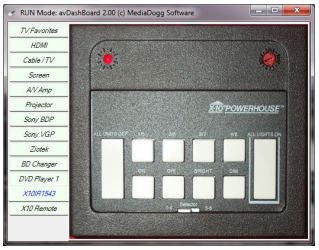
a/v Automation System

Revision: March 2014



- Make your own PC-based Remote Controls
- Learn and playback any infrared (IR) codes
- Use buttons, pictures and text to design your layout
- Control devices with an IR receiver, including X10 and INSTEON
- Control Sony DVD Changers (VGPXL1Bx, CX995VX, CX777ES et al)
- Control Sony BD Megachanger CX7000ES (Rs232 and UPnP)
- Supports Global Cache ® iTach
- Built-in control of Dacal/Ziotek style USB changers
- Works with Invelos DVD Profiler
- Works with any other program in your network
- Works with any device that can connect over IP
- Supports client / server in your home network

Table of Contents

Introduction

The mediadogg a/v Automation System is an inexpensive way to build control sequences for devices that respond to infrared signals. The control sequences can be tied to graphical representations of hand-held remote control controls, buttons or any graphic image.

Groups of buttons can be aggregated under a common name, called a device. Groups of control sequences can be aggregated under a common name called Actions.

Underlying the Automation System are data structures in the form of XML files that are used to save the automation configuration and the configuration of virtual remote controllers. These files can be loaded and saved, so that an automation configurations can be created and adapted to various usage patterns.

The a/v Automation System also has dedicated support for several non-infrared controlled devices: (1) Sony VGPXL1Bx fire wire-controlled 200 DVD changers, (2) Sony CX777ES rs232 controlled 400 DVD changer, and (3) Dacal/Ziotek – style USB connected DVD carousels.

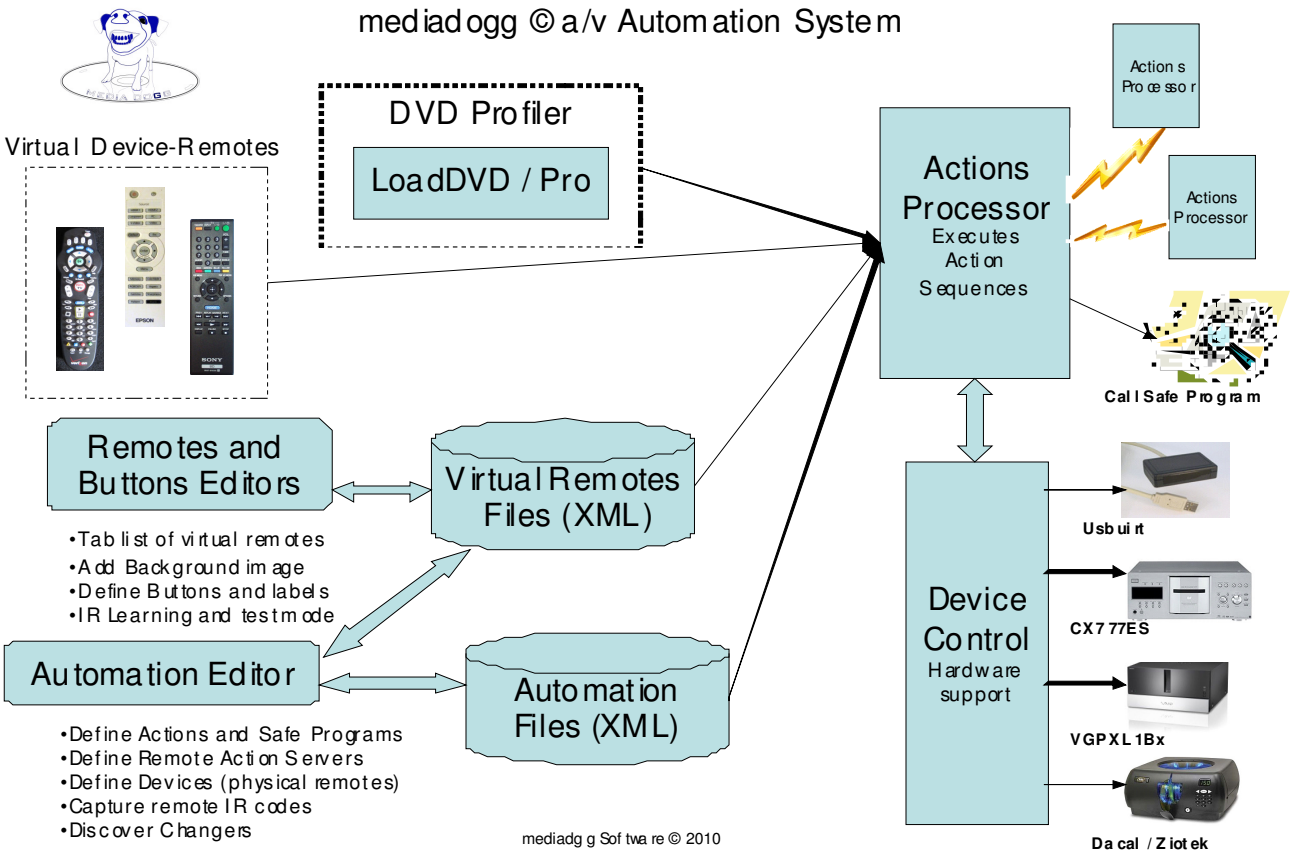
A standalone component, **a/v DashBoard** provides an Automation Editor and Virtual Remotes Editor, which presents the virtual remotes in a tabbed view. Buttons can be assigned and positioned, and infrared sequences can be captured (learned) and associated with the buttons on the virtual remote tabs. This component also supplies Remote Automation Services to other **a/v Automation System** components.

Shown in the figure is the **a/v DashBoard** in run mode. The virtual remote uses pictures of actual personally owned remote controls as a backdrop, and hidden "hotspot" buttons have been defined, such that when the mouse clicks over the button positions, the correct infrared sequences are retrieved and blasted, using the USB-UIRT (http://www.usbuirt.com) IR blaster device. Other buttons have been defined that perform specific functions such as channel favorites and TV input selection.

In addition to the standalone component, an Automation Engine is used internally within other products to process the action sequences designed with the Automation Editor. Initial implementations of the Automation Engine are included as enhancements to the LoadDVD (www.mediadogg.com) and LOADDVD Pro (www.shopping.mediadogg.com) plugins for Invelos DVD Profiler.

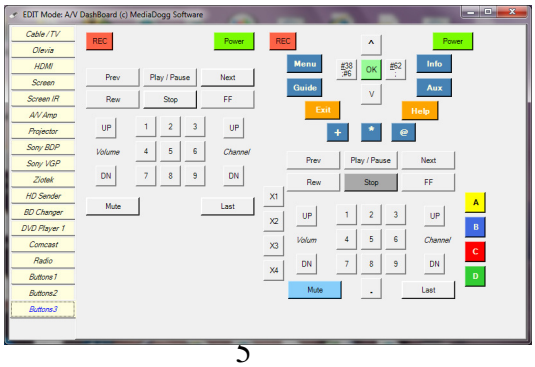
This target audience for this system is the individual home theater owner and user. It is unlikely that this system has now, or will ever possess the performance and robustness required for commercial applications.

Method Of Operation



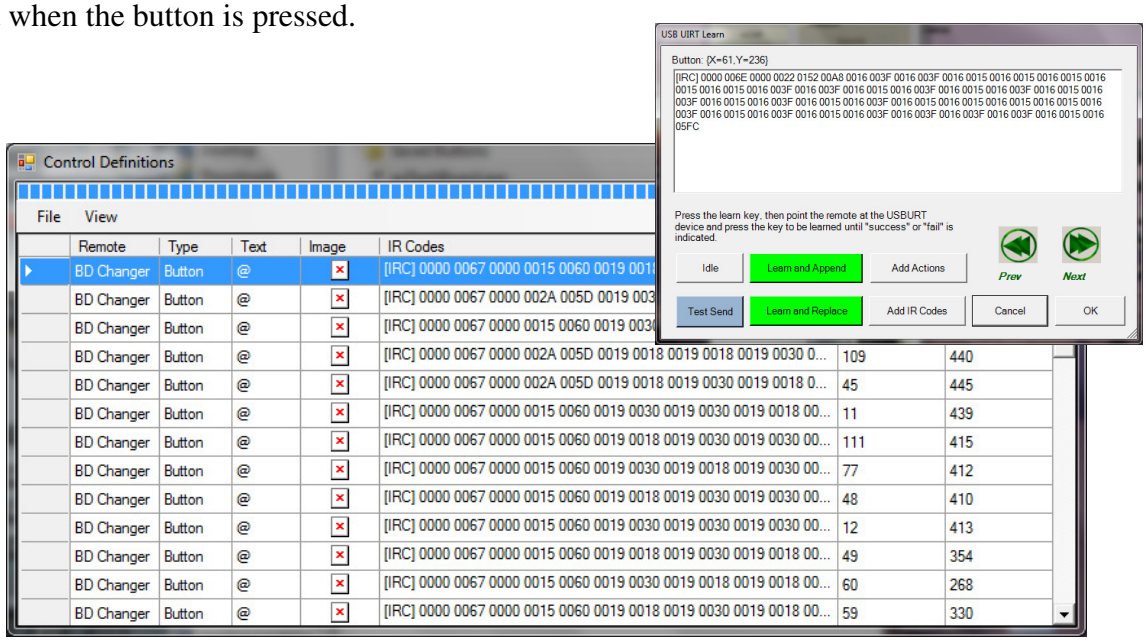
The system diagram shows the automation system components and how they are logically connected.

Virtual Device-Remotes and Button Controls Editors – present a set of tabs where almost any kind of visual representation of a remote control can be designed. Editing controls are provided for associating a background image and for defining and manipulating buttons. Each button can have a set of Actions defined, including infrared control sequences and other actions that allow control of multiple home theater elements. For example, a button could be defined that would adjust the lights and turn on the necessary components for watching a DVD, including switching to the correct inputs and lowering a projection screen. All aspects of the Virtual Remotes tabs are saved in XML format in the virtual remotes tabs file.

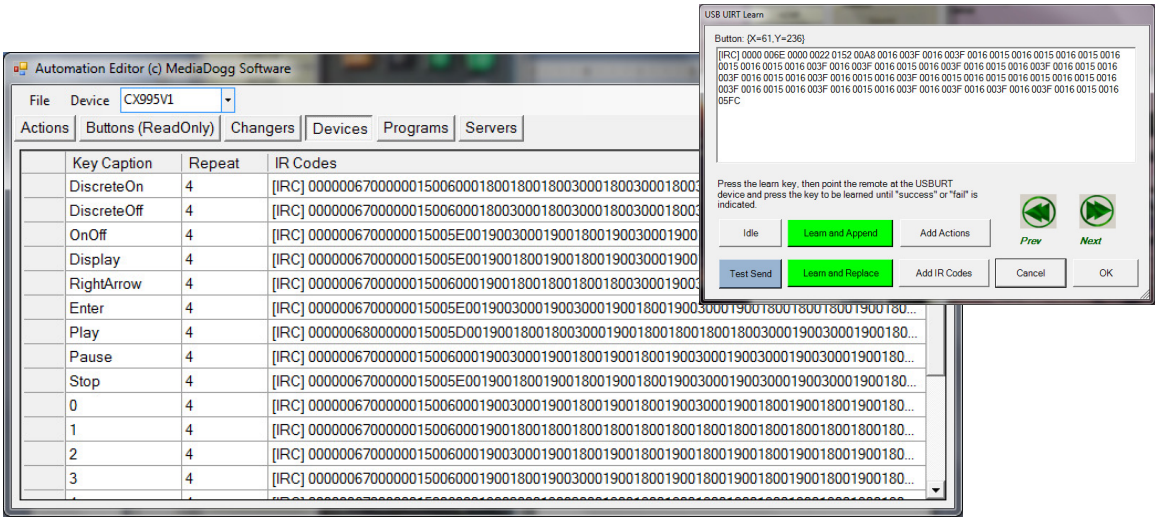


Method Of Operation (contd.)

The Button Controls Editor is called from the Virtual Device-Remotes Editor. Only the buttons defined on the selected virtual remotes tab are displayed. On this page, it is possible to manually edit button properties such as size, location and background image. When a row in the table is double clicked, an IR Learn panel is displayed, where IR codes can be captured and edited. In fact, any action sequence can be entered in this mode, as part of the operations that will be executed when the button is pressed.



Automation Editor – is called from the Virtual Device-Remote Editor, and is also available in LoadDVD Pro. It creates a table for storing properties of the various resources of the automation system: Actions, Changers, Devices, Programs, and Servers. For convenience, the Buttons used on the selected virtual remote tab are listed in Read Only mode. Editing Buttons is actually done with the Buttons Editor. On the changers tab, it is possible to discover locally connected changers and have them added automatically to the table. On the devices tab, it is possible to edit the IR codes associated with a device, either manually or using the IR Learn tool.



Method Of Operation (contd.)

Actions Processor – this component decodes the commands that are associated with Buttons in **a/v DashBoard**, or associated with Profile discs in the **LoadDVD** plugin for Invelos DVD Profiler, and necessary calls to Device Control are made. Unrecognized commands are simply ignored. No error messages are generated as a result of syntax errors, however errors may be generated from interactions with devices.

Device Control – provides the software for built-in support of certain devices, such as Sony VGPXL1Bx changers, Sony CX995V, Sony CX777ES, Sony CX7000ES, Dacal/Ziotek media carousels and USBUIRT IR Blaster. Several of the author's personally owned remote control controls are reflected in the provided sample Virtual Device-Remote tabs. Additional devices can be supported by user-supplied scripts and programs accessed via the [PRG] action sequence.

Virtual Device-Remote Configuration Files – the location and properties of buttons on device-remote tabs are organized into a proprietary XML file format, a sample of which is included in the document. This format is subject to change without notice, but only for good reason. The last used configuration is loaded automatically, and all products allow the loading of a configuration. **The a/v DashBoard** additionally allows the editing and saving of configurations.

Automation Configuration Files – the properties of the various automation components: Actions, Changers, Devices, Programs and Servers. These properties are organized into a proprietary XML file format, a sample of which is included in the document. This format is subject to change without notice, but only for good reason. The last used configuration is loaded automatically, and all products allow the loading of a configuration. **LoadDVD Pro** and **a/v DashBoard** additionally allow the editing and saving of configurations.

Device vs. Virtual Device-Remote - the author has made a distinction between a configuration that is a direct reflection of the remote controller of a physical a/v device, such as an a/v receiver, set-top box, DVD Player, etc, and the configuration of a "virtual" remote control, that can have buttons from multiple devices, specialized buttons that control multiple devices or run programs and scripts. In the Virtual Device-Remote Editor, each pseudo remote control is represented on a tab. The configuration saves the positions and sizes of the buttons, background images, and the action sequences associated with each button.

By contrast, a Device, as seen in the Automation Editor, is designed as a convenient way to capture the IR codes associated with a specific physical remote control. Their codes can be copied into the virtual remotes or used in the definition of action sequences. Devices are saved as part of the automation configuration file. In this format, button positions, captions and background images are not captured initially while in IR Learn mode, but may be added later using the Buttons Editor.

Since the [DEV] command will recognize both a Virtual Device-Remote tab as well as a Device name, it is possible to use buttons from either configuration so long as the button captions match the argument of the [KEY] or [NUM] commands.

Virtual Device-Remote Editor Guide

The virtual device-remote editor consists of a tabbed presentation of remote controls that can be highly customized. Tabs can optionally display background images. The examples shown use digital images taken by the author of personally owned remotes. Superimposed on the tabs are buttons that host the action sequences for controlling a/v devices.

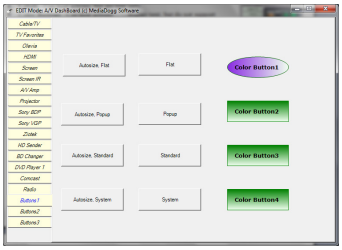
Run vs Edit Mode

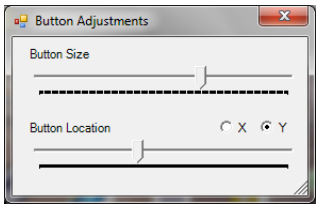
There are two modes of operation: Run Mode (top picture) and Edit Mode (lower picture). In Run Mode, it is possible to Global Remote mode, where all actions are automatically re-routed to a specified remote server. It is also possible to create invisible hotspots in place of button with transparent background color and no background image. The lower picture shows a tab with invisible hotspots.

Editing Virtual Device-Remote Tabs

In Edit Mode, tabs can be manipulated and buttons defined. Menus are provided for adding, deleting, copying and pasting. Tab files can be loaded and saved, and a tools menu is provided for accessing the Button Editor, Automation File Editor and for moving and re-sizing buttons.

- **Buttons** - Can host actions, text, background images and color.
- **Labels** - Can host actions, but are text only.
- **Color Buttons** - Can host actions , display text, but do not support background images. Several pleasing color and shading patterns are available.
- **Copy / Paste** - All objects can be individually copied and pasted, across tabs. Group copy is implemented with a “rubber band” technique where the buttons to be copied are included within a doted rectangle.
- **Adjust Buttons** - This control will translate or resize all buttons on a tab by the same amount.

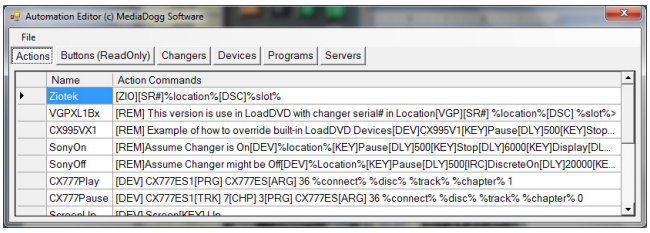




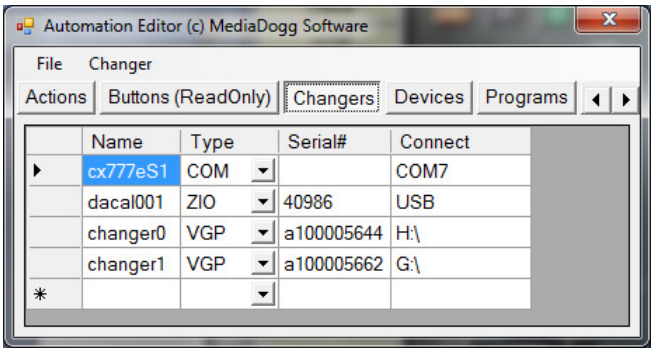
- **Freeze Button Positions** - This function saves the positions of all objects, including the tabs and recreates the layout in Run Mode.
- **Freeze at WHS Size** – saves the layout in a size compatible with a/v Engine for WHS.
- **Copy / Paste Tabs** - New tabs can be created and existing tabs deleted, moved, copied or pasted.
- **Remote Server** – You can assign a server name that will be used to send all action commands from this tab. This facilitates changes to your automation environment without needing to reprogram every button within a tab.

Automation Editor Guide

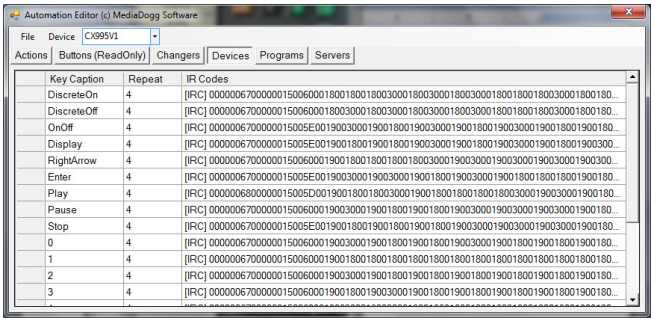
Actions Table: Actions represent a sequence of commands that can be referenced by name. This is useful in LoadDVD. The Location field is checked for a match in the Actions table. If a match is found, the corresponding action sequence is processed.



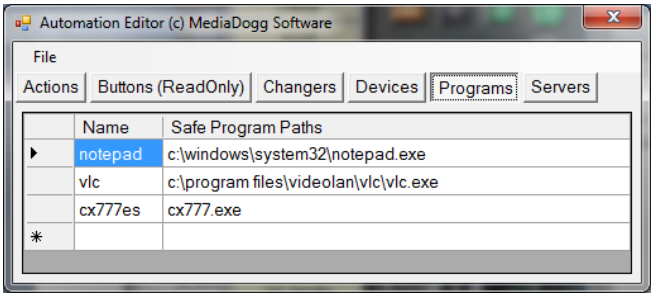
Changers Table: lists all of the supported types of changers and carousels. The Changer Menu contains functions for discovering firewire connected Sony VGPXL1Bx, Sony CX777ESs connected via serial ports, USB-connected Dacal/Ziotek carousels, and UPnP Sony BD CX7000ES. This is the second table, after Devices, that the [DEV] command searches for a match for use with subsequent [VGP] and [ZIO] commands.



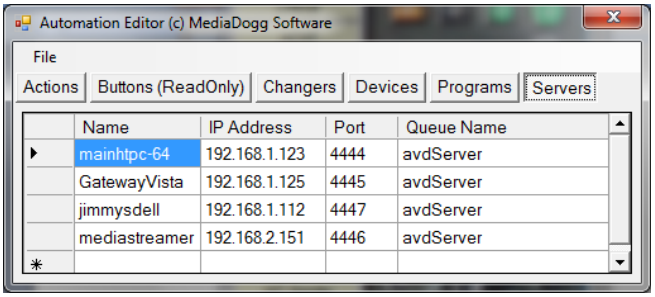
Devices Table: represents collections of buttons corresponding to an actual physical remote control. There is typically only one [IRC] command per button, although there is no technical restriction. This is the first table that the [DEV] command searches for a match for use with subsequent [KEY] and [NUM] commands.



Programs Table: The programs listed here are considered to be “safe”, in other words, these are the only programs other than rs232.bat, usbirt.bat, and PlayFromDisk.bat (and their .wsf counterparts) that can be invoked with the [PRG] command. This is an attempt to prevent rogue or accidentally executed programs from damaging the server.



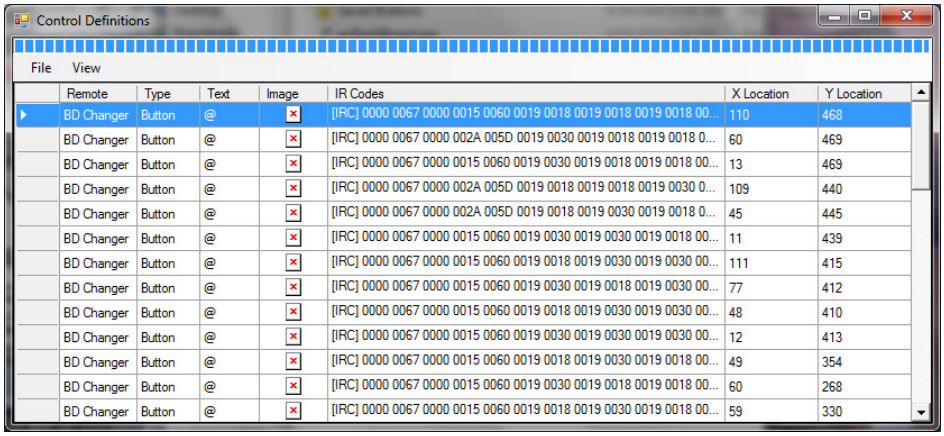
Servers Table: lists computers that are running the a/v DashBoard product and that can receive commands delivered by clients using the [RON] / [ROF] brackets. This table is used correct on the client side. The server also accesses this table to discover what port it should be using. (Queue names are not used at this time.)



Button Controls Editor Guide

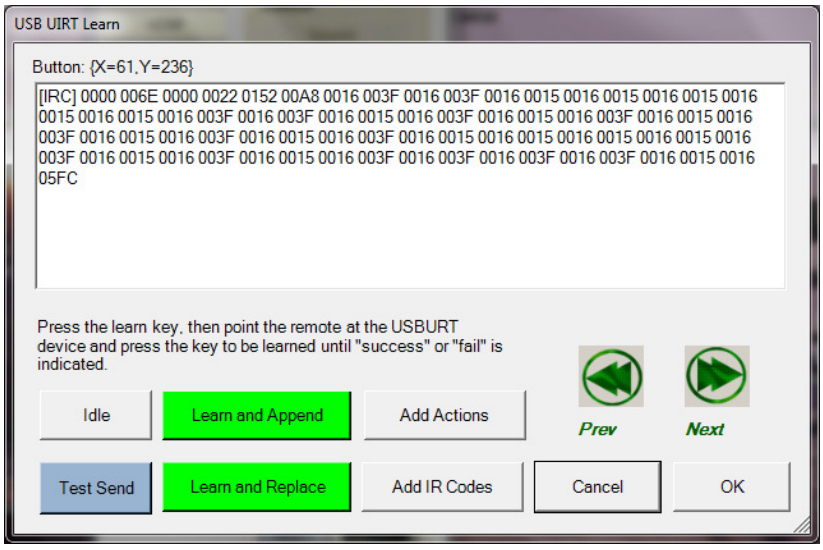
This panel allows the editing of various the selected tab's buttons parameters in tabular format. This style may be easier for some types of changes. Button properties can also be edited by right-clicking on the button in Edit Mode, which presents a Button Properties context menu. The same procedures works also for Labels and Color Buttons.

File – Exit with or with saving changes.
View – Buttons only, Labels only, Color Buttons only, or All.



IR Learn Guide

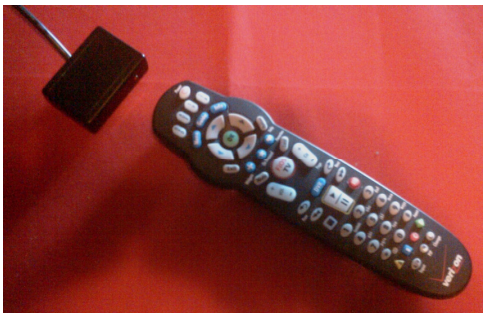
Either when a row in the Buttons Editor is double-clicked, or the actual button is double-clicked in Edit Mode, the IR Learn panel is presented. Here, you can use the USBUIRT device to receive IR signals; i.e., "learn" them, in PRONTO format. These codes are stored as actions sequences associated with the button, using the [IRC] command.



IR Learn Guide(Cont'd)

Functions:

- **Test Send** – Pressing this button will pass the contents of the text box to the Action Processor, for testing purposes.
- **Learn and Append** – Pressing this button puts the USBUIRT into "learn mode". Then you must press the desired key on the actual remote, while aiming that remote in the direction of the USBUIRT. The result is append to whatever was previously in the text box.
- **Learn and Replace** – Same as above, except that the contents of the text box are erased and replaced with the results of the learning operation.



- **Add Actions** – Pressing this button brings up the Actions tab of the Automation Editor. The contents of the selected actions are appended to the end of the existing contents of the text box.
- **Add IR Codes** – Just as with Add Actions, selected IR codes from the Devices tab of the Automation editor can be appended to the end of the text box contents.
- **Prev** – Advance to the next button (the button is highlighted for convenience).
- **Next** – Select the prior button.
- **Cancel** – Exit the panel without saving changes.
- **OK** – Exit the panel and save changes. Note that this only saves changes for in-memory copy of the a/v DashBoard. An explicit file save operation must be performed to include the changes as part of a configuration file.

Techniques for learning IR Codes:

Most people find that capturing IR codes is as much an art as a science. Positioning is very important. Sometimes success or failure is obtained simply by rotating the relative positions of the remote control and the USBUIRT, or by moving them closer or further apart. Another trick in difficult situations is to use a physical learning remote to capture the codes first, then blast the codes from the learning remote into the USBUIRT.

Many of these techniques can be found by searching the internet. In some cases, it may be necessary to enter the codes manually. There are web sites that specialize in making remote control codes available for many popular devices, all in Pronto format. One such popular web site for these codes, plus tips and hints is RemoteCentral.COM.

Action Processor Commands

Each command in an action sequence consists of three letters, all UPPER CASE. There are some cases where certain commands are expected to follow certain others, and one case, [RON] and [ROF] where one level of nesting is supported. In all other cases, each command is standalone and separate from all others. Unrecognized commands are ignored. There are no error messages generated from invalid syntax. Use of this protocol is free for unlimited personal use. Commercial use (embedding in commercial products such as mobile apps) is available for a nominal license fee.

Firewall Issues

Automation commands are sent over the connected sockets on the TCP/IP network(s) to which your clients and servers are connected. a/v DashBoard automatically adds its server port to the Windows Firewall. **Important:** if you have any other firewalls, such as McAfee, or if you are sending commands through the network, you must enable incoming connections on the port being used (default 4444).

List of Commands:

[ARG] list of arguments

This command only follows a [PRG] command, and is used to indicate the start of a string of parameters that you are passing to your safe program. All text following the [ARG] command is subject to symbol substitution, as shown in the example.

Sample Action sequence: *[PRG] notepad [ARG] %server%.doc*

[ALT] on | off (not LoadDVD)

Turns on or off the use of alternate IR transmission. The plugin LoadDVD Pro also has an Option flag that turns on this feature permanently. In this case, {ALT] serves as a temporary override. LoadDVD Pro provides for saving the file path of the alternate IR program.

[CMD] action (following [VGP])

Following a [VGP] command, indicates what action you want the Sony VGPXL1Bx to perform. Valid actions are:

- mount – transfers the selected disc to the drive
- unmount – transfers the disc from the drive back to its storage slot
- load – loads the selected slot from the changer front opening
- unload or eject – ejects the disc from the selected slot from the changer front opening
- next – mounts the disc from the next slot
- prev – mounts the disc from the previous slot
- info – displays a popup showing what disc, if any, is current mounted

Sample Action sequence: *[VGP] [SR#] a100005644 [DSC] 47 [CMD] mount*

[CMD] action (following [MCH])

Following a [MCH] command, indicates what action you want the Sony changer to perform. Valid actions following [MCH] are (do use the quotes):

- mount – transfers the selected disc to the drive. The disc does not automatically play.
- unmount or eject – transfers the disc from the drive back to its storage slot

Remote Control Button Commands (CX777ES and CX7000ES)

- "NUMERIC 0"
- “NUMERIC 1"
- "NUMERIC 2"
- "NUMERIC 3"
- "NUMERIC 4"
- "NUMERIC 5"
- "NUMERIC 6"
- "NUMERIC 7"
- "NUMERIC 8"
- "NUMERIC 9"
- "ALL DISCS"
- "ANGLE"
- "AUDIO"
- "BLUE"
- "CLEAR"
- "CURSOR DOWN"
- "CURSOR ENTER"
- "CURSOR LEFT"
- "CURSOR RIGHT"
- "CURSOR UP"
- "DIMMER"
- "DISC NEXT"
- "DISC PREVIOUS"
- "SKIP+"
- "SKIP-"
- "DISPLAY"
- "ENTER"
- "GREEN"
- "HOME"
- "LOAD"
- "NEXT TRACK”
- "OPEN"
- "CLOSE"
- "OPTION"
- "PAUSE"
- "PLAY"
- "POP UP MENU”
- "POWER OFF"
- "POWER ON / OFF"
- "POWER ON"
- "PREV TRACK"
- "RED"

- "REPEAT"
- "RETURN"
- "SCAN FORWARD"
- "SCAN REVERSE"
- "SHUFFLE"
- "SUBTITLE"
- "SLOW STEP FORWARD"
- "SLOW STEP REVERSE"
- "STOP"
- "SUB TITLE"
- "TEST"
- "TIME"
- "TOP MENU"
- "YELLOW"

Remote Control Button Commands (CX777ES Only)

- "TIME / TEXT"
- "INSTANT REPLAY"
- "INSTANT ADVANCE"
- "FOLDER"
- "PICTURE NAVI"

Example: *[MCH] [SR#] cx7kcom1 [DSC] 47 [CMD] mount*

[CHP] chapter#

This command can only follow the [DEV], [VGP] and [ZIO] commands in order to set the %track% and %chapter% parameters that can be used in subsequent commands, such as [PRG] to pass those values to your own device control program. At this time, these values are ignored by the internal changer support for VGPXL1Bx, and Dacal/Ziotek.

Sample Action sequence:
[DEV] cx777es [DSC] 12 [TRK] 2 [CHP] 4
[PRG] cx777.exe [ARG] com1 36 %disc% %track% %chapter% 1

[DEV] remote-name

This command sets the virtual remote associated with a device, so that specific IR codes can be sent. For example, you could name a device CX995VX1 for the collection of IR codes for your Sony CX995VX set to mode 1.

Here is an Action sequence for turning on the DVD player and selecting a disc using one button click. The %sendkeys% parameter gets the disc number from an input field on the virtual remote control screen (this is the sequence that LoadDVD uses internally):

[DEV]CX995V1 [KEY] Pause [DLY] 500 [KEY] Stop [DLY] 6000
[KEY] Display [DLY] 300 [KEY] RightArrow
[DLY] 300 [NUM] %sendkeys% [DLY] 500 [KEY] Enter [DLY] 35000
[KEY] Display [DLY] 300 [KEY] Display [DLY] 300

[DLY] milliseconds

This command simply inserts a delay of the requested time before executing the next command.

[DSC] disc#

This command sets the %slot% parameter for [PRG], and also supplies the disc number to the internal [VGP] and [ZIO] commands.

Sample Action sequence: *[DEV] changer0 [VGP] DSC] 124 [CMD] mount*

[DVD] profileID (LoadDVD only)

This command selects a profile within DVD Profiler.

Example: *RunAction "[DVD] 043396059900" 192.168.1.125 4747*
Example: *RunAction "[DVD] ICFD8461A80517AC6.17" 192.168.1.125 4747*

[GLC] string of characters (cannot include "[") (not LoadDVD)

This command sends an arbitrary string to a Global Cache device. The server IP address (%serverip%) and port (%serverport%) are taken from the last values set from a preceding [RON] / [ROF] or [SRV] command sequence. The response string is used to update the %ipresponse% variable. In the future, [GLC] operation may diverge from [IPS] in order to specifically support Global Cache devices.

[IPS] string of characters (cannot include "[") (not LoadDVD)

This command sends an arbitrary string to a remote IP server. The server IP address (%serverip%) and port (%serverport%) are taken from the last values set from a preceding [RON] / [ROF] or [SRV] command sequence. The response string is used to update the %ipresponse% variable.

[IRC] Pronto IR codes in ASCII hex format

This command sends a sequence of learned IR codes using the supported IR Blaster product.

This sample Action sequence lowers my projection screen ("Down"):
[IRC]
0000006E0000000C00300010003000100030001000300010001000300010003000100030001000300030001000100030001008 8D

[IRX] Pronto IR codes in ASCII hex format

This command stores codes into the variable %irc% for later use by the [PRG] command. Otherwise %irc% expands to the last codes processed by [IRC].

[KEY] key-name

This commands processes the Action sequence defined for the key key-name in the current device. This is usually a learned [IRC] codes, but can be augmented with any other commands, so that a single virtual device button can execute complex sequence of events.

Sample Action sequence: *[DEV] Screen [KEY] Down*
(Notice this does the same thing as the previous sample. In this case, the *Screen* device as the *[IRC]* sequence shown above as the defined Actions for the *Down* key.

[MCH]

This command triggers the built-in support for Sony CX777ES and CX7000ES changers, and can be followed by [SR#], [DSC], [CHP], and [TRK] in any order, then finally with a [CMD] command. Note that [CHP] and [TRK] are not actually used at this time.

[MSG] message text

This command presents a popup message box on the Action server that times out in a few seconds, so there is no need for the user to respond.

Sample Action sequence: *[MSG] Device %device% has just been selected*

[NUM] number

This command will play the actions for each digit of the number, with a small delay in-between.

Sample Action sequence: *[NUM] 123* is actually equivalent to: *[DEV] device [KEY] 1 [DLY] 50 [KEY] 2 [DLY] 50 [KEY] 3 [DLY] 50*

[PLY] disc#

This command is equivalent to clicking the disc icon in the DVDP GUI, or to clicking the corresponding menu item on the DVD, Main or Collection List context menu. It is equivalent to using the Ctrl-disc# hotkey sequence. Valid for automation server running inside LoadDVD.

Example: RunAction *"[PLY] 2" 192.168.1.125 4747*

[PLY] filepath – path to file to be played

This command will "Open" a media file using the windows associated program. Executables are specifically excluded, so you can play an "mp3" but you can't run an "exe" file. In LoadDVD Pro, this action is modified in that the user can opt to play the file inside the embedded WMP player instead of with the associated program. The action sequence "[PLY] %filepath%" is equivalent to the legacy LoadDVD "file" command. Both retrieve the filepath from Notes.

Example: RunAction *"[PLY] \\server\mymovies\star_wars.avi" 192.168.1.125 4747*

[PRG] safe-program

This command will execute a program, but only if that program mnemonic is found in the automation configuration file. This prevents programs from being executed that are not determined to be "safe" by the user. Each program mnemonic is associated with an explicit program path that is saved in the automation configuration file. In the case of the example, the stored path is c:\windows\system32\notepad.exe. ***Note: For rs232, PlayFromDisk and USBIRT, both .bat and .wsf, are accepted without explicit entries in the safe-program list.***

Sample Action sequence: *[PRG] notepad [ARG] c:\todolist.txt*

[RCF] command file path (LoadDVD only)

This command causes the specified DVD Profiler command file to be run. Valid for automation server running inside LoadDVD.

Example:
RunAction *"[RCF] \\host\mydocuments\DVD Profiler\GetLayout.txt" 192.168.1.125 4747*

[RON] server-name

This command tells the automation system to begin collecting subsequent commands to be sent to a remote server identified by server-name. The server-name token must have a match in the automation configuration file, which will then specify the IP address and port to be used to send the commands to the remote automation server.

Example: *[RON] mainhtpc-64*

[ROF]

This command signals to the automation server to end the collecting of commands, and sends the previously collected batch to the remote automation server already identified.

[RPT] count

This command changes the default repeat count (currently 4) for subsequent [IRC] commands. This is helpful in some cases when the default causes an undesired result. For example, I needed to do this for the "Mute" function on my A/V receiver. The default repeat count of 4 caused the mute to cycle twice and therefore have no net effect.

Example: *[RPT] 2*

[SAY] text to be spoken

This command uses the Microsoft text to speech capability built into Windows. This has been tested on XP Home up through Windows 7 Home Premium – 64 bit.

Example: *[SAY] DVD %title% has been selected. Please enjoy the show.*

[SHW] normal | hidden | maximized | minimized

This tells sets what kind of window [PRG] uses when executing programs.

Example: *[SHW] normal.*

[SR#] serial-number (used after [VGP])

This command only follows either a [VGP] or [ZIO] to explicitly set the serial number of the requested device, in lieu of using a device name. These serial numbers are the same ones used in the Automation Table on the Changers tab, either by discovery or manual entry.

Example: *[ZIO] [SR#] 40986 [DSC] 120.*

If the device name dacal01 is defined in the automation configuration file to have serial number 40986, then the following Action sequence could be used instead:

[DEV] dacal01 [ZIO] [DSC] 120

Example of Sony VGP serial number*: A000056044*

[SR#] serial-number (used after [MCH])

This command only follows [MCH to explicitly set the device being used. In this case, what we are calling "serial number" here actually appears in the device name column of Automation Table on the Changers tab, due to an implementation issue.

Example of Sony CX777ES com port serial: cx777com1
Example of Sony CX7000ES com port serial: cx7kcom1
Example of Sony CX7000ES UPnP serial: cx7kip1

[SRV] ipaddress:port

[SRV] hostname

Either form of this command sets the %serverip% and %serverport% variables, whoch are also used by the [GLC} and [IPS} commands.

[TON] beep-frequency

This command makes a beep tone of the specified frequency from the audio system.

[TRK] track#

This command can only follow the [DEV], [VGP] and [ZIO] commands in order to set the %track% and %chapter% parameters that can be used in subsequent commands, such as [PRG] to pass those values to your own device control program. At this time, these values are ignored by the internal changer support for VGPXL1Bx, Dacal/Ziotek. See [CHP] for a sample.

[USB] unit-name

This command selects which USBIRT blaster, by name, all subsequent [IRC] and [KEY] signals are sent, unless redirected by the [ALT] command. Note that the USBUIRT device must be renamed using the uurename.exe utility available at www.usbuirt.com.

[WFF] filepath

This command cause the automation system to wait up to one minute for a file to become available, in a changer environment where there can be unpredictable delays in disc access.

[VGP]

This command triggers the built-in support for Sony VGPXL1Bx changers, and can be followed by [SR#], [DSC], [CHP], and [TRK] in any order, then finally with a [CMD] command. Note that [CHP] and [TRK] are not actually used at this time.

[XML]

Sends the XML string for the currently selected DVD. The result populates the %ipresponse% variable in the sending engine.

[ZIO]

This command triggers the built-in support for Sony Dacal/Ziotek carousels, and can be followed by [SR#] and [DSC] in any order.

[ZON] all | 1 | 2 | 3

This command sets the zone for the USBUIRT blaster. Zone 1 sends signals to the RING connection of the auxiliary IR stereo output plug. Zone 2 sends signals to the TIP, and Zone 3 sends signals only to the front-facing internal emitters.

Notes:

- Commands can be sent from anywhere in the network, from any device, including iPod and Android.
- Symbol substitution is supported within the commands, so that "[PLY] \\server\mymovies\%title%.avi" uses the title from the selected profile as part of the filepath.
- Commands can be strung out in sequence, so "[DVD] 043396059900 [PLY] 1" selects the DVD and immediately plays it.

More Examples:

1. Lets say you want to simply play a file that is located on disc 37 on your Sony VGPXL1B2. The file is perhaps an interview with the director of a movie that you taped off TV.

    - Legacy LoadDVD: Put the word “changer0” in the Location field of a DVD Profiler disc that you have added as a local change to the DVD Profile. The Slot field contains 37. The definition of “changer0” is set using LoadDVD Options.
    - a/v Automation – option1: Put “action” in the Location field of the movie profile disc, and 37 into the Slot field. In Notes, define the action as: “<action name=”disc1”>[DEV] changer0 [VGP] [DSC] %slot [CMD] mount </action>”. The definition of “changer0” comes from the Changers tab of the a/v automation configuration file. Changers can be discovered automatically or manually defined. Alternatively, you can use this action sequence: “[VGP] [SR#] A100005644 [DSC] %slot% [CMD] mount", if you know the changer serial number.
    - a/v Automation – option2: Put either of the preceding the action sequences directly in the Location field, and the number 37 into the Slot field.
    - a/v Automation – option3: Define an action, say “Interview” in the a/v automation configuration file. The contents are one of the same actions sequences, with 37 in the Slot field. But in the Location field, simply put “[Interview]”.

2. It’s movie night! You want to play a movie from your HTPC on the projector, after selecting the disc from a carousel. You are using DVD drive “F:\” on the PC. The movie disc is in slot 124 in the Ziotek carousel, which is device 40986, defined as dacal002 in the Changers tab of the a/v automation file. You defined an action named “PlayMovie”.

    - Legacy LoadDVD: Put the word “dacal001” in the Location field, the number 124 in the Slot field, and check “call PlayFronDisk.bat” in Options. In PlayFromDisk.bat, you execute custom programming to control the projector, etc.
    - a/v Automation: You have defined or discovered your Dacal/Ziotek carousels in the Changers tab, and you have defined Devices “Screen” and “Lights” in the Devices tab. For each of these devices, you have captured and stored the IR sequences for raising and lowering the projector screen, X10 light dimmer, and projector control. These controls can also come from virtual remote buttons that you use on your Remotes tabs. The system looks for the first match of a device or remotes name, followed by a match on the button caption. Here is a sample action sequence: “[SAY] Welcome Folks [DEV] Screen [KEY] Down [DLY] 3000 [SAY] %overview% [PLY] d:trailers\%title%.avi [ZIO] [SR#] 40986 [DSC] %slot% [DEV] Projector [KEY] On [DLY] 6000 [KEY] PC [WFF] f:\VIDEO_TS\VIDEO_TS.IFO [SAY] Thanks for waiting, enjoy the show [DEV] Lights [KEY] DIM90”.

Symbol Substitution

Action commands that use text, are subject to CASE SENSITIVE symbol substitution. Thus, automation sequences can take advantage of information stored in the automation configuration file, pass parameters to scripts, and insert information from DVD Profiler profiles.

The following symbol substitutions are performed for the [SAY], [MSG], [DEV], [PRG], [TRK], [CHP] and [DSC] commands when the automation system is running outside of DVD Profiler:

%altirpath% - complete path to alternate IR program, including extenion and parameters
Substitution is applied to the string, so that %irc% can be used as a parameter.
%chapter% - current chapter (legacy %9 in LoadDVD)
%connect% - current changer connection (USB, COMx or drive path)
%device% - current device
%irc% - last non-blank set of IR codes processed in an [IRC] or [IRX] command
%ipresponse% - text string sent in response to [GLC] and [IPS]
%sendkeys% - inserts the numbers from the run mode context menu
%serial% - current serial number
%server% - current server
%serverip% - ip address of current server
%serverport% - port number of current server
%slot% - supplied from the [DSC] command
%track% - current track (legacy %8 in LoadDVD)
%unitname% - name of the USBUIRT blaster to be used, default "USB-UIRT"
%usbzone% - output zones for the USBIRT blaster, default "all"

In addition, the following substitutions corresponding to DVD Profiler profile fields are made when the automation system is running as part of the LoadDVD or LoadDVD Pro plugins:

%collection#% - (legacy %4, option, in LoadDVD)
%customMediaType%
%descriptionSideA% - (legacy %1 in LoadDVD)
%descriptiondSideB%
%disc% - current disc (legacy %3 in LoadDVD)
%discIDSideA% ,%discIDSideB%
%edition%
%filepath% - LoadDVD filepath from Notes for the selecetd disc, legacy %6.
%ipresponse% - also returns the results from [XML] command sent from a/v client.
%labelSideA% , %labelSideB%
%location%
%mediaType% - (legacy %7 in LoadDVD)
%overview%
%notes%
%profileID% - (legacy %2 in LoadDVD)
%sortTitle% - (legacy %5, option, in LoadDVD)
%slot% - (legacy %4, option, in LoadDVD)
%title% - (legacy %5, option, in LoadDVD)

You may also use: %1, %2, %3, %4, etc., which will give the same substitutions as for lagacy rs232.bat, PlayFromDisk.bat and USBIRT.bat.

Special Note: *When sending symbols to a remote server, the substitutions will be made when received by the server. If you want substitutions to be made PRIOR to sending, you must precede the subsitution symbol with an "**r**", for examle, use %**rslot**% instead of %**slot**%, %**rsortTitle**% instead of %**sortTitle**%, etc.*

Remote Automation Services

The a/v Automation System supports the concept of remote processing action sequences. Automation clients connect to servers using TCP/IP sockets, and the names, address and port numbers are of valid servers are saved in the automation configuration file.

At this time, only the **a/v DashBoard** component supplies the server function in the **a/v Automation System**. Other components may be developed in the future or other components possibly extended to supply server functions. On startup, a/v DashBoard determines the IP address of the host machine and begins to listen for commands on port 4444. If there is an entry in the automation configuration file, servers tab, with a server name that matches the DNS Hostname where a/v DashBoard is running, the IP address and port number from that entry are used instead of the defaults.

RunAction.exe Command Line Client Utility

This program allows you to send action sequences from your own Windows-based program or script. The usage is as follows:

RunAction ***message server port***

where:

message: an action sequence to be run on the target server
server: server name or IP address – optional, set to local host if missing (note: server is case sensitive)
port: target server port – optional, set to 4444 by default.

example: runaction "[SAY] Hello World" mainhtpc 4447

Using Other Clients

Any program or device, such as a phone or non-Windows computer on your network that can establish a simple IP connection can send action sequences. The implementation logic is simply:

- Create an IP connection a/v DashBoard on the target server and port
- When connected, send an ascii text string that conforms to the action sequence rules
- Disconnect

Product Function Comparison

	Action Processor	Built-in Changer Support	Remote Automation Client	USBUIRT Support	Automation Table Editor	Remote Automation Servver	Virtual Remote Control Tabs GUI Design
RunAction			X				
LoadDVD	X	X	X	X		[DVD], [XML], [PLY], [RCF] only	
LoadDVD Pro	X	X	X	X	X	X	
avEngine for WHS	X	X	X	X	X	Limited to first release commands.	
a/v DashBoard	X	X	X	X	X	All except [DVD], [XML] and [RCF]	X

Using a/v Automation with LoadDVD and LoadDVD Pro

LoadDVD and LoadDVD Pro have been enhanced to take advantage of the a/v Automation System Action Processor. Furthermore, if a/v DashBoard is available in the network, it can be used as a server for action sequences. This can be useful for playing media from equipment that is not locally attached to the machine where DVD Profiler is running.

New menus have been added to LoadDVD and LoadDVD Pro to allow turning automation on or off, and in the case of LoadDVD Pro, for using the Automation Editor.

When Automation is turned on, legacy LoadDVD functions are still operational, along with automation functions, and legacy operations can be overridden without making any changes to the Location and Slot fields of DVD Profiler, in order to ease the transition to the a/v Automation System.

Using Action Sequences in the Location field

The easiest way to use the new system, is to simply type them into the Location field. Try typing "[SAY] Hello World" (without quotes) into a blank Location field. When the disc icon (or Ctrl+1) is pressed, you should hear the words spoken on most Windows systems. LoadDVD looks for a "[" as the first non-blank character in the Location, and will then treat the entire contents as an action sequence. The obvious limitation of this method is the length of the Location field. Any valid set of action commands can be processed this way, subject to the length limitation.

Using Action Sequences in the Notes field

Action sequences can also be stored on the Notes field. They are retrieved by LoadDVD whenever the word "action" is found in the Location field. The encoding used in the notes field is very similar to that used for the LoadDVD Filepath. Following is an example of using action sequences to (1) play a movie from a changer with the disc1 icon, (2) playing a trailer with the disc2 icon, (3) using Windows text-to-speech to recite the overview of the selected profile with disc3, and (4) sending a command to a remote machine with disc4. The format follows closely the XML format of action sequences stored in the automation configuration file.

1. <action name="disc1"> [DEV] changer0 [VGP] [DSC] %slot% [CMD] mount </action>
2. <action name="disc2"> [PRG] VLCPlayer [ARG] %filepath% </action>
3. <action name="disc3"> [SAY] %overview% </action>
4. <action name="disc4"> [RON] remotepc [DEV] Screen [KEY] Down [ROF] </action>

Setting Options in DVD Profiler

Using the menu Tools>View Plugins>LoadDVD(Pro)>Options, the following automation parameters can be set:

Alternate IR: On / Off - whether or not to use an external program to process IR codes.
Alternate Path – Path to program that will be called to process IR codes.
Cmd Port – IP port number for receipt of external commands. Default is 4747.

Using a/v Automation with MyTools Plugin for DVD Profiler

MyTools 2.0 Sample Automation Icons

Play Media
My Script
Edit XML
Say Overview

SayOverview.act = [SAY] %overview%

EditXML.act = [PRG] notepad [ARG] c:\collection.xml

MyScript.act = [SHW] hidden [PRG] myscript [ARG] %labelSideA%

PlayMedia.act = [PRG] vlc [ARG] %location%

PlayMedia2.act = [PLY] %location%

Automation Table Entry For "myscript" (LoadDVD 2.05 and above)

<Program name="myscript">c:\MyScript.bat</Program>

MyScript.bat

```
@echo off
"C:\Program Files\Windows Media Player\wmplayer.exe" "\\mainserver\movies\digital copies\%~1_PC_EN.WMV"
```

In the picture below, MyTools has been used to add two icons to a Toolbar called "Automation". This icon, which turns on some lights, is associated with LightsOn.act with contents:

[RON] backserver
[IRC] 0000 006b 0018 0000 00a5 0096 002e 00fe 008e 0096 002e 00fe 008e 0096
002e 00fe 008e 0096 002e 00fe 008e 0096 002e 00fe 008e 0096 01c2 0096 00a5 0096 002e 00fe 008e 0096 002e 00fe 008e 0096
002e 00fe 008e 0096 002e 00fe 008e 0096 002e 00fe 008e 0096 01c2 0e10
[RPT] 1 [IRC] 0000 006b 000c 0000 00a5 0096 002e 00fe 002e 00fe 008e 0096 002e 00fe 008e 0096 008e 0096 008e 0096 002e 00fe
008e 0096 002e 00fe 01c2 0e10 [RPT] 3
[ROF]

Using a/v Automation with DVD Profiler Manual Profiles

In this example, manual profiles have been created with one "Disc". A custom MediaType of "Automation" was defined, as well as a Custom Category with a distinct icon. Each profile has been assigned a front case image associated with a TV channel to be watched, with the exception two profiles that are used to turn lights and off. Each profile also has an **a/v Automation System** action sequence stored in the Location field. When the LoadDVD disc menu or icon is pressed, the automation sequence is "played," with the result being that the TV channel changes or the light is turned on or off. For example, the ABC profile has the following text in the Location field: [DEV] Cable/TV [SAY] ABC Network [NUM] 257. This results in the channel being announced over the PC speaker, then the IR codes for my FIOS set top box are retrieved from the automation table, using the name "Cable/TV" and buttons "2", "5" and "7".

Overriding legacy operations

It is possible to override legacy operations with a/v automation action sequences. Before processing commands found in the Location field, LoadDVD first checks to see if there is a match in the automation configuration file. Following is an action sequence defined with the name "cx995vx1" that will override the legacy code for that command. In fact, this action sequence creates virtually the identical infrared sequences as does the legacy code internal to LoadDVD. The advantage of this format is that nw you can tweak them to meet your own needs. Notice that in this case, the device is also named "cx995vx1." In general, however, it does not have to be the same as the action name.

```
[DEV] CX995V1 [KEY] Pause [DLY] 500 [KEY] Stop [DLY] 6000
[KEY] Display [DLY] 300 [KEY] RightArrow
[DLY] 300 [NUM] %slot% [DLY] 500 [KEY] Enter [DLY] 35000
[KEY] Display [DLY] 300 [KEY] Display [DLY] 300
```

Here is an action sequence named "rs232" that overrides the call to rs232.bat:

```
[PRG]rs232 [ARG]%1 %2 %3 %4 %5 %6 %7 %8 %9

Where "rs232" is defined as "c:\automation\myrs232.exe" in the
automation configuration file.
```

Default Automation

In an effort to provide a way to obtain some automation with a minimum of impact to your DVD Profiler database, LoadDVD has an option to set a "Default Changer." This feature has always been there, and in this situation it is somehwhat mis-named, however, it is convenient to use it.

Whenever Default Changer is set to any one of these values: DefaultAuto, Dacal/Ziotek, SonyVGPXL1B, SonyCX777ES, SonyCX850D, SonyCX860, SonyCX875P, or SonyCX995V, AND the Location field is blank, LoadDVD will search for and execute an action sequence of the same name. An imaginary Slot value is calculated and supplied in the %slot% parameter. The changer unit is also derived, using the changer capacity as a modulus. The imaginary Slot value is derived by computing the collection number modulo changer capacity, except in the case of "DefaultAuto."

> For an example, let collection number = 450. This would result in changer cx995v2, slot 50 for the SonyCX995V, changer03 – slot 50 for the SonyVGPXL1B, dacal04 – slot 69 for Dacal/Ziotek, and slot 450 for DefaultAuto (no device specified).

When there is no action name match, the legacy default changer operations are performed, using the derived Slot and changer unit values.

This means that without any entries in DVD Profiler Location, Slot or Notes fields, you can do automation with a %slot% and %location% (changer unit) derived from the collection number as described. The value for %disc% and other DVD Profiler fields are provided as normal.

Sample Action Scripts

Here are some sample scripts to give you an idea of some things that can be done:

- **Computer reading the overview**

  [SAY] %overview%

- **Setting Up For a Movie**

  [SAY] Welcome ladies and gentlemen, the show is about to begin
  [DEV] Screen [KEY] Down
  [DEV] Projector [KEY] On
  [DEV] A/V [KEY] On [DLY] 2000 [KEY] DVD
  [DEV] CX777ES1 [DSC] %slot% [KEY] On
  [SAY] The screen is coming down … it won't be long now
  [DLY] 10000 [REM] 10 second delay for screen to come down and projector to heat up
  [DEV] Projector [KEY] HDMI1 [DEV] CX777ES1 [KEY] Play
  [SAY] Thanks for waiting. Enjoy the show
  [PRG] Lights [ARG] DIM80 [REM] "Lights" is a fictitious light dimmer program

  Notes:
  1. CX777ES1 "Play" is saved in the automation file as: "[PRG] CX777 [ARG] 36 %connect% %disc% %track% %chapter% 1"
  2. CX777 is saved in the automation file as "c:\automation\cx777es.exe"
  3. Lights is saved in the automation file as "c:\automation\lightdimmer.exe"

- **Playing a DVD from a Sony VGPXL1Bx changer attached to a remote computer. The remote drive is mapped as H:\ for local access. The server name is "mainhtpc".**

  [RON] mainhtpc-64
  [VGP] [SR#] A100005644 [DSC] %slot% [CMD] mount
  [ROF]
  [DLY] 30000 [REM] Waiting for the disc to mount and mapped drive to become ready
  [PRG] VLCPlayer [ARG] H:\

  Notes:
  1. VLCPlayer is defined in the automation file as "c:\program files\videolan\vlc\vlc.exe"
  2. mainhtpc-64 is defined in the automation file as a server, with a specific IP address and port number of your choice. A copy of a/v DashBoard must be running on this server, to process the remote automation commands.

Sample Action Scripts (contd.)

- **Streaming Video From a Remote Computer: VLC Player to WMP**

  [RON] mainhtpc-64
  [PRG] VLCStrm [ARG] %filepath% %serverip% %serverport%
  [ROF]

  In this sample, VLCStrm is defined as "c:\automation\VLCStream.bat", server IP is 192.168.1.123 (%2) and server port is 8080 (%3). The LoadDVD filepath is passed into the .bat file as %1.

  And VLCStream.bat looks lke:

  ```
  "C:\Program Files (x86)\VideoLAN\VLC\vlc.exe" -vvv %1
  :sout=#transcode{vcodec=WMV2,vb=400,scale=1,acodec=wma2,ab=128,channels=2,samplerate
  =44100}:std{access=mmsh,mux=asfh,dst=%2:%3} :no-sout-rtp-sap :no-sout-standard-sap :sout-
  keep}
  ```

  Now on the client side, running WMP (or the embedded player in LoadDVD Pro), you can load a playlist that looks like:

  ```
  <?wpl version="1.0"?>
  <smil>
     <head>
        <meta name="Generator" content="Microsoft Windows Media Player"/>
        <meta name="ItemCount" content="1"/>
        <title>Playlist For: Streaming from VLC Player</title>
     </head>
     <body>
        <seq>
           <media src="mms://192.168.1.123:8080"/>
        </seq>
     </body>
  </smil>
  ```

The result is the media is streamed from the remote server, using VLC Player, to the client running Windows Media Player. This is just an example. The author makes no claims that this provides an acceptable streaming solution in your environment. Personally, I have found it far better to load media from shared folders than to stream, especially HD content.

Using this method, any medium that VLC supports can be streamed, including DVDs, video capture boards and web cameras. The author has experimented with streaming from a web camera to the LoadDVD embedded player. It works, but I'm not sure how useful it would be in the context of DVD Profiler.

Sample File a/v Automation Configuration File Format

This format is subject to change in any way with no notice.


```
<?xml version="1.0" encoding="windows-1252"?>
<!-- A/V DashBoard Automation File Export (c) 2010 MediaDogg Software -->
<Automation>
  <Servers>
    <Server name="mainhtpc-64" ip="192.168.1.123" port="4444" queuename="avdServer"/>
    <Server name="GatewayVista" ip="192.168.1.125" port="4445" queuename="avdServer"/>
    <Server name="jimmysdell" ip="192.168.1.112" port="4447" queuename="avdServer"/>
    <Server name="mediastreamer" ip="192.168.2.151" port="4446" queuename="avdServer"/>
  </Servers>
  <Changers>
    <Changer name="cx777eS1" type="COM" serial="" connect="COM7"/>
    <Changer name="dacal001" type="ZIO" serial="40986" connect="USB"/>
    <Changer name="changer0" type="VGP" serial="a100005644" connect="H:\"/>
    <Changer name="changer1" type="VGP" serial="a100005662" connect="G:\"/>
  </Changers>
  <Devices>
    <Device name="CX777ES1">
      <IRC name="DiscreteOn" repeat="4">
000000670000001500600018001800180030001800300018003000180018001800300018001800180018001800300018001800180018
0030001800300018003000180018001800180018003000180018001800180018003000180018000180211 </IRC>
      <IRC name="DiscreteOff" repeat="4">
00000067000000150060001800300018003000180030001800300018001800180030001800180018001800180030001800180018
00300018003000180030001800180018001800180030001800180018001800180030001800180211 </IRC>
    </Device>
  </Devices>
  <Actions>
    <Action name="Ziotek"> [ZIO][SR#]%location%[DSC]%slot%</Action>
    <Action name="VGPXL1Bx">[REM] This version is use in LoadDVD with changer serial# in Location [VGP] [SR#]
%location% [DSC] %slot%></Action>
    <Action name="CX995VX1">  [REM] Example of how to override built-in LoadDVD Devices
[DEV]CX995V1 [KEY]Pause [DLY]500 [KEY]Stop [DLY]6000 [KEY]Display [DLY]300 [KEY]RightArrow [DLY]300
[NUM]%Slot% [DLY]500
[KEY]Enter [DLY]35000 [KEY]Display [DLY]300 [KEY]Display [DLY]300 </Action>
    <Action name="ScreenUp"> [DEV] Screen [KEY] Up </Action>
    <Action name="ScreenStop"> [DEV] Screen [KEY] Stop </Action>
    <Action name="ScreenDown"> [DEV] Screen [KEY] Down </Action>
    <Action name="changer0"> [REM] LoadDVD - Legacy Override [VGP] [SR#] a100005644 [DSC] %slot% </Action>
    <Action name=""> [VGP] [SR#] a100006544 [DSC] 1 </Action>
    <Action name=""> [RON] mainhtpc-64 [DEV] dacal001 [ZIO] [DSC] 30 [ROF] </Action>
    <Action name=""> [RON] GatewayVista [SAY] Hello [DEV] Screen [KEY] Down [DLY] 6000 [KEY] UP [ROF] </Action>
  </Actions>
  <Programs>
    <Program name="notepad">c:\windows\system32\notepad.exe</Program>
    <Program name="vlc">c:\program files\videolan\vlc\vlc.exe</Program>
    <Program name="cx777es">cx777.exe</Program>
  </Programs>
</Automation>
```

a/v Automation Virtual Remotes Configuration File Format

(Sample File – HDMI Switcher with 4 buttons)

This format is subject to change in any way with no notice.

```
<?xml version="1.0" encoding="windows-1252"?>
<!-- A/V DashBoard Button Tab Collection Export (c) 2010 MediaDogg Software -->
<TabCollection>
 <Location>{X=0,Y=0}</Location>
 <Size>{Width=469, Height=474}</Size>
 <SelectedTab>2</SelectedTab>
 <Font Bold="False" Italic="False" Strikeout="False" Underline="False" emSize="8.25" >Microsoft Sans Serif</Font>  <TabPage enabled="True" hotspot="False" taborder="2" text="HDMI">
   <Font Bold="False" Italic="False" Strikeout="False" Underline="False" emSize="8.25" >Microsoft Sans Serif</Font>
   <BackColor>Transparent</BackColor>
   <Location>{X=104,Y=4}</Location>
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Where To Get a/v Automation System Components

The software may be purchased and downloaded at the http://www.mediadogg.com/shopping. (http://www.mediadogg.com/shopping). The modest one-time only license fee entitles the user to free future upgrades. Only Paypal is accepted at this time.

Installation and Startup

1. The software is downloaded in ".zip" format. Once unzipped, a self-installing .exe file is created. *It is important to uninstall old versions of* ***LoadDVD or LoadDVD Pro*** *prior to installing new versions*. LoadDVD personal data will be preserved, however it is recommended that the Plugins\LoadDVD folder, DVD Profiler databases, and the entire computer system be completely backed up, prior to installation of the new software.

Note: The free version **LoadDVD** and the fee version **LoadDVD Pro** cannot coexist on the same computer. However, **LoadDVD (Pro)** can coexist with **a/v DashBoard** on the same computer.

Known Limitations

1. Most of this system runs only in a Microsoft Windows environment, and only where Invelos DVD Profiler is supported. As an exception, the standalone component, **a/v DashBoard**, should operate correctly even when DVD Profiler is not installed.
2. Port-forwarding and firewall issues may prevent, complicate or slow down the remote automation functions. The user is responsible for resolving these issues. Mediadogg software is not equipped to provide networking support, but will gladly share general information, tips and hints and other experience in a Forum context.
3. There is internal support for a limited number of devices, such as Sony changers, Dacal/Ziotek style carousels, the USBUIRT blaster and sample Virtual Device-Remotes that are reflections of what the author owns personally. Other devices can be supported by external scripts or programs that can be incorporated using the [PRG] action sequence.
4. A limited number of images are supplied for demonstration purposes only. The user is responsible for obtaining the images that serve as button and tab backgrounds.

Support

The author appreciates the use of *Invelos Software Forums* for discussion and support of this plugin. You will find a dedicated Plugins Forum and dedicated LoadDVD Pro thread at www.Invelos.com. You will find an active community of other users of *Invelos DVD Profiler* and its plugins, both Invelos-supplied and third-party, such as LoadDVD Pro.

The author is not affiliated with Invelos Software, its management or operations in any way, nor is Invelos Software responsible in any way for support of LoadDVD Pro.

The author may also be contacted via email: mailto:plugindogg@mediadogg.com.

System Requirements

a/v Automation System is supported under Windows XP (all versions), Windows Vista (all versions) and Windows 7 (all versions).

The USB-UIRT is the only supported IR blaster at this time. Other hardware can be supported using the program call capability.

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Next, I would like to thank the users, both of the paid versions of plugins, and of the free versions, for their patience, support and ideas for improvements.

As a newcomer to the world of object-oriented programming, I have taken liberal use of the many samples and code snippets available on the internet professional programming forums. Most notably, but not limited to: the Code Project, MSDN and switchonthecode.com. I have sometimes gotten the gist of a technique from an article, or at other times, pulled a code sample as a basis for tailoring to my needs. I am grateful for the generosity and ingenuity of the many authors from whom I've learned.

It goes without saying that the loving support of my family and friends are the foundation from which I draw all my inspiration and motivation.