Detail View**.
8. Select the first digital input signal and press **CTRL-V** to paste the signals. The **Preserve Unconnected Signals?** window appears. See [Figure 4-15](#).

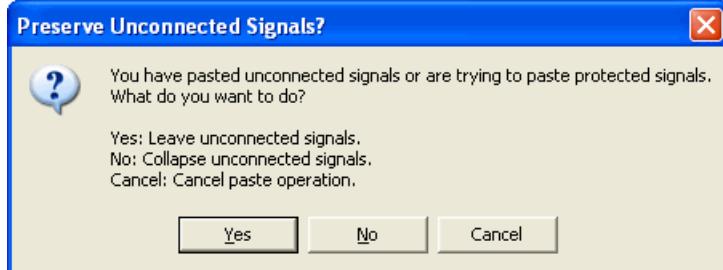


Figure 4-15 Preserve Unconnected Signals? Window

9. Click **YES**. The **Expand Symbol?** window appears. See [Figure 4-16](#).

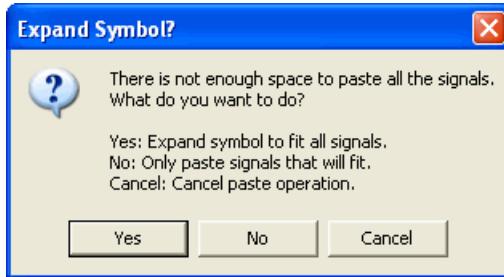


Figure 4-16 Expand Symbol? Window

10. Click **YES**. If a prompt appears to name unconnected signals, click **NO**.
11. Return to the Kaleidescape OSD Demo program and repeat Steps 4 through 10 for the remaining input and output signals: digital, analog, and serial.
12. Copy all the signals from the Kitchen TPS-12 that was just created.
 - a. Select the touch screen symbol in the **Program View**.
 - b. Right click and drag the symbol over the **Family Room** symbol. A menu appears. See [Figure 4-17](#).

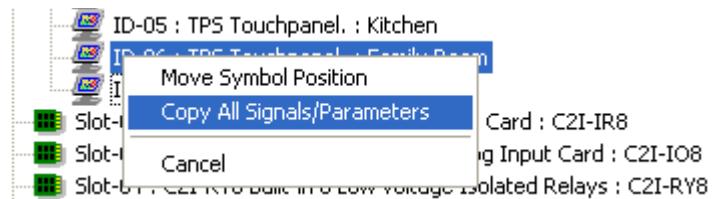


Figure 4-17 Copy/Move Menu

- c. Select **Copy All Signals/Parameters**.
- d. Repeat for the **Theater** touch panel.

The **Bedroom** and the **Sunroom** touch panels use the signals from the SATP Demo program. The procedure is the same except that the SATP Demo program must be opened to copy the signals from the TPS-15 symbol. Note that the signal set is different.

When finished copying the signals to either the **Bedroom** or **Sunroom** touch panel, use the right-click technique described above to copy the signals to the other SATP touch panel.

Adding Kaleidescape Modules

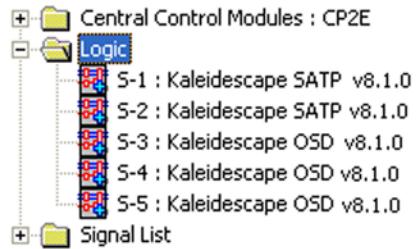
Use the following procedure to add the sample OSD and SATP modules from the Kaleidescape Demo programs to the SIMPL program.

1. From the **File** menu, open the program Kaleidescape SATP Demo.
2. Select the symbol **S-1: Kaleidescape SATP v8.1.0** (see [Figure 4-18](#)) and press **CTRL-C** to copy the symbol.

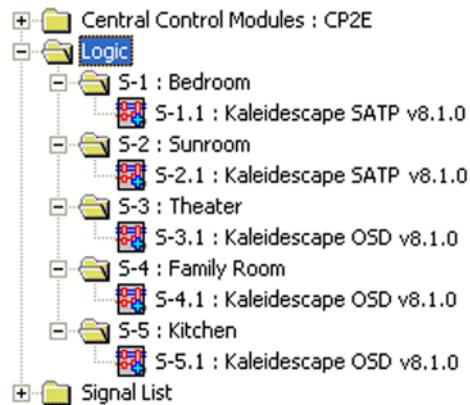


Figure 4-18 Copying the SATP Demo Module

3. Return to the program and select the **Logic** folder.
4. Press **CTRL-V** twice to paste two copies of the module in the **Logic** folder. If an error appears stating **Could not paste symbol**, verify that the Kaleidescape Demo programs were imported correctly. See [Importing a Kaleidescape Module on page 21](#).
5. From the **File** menu, open the program **Kaleidescape OSD Demo**.
6. Highlight the symbol **S-2: Kaleidescape OSD v8.1.0** in the **Logic** folder and press **CTRL-C** to copy.
7. Return to the program and select the **Logic** folder.
8. Press **CTRL-V** three times to paste three copies of the module in the **Logic** folder. See [Figure 4-19](#).

**Figure 4-19 Copying into the Logic Folder**

9. For clarity, organize the program by moving everything into subsystems based on zones. See [Figure 4-20](#).

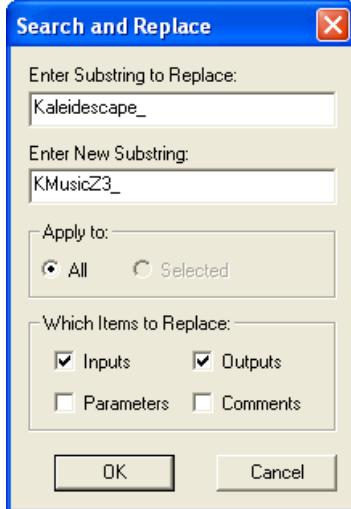
**Figure 4-20 Creating Subsystems**

Programming Kaleidescape Modules

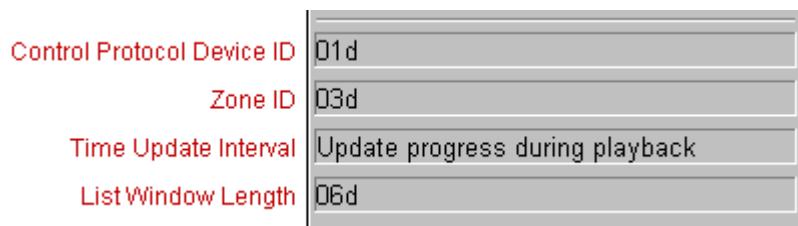
Each module must be made unique by modifying the signal names of the sample modules.

Use the following procedure to modify signal names.

1. Select the **Bedroom** subsystem (music zone **3**) and press **F9**. The **Search and Replace** window appears. See [Figure 4-21](#).

**Figure 4-21 Search and Replace Window**

2. For all the inputs and outputs, replace **Kaleidescape_** with **KMusicZ3_**.
3. Click **OK**.
4. Repeat process with the Sunroom (music zone **4**) using the name **KMusicZ4_** and also with the Theater (**KPlayer3_**), Family Room (**KPlayer2_**) and Kitchen (**KPlayer1_**).
5. Open the SATP module for the Bedroom, and scroll to the bottom.
6. Set the Zone ID to **03d** (this is the third music zone of the Music Player).
7. Change the **List Window Length** to **06d** (the TPS-4L only supports 6 lines of text). See [Figure 4-22](#).

**Figure 4-22 Setting Zone ID and List Window Length**

8. Repeat this process for the Sunroom SATP module using Zone ID **04**.
9. Use the same process to rename the signals of the touch panel modules.

In this installation example, all Control Protocol Device ID parameters are correctly set to the default CPDID **01d** (None) because the example does not use any command routing.

Screen Masking and Anamorphic Lenses

Use the following procedure to includes screen masking system in the Theater room.

1. Open the OSD module for the Theater and scroll to the bottom.
2. Click **Using a Controlled Mask** and select **Yes** from the drop-down menu. See [Figure 4-23](#).

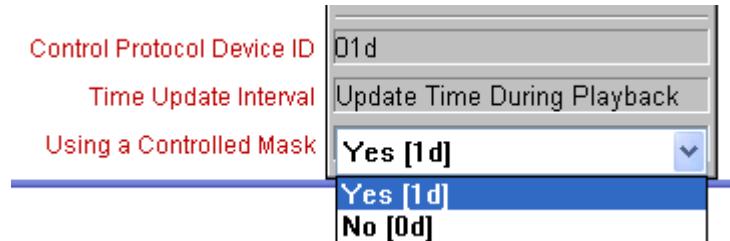


Figure 4-23 Using a Controlled Mask

The player is now using the screen mask which places pop-up messages (such as the **Paused** wedge that appears in the upper right corner of the display) in the visible screen area.

3. Find the **[Mask ...]** output signals in the **Masking_Data** roll-up. These outputs go high to indicate the type of picture is being shown. See [Figure 4-24](#).

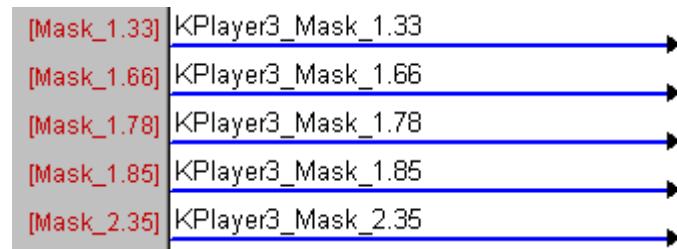


Figure 4-24 Mask Output Signals

4. Tie these outputs directly to a Serial I/O symbol to use with the masking system.

If the projector in this installation used an anamorphic lens, the projector could be controlled using the anamorphic outputs in the **Video_Mode** roll-up. See [Figure 4-25](#).

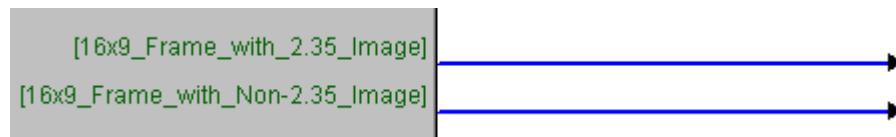


Figure 4-25 Anamorphic Outputs

Lighting and Shades

In rooms that are primarily for movie watching such as the Theater and Family Room, lights can be turned down the lights when the movie starts, turned up the lights during intermission, and turned on again at the end credits.

The OSD module provides outputs in the **Lighting_Cues** roll-up to provide this feature. See [Figure 4-26](#).

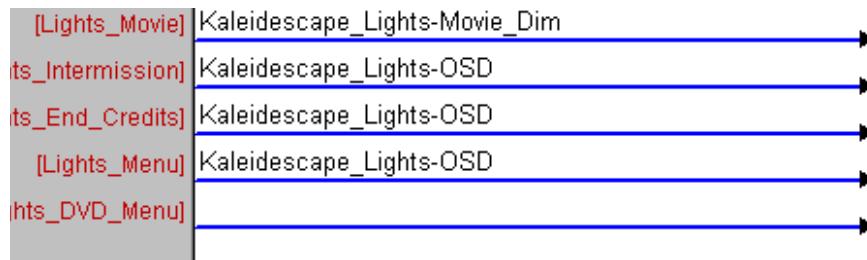


Figure 4-26 Lighting Cues

The signals go high for half a second for each of these events. The signals are also buffered to allow for jamming events together (as shown). For IR controlled lighting systems, no additional logic is required. Simply tie these signals to the appropriate IR commands. For more complex lighting systems, tie these signals to the logic or module being used to control the lights.

Secondary SATP Control

Suppose that in our sample installation, the owner decides to add a second SATP touch panel in the Bedroom, for example, a TPMC-8X. The SATP template for the TPMC-8X uses 16 lines of text for display, instead of the 6 lines as the TPS-4L. The best approach in this situation is to include an SATP module per touch panel size controlling each stream, each with a separate TCP/IP client.

To support our two-panel sample scenario, add another TCP/IP client pointing to the IP address of the Music Player and duplicate the entire control chain for the Bedroom. Copy the SATP module for the Bedroom and change all the signals to a unique name, for example, **KMusicZ3.1_**.

Change the **List Window Length** parameter on the new module to **16**. Now the touch panels can browse independently of each other. One touch panel can be looking through the **Now Playing** information while the other is adding new content to play from the genre list.

This method of control does not work properly with command routing because the modules are not able to isolate individual feedback. A dedicated direct TCP/IP connection must be used for each SATP module.

In larger, more complex installations, this method becomes problematic. If there are a large number of touch panels that need to control a large number of zones, creating a module for each zone-to-touch-panel combination is unworkable. To support more complex scenarios, the SATP module has an analog input for **List Window Length** in the **List_Control** roll-up. See [Figure 4-27](#).

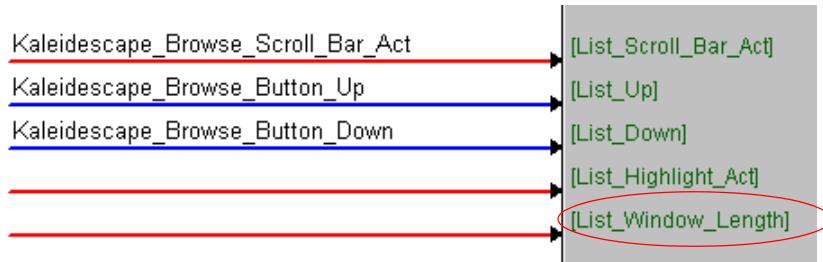


Figure 4-27 SATP Analog Input for List Window Length

This input allows changing the list length at run time as needed. When the length changes the module refreshes the list with the new length.

For installations like this, remember to add a **Make String Permanent** symbol to keep the nonrouted serial strings in memory.

Section 5

Troubleshooting

User Program Commands

The following commands can help debug problems in an installation. These commands must be typed in the Crestron ViewPort or Toolbox Console using the **USERPROGCMND** command or the short version, **UCMD**.

These commands have the following syntax.

USERPROGCMND "<COMMAND>"
UCMD "<COMMAND>"

Where **<COMMAND>** is one of the following commands. For example, is **UCMD "K DEBUG"** is the command to enable debugging.

K HELP	This command shows all the valid K commands. If multiple modules are in the program, this information displays multiple times.
K DEBUG	This command enables debugging on all modules at run time. All modules report that debugging is turned on.
K DEBUG <CPDID>	This command enables debugging on only the modules controlling a player with the matching CPDID. This command is helpful in installations using command routing.
K STOP DEBUG	This command stops debugging output on all modules.
K ID	This command makes all modules report the CPDID of the component the modules are controlling. If the component CPDID is set to None , the module reports 01 .
K VER	This command reports the version number of the module. If multiple modules are in the program, this information displays multiple times.

Nothing is working

1. If using **TCP/IP**, open up ViewPort or the Toolbox Console and type `est` to check the Ethernet Status. Verify that the TCP/IP client is connected.

If the TCP/IP client is not connected,

- Verify that TCP/IP client is attempting to connect to the proper IP address.
 - Verify that a **1** has been placed on the **Connect** input of the TCP/IP client.
 - Verify that port 10000 is being used on the TCP/IP client.
 - Verify that the Crestron controller can successfully ping the Kaleidescape component by typing `ping` followed by the component IP address. If this action fails, check the network connections and settings.
2. If using **RS-232**, check the cable connections, pinouts, and communication parameters. See [Appendix B](#).
 3. Verify that the CPID setting on the module matches the component CPID set on the installer pages of the browser interface.
 4. Verify that the Zone ID matches the audio output for listening (SATP).
 5. Verify that there are no attempts to control the Kaleidescape 1U, 3U or 5U Server.
 6. Open up **ViewPort** or the **Toolbox Console**, type `ucmd "k debug"` and try to use the interface. Module errors are shown in the window as errors occur and can provide useful information about what the problem could be.
 7. Open up **Test Manager** and verify that touch panel signals are reaching the module, and the module **TX\$** signal is reaching the communication port. Verify that the communication port **RX\$** signal is reaching the module.

Music is Not Changing (SATP Controlled Zone)

Verify that control is for the intended music zone (audio output).

Cannot Make Selections with a Touch Panel with a Video Window

The zone touch panel interface is not calibrated correctly. See [Calibrating the Touch Interface on page 37](#).

No Video on the Touch Panel with a Video Window

1. If using S-Video, verify that the **Y** and **C** connections are not reversed.
(Try reversing the connections, just to be sure.)
 2. Verify that the TPS/IMPC (the device where the video cables terminate) is receiving power either through Cresnet or the power connector.
- Note:** A touch panel can be powered by the TPS/IMPC, but a TPS/IMPC cannot be powered by a touch panel.
3. Verify that the video input for the touch panel is set correctly. Remove the power to the touch panel, touch and hold the touch screen, and reapply power to the touch panel. The touch panel setup menu should appear, which includes an option for setting up the video input.
 4. Verify that the touch panel has the requisite video card installed (if applicable). If there is no option to configure the video input in the touch panel setup menu, the panel probably does not support video.
 5. Verify that the Kaleidescape movie zone is configured to provide the video output that the touch panel requires.
 6. If more than one video input is available on the touch panel, verify that the input is correct.

Video on the Touch Panel is Black and White

The video input for the touch panel is set incorrectly (either using S-Video and the touch panel expects composite, or vice-versa). Remove the power to the touch panel, touch and hold the touch screen, and reapply power to the touch panel. The touch panel setup menu should appear, which includes an option for setting up the video input.

Kaleidescape Support

This document has outlined different options for controlling a Kaleidescape System, and has presented a sample installation.

If additional help is required to implement Crestron control of a Kaleidescape System, contact Kaleidescape Support.

- ▶ Send an email message to support@kaleidescape.com.
- ▶ Call the Kaleidescape support line at **+1 (650) 625-6160**.

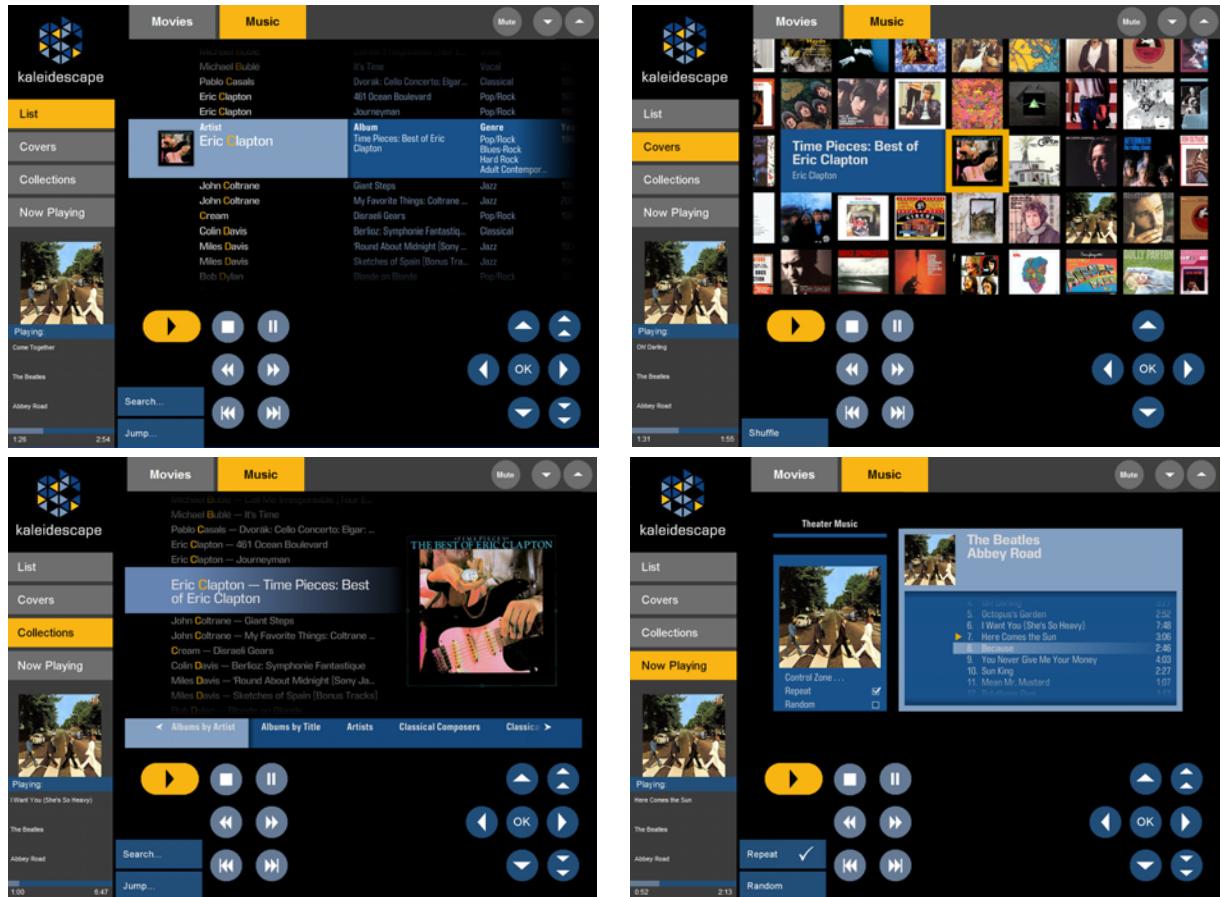
The modules and templates described in this document are not supported by Crestron.

When contacting Kaleidescape Support, be prepared to provide the serial number of the Kaleidescape server. The serial number label is located on the back of all components, and behind the front panels of Kaleidescape servers.

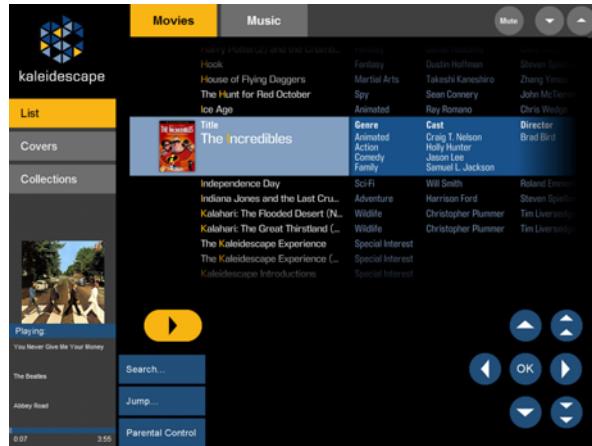
Appendix A

Screen Shots for UI Layouts

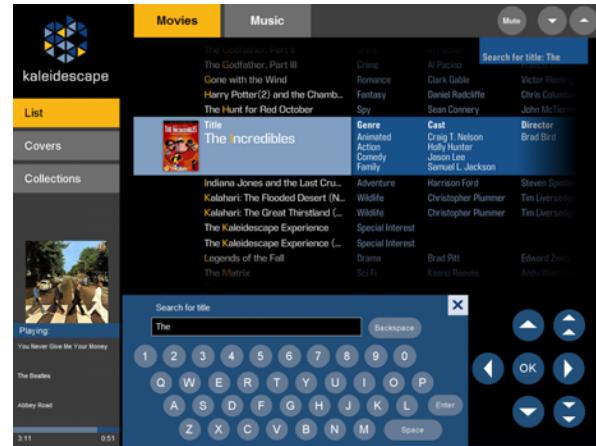
OSD Control with a Video Window – Music



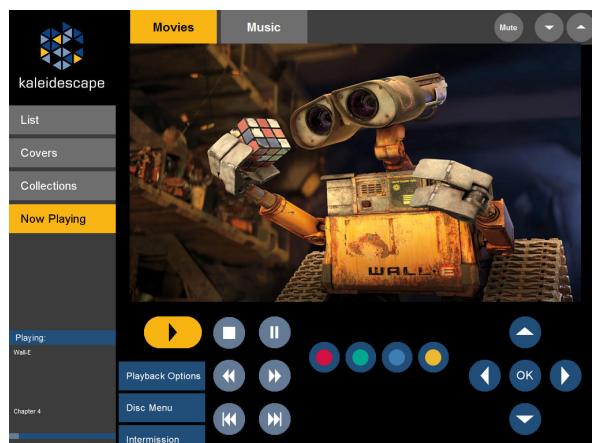
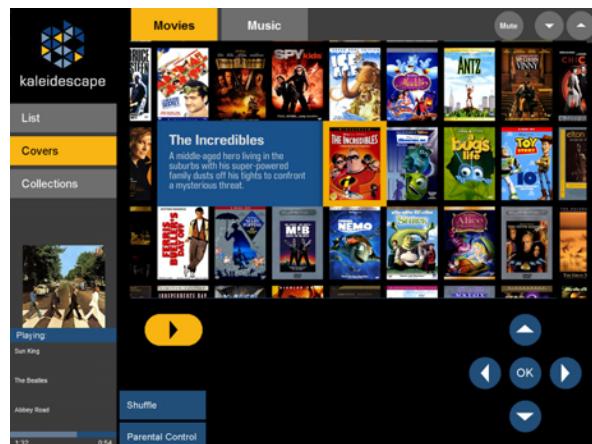
OSD Control with a Video Window — Movies



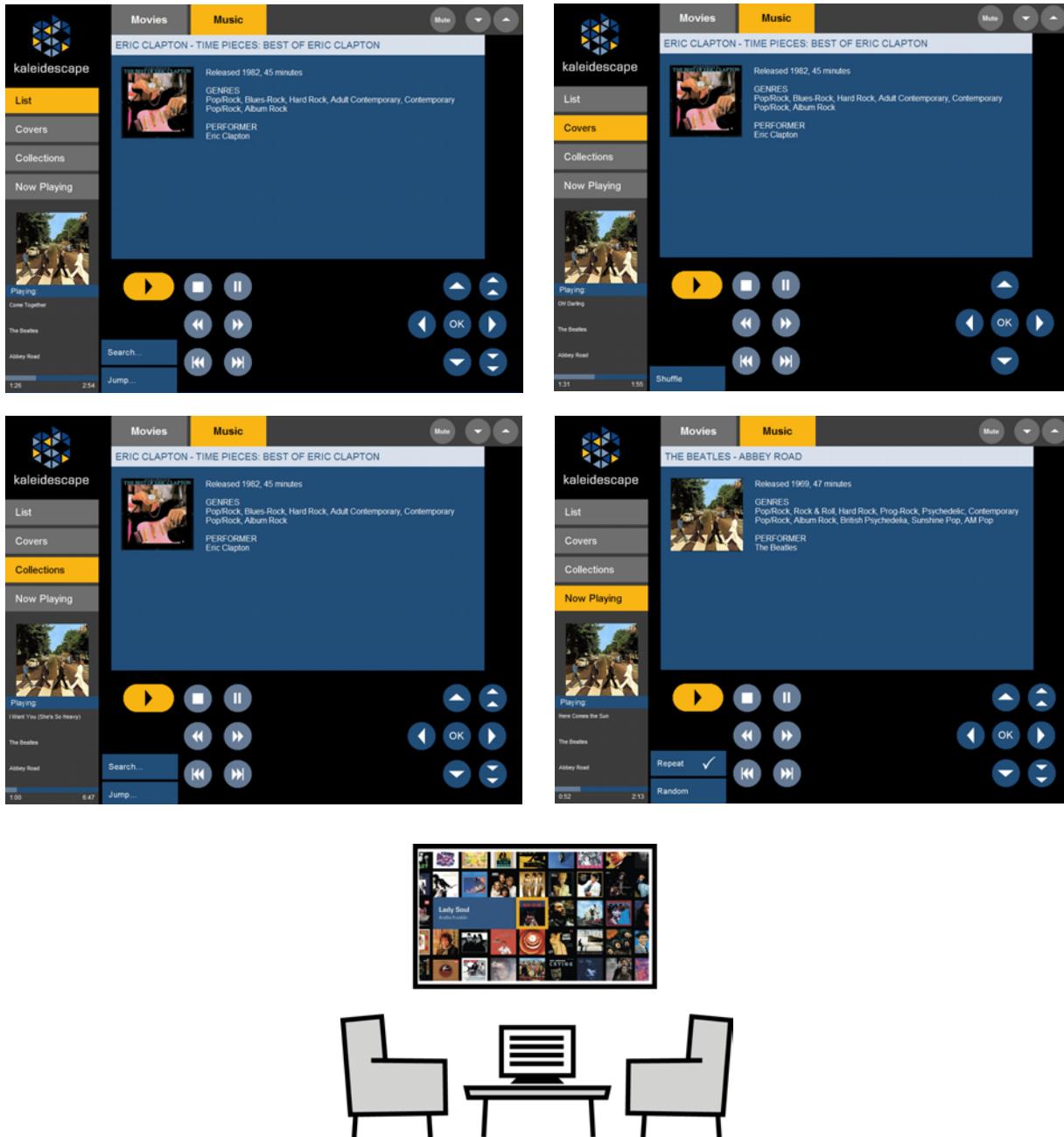
Music can be playing while selecting a movie to watch. The playback status box in the lower left corner feeds back either movie or music information.



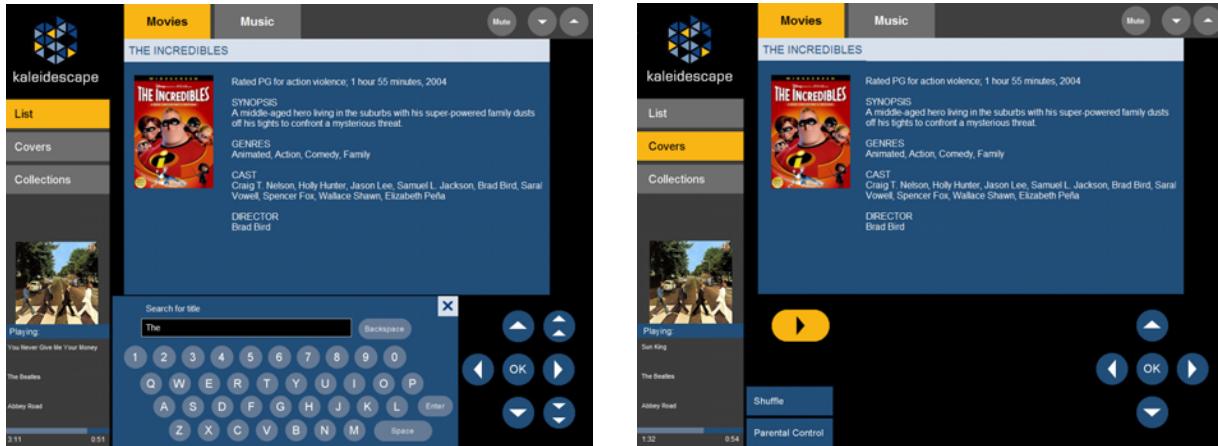
This layout shows the keyboard pop-up after selecting the SEARCH... button.



OSD Control without a Video Window – Music

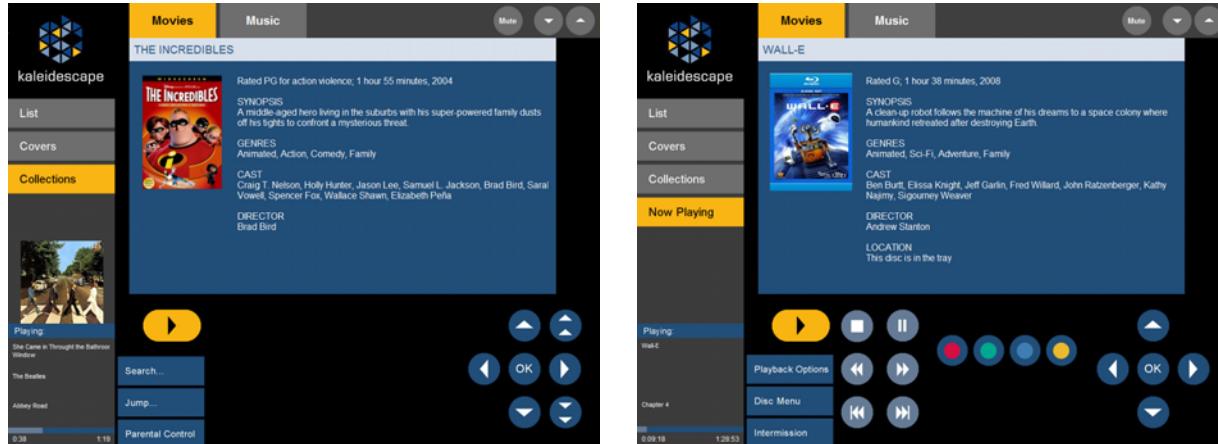


OSD Control without a Video Window – Movies

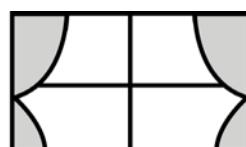
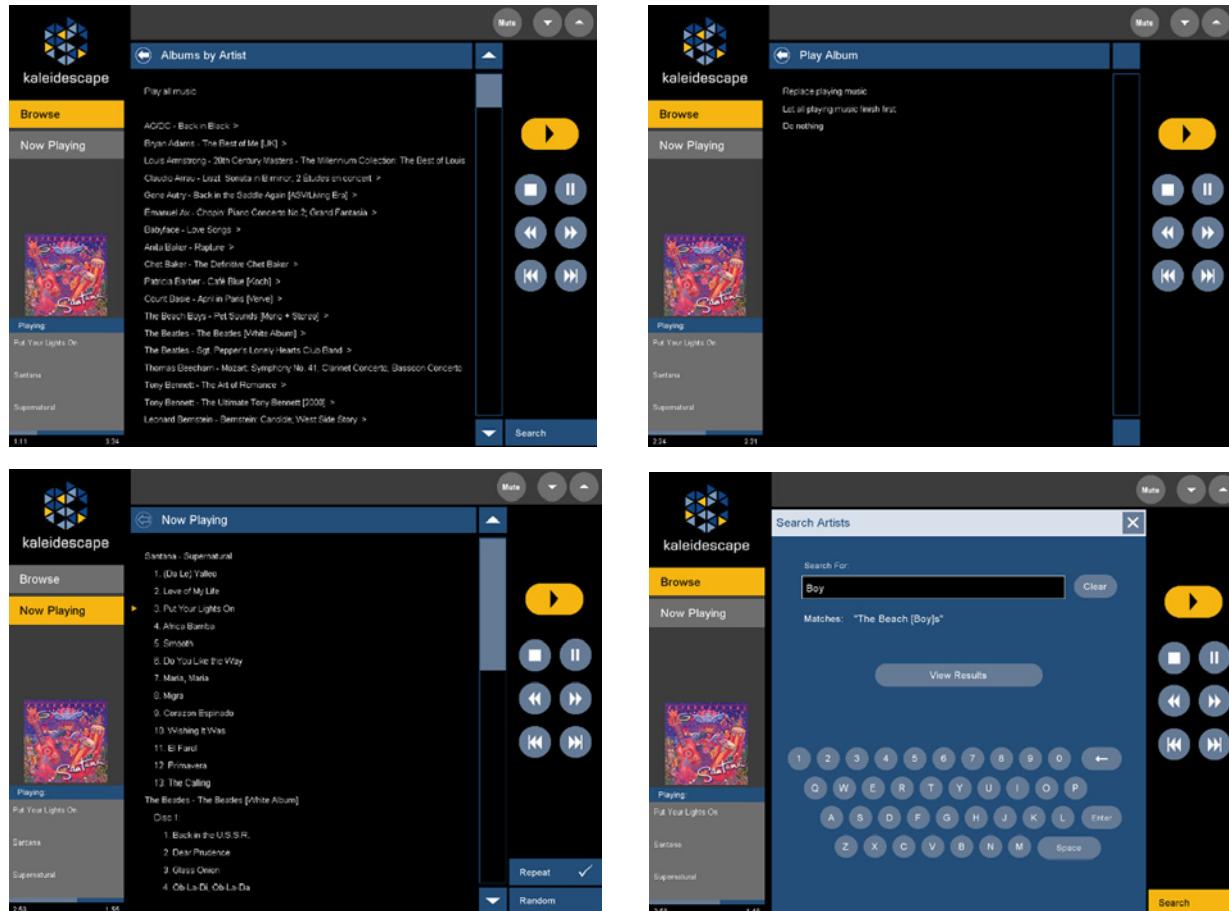


This layout shows the keyboard pop-up after selecting the **SEARCH...** button.

Music can be playing while selecting a movie. The playback status box in the lower left corner feeds back either movie or music information.



Standalone Touch Panel



Appendix B

RS-232 Port Configuration and Cable Pinout

Port Configuration

M500 Player, Music Player and Cinema One

If the RS-232 port is used to communicate with the Kaleidescape player or Cinema One, use the following default communication parameters:

Baud rate	19200
Data bits	8
Stop bits	1
Parity	N
Flow control	N

RS-232 communications parameters can be changed on the installer pages of the browser interface.

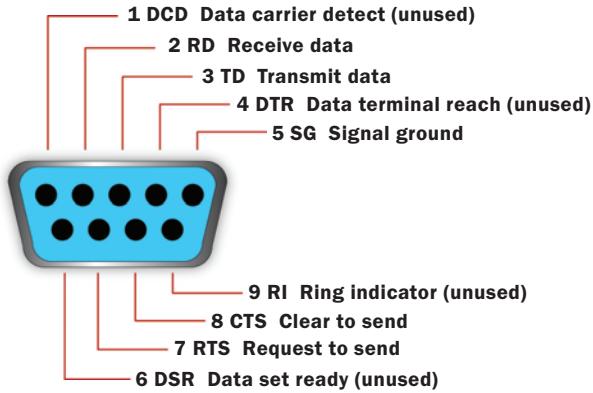
1U, 3U and 5U Servers

If the RS-232 port is used to communicate with the Kaleidescape server, server default communication parameters cannot be changed.

Baud rate	115200
Data bits	8
Stop bits	1
Parity	N
Flow control	N

RS-232 Port Pinout

The pinouts for the RS-232 port are illustrated below.



Most Crestron controllers require a crossover (null-modem) cable.

Note: The older KPLAYER-2000 also has a female DB-9 service port that cannot be used for Crestron control.

Appendix C

OSD Module v8.1.0 Parameters and I/O

Parameters

Control Protocol Device ID

This must match the Control Protocol Device ID of the component as set through the Kaleidescape browser interface (<http://my-kaleidescape/installer>). Selecting **None** in the browser interface is equal to **01** for this parameter. **01** (None) is the default.

When using **01**, the Crestron processor must be directly connected to the designated component.

Time Update Interval

This indicates whether the component should update the time remaining. If the title or chapter location, remaining, or level signals are used, this parameter must be set to **1**. If this information is not used, set this parameter to **0** to conserve Crestron processing.

Using a Controlled Mask

If using an automated screen masking system, set this to **1** (yes) to ensure that system messages are not shown in the masked area. If using a fixed mask or no masking, set this to **0** (no) to allow those messages to appear at the top or bottom of the visible area.

Inputs

{ {Rx\$} }	Used for connection to the RX\$ of the connected RS-232 port or TCP/IP client.
{ {Connect-F} }	Resends the startup messages to get the module feedback in sync with the component. If using TCP/IP, tie this to the Connect-F output of the TCP/IP client in order to re-sync the feedback if the connection cycles. If using RS-232, simply put a 1 on this input.

Transports

[Play], [Pause], [Pause_On], [Pause_Off]
Performs the associated transport action.

[Stop]	Performs the associated transport action. On some screens this also acts as [Cancel].
[Fast_Forward], [Rewind]	Performs the associated transport action. Each press steps through different speeds. [Play] resumes the content at normal speed.
[Instant_Replay]	Skips backward 5 seconds on each rising edge.
[Skip_Forward], [Skip_Reverse]	Moves to the next or previous chapter. On some screens this also acts as [Page_Up] or [Page_Down].
[Intermission_Toggle]	Activates the intermission if not currently active. If intermission is already active, deactivates. Activating intermission pauses the content, displays the cover art and cues the lighting system (if configured). When in intermission, [Play] resumes the content and [Stop] halts playback and returns the user to the Kaleidescape onscreen display.
[Intermission_On]	Like [Intermission_Toggle], but only activates intermission. Does nothing if intermission is already active.
[Intermission_Off]	Like [Intermission_Toggle], but only deactivates intermission. Does nothing if intermission is not active.
[Bluray_Special_Stop]	During Blu-ray Disc™ playback, sends the Blu-ray STOP command to the disc playing. For all other content, the command behaves as the [Stop] command.

 **CAUTION****USING THIS COMMAND CAN TRAP THE USER.**

Depending on how the disc was authored, this command does not always return the user to a Kaleidescape movie place. Some discs use this command to access special features. If used as the only STOP command, the controller MUST provide another mechanism to return to the Kaleidescape menu or a Kaleidescape movie place.

Navigation

[Up], [Down], [Left], [Right]

OSD navigation controls. Can be held down to speed the user through whatever list or menu currently being navigated.

[Page_Up], [Page_Down]

For OSD screens showing a list, scrolls the list up or down by several lines at a time. Can be held down to speed the user through whatever list or menu currently being navigated. Not required for basic navigation.

[Select]

Selects the option currently highlighted, finishes keypad input, clears error and warning messages and can re-sort the movie list.

[Child_Select]

Selects the highlighted item in the onscreen display. Also puts the player in Child Mode displaying the child user interface.

[Cancel]

Dismisses the Kaleidescape menu, dismisses the movie details page, halts keypad or keyboard input, and dismisses the movie overlay. For most functions, the [Stop] key performs identically, with the noted exception of dismissing the movie overlay. Not required for basic navigation.

The next three signals are used for OSD Video. These signals allow a touch overlay to be created where the user can touch any aspect of the Kaleidescape OSD or the disc menu to make a selection. For this feature to function, a transparent slider must be placed over the video window. On the slider's Design tab, set the Dimension to **2-D**, the Indicator type to **None** and ensure that Signed Feedback is **off**. The Slider's Analog join must be set as well as the Digital Press join. The first Analog value is the **X** value and the second is the **Y** value.

The first time used, the OSD prompts to calibrate the video touch interface.

[Touch_Channel] Tie this signal to the Digital Press join of the slider. Indicates that the video window has been touched.

[Touch_X] Tie this signal to the **X** value of the slider. Indicates the **X** coordinate of the video window that was selected.

[Touch_Y] Tie this signal to the **Y** value of the slider. Indicates the **Y** coordinate of the video window that was selected.

OSD Menu Control

[Kaleidescape_Menu_Toggle]

Toggles the display of the Kaleidescape menu. The

Kaleidescape menu can be used as a guide to take the user to any location in the Kaleidescape OSD. This menu pops up over whatever activity the user is currently engaged in. The [Menu_x] commands below are shortcuts to different selections within the Kaleidescape menu.

[Kaleidescape_Menu_On]

Like [Kaleidescape_Menu_Toggle], but only causes the Kaleidescape menu to pop up. If the Kaleidescape menu is already onscreen, this command has no effect.

[Kaleidescape_Menu_Off]

Like [Kaleidescape_Menu_Toggle], but only causes the Kaleidescape menu to close. If the menu is not onscreen, this command has no effect.

[Menu_Movie_Place]

Causes the OSD to return to the last movie view (List, Covers, or Collections).

[Menu_Music_Place]

Causes the OSD to return to the last music view (List, Covers, Collections, or Now Playing).

[Menu_Movie_List]

Causes the OSD to change to the Movie List view.

[Menu_Movie_Collections]

Causes the OSD to change to the Movie Collections view.

[Menu_Movie_Covers]

Causes the OSD to change to the Movie Covers view.

[Menu_Parental_Control]

Causes the OSD to change to the Parental Control view.

[Menu_Music_List]

Causes the OSD to change to the Music List view.

[Menu_Music_Covers]

Causes the OSD to change to the Music Covers view.

[Menu_Music_Collections]

Causes the OSD to change to the Music Collections view.

[Menu_Music_Now_Playing]

Causes the OSD to change to the Music Now Playing view.

[Menu_System_Status]

Causes the OSD to change to the System Status view.

This last menu selection is not often used, but the command is available for completeness.

[Screen_Saver] Activates the screen saver, if not already active.

[Screen_Saver_Stop]
Stops the screen saver. Performs no operation if the screen saver is not active.

[Child_Safe_Level]
Instantly sets the parental control level to the next level below the lowest level with a password.

[Default_Parental_Control_Level]
Changes the parental control level to the default level set on the browser interface.

[Shuffle_Cover_Art]
Shuffles the covers shown on the screen. Also places the OSD into the shuffle mode if the alphabetize mode has previously been selected. This command only functions when in the Movie or Music Covers view. Shuffle mode is on by default, but can be disabled in the browser interface.

[Child_Shuffle_Cover_Art]
Shuffles cover art on the child user interface.

[Alphabetize_Cover_Art]
Rearranges the cover art onscreen into alphabetical order, disabling automatic shuffling. This command only functions when in the Movie or Music Covers view. This mode is off by default, but can be enabled in the browser interface.

[Details_Popup_Toggle]
Opens the details page on the OSD. This displays details about the content currently playing or currently selected.

[Filter_List] Filters the Movie or Music List. Text entered is used to narrow down the list of movies or albums.

[Filter_Keyboard_Clock]
Issues a Filter_List command if the keyboard is not active, and issues a Cancel if the keyboard is active. This has the effect of toggling the keyboard on and off while in the Movies or Music List.

[Quick_Search_Keyboard_Clock]
Pulse this input to toggle the [Quick_Search_Keyboard_Active] feedback. This input is used to show and hide the quick search keyboard. The quick search keyboard should only have keys **a** through **z** on it.

Movie Playback

- [Disc_Menu] For most DVD or Blu-ray Discs, this command calls up the disc menu. The operation of this key can vary from disc to disc. This command can also cue the lighting system, if so configured.
- [Disc_Top_Menu] For most DVD or Blu-ray Discs, returns to the main disc menu. The operation of this key can vary from disc to disc.
- [DVD_Resume] For most DVDs, dismisses the DVD menu and returns to the previously viewed content. The operation of this key can vary from disc to disc. This command has no effect on Blu-ray Discs.
- [Disc_or_Kaleidescape_Menu] Functions as [Disc_Menu] during content playback and as [Kaleidescape_Menu_Toggle] when not in content playback. This command can be used when control buttons are limited.
- [Force_Disc_Menu_mode] Temporarily forces the output of [Disc_Menu_fb] to go high. Useful as an override when the menu detection is incorrect.
- [Force_clear_Disc_Menu_mode] Temporarily forces the output of [Disc_Menu_fb] to go low.
- [Force_Disc_Menu_mode_toggle] Temporarily toggles the state of [Disc_Menu_fb].
- [Favorite_Scene_Set_Start] Sets the beginning of the favorite scene. If not set, this defaults to the beginning of the content.
- [Favorite_Scene_Set_End] Sets the end of the favorite scene. If not set, this defaults to the end of the content.
- [Favorite_Scene_clock] Toggles the state of [Favorite_Scene_fb], which can be used to control when the touch panel shows the favorite scene start and end buttons.
- [Status_and_Settings_Toggle] Toggles the display of the movie overlay.
- [Show_Navigation_Overlay] Takes the user directly to the navigation option of the movie overlay.
- [Start_Chapter_Entry] Used to enter a chapter number during content

playback. Use the [Select] command as an enter key.

[Start_Chapter_Entry_Clock]

This activates the [Start_Chapter_Entry] or [Cancel] command in the OSD depending on the state of [Keypad_Active]. This command toggles the chapter entry on and off during playback.

[Audio_Next]

During movie playback, changes to the next audio stream. At other times this command has no effect.

[Subtitles_Next]

During movie playback, changes to the next subtitle stream. At other times this command has no effect.

[Angle_Next]

During movie playback, selects the next available angle. At other times this command has no effect.

[Angle_Prev]

During movie playback, selects the previous available angle. At other times this command has no effect.

[Red_Button]

[Green_Button]

[Blue_Button]

[Yellow_Button]

During Blu-ray Disc playback, performs the disc actions associated with that color button. These actions are defined by the disc itself and can vary from disc to disc. Kaleidescape recommends that these buttons are displayed to the user in a row, in the order of Red – Green – Blue – Yellow.

Note: These buttons can be used only when the movie is started with **Play Disc**. If the movie was started from the bookmark (using **Play Movie**), the movie must be restarted with **Play Disc** to use these special features.

Music Playback

[Random_Toggle]

Toggles random music playback. Note that this command does not always function because some music always plays back in random order. See [Music Items in the Kaleidescape System on page 13](#) for details.

[Repeat_Toggle]

Toggles repeat music playback. Note that this command does not always function because some music always repeats. See [Music Items in the Kaleidescape System on page 13](#) for details.

Keyboard/Keypad

Keyboard input is used for filtering the Movie or Music Lists, jumping to a specific place in the list, for naming favorite scenes and for naming mix albums. If any non-numeric (**a-z**) key is sent to the OSD when in the Movie or Music List, the OSD jumps to the item that begins with that letter in the currently sorted column. Numeric keys start the passcode entry dialog.

To filter the list in the Movie or Music List, the [`Filter_List`] command must be sent first. Once given, all keyboard keys (**a-z, 0-9**) are can be used for the filter. If using the [`Filter_Keyboard_Clock`] input and [`Keyboard_Active`] output, the [`Filter_List`] command is automatically issued at the appropriate time.

[<code>Backspace</code>]	The Backspace key for a keyboard or keypad.
[<code>Enter</code>]	The Enter or Select key for a keyboard or keypad.
[<code>Keypad_0</code>] ... [<code>Keypad_9</code>]	Sends this digit to the OSD. Keypad input (0-9) is solicited from various functions such as [<code>Start_Chapter_Entry</code>], passcode entry and UPC entry. Entering unsolicited keypad input is interpreted as passcode entry. Various entry modes require the [<code>Select</code>] input to be used as an enter key.
[<code>Keyboard_A</code>] ... [<code>Keyboard_Z</code>]	Sends this character to the OSD.
[<code>Keyboard_space</code>], [<code>Keyboard_period</code>], [<code>Keyboard_comma</code>], [<code>Keyboard_apostrophe</code>], [<code>Keyboard_hyphen</code>]	Sends this character to the OSD.
[<code>Other_Key_Inputs\$</code>]	If other keyboard characters are required, create a Serial I/O (SIO) symbol and populate the SIO with the desired keys. Each key should only send a single character at a time. Do not use the Crestron keyboard symbol with this input.

Masking

[<code>Calibrate_Masking</code>]	Causes the OSD to change to the Calibrate Masking screen. This screen is used to calibrate [<code>Mask_Calibrated_Top</code>] and [<code>Mask_Calibrated_Bottom</code>] values.
[<code>Calibrate_Masking_Overscan</code>]	Causes the OSD to change to the Calibrate Masking Overscan screen. This screen is used to indicate the

position of the overscan onto the Kaleidescape movie zone. This overscan data is used in calculating the [Mask_Calibrated_Top] and [Mask_Calibrated_Bottom] values.

Script Control

- [Play_Script\$] Use a Serial I/O (SIO) symbol to send the name of the script to play to this input. Every time this text changes, the module sends the command to play the script. The same script can be triggered more than once. The name is case sensitive. If the script name does not exist, a message appears on the OSD.
- [Demo] Plays the script named “Demo button”, if Demo button exists. Otherwise, plays all favorite scenes in order.
- [Demo_Loop] Plays the script named “Demo button loop,” if Demo button loop exists. Otherwise, plays all favorite scenes in an infinite loop.

Power

- [Power_on] Turns the component on. See [Power Control on page 37](#) for additional notes on this input. While held high, the module attempts to keep the component turned on.
- [Power_off] Turns the component off. When A/C power is interrupted, a component always returns to the last power state. See [Power Control on page 37](#) for more information.
- [Command_To_Player\$] This input can be used to send any arbitrary command to the component. The module automatically adds the correct CPID, sequence number, and terminating colon and line feed to any string sent to this input. For example, attaching a Serial I/O (SIO) symbol to this signal and sending PLAY would send 03/1/PLAY:\n to the component with CPID 03. This input provides direct access to the control protocol.

Music Zone Control

- [Zone_to_Control\$] Sets the local movie zone to control a (possibly remote) music zone. Input can define the device to control either by serial number or by CPID. A 01.01 always returns to local control. See [Music Zone Control on page 32](#) for more information.

Outputs

{ {Tx\$} }	Used for connection to the Tx\$ signal of the connected RS-232 or TCP/IP client.
[Player_Name\$]	This output provides the name of the connected movie zone as defined in the installer pages of the browser interface.

Transports

[Play_fb], [Stop_fb], [Pause_fb], [Fast_Forward_fb], [Rewind_fb]	Indicates feedback state for these functions.
[Intermission_fb]	This signal is active when in the intermission state.

Navigation

[Arrow_Keys_Active]	Indicates that the OSD is in a state where the arrow keys are required.
[Page_Keys_Active]	Indicates that the OSD is in a state where the page keys can be used.

OSD Menu Control

[UI_Page OSD_Menu]	Indicates that the player is currently showing the Kaleidescape OSD (as opposed to when a movie is playing).
[Kaleidescape_Menu_fb]	This output is high as long as the Kaleidescape menu is showing on the OSD.
[Menu_Movie_Place_fb]	Indicates that the OSD is in a movie place. This is high when [Menu_Movie_List_fb], [Menu_Movie_Collections_fb], [Menu_Movie_Covers_fb], [Menu_Parental_Control_fb], or [Menu_Movie_Playing_fb] are high.
[Menu_Music_Place_fb]	Indicates that the OSD is in a music place. This is high when [Menu_Music_List_fb], [Menu_Music_Covers_fb],

[Menu_Music_Collections_fb], or [Menu_Music_Now_Playing_fb] are high.

[Movie_Capable] Indicates that the Kaleidescape System is capable of movie playback. As of control protocol version 6.2, this capability is always assumed to be true.

[Menu_Movie_List_fb]
Indicates that the OSD is currently in the Movie List view.

[Menu_Movie_Collections_fb]
Indicates that the OSD is currently in the Movie Collections view.

[Menu_Movie_Covers_fb]
Indicates that the OSD is currently in the Movie Covers view.

[Menu_Parental_Control_fb]
Indicates that the OSD is currently in the Parental Control view.

[Menu_Movie_Playing_fb]
Indicates that movie content is currently playing back.

[Music_Capable] Indicates that the Kaleidescape System is capable of music playback. This is assumed to be true when the Kaleidescape System reports a control protocol version of 5 or higher.

[Menu_Music_List_fb]
Indicates that the OSD is currently in the Music List view.

[Menu_Music_Covers_fb]
Indicates that the OSD is currently in the Music Covers view.

[Menu_Music_Collections_fb]
Indicates that the OSD is currently in the Music Collections view.

[Menu_Music_Now_Playing_fb]
Indicates that the OSD is currently in the Music Now Playing view.

[Menu_System_Status_fb]
Indicates that the OSD is currently displaying the System Status page.

[Screen_Saver_fb]
Indicates that the screen saver is currently being displayed. The screen saver can be configured on the browser interface to start automatically after a selected period of inactivity. This setting defaults to 5 minutes.

[Screen_Saver_fb*]
The inverse of [Screen_Saver_fb].

[Details_Popup_fb]
Indicates that the details page is visible on the OSD.

[Quick_Search_Keyboard_Active]
Feedback for showing the quick search keyboard. If any key is pressed on the keyboard, this feedback signal goes low.

[Passcode_Entry_fb]
Indicates that the Parental Control Passcode dialog box is being displayed onscreen. Used for parental control.

[Simple_Question_fb]
Indicates a dialog box containing a simple question is onscreen.

[Information_Message_fb]
Indicates that a dialog box with an information message is onscreen.

[Warning_Message_fb]
Indicates that a dialog box with a warning message is onscreen.

[Error_Message_fb]
Indicates that a dialog box with an error message is onscreen.

[Play_Button_Available]
Indicates that the **PLAY** button should be displayed to the user.

Movie Playback

[UI_Page_Movie_Playback]
Indicates that the player is currently in movie playback mode.

[Playing_DVD] Indicates that the player is currently playing a DVD.

[Playing_Video_Stream]
Indicates that the player is currently playing a video stream. A video stream is movie content that does not come from a DVD or Blu-ray Disc.

[Playing_BluRay] Indicates that the player is currently playing a Blu-ray Disc.

[Disc_Menu_fb] Indicates that the disc menu is being displayed. Because of the various methods of disc authoring, this is an inexact indicator, which can be incorrect.

[Disc_Menu_fb*] The inverse of [Disc_Menu_fb].

[Main_Content_fb]
Indicates that the main video content is playing. This is low during trailers, special features, and the disc menu.

[Ending_Credits_fb]
Indicates that the end credits are being shown.

[Favorite_Scene_fb]
Indicates that the touch panel should display the favorite scene start and end buttons.

[Status_and_Settings_fb]
Indicates that the movie overlay is active.

[Popup_Status_fb]
Indicates that the movie overlay is active and displaying the status option.

[Popup_Navigation_Overlay_fb]
Indicates that the movie overlay is active and displaying the navigation option.

[Angle_Available]
This feedback goes high if an alternate angle is available in the current position of the playback.

[Number_Camera_Angles]
This feedback indicates the number of angles available in the current position of the playback.

[Current_Camera_Angle]
This feedback indicates the currently selected angle.

Music Playback

[Music_Playback_Active]
This signal is active during music playback.

[Random_Status] Indicates that music is currently in random playback mode. Note that this condition sometimes remains as some music always plays back in random order. See [Music Items in the Kaleidescape System on page 13](#) for details.

[Repeat_Status] Indicates that music is currently in repeat playback mode. Note that this condition sometimes remains as some music always repeats. See [Music Items in the Kaleidescape System on page 13](#) for details.

Playback Information

[Now_Playing_Title_Name\$]

Name of the content currently playing.

[Now_Playing_Artist_Name\$]

Name of the artist for the content currently playing.

[Now_Playing_Album_Name_or_Chapter\$]

Name of the chapter or album for the content currently playing.

[Now_Playing_Cover_URL\$]

A touch panel that supports dynamic graphics can use this signal to display cover art for the content currently playing.

The following nine signals [Title_x] and [Chapter_x] can be used to display information about the content currently playing. If the Time Update Interval parameter is set to **1**, the signals update once per second, otherwise the signals only update when the chapter or title changes.

Note that on a DVD, each title usually contains full content, i.e., the movie will be on its own title, as will an episode. Title information can be used to show overall progress through a piece of content.

[Title_Length] Length of the current title in seconds. This is usually the length of the movie.

[Title_Location] Current position of the playback within the title, expressed in seconds.

[Title_Remaining]

Number of seconds remaining in the current title.

[Title_Level]

A percentage of the elapsed time in the title (actually expressed as 0–65535). This percentage can be used to place a progress bar (slider) on a touch panel to show the current relative position in playback.

[Chapter_Number] Analog feedback indicating the current chapter.

[Chapter_Length] Length of the current chapter in seconds. Usually a movie is made up of several chapters.

[Chapter_Location]

Current position of the playback within the chapter, expressed in seconds.

[Chapter_Remaining]

Number of seconds remaining in the current chapter.

[Chapter_Level]

A percentage of elapsed time in the current chapter (actually expressed as 0–65535). This percentage can be used to place a progress bar (gauge) on a touch

panel to show the current relative position within the chapter.

Details Page

[Details_Visible]

Used to drive the details page on the touch panel. This is high when the details can be displayed and low when details have been made obsolete by an onscreen change. Details should not be displayed when this is low.

[Details_Text\$] A complete description of the item currently highlighted in the OSD, formatted to be similar to the text of the details page of the item on the OSD.

[Details_Title\$] The title of the content that is currently highlighted in the OSD.

[Details_Cover_URL\$]

The URL of cover art image for the highlighted item (movie or music). A touch panel that supports dynamic graphics can display the image at this URL.

[Movie_Details_Visible]

Same as [Details_Visible], except that this signal and the next one specify the aspect ratio of the cover art for the touch panel. A high signal indicates that the details should be displayed, and that the cover art being reported through [Details_Cover_URL\$] is a movie, and that the touch panel should use the **10:7** aspect ratio for cover art.

[Music_Details_Visible]

Same as [Details_Visible], except that this signal and the previous one specify the aspect ratio of the cover art for the touch panel. A high signal indicates that the details should be displayed, and that the cover art being reported through [Details_Cover_URL\$] is a CD, and that the touch panel should use the **1:1** aspect ratio (square) for cover art.

Keyboard/Keypad

[Keyboard_Active]

Feedback indicating that keyboard input is expected. This should be used to show a A-Z, 0-9 keyboard on a touch panel.

[Keypad_Active]

This feedback indicates that keypad input is being solicited. This should be used to show a 0-9 keypad on the touch panel.

[User_Input_Prompt\$]
Used for the keyboard and keypad input. Indicates what input is being prompted for on the OSD.

[User_Input_Text\$]
Used for keyboard and keypad input. Indicates what input has already been entered on the OSD.

Screen Masking

[Mask_Absolute_Top], [Mask_Absolute_Bottom]
Describe the position for the top and bottom masks in absolute terms, measured from the top and bottom of the video signal, respectively. These values are expressed as Crestron percentage values. A [Mask_Absolute_Top] value of 20%, for example, means that the top mask should cover the top 20% of the video signal. These values do not account for overscan.

[Mask_Calibrated_Top], [Mask_Calibrated_Bottom]
Once the masking system is calibrated through the OSD, these signals display the same information as [Mask_Absolute_Top] and [Mask_Absolute_Bottom], but in the values obtained mathematically from the calibration. The calibration will account for overscan.

[Mask_1.33], [Mask_1.66], [Mask_1.78], [Mask_1.85],
[Mask_2.35]

Indicate the actual aspect ratio of the video content (as opposed to the full-frame content stored on the DVD or Blu-ray Disc). These signals can be used to recall presets on a masking system or scaler.

[Conservative_1.33], [Conservative_1.66],
[Conservative_1.78], [Conservative_1.85],
[Conservative_2.35]

The [Conservative_x] signals are similar to the [Mask_x] signals, but represent a more conservative estimate of the image aspect ratio. This value will never go too far into the actual picture. For instance, if a 2.35 movie were a bit taller than 2.35 and a true 2.35 mask would crop the image a bit, the conservative information would suggest the next most open value: 1.85 – [Mask_2.35] and [Conservative_1.85] would both be active. Do not use these signals in conjunction with the [Mask_x] signals – use one set or the other.

Lighting Cues

- [Lights_Movie] Pulses for **0.5** seconds when entering movie playback. This uses the [Main_Content_fb] signal and has the same restrictions. This is buffered so that it can be jammed with a touch panel button.
- [Lights_Intermission] Pulses for **0.5** seconds when entering Intermission. This is buffered so it can be jammed with a touch panel button.
- [Lights_End_Credits] Pulses for **0.5** seconds when end credits are shown. This is buffered so that it can be jammed with a touch panel button.
- [Lights_Menu] Pulses for **0.5** seconds when returning to the Kaleidescape OSD from playback. This is buffered so that it can be jammed with a touch panel button.
- [Lights_Disc_Menu] Pulses for **0.5** seconds when entering the disc menu as indicated by the [Disc_Menu_fb] signal. This is buffered so that it can be jammed with a touch panel button.

Video Mode

- [Frame_4x3], [Frame_16x9] Indicate the full-frame aspect ratio of the video content output by the movie zone. This allows for adjustments for any external scaling that gets applied to the video frame. If the video output is configured to correct for 16×9, then [Frame_16x9] will remain high and black bars will be put in the image to correct any 4×3 content. Similarly, when correcting for 4×3; black bars will be put in the image to correct any non-4×3 content.
- [16x9_Frame_with_2.35_Image] Indicates that the movie playing has a 16×9 frame and has an aspect ratio of 2.35:1. Use to control the positioning of the anamorphic lens used with 2.35 screens.
- [16x9_Frame_with_Non-2.35_Image] Indicates that the movie playing has a 16×9 frame and has an aspect ratio that is not 2.35:1. Use to control the positioning of the anamorphic lens used with 2.35 screens.

[Composite_x], [Component_x], [HDMI_x]	Used to describe the precise video mode and aspect ratio of each output. These signals provide similar information to that presented in the [Frame_x] feedback above. The specific meanings of the different suffixes are provided below.
[x_No_Output]	When this feedback is high, the video output x is turned off. This happens on a secondary output when the primary output is showing a mode that this output is not configured for. For example, if HDMI is configured as the primary video output, and the HDMI can display 576i but the composite video is configured without 576i, then when a 576i signal is shown, the composite output is disabled.
[x_480i]	NTSC interlaced
[x_576i]	PAL interlaced
[x_480p]	NTSC progressive
[x_576p]	PAL progressive
[x_720p60]	720p HD (North America)
[x_720p50]	720p HD
[x_1080i60]	1080i HD (North America)
[x_1080i50]	1080i HD
[x_1080p60]	1080p HD (North America)
[x_1080p50]	1080p HD
[x_4x3]	Showing 4x3 output.
[x_16x9]	Showing 16x9 output.

Script Control

[Script_User_Command\$]

A script can contain a step that sends a string to the control system. That string appears in this output and can be matched with a Serial I/O (SIO) symbol to trigger custom programming.

Power

[Power_on_fb]	Indicates that power to the component is on. While held high, the module attempts to keep the component turned on.
[Power_off_fb]	Indicates that power to the component is off.

Music Zone Control

[Controlling_SN.Zone\$]

Indicates (by serial number) which music zone the local movie zone is controlling. When the local music zone is controlled, this will match the serial number (plus .01) of the local device. See [Music Zone Control on page 32](#) for more information.

[Controlling_CPDID.Zone\$]

Indicates (by CPDID) which music zone the local movie zone is controlling. When the local music zone is controlled, this will match the CPDID (plus .01) of the local device. See [Music Zone Control on page 32](#) for more information.

Child Commands

[Child_Play]

If child user interface is already active, performs the associated transport action. If not, activates child user interface if the child user interface is not active.

[Child_Stop]

[Child_Pause]

[Child_Up], [Child_Down], [Child_Left], [Child_Right]

If already in child user interface, navigates the covers view. If not, activates the child user interface.

[Child_Shuffle_Cover_Art]

If the child user interface is already active, shuffles cover art on the child user interface. If not, activates the child user interface.

[Enter_Child_Mode]

Puts the player in Child Mode and displays the child user interface.

[Leave_Child_Mode]

Takes the player out of Child Mode and displays covers view.

[Child_Mode_FB] Indicates that the child user interface is active.

Appendix D

SATP Module v8.1.0 Parameters and I/O

Parameters

Control Protocol Device ID

This must match the Control Protocol Device ID of the component as set through the Kaleidescape browser interface (<http://my-kaleidescape/installer>). Selecting **None** in the browser interface is equal to **01** for this parameter. **01** (None) is the default.

When using **01**, the Crestron processor must be directly connected to the designated component.

Zone ID

This indicates which zone output to control on the Kaleidescape player.

Time Update Interval

This indicates whether or not the component updates the time remaining. If the song position, remaining or progress level are used this needs to be set to **1**. If this information is not used, set this to **0** to conserve Crestron processing.

List Window Length

This indicates the number of indirect text fields on the touch panel available for displaying selections while browsing or searching music. This can also be overridden using the analog input of the same name.

Inputs

{ {Rx\$} }

Used for connection to the **RX\$** signal of the connected RS-232 port or TCP/IP client.

{ {Connect-F} }

Resends startup messages to get the module feedback in sync with the component. If using TCP/IP, tie this to the Connect-F output of the TCP/IP client to re-sync the feedback if the connection cycles. If using RS-232, simply put a **1** on this input.

Transports

- [Play], [Stop], [Pause], [Pause_On], [Pause_Off],
[Fast_Forward], [Rewind], [Skip_Forward], [Skip_Reverse]
Performs the associated transport action.
- [Play_or_Pause] Performs a play action or pause action depending on the current playback state. If music is playing, this input pauses music playback. If music is stopped or paused, this input resumes playback.

Playback Control

- [Random] Toggles random music playback. Note that this feature does not always function because some music always plays back in random order. See [Music Items in the Kaleidescape System on page 13](#) for details.
- [Repeat] Toggles repeat music playback. Note that this feature does not always function because some music always repeats. See [Music Items in the Kaleidescape System on page 13](#) for details.

List Control

- [Browse_Select] Causes the Browse view to be shown in the List Window. If the Browse view is already shown in the List Window, this input takes the user to the top of the Browse tree (home).
- [Now_Playing_Select] Causes the Now Playing information to be shown in the List Window.
- [List_Begin] Causes the List Window to go to the top of whatever list it is showing. If showing the Browse view, this input takes the user to the top of the tree (home). If showing the Now Playing view, this input takes the user to the beginning of the list or, if music is playing, to the item currently playing.
- [List_Back] Causes the List Window to show the previous list. The back information between the Now Playing view and Browse view are independent.
- [Keyboard_Search] Activates the keyboard pop-up to allow a search string to be entered.
- [List_Scroll_Bar_Act] An analog input to allow the list to scroll.
- [List_Up] Moves the List Window up one page.

[List_Down] Moves the List Window down one page.

[List_Highlight_Act]
An analog input to allow the highlight to scroll through the list.

[List_Window_Length]
Allows the number of indirect text fields used to display results to be modified at run time.

[List_Highlight_Up]
Moves highlight up one item.

[List_Highlight_Down]
Moves highlight down one item.

[List_Highlight_Select]
Selects currently highlighted item.

List Window

[List_Select1], [List_Select20]
Selects one of the specific lines of the list window.

Keyboard

[View_Search_Result]
Displays the results of the search to be browsed by the user.

[Keyboard_Enter] If multiple matching items are found, the results are displayed to be browsed by the user. If a single matching item is found, the item is selected for playback.

[Keyboard_Backspace]
Removes the last character entered from the queue built using Keyboard_Input.

[Keyboard_Clear] Removes all characters entered from the queue built using Keyboard_Input.

[Keyboard_Cancel]
Aborts the current search.

[Keyboard_Space]

[Keyboard_A] through [Keyboard_Z]
[Keyboard_0] through [Keyboard_9]
Sends this character to perform search functions. For a standard QWERTY keyboard, each button on the keyboard triggers a single character.

[Alphapad_x]
For a smaller, predictive text (cell phone style) keyboard, each button can represent multiple characters. For example, the **2** button can trigger

[**2ABC**], which would then match any item with either a **2**, **A**, **B** or **C** in that position.

[Other_Key_Inputs\$]

If other keyboard characters are required, create a Serial I/O (SIO) symbol and populate the symbol with the required keys. Each key should only send a single character at a time to this input.

Power

[Power_On] and [Power_Off]

Places the component in or out of standby mode. These inputs affect all four music zones of a Music Player. If [Power_On] is held high, the module attempts to keep the component powered on.

[Command_To_Player\$]

This input can be used to send any arbitrary command to the component. The module automatically adds the correct CPDID, Zone ID, sequence number, and terminating colon and line feed to any string sent to this input.

For example, PLAY would become 01.01/1/PLAY:\n for a module controlling CPDID **01** Zone ID **01**. This input provides direct access to the control protocol.

Outputs

{ {Tx\$} }

Used for connection to the **TX\$** signal of the connected RS-232 or TCP/IP client.

[Zone_Name\$]

This output provides the name of the connected music zone as defined in the installer pages of the browser interface.

Transports

[Play_fb], [Stop_fb], [Pause_fb], [Fast_Forward_fb], [Rewind_fb]

Transport feedback. Only one of these signals is active at any given time.

Playback Control

[Random_Status] Indicates that music is being played back randomly. Note that this will sometimes remain on because some music always plays back in random order. See [Music](#)

[Items in the Kaleidescape System on page 13](#) for details.

[Repeat_Status] Indicates that music is playing back repeatedly. Note that this will sometimes remain on because some music always repeats. See [Music Items in the Kaleidescape System on page 13](#) for details.

Playback Information

[Music_Playback_Active]

This signal is active while music playback is occurring.

[Song_Length] Length of the song currently playing, expressed in seconds.

[Song_Remaining] Amount of time remaining in the song currently playing, expressed in seconds.

[Song_Progress_Level]

A percentage of the elapsed time in the song (actually expressed as 0–65535). This can be used to place a progress bar (gauge) on a touch panel to show the current relative position in the playback.

[Song_Position] Current position of the current song, expressed in seconds.

[Now_Playing_Title\$]

Name of the song currently playing.

[Now_Playing_Album\$]

Name of the album associated with the song currently playing.

[Now_Playing_Artist\$]

Name of the artist associated with the song currently playing.

[Now_Playing_Cover_URL\$]

Indicates the URL of the cover art for the content currently playing.

List Control

[Browse_Selected]

Indicates that the Browse view is shown in the List Window.

[Now_Playing_Selected]

Indicates that the Now Playing view is shown in the List Window.

[List_Back_Available]

Indicates that the user can go back to the previous list.

This can be used to show the **BACK** button as enabled or disabled.

[Keyboard_Search_Available]

Active when the touch panel is displaying a list that can be searched.

[Keyboard_Search_Active]

Active when the keyboard is required to accept a search string from the user.

[List_Scroll_Available]

Indicates that there is more information in the current list than can be shown in the List Window. This can be used to display the scroll bar dynamically.

[List_Scroll_Bar_FB]

Indicates the relative position within the list that is shown in the List Window. This provides the feedback for the [List_Scroll_Bar_Act] input.

[List_Scroll_Bar_Size_FB]

Indicates the relative size of the list to the size of the List Window and can be used with scroll bar modes to show a scroll bar handle that changes size depending on the amount of information not shown in the list.

A value of **0** means that the entire list fits in the List Window (and the [List_Scroll_Available] output is low). Values between **1** and **9** indicate relative list bar sizes with **1** being the smallest (approximately 10% of the entire size scroll bar size) and **9** being the largest (approximately 90% of the entire size).

[List_Highlight_FB]

Indicates the absolute position of the highlighted line in the list currently displayed. This provides the feedback for the [List_Highlight_Act] input.

List Window

[List_Title\$] The title shown at the top of the List Window.

[List_Text1\$], [List_Text20\$]

Text for each line of the List Window.

[List_Selected1], [List_Selected20]

Feedback for the select status of each line of the list. Leave any output blank that the touch panel is not actually using.

[List_Queue_Status1], [List_Queue_Status20]

Feedback to show the queue status of each line of the list. These values will either be **1** (playing), **2** (paused)

or **3** (in the queue). This should be used to show a small icon adjacent to each line in the List Window.

Keyboard

[Keyboard_Title\$]

Text describing the current function of the keyboard.
For example, while searching for an artist, this will contain “Search Artists.”

[Keyboard_Text\$] This field contains the text that has been entered on the search keyboard.

[Search_Mini_Result\$]

This field contains an abbreviated version of the search results. For example, while 43 items match the query, this string would read “43 Entries.” If the search has been narrowed down to a single item, this string will display that item (for example, “The Beatles”).

Appendix E

Keyboard Presets Module v7.0.2 Parameters and I/O

Parameters

Control Protocol Device ID

This must match the Control Protocol Device ID of the component as set through the Kaleidescape browser interface (<http://my-kaleidescape/installer>). Selecting **None** in the browser interface is equal to **01** for this parameter. **01** (None) is the default.

When using **01**, the Crestron processor must be directly connected to the designated component.

Zone ID

This indicates which zone output to control on the Kaleidescape player.

Preset ID

A text identifier used for the set of presets. The Preset ID can be unique among all preset modules, or multiple instances of the module can use the same Preset ID to manipulate the same set of presets.

Hold Time

This sets the amount of time to hold one of the [Preset#] inputs, must be held in order to save the preset.

Inputs

{ {Rx\$} }

Used for connection to the **RX\$** of the connected RS-232 port or TCP/IP client.

{ {Connect-F} }

Resends the startup messages to get the module feedback in sync with the component. If using TCP/IP, tie this to the Connect-F output of the TCP/IP client in order to re-sync the feedback if the connection cycles. If using RS-232, simply put a **1** on this input.

[Play], [Stop], [Pause], [Fast_Forward], [Rewind],
[Skip_Forward], [Skip_Reverse]

Performs the associated transport action.

[Play-Pause]

Performs a play action or pause action depending on the current playback state. If music is playing, this input pauses music playback. If music is stopped or paused, this input resumes playback.

[Random]	Toggles random music playback. Note that this does not always function because some music always plays back in random order. See Music Items in the Kaleidescape System on page 13 for details.
[Repeat]	Toggles repeat music playback. Note that this does not always function because some music always repeats. See Music Items in the Kaleidescape System on page 13 for details.
[Preset_Lock]	When this input is high, saving any preset is disabled.
[Preset_First]	Triggers the first defined preset, starting at preset 1 and moving forward from there. Any preset not stored in the Kaleidescape System is skipped.
[Preset_Next], [Preset_Previous]	Cycles through module presets, skipping any presets not been stored in the Kaleidescape System. If a preset is currently active, then the cycle starts there. If no presets are active, the cycle starts with the most recently selected preset.
[Preset1] – [Preset10]	Triggers or sets the preset. If the [Lock] input is low and the input remains high (held) for the amount of time specified by the Hold Time parameter, the preset will be saved. When the preset is saved, the audio will mute for a moment.
[Command_To_Player\$]	This input can be used to send any arbitrary command to the component. The module automatically appends the correct CPDID, Zone ID, sequence number, and terminating colon and line feed to any string sent to this input. For example, PLAY becomes 01.1/1/PLAY:\n for a module controlling CPDID 01 Zone ID 1 . This input provides direct access to the control protocol.

Outputs

{ {Tx\$} }	Used for connection to the TX\$ signal of the connected RS-232 or TCP/IP client.
[Now_Playing_Item\$]	Information about the item currently playing. If the user is playing a genre, it displays the genre name. If the user is playing an album, it displays the album name. If the user is playing all music by a particular artist, the artist name is displayed.

[Now_Playing_Track\$]	The title and artist for the track currently playing given in the format <title> - <artist>.
[Play_fb], [Stop_fb], [Pause_fb], [FastForward_fb], [Rewind_fb]	Transport feedback. Only one of these signals is active at any given time.
[Play-Pause_fb]	Same feedback as [Play_fb]
[Random_fb]	Indicates that the music is playing back randomly. Note that this sometimes remains on because some music always plays back in random order. See Music Items in the Kaleidescape System on page 13 for details.
[Repeat_fb]	Indicates that the music is playing back repeatedly. Note that this sometimes remains on because some music always repeats. See Music Items in the Kaleidescape System on page 13 for details.
[Preset1_fb] – [Preset10_fb]	Indicates when the associated preset is currently active. Multiple presets can be active simultaneously, if the presets are set to the music entity.
[Preset1_Label\$] – [Preset10_Label\$]	Displays the name of the genre, artist, album, or track that the preset is set to. This is the same information that is displayed in the [Now_Playing_Item\$] signal when the preset is active. Automatically updates to the latest information when a preset changes, as well as at connection.

Appendix F

Music Collection Module v7.0.2 Parameters and I/O

Parameters

Control Protocol Device ID

This must match the Control Protocol Device ID of the component as set through the Kaleidescape browser interface (<http://my-kaleidescape/installer>). Selecting **None** in the browser interface is equal to **01** for this parameter. **01** (None) is the default.

When using **01**, the Crestron processor must be directly connected to the designated component.

Zone ID

This indicates which zone output to control on the Kaleidescape player.

Collection

The music collection that this module will cycle through. Default collections include:

- ▶ Albums by Artist
- ▶ Albums by Title
- ▶ Genres (top 40 genres in the music library)
- ▶ Mix Albums (user-defined mix albums)
- ▶ New (most recently imported albums, the time is defined in the browser interface)

User-defined collections can also be specified.

Inputs

[First], [Next], [Previous]

Play the first, next or previous item in the collection.

Outputs

{ {Tx\$} }

Used for connection to the TX\$ signal of the connected RS-232 or TCP/IP client.

Appendix G

Revision History

Crestron OSD Module

Version 8.1.0

- Added child commands.

Version 8.0.0

- Added support for Blu-ray Discs.
- Fixed a bug causing spurious messages to be dumped to the log.
- Minor bug fixes and other modifications

Version 7.0.1

- Added support for the Cinema One.
- Significant speed improvements.
- Better handling of power state and connection status.
- Added [Zone_to_Control\$] input and [Controlling_SN.Zone\$] and [Controlling_CPDID.Zone\$] outputs.

Version 7.0

- Module reorganized to use signal roll-ups.
- Added keyboard and keypad inputs.
- Added [16x9_Frame_with_2.35_Image] and [16x9_Frame_with_2.35_Image] outputs.
- Added [Mask_Calibrated_Top] and [Mask_Calibrated_Bottom] outputs.
- Added [Random_Toggle] and [Repeat_Toggle] inputs for music playback.
- Added power status signals: [Power_on_fb] and [Power_off_fb].
- [Now_Playing_Cover_URL] can also return movie cover URLs.
- Changed join numbers in demo program.

Version 6.3.1

This version has been successfully tested using CUZ 4.0 Beta release.

- Improved high traffic performance.
- Added version number to file names.

Version 6.3.0

- Changed Connection_Reset to Connect-F in sample code to clarify its purpose.
- Fixed bug where content detail strings were sometimes overrunning the string buffer.
- Added signal to activate lighting when in the DVD menu.
- Added override capability for handling NAT for cover art URLs.
- Minor formatting and spelling corrections in code.

Version 6.2.0

- Fixed bug where the play button disappears when the new music choices pop up.
- Fixed bug where setting Time Update Interval to 0 does not work.
- Added support for cover art for details browsing, including signals to indicate whether to use the DVD or CD aspect ratios.
- Modified coding style of module to reflect a single consistent style.
- Created SIMPL+ library to allow code to be used across all Crestron modules.
- Updated copyright text in the module.
- Added Virtual Serial Driver to module.
- Added signal for custom commands to be sent to the player.
- Added Virtual GUI Device driver to module.
- Linked module help function to this document.
- Added System Builder Device Support definitions so that the module can more easily be found in the database.
- Modified signal names to hide unnecessary signals in System Builder.
- Modified many signal names to clarify their purpose.

Crestron SATP Module

Version 8.1.0

- Fixes an out-of-bounds array reference introduced in 8.0.0.
- Fixed a bug in version 8.0.0 that could cause the Crestron processor to lock up when used with CUZ 4.x prior to 4.003. Note that lockup usually takes a fairly long time to occur. All users of SATP 8.0.0 are strongly encouraged to update to 8.1.0.

Version 8.0.0

- Fixed the buffer overrun bug.

Version 7.0.1

- Significant speed improvements.
- Better handling of power state and connection status.
- The SATP Now Playing list now defaults to the currently playing track.
- The SATP search button is now suppressed on top Browse node. Searching on the top node is not supported.
- Better handling of an invalid SATP node. If an SATP interface is showing a collection while the collection is deleted, the interface will correctly move to a valid node.

Version 7.0

- Module reorganized to use signal roll-ups.
- Added version number to file names.
- Added keyboard and keypad inputs.
- Changed join numbers in demo program.
- Added [Random_Toggle] and [Repeat_Toggle] inputs for music playback.
- Added [Zone_Name\$] to return the name of the currently controlled zone.

Version 6.3.0

- Changed Connection_Reset to Connect-F in sample code to clarify its purpose.
- Corrected system name in sample program.
- Fixed bug where the module would sometimes not initialize properly if using command redirection.

- Modified nomenclature inside the module to clarify the browse protocol implementation.
- Minor formatting and spelling corrections in code.

Version 6.2.0

- Added help text to Crestron SATP module.
- Removed deprecated signals from module.
- Fixed bug where too many search results were being returned.
- Modified parsing routines to significantly improve module performance.
- Modified coding style of module to reflect a single consistent style.
- Created SIMPL+ library to allow code to be used across all Crestron modules.
- Updated copyright text in the module.
- Enabled signal containing URL for the cover art of the currently playing album.
- Added Virtual Serial Driver to module.
- Added signal for custom commands to be sent to the player.
- Added Virtual GUI Device driver to module.
- Linked module help function to this document.
- Added System Builder Device Support definitions so that the module can more easily be found in the System Builder database.
- Modified signal names to hide unnecessary signals in System Builder.
- Modified many signal names to clarify their purpose.

Crestron Keypad Module

Version 7.0.2

- Significant speed improvements.
- Better handling of power state and connection status.

Version 7.0.1

- Added version number to file names.

Version 7.0.0

- Changed Connection_Reset to Connect-F in sample code.
- Added signals to output labels for each preset.

- Added First/Next/Previous inputs to browse presets.
- Added Now Playing item output to display a plain text string indicating what is currently playing.
- Minor formatting and spelling corrections in code.

Version 6.2.0

- Modified coding style of module to reflect a single consistent style.
- Created SIMPL+ library to allow code to be used across all Crestron modules.
- Update copyright text, Crestron code.
- Added Virtual Serial Driver to module.
- Added signal for custom commands to be sent to the player.
- Linked module help function to this document.
- Added System Builder Device Support definitions so that the module can be more easily found in the database.
- Modified signal names to hide unnecessary signals in System Builder.
- Modified many signal and variable names to clarify their purpose.

Version 6.1.0

- Initial implementation of keypad API.

Crestron Touch Panel Templates

Versions Dated 2011-03-01

- Added search and jump to collections page.

Versions Dated 2010-04-29

- Added Blu-ray Disc color buttons to templates.
- References to DVD replaced by generic references to “Disc.”
- Removed favorite scenes buttons.
- Changed select button to OK button.
- Removed the alphabetize button.

Versions Dated 2008-08-08

- Changed join numbers.
- Added repeat and random buttons to OSD-no-Video.

- Updated templates for current generation of Crestron touch panel hardware (e.g., TPS-15 instead of TPS-6000).

Version 6.2.0

- Fixed bug where the Now Playing view was not showing **Paused** status.
- Updated the copyright text.
- Fixed bug where the play button disappears when the new music choices pop up.
- Added dynamic graphics object to OSD No Video details sub-pages. Split sub-page into two pages to handle different aspect ratios. This allows the cover art for the selection currently highlighted on the OSD to be displayed on the touch panel.
- Added dynamic graphics object to the now playing music bug for SATP and OSD to show the cover art for the currently playing music album.
- Placed a **PLAY** button over the browse cover at on OSD No Video touch panel templates.