madVR Envy IP Control revision 1.1.3

1. INTRODUCTION

Envy serves as a TCP server, using port number 44077, supporting up to 16 concurrent connections from clients.

2. CONNECTION / HEARTBEAT

When you connect, Envy will send a welcome text such as this, which you don't need to reply to:

⊠ WELCOME to Envy v1.0.1.0 ⏎

It is recommended that you keep the connection open. Please send a heartbeat signal every 20 seconds. If Envy doesn't receive any message from you within 1 minute, it will close the connection. The heartbeat signal very simply looks like:

⊠ Heartbeat ⏎

Envy will reply with "OK ⏎" to the heartbeat.

If you prefer, you can also open a connection, send a command and then directly close the connection again. But you'll not get regular notifications this way, of course.

3. COMMUNICATION SYNTAX

You can send Envy commands via ASCII text (UTF8) in the following format:

⊠ SomeCommand Some Parameters ⏎

Parameters are separated by a space character. If a parameter has spaces inside, you can use "" to mark the start and end of a parameter. Valid ⏎ (return) characters are 0x0D, 0x0A or 0x0D 0x0A.

Envy will reply in one of these 2 ways:

⊠ OK ⏎
⊠ ERROR "some error description" ⏎

Example:

⊠ CreateWorldPeace "in all nations" ⏎
⊠ ERROR "not implemented yet in the current firmware" ⏎

4. NOTIFICATIONS

As long as you stay connected, Envy will automatically notify you about any events, e.g. if the detected aspect ratio changes. You don't need to acknowledge or otherwise react to these notifications.

If you send a command which successfully changes something, Envy will not only reply with "OK ⏎" to you, but will afterwards also send a notification message to all connected clients (including you) informing them about the performed change.

You can't always rely on the exact order of replies & notifications. Sometimes replies and notifications may be sent in an unexpected order.

Example Notifications:

```
⊠ ActivateProfile SOURCE 2 ⏎
⊠ IncomingSignalInfo 3840x2160 23.976p 2D 422 10bit HDR10 2020 TV 16:9 ⏎
⊠ OutgoingSignalInfo 3840x2160 23.976p 2D RGB 12bit SDR 2020 TV ⏎
⊠ AspectRatio 3840:1600 2.400 240 "Panavision" ⏎
⊠ MaskingRatio 3840:1700 2.259 220 ⏎
```

5. COMMAND REFERENCE

5.1 Power Commands

⊠ PowerOff ⏎

Turns Envy off. In this state Envy does not react to the remote control, any longer. You can only turn it back on by pressing the power button on the front plate, or by sending Envy a Wake-On-LAN packet.

⊠ Standby ⏎

Switches Envy into Standby mode, which is not completely off, but saves a lot of power. In Standby mode, Envy still reacts to the remote control. Pressing any remote control button, or the button on the front plate will wake Envy up, as will a Wake-On-LAN packet.

⊠ Restart ⏎

Completely restarts Envy. This should usually not be needed.

⊠ ReloadSoftware ⏎

This just reloads/restarts the Envy main software, which usually takes about 2-3 seconds. This should usually not be needed.

5.2 Menu / GUI Commands

⊠ `OpenMenu %someMenu%|%pageId%` ⏎
⊠ `OpenMenu Configuration` ⏎
⊠ `OpenMenu hdrSettings` ⏎
⊠ `CloseMenu` ⏎

This will open/close Envy's Menu on your display. Supported menus are:

`Info, Settings, Configuration, Profiles, TestPatterns`

Section 5.3 explains how to enumerate the Settings and Configuration page IDs.

⊠ `KeyPress|KeyHold %ButtonName%` ⏎
⊠ `KeyPress MENU` ⏎

You can simulate a remote control button press (less than 0.7 seconds) or hold (more than 1 second) event, for any of the 13 different buttons. Supported button names are:

`POWER, INFO, MENU=CONFIG, LEFT, RIGHT, UP, DOWN, OK, INPUT=PROFILES, SETTINGS, BACK, RED, GREEN, BLUE, YELLOW, MAGENTA, CYAN`

⊠ `DisplayAlertWindow "some alert window text"` ⏎
⊠ `DisplayAlertWindow "Your door bell is ringing!"` ⏎

You can ask Envy to display a centered alert window with a message text in it. The user has to manually close the window, otherwise it's displayed "forever".

⊠ `CloseAlertWindow` ⏎

This closes the window you opened before by issuing a "DisplayAlertWindow" command (see above).

⊠ `DisplayMessage %timeoutInSeconds% "some message text"` ⏎
⊠ `DisplayMessage 3 "Saying Hello for 3 seconds..."` ⏎

This displays a little text message in the bottom center of the screen, for a specific number of seconds.

⊠ `DisplayAudioVolume %minValue% %currentValue% %maxValue% "unitDescription"` ⏎
⊠ `DisplayAudioVolume 25 35 50 "dB"` ⏎
⊠ `DisplayAudioVolume 0 60 100 "%"` ⏎
⊠ `DisplayAudioMute` ⏎
⊠ `CloseAudioMute` ⏎

This command tells Envy to display an AVR volume control GUI, in case your AVR doesn't show a volume control GUI, for whatever reason.

Currently, Envy displays this in a simple ugly text message in the bottom center of your screen. In a future firmware, Envy will draw a pretty volume control GUI instead.

5.3 Temporary Aspect Ratio Overrides

⊠ `SetAspectRatioMode Auto|Hold|%someAspectRatio%` ⏎

This command affects Envy's "temporary" aspect ratio handling, only. So whatever you set here will be automatically reset when the movie stops playing. "Auto" is the default mode and means that Envy always auto-detects the movie's aspect ratio. "Hold" means that the currently detected aspect ratio is frozen until the movie stops playing. Supported custom override aspect ratios are:

`4:3, 16:9, 1.85:1, 2.00:1, 2.20:1, 2.35:1, 2.40:1, 2.55:1, 2.76:1`

5.4 Information Requests

⊠ `GetIncomingSignalInfo` ↵
⊠ `GetAspectRatio` ↵
⊠ `GetMaskingRatio` ↵

Asks Envy to report the format/properties of the incoming or outgoing video signal. More details see "IncomingSignalInfo" and "AspectRatio" notification documentation.

⊠ `GetTemperatures` ↵

This will report the current temperatures (in Celsius) to you as follows:

⊠ `Temperatures %gpu% %hdmiInput% "%cpu%" "%mainboard%" %unknownFuture%` ↵
⊠ `Temperatures 74 67 41 45` ↵

A future Envy firmware version may send additional temperatures.

⊠ `GetMacAddress` ↵

You can ask Envy's MAC address (useful for Wake-On-LAN). Envy will reply like this:

⊠ `MacAddress 01-02-03-04-05-06` ↵

5.5 Custom Profile Groups

⊠ `CreateProfileGroup "new custom profile group name"` ↵
⊠ `CreateProfileGroup "Ambient Light"` ↵

You can create custom profile groups with fancy names. The new profile group already has 1 profile in it.

If you later want to reference the new profile group in other commands, you can't reference it by name, you have to use its "ID". The ID is reported in the "CreateProfileGroup" notification (explained later in this document). Envy uses simple integer IDs, starting with 1. When a new profile group is created, the first unused ID is assigned to the new group.

The "full" ID consists of the string "customProfileGroup" with the numeric ID appended to it (e.g. "customProfileGroup1"), but usually you can simply reference a custom profile group by the numeric ID.

⊠ `RenameProfileGroup %customProfileGroupId% "changed custom profile group name"` ↵
⊠ `RenameProfileGroup 1 "Ambient Light Level"` ↵

⊠ `DeleteProfileGroup %customProfileGroupId%` ↵
⊠ `DeleteProfileGroup 1` ↵

You can rename or delete custom profile groups, but you need to reference them by their ID.

⊠ `EnumProfileGroups` ↵

This will enumerate all profile groups, both predefined automatic profile groups and also manually created custom profile groups. Each profile group is sent as a separate line in the following format:

⊠ `ProfileGroup %profileGroupId% "profileGroupName"` ↵

Example Reply:

⊠ `ProfileGroup displayProfiles "Displays"` ↵
⊠ `ProfileGroup customProfileGroup1 "Ambient Light"` ↵
⊠ `ProfileGroup.` ↵

5.6 Source, Display and Custom Profiles

⊠ `CreateProfile SOURCE|DISPLAY|%customProfileGroupId% "new profile name"` ⏎
⊠ `CreateProfile SOURCE "Oppo Blu-Ray Player"` ⏎
⊠ `CreateProfile 1 "Sunlight"` ⏎

You can create custom profiles in your manually created custom profile groups, and also in the predefined "SOURCE" and "DISPLAY" profile groups. Please reference profiles by their "ID", not their name. The ID is reported in the "CreateProfile" notification (explained later in this document).

The "full" ID consists of multiple parts, starting with the full ID of the profile group and ending with the numeric profile ID. E.g. the full ID of the first custom profile is likely "customProfileGroup1_profile1", but in most commands you can simply reference a custom profile by just its numeric ID.

⊠ `RenameProfile SOURCE|DISPLAY|%customProfileGroupId% %profileId% "new name"` ⏎
⊠ `RenameProfile 1 1 "Direct Sunlight"` ⏎

⊠ `DeleteProfile SOURCE|DISPLAY|%customProfileGroupId% %profileId%` ⏎
⊠ `DeleteProfile SOURCE 2` ⏎

Deleting the last profile in a custom profile group also deletes the custom profile group. You can't delete the last profile in the SOURCE and DISPLAY profile groups.

⊠ `AddProfileToPage %fullProfileId% %pageId%` ⏎
⊠ `AddProfileToPage sourceProfiles_profile2 displayConfig` ⏎
⊠ `RemoveProfileFromPage %fullProfileId% %pageId%` ⏎
⊠ `RemoveProfileFromPage customProfileGroup1_profile1 hdrSettings` ⏎

You can add any profile to a specific settings or configuration page. You need to provide the proper full ID values for both the profile and the menu page.

⊠ `ActivateProfile SOURCE|DISPLAY|%customProfileGroupId% %profileId%` ⏎
⊠ `ActivateProfile SOURCE 1` ⏎
⊠ `ActivateProfile 1 1` ⏎

Manually created custom profiles need to be manually switched. Also, SOURCE and DISPLAY device profiles may need manual switching, as well, if automating them doesn't work for some reason. There can only be one active profile in each profile group. Use "0" to deactive profiles for a profile group.

⊠ `GetActiveProfile SOURCE|DISPLAY|%customProfileGroupId%` ⏎
⊠ `GetActiveProfile SOURCE` ⏎

Asks which profile is active in a profile group. The first profile usually has index 1. The reply looks like this:

⊠ `ActiveProfile %requestedProfileGroup% %activeProfileIndex%` ⏎
⊠ `ActiveProfile SOURCE 1` ⏎

You can enumerate all profiles in a specific profile group like this:

⊠ `EnumProfiles SOURCE|DISPLAY|%customProfileGroupId%` ⏎
⊠ `EnumProfiles 1` ⏎

Each profile is sent as a separate line like this:

⊠ `Profile %fullProfileId% "profileName"` ⏎

Example Reply:

⊠ `Profile sourceProfiles_profile1 "Oppo Blu-Ray Player"` ⏎
⊠ `Profile sourceProfiles_profile2 "Panasonic Blu-Ray Player"` ⏎
⊠ `Profile.` ⏎

5.7 Accessing Options

⊠ `EnumSettingPages|EnumConfigPages` ↵

This command enumerates all Envy settings or configuration pages like this:

⊠ `SettingPage|ConfigPage %profileGroupId% "profileName"` ↵

Example Reply:

⊠ `SettingPage hdrSettings "hdr settings"` ↵
⊠ `SettingPage sourceColor "image adjustments"` ↵
⊠ `SettingPage.` ↵

You can enumerate all options in a specific page or profile:

⊠ `EnumOptions %settingsPageId%|%configPageId%|%detailedPagePath%` ↵
⊠ `EnumOptions hdrSettings` ↵
⊠ `EnumOptions temporary\hdrSettings` ↵

You can use a simple page ID or a detailed profile page ID path. Each option is enumerated like this:

⊠ `Option %optionType% %optionId% %currentValue% %effectiveValue%` ↵

Example Reply:

⊠ `Option STRING hdrMode "toneMapMath" "toneMapMath"` ↵
⊠ `Option INTEGER hdrHighlightRecovery 2 3` ↵
⊠ `Option.` ↵

You can query options directly by using an option ID or a full ID path:

⊠ `QueryOption %optionId%|%detailedOptionPath%` ↵
⊠ `QueryOption hdrHighlightRecovery` ↵
⊠ `QueryOption customProfileGroup1_profile1\hdrHighlightRecovery` ↵

Example Reply:

⊠ `Option INTEGER hdrHighlightRecovery 2 3` ↵

The first value is the option value read from the exact path you requested. The 2nd value is the effective value which is currently used by Envy for rendering. The two values are often identical, but they can differ e.g. if you query an option in a specific profile which is currently not active.

⊠ `ChangeOption %optionIdPath% "changed string value"|%changedIntegerValue%|YES|NO` ↵
⊠ `ChangeOption hdrNits 120` ↵
⊠ `ChangeOption temporary\hdrNits 121` ↵

You can change any Envy option, in either a profile or in the active (temporary) or base settings. Referencing an option just by its ID (without a path) modifies the base settings.

⊠ `InheritOption %optionIdPath%` ↵
⊠ `InheritOption temporary\hdrNits` ↵

You can set overwritten options in profiles or temporary settings back to "inherit" state. You need to provide a detailed profile ID path, otherwise Envy doesn't know what you want to do.

⊠ `ResetTemporary` ↵

Envy automatically resets all temporary options /changes whenever the current movie stops playing. But you can also manually request a reset of all temporary settings.

5.8 Managing 3DLUT Files

⊠ `Enum3DLUTFiles` ⏎

This enumerates all 3DLUT files which are currently stored on the Envy.

Example Reply:

⊠ `3DLUTFile "BT.2020.3dlut"` ⏎
⊠ `3DLUTFile.` ⏎

You can rename or delete 3DLUT files:

⊠ `Rename3DLUTFile %oldFileName.3dlut% %newFileName.3dlut%` ⏎
⊠ `Rename3DLUTFile "BT.2020.3dlut" "BT.2021.3dlut"` ⏎

⊠ `Delete3DLUTFile %fileName.3dlut%` ⏎
⊠ `Delete3DLUTFile "BT.2021.3dlut"` ⏎

Caution: There's no "undelete" available. A 3DLUT file deleted is lost forever.

⊠ `Download3DLUTFile %fileName.3dlut%` ⏎

This command "downloads" a 3DLUT file from the Envy. Envy will reply by first sending an information line as follows:

⊠ `Download3DLUTFile %base64size% %crcInHex% %fileName.3dlut%` ⏎
⊠ `Download3DLUTFile 134219096 8150f2a0 "BT.2020.3dlut"` ⏎

Afterwards, Envy sends the full 3DLUT file in base64 encoding.

The "base64size" is the number of bytes of the base64 stream. You should double check the CRC32 of the file after you decode the base64 encoding to confirm that the transfer was sent without any bit errors. For CRC32 calculation, initialize with -1.

⊠ `Upload3DLUTFile %base64size% %crcInHex% %fileName.3dlut%` ⏎
⊠ `Upload3DLUTFile 134219096 8150f2a0 "BT.2020.3dlut"` ⏎

If you want to "upload" a 3DLUT file to the Envy, you first have to send this command with some basic information. Afterwards, you need to send the contents of the 3DLUT file in base64 encoding. Envy will reply to both the command and to the base64 sending with "OK ⏎ ".

5.9 Demo Commands

⊠ `Toggle %someOption%` ⏎

Some options can be toggled on/off for quick demo purposes. Supported toggle options are:

```
ToneMap, HighlightRecovery, ContrastRecovery, ShadowRecovery,
3DLUT, ScreenBoundaries, Histogram, DebugOSD
```

The toggles affect temporary settings.

⊠ `ToneMapOn|ToneMapOff` ⏎

This allows temporarily turning Envy's DTM (dynamic tone mapping) on/off.

5.10 Settings Management

⊠ `DownloadSettingsFile` ⏎

This command "downloads" the current settings (in file format) from the Envy. Envy will reply by first sending an information line as follows:

⊠ `DownloadSettingsFile %base64size% %crcInHex%` ⏎
⊠ `DownloadSettingsFile 89872 65c31a47` ⏎

Afterwards, Envy sends the full settings file in base64 encoding.

The "base64size" is the number of bytes of the base64 stream. You should double check the CRC32 of the file after you decode the base64 encoding to confirm that the transfer was sent without any bit errors. For CRC32 calculation, initialize with -1.

⊠ `UploadSettingsFile %base64size% %crcInHex%` ⏎
⊠ `UploadSettingsFile 89872 65c31a47` ⏎

If you want to "upload" a settings file to the Envy, you first have to send this command with some basic information. Afterwards, you need to send the contents of the settings file in base64 encoding. The uploaded settings file will become the new active settings immediately.

⊠ `StoreSettings Installer|Suggested|%slotIndex% "storage name" ["password"]` ⏎
⊠ `StoreSettings Installer "Installer Settings" "wouldn't you like to know?"` ⏎
⊠ `StoreSettings 1 "Slot 1 Fancy Name"` ⏎

You can store the current settings to the cloud as the Predefined "Installer Settings" or "Suggested Settings", or to one of the 16 user slots. The "Installer Settings" can't be deleted or renamed by the user, but the user can apply them at any time. The "Suggested Settings" can be deleted by the user. You can only overwrite the "Installer" and "Suggested" settings if you provide the service password.

⊠ `RestoreSettings Installer|Suggested|%slotIndex%` ⏎

You can restore either the "Predefined Installer Settings", the "Predefined Suggested Settings" or any of the 16 user slots. The restored settings become active immediately.

5.11 EDID Management

⊠ `DownloadEDIDFile Current|%slotIndex%` ⏎
⊠ `DownloadEDIDFile 1` ⏎

This command "downloads" an EDID block/file from the Envy. Using no parameters or "Current" will download the EDID of the display. Envy will reply by first sending an information line as follows:

⊠ `DownloadEDIDFile %base64size% %crcInHex% "storage name"` ⏎
⊠ `DownloadEDIDFile 344 1cf7432a "Slot 1 Fancy Name"` ⏎

Afterwards, Envy sends the full EDID block/file in base64 encoding.

⊠ `UploadEDIDFile %slotIndex% %base64size% %crcInHex% "storage name"` ⏎
⊠ `UploadEDIDFile 1 344 1cf7432a "Slot 1 Fancy Name"` ⏎

If you want to "upload" an EDID block/file to one of the EDID storage slots, you first have to send this command with some basic information. Afterwards, you need to send the contents of the EDID block/file in base64 encoding.

5.12 Other Commands

⊠ `RefreshLicenseInfo` ↵

Envy's license information (user name etc) is not updated automatically. So whenever this information is changed on our server side, you need to manually refresh it to become visible in the Envy.

⊠ `Force1080p60Output` ↵

If your display can't sync to Envy (for whatever reason), this command tells Envy to switch the output resolution to 1080p60. This should hopefully result in the display successfully syncing to Envy again.

⊠ `Hotplug` ↵

This command issues an HDMI Hotplug event to Envy's HDMI input port. This may help in rare cases when Envy fails to get a sync to the AVR or source device.

⊠ `Bye` ↵

This will cause Envy to close the TCP/IP connection to you immediately.

6. NOTIFICATION REFERENCE

6.1 Power Notifications

⌧ `PowerOff` ↵
⌧ `Standby` ↵
⌧ `Restart` ↵

These notifications tell you that Envy is about to be turned off, sent into Standby mode or restarted.

⌧ `ReloadSoftware` ↵

This notification informs you that the Envy main software is about to be reloaded/restarted. This happens in certain situations when the incoming video signal format changes.

6.2 Menu / GUI Notifications

⌧ `OpenMenu %someMenu%` ↵
⌧ `OpenMenu Configuration` ↵

This notification tells you that an Envy Menu was just opened. Supported menus are:

`Info, Settings, Configuration, Profiles, TestPatterns`

⌧ `CloseMenu` ↵

This notification tells you that the Envy Menu just got closed.

⌧ `KeyPress|KeyHold %ButtonName%` ↵
⌧ `KeyPress MENU` ↵

This tells you that the user just pressed a remote control button. Supported button names are:

`POWER, INFO, MENU, LEFT, RIGHT, UP, DOWN, OK, INFO, SETTINGS, BACK, RED, GREEN, BLUE, YELLOW, MAGENTA, CYAN`

6.3 Aspect Ratio Notifications

⌧ `AspectRatio %pixelAR% %floatAR% %nearestWellKnownAR% "description"` ↵
⌧ `MaskingRatio %pixelAR% %floatAR% %nearestWellKnownAR%` ↵
⌧ `AspectRatio 1920:0800 2.400 240 "Panavision"` ↵

The "AspectRatio" notification informs you that the aspect ratio of the active video area of the content just changed. The "MaskingRatio" suggests a suitable position for your physical masking system, taking subtitles and custom zoom settings + NLS into account. Here's the list of "well known ratios":

`119, 133, 137, 143, 166, 175, 178, 185, 190, 200, 210, 220, 235, 239, 240, 255, 266, 276`

⌧ `SetAspectRatioMode Auto|Hold|%someAspectRatio%` ↵

This tells you that Envy's "temporary" aspect ratio handling was just changed. "Auto" is the default mode and means that Envy always auto-detects the movie's aspect ratio. "Hold" means that the currently detected aspect ratio is frozen until the movie stops playing. Supported custom override aspect ratios are:

`4:3, 16:9, 1.85:1, 2.00:1, 2.20:1, 2.35:1, 2.40:1, 2.55:1, 2.76:1`

6.4 Custom Profile Groups

```
⊠ CreateProfileGroup %customProfileGroupId% "new custom profile group name" ↵
⊠ CreateProfileGroup 1 "Ambient Light" ↵
```

This notification tells you that a new profile group just got created, and which ID was assigned to it.

```
⊠ RenameProfileGroup %customProfileGroupId% "changed custom profile group name" ↵
⊠ RenameProfileGroup 1 "Ambient Light Level" ↵

⊠ DeleteProfileGroup %customProfileGroupId% ↵
⊠ DeleteProfileGroup 1 ↵
```

These notifications tell you that a custom profile group just got renamed or deleted.

6.5 Source, Display and Custom Profiles

```
⊠ CreateProfile SOURCE|DISPLAY|%customProfileGroupId% %profileId% "new name" ↵
⊠ CreateProfile SOURCE 2 "Oppo Blu-Ray Player" ↵
⊠ CreateProfile 1 2 "Sunlight" ↵
```

This notification tells you that a new profile just got created, and which ID was assigned to it.

```
⊠ RenameProfile SOURCE|DISPLAY|%customProfileGroupId% %profileId% "new name" ↵
⊠ RenameProfile SOURCE 2 "Panasonic Blu-Ray Player" ↵
⊠ RenameProfile 1 1 "Direct Sunlight" ↵

⊠ DeleteProfile SOURCE|DISPLAY|%customProfileGroupId% %profileId% ↵
⊠ DeleteProfile SOURCE 2 ↵
```

These notifications tell you that a profile just got renamed or deleted.

```
⊠ AddProfileToPage %profileId% %pageId% ↵
⊠ AddProfileToPage sourceProfiles_profile2 displayConfig ↵
⊠ AddProfileToPage customProfileGroup1_profile1 hdrSettings ↵

⊠ RemoveProfileFromPage %profileId% %pageId% ↵
```

These notifications tell you that a profile was just added to (or removed from) a specific settings or configuration page.

```
⊠ ActivateProfile SOURCE|DISPLAY|%customProfileGroupId% %profileId% ↵
⊠ ActivateProfile SOURCE 1 ↵
⊠ ActivateProfile 1 1 ↵
```

This notification tells you that a profile was just activated. The activation could have happened automatically (based on the properties of the incoming video signal) or manually.

6.6 Option Notifications

```
⊠ ChangeOption %optionType% %optionIdPath% %currentValue% %effectiveValue% ⏎
⊠ ChangeOption INTEGER hdrNits 120 121 ⏎
⊠ ChangeOption INTEGER temporary\hdrNits 121 121 ⏎
```

This notification tells you that a specific option was changed, and which new value the option has, and which effective value Envy is actually using for rendering at the moment.

```
⊠ InheritOption %optionType% %optionIdPath% %effectiveValue% ⏎
⊠ InheritOption INTEGER temporary\hdrNits 120 ⏎
```

This notification informs you that a specific option was set to "inherit" in a profile or in the temporary settings, and which effective value Envy is now actually using for rendering.

```
⊠ ResetTemporary ⏎
```

This notification tells you that Envy just automatically reset all temporary options /changes. This happens automatically whenever the current movie stops playing.

6.7 3DLUT File Notifications

```
⊠ Upload3DLUTFile "BT.2020.3dlut" ⏎
```

This notifications tells you that a 3DLUT file just got uploaded to the Envy.

```
⊠ Rename3DLUTFile %oldFileName.3dlut% %newFileName.3dlut% ⏎
⊠ Rename3DLUTFile "BT.2020.3dlut" "BT.2021.3dlut" ⏎

⊠ Delete3DLUTFile %fileName.3dlut% ⏎
⊠ Delete3DLUTFile "BT.2021.3dlut" ⏎
```

These notifications tell you that a 3DLUT file just got renamed or deleted.

6.8 Demo Notifications

```
⊠ Toggle %someOption% ⏎
```

This notification tells you that an option was just toggled on/off for quick demo purposes. Supported toggle options are:

```
ToneMap, HighlightRecovery, ContrastRecovery, ShadowRecovery,
3DLUT, ScreenBoundaries, Histogram, DebugOSD
```

```
⊠ ToneMapOn|ToneMapOff ⏎
```

This notification tells you that Envy's DTM (dynamic tone mapping) was just temporarily turned on/off.

6.9 Settings Management Notifications

⊠ `UploadSettingsFile` ↵

This notification tells you that a settings file was just uploaded to the Envy and replaced the current settings.

⊠ `StoreSettings Installer|Suggested|%slotIndex% "storage name"` ↵
⊠ `StoreSettings Installer "Installer Settings"` ↵
⊠ `StoreSettings 1 "Slot 1 Fancy Name"` ↵

This notification tells you that the current settings were stored to the cloud as the Predefined "Installer Settings" or "Suggested Settings", or to one of the 16 user slots.

⊠ `RestoreSettings Installer|Suggested|%slotIndex%` ↵

This notification tells you that the "Predefined Installer Settings", the "Predefined Suggested Settings" or one of the 16 user slots were just restored and replaced the current settings.

6.10 Other Notifications

⊠ `NoSignal` ↵
⊠ `IncomingSignalInfo 3840x2160 23.976p 2D 422 10bit HDR10 2020 TV 16:9` ↵
⊠ `OutgoingSignalInfo 3840x2160 23.976p 2D RGB 12bit SDR 2020 TV` ↵

These inform you that the incoming/outgoing video signal just changed. Supported values are:

`2D|3D RGB|444|422|420 8|10|12bit SDR|HDR10|HLG 601|PAL|709|DCI|2020 TV|PC 16:9|4:3`

⊠ `DisplayChanged` ↵

This notification tells you that Envy detected that you connected a different display device.

⊠ `RefreshLicenseInfo` ↵

This notification tells you that Envy's license information (user name etc) was just refreshed.

⊠ `Force1080p60Output` ↵

This notification tells you that Envy just activated 1080p60 output mode, probably in order to try fix some sync issue between Envy and your display.

⊠ `Hotplug` ↵

This notification informs you that an HDMI Hotplug event was just issued to Envy's HDMI input port.

⊠ `FirmwareUpdate` ↵

This notification tells you that Envy is about to install a firmware update.

⊠ `MissingHeartbeat` ↵

This notification tells you that Envy is about to close the connection because it didn't receive any messages from you in the last 60 seconds.

7. OPTION REFERENCE

7.1 Introduction

There are a great number of options, split into multiple settings and configuration pages. Explaining every single one of those options would make this document very long and complex. So instead this section will tell you how to easily figure out for yourself which options are available for you to query and change, and which values every option supports.

7.2 Settings vs Configuration

All the options are split into pages. There are 2 kinds of pages: "Settings" pages are shown in the Envy Settings Menu. And "Configuration" pages are shown in the Envy Configuration Menu.

The difference is that "Settings" are things that you could potentially want to adjust on a movie-by-movie basis (although ideally you don't want to constantly fiddle around with the options, of course).

The "Configuration" pages contain options which you're expected to setup only once and then never touch again (at least not during daily use).

7.3 Finding the Page ID

All the options you see in the Envy Menu are available via IP control to be enumerated, queried and modified. As an example, let's say you want to figure out how to modify the "Highlight Recovery" option via IP control.

In the first step, you would open the Envy Menu and notice that this option is located in a "Settings" page, not a "Configuration" page. To be more exact, the option is located in the "HDR Settings" page.

In the 2nd step, you would then enumerate all "Settings" pages like this:

```
EnumSettingPages
```

Envy will reply with something like this:

```
SettingPage hdrSettings "hdr settings"
SettingPage deintMotion "deinterlacing & motion"
SettingPage artifactRemoval "artifact removal"
SettingPage scalePost "upscaling & sharpening"
SettingPage sourceOverrides "incoming video overrides"
SettingPage sourceColor "image adjustments"
SettingPage.
```

Now we can see that the option we're looking for is in the Settings page with the ID "hdrSettings".

7.4 Finding the Option ID

Next thing to do is to enumerate all options that are contained in this settings page, as follows:

```
⊠ EnumOptions hdrSettings ↵
```

Envy will reply with something like this:

```
⊠ Option STRING hdrMode "toneMapMath" "toneMapMath" ↵
⊠ Option INTEGER hdrHighlightRecovery 3 3 ↵
⊠ Option INTEGER hdrShadowRecovery 1 1 ↵
⊠ Option INTEGER hdrContrastRecovery 6 6 ↵
⊠ Option INTEGER hdrHueShift 1 1 ↵
⊠ Option INTEGER dynamicTuning 50 50 ↵
⊠ Option. ↵
```

Now we know that the option we're looking for has the ID "hdrHighlightRecovery" and has an INTEGER value type.

7.5 Finding the Supported Values

Now we need to figure out which values this option supports. We do this by listening to the IP control notification messages and then in the Envy Menu via the Envy remote control manually switching the "Highlight Recovery" option to all possible values, starting with "Off", up to "Insane". When doing so, Envy will send the following notifications:

```
⊠ ChangeOption INTEGER hdrHighlightRecovery 0 0 ↵
⊠ ChangeOption INTEGER hdrHighlightRecovery 1 1 ↵
⊠ ChangeOption INTEGER hdrHighlightRecovery 2 2 ↵
⊠ ChangeOption INTEGER hdrHighlightRecovery 3 3 ↵
⊠ ChangeOption INTEGER hdrHighlightRecovery 4 4 ↵
⊠ ChangeOption INTEGER hdrHighlightRecovery 5 5 ↵
```

Finally, we know everything there is to know. E.g. "Off" equals "0", and "Insane" equals "5".

7.6 Modifying the Option

With all the information we collected we can now set the option to any value we want. E.g. the following command will set "Highlight Recovery" to "Medium":

```
⊠ ChangeOption hdrHighlightRecovery 2 ↵
```

7.7 "Envy IP Control" Tool

We've created a little Envy IP Control Tool (Windows only), which you can use to perform a number of Envy management tasks. The tool is available here with full Delphi source code:

http://madVR.com/EnvyIpControl.zip

8. PROFILE CONCEPT

8.1 Introduction

Envy's concept of Profile Groups and Profiles may seem daunting at first. Many other devices have a much simpler concept where you simply have a number of "memory banks" available and each bank contains a full set of all available settings. This "memory bank" concept is very easy to understand. You can prepare e.g. 8 different memory banks and then you can simply switch between them as needed.

So why is Envy using a more complicated concept? The reason is that the "memory bank" concept has serious flaws. Let's think through an example:

Let's assume you have multiple source devices, e.g. a Blu-Ray player, a cable TV box, a streaming device and a Linux based network player. You may want to use different settings for each of these devices. E.g. the cable TV channels may have higher compression artifacts than Blu-Ray sources, so you may want to use stronger artifact reduction settings for cable TV.

Let's further assume you watch both SDR and HDR movies, and you want to use different calibration settings for each content type, e.g. a different 3DLUT or a different output gamut setting.

You might also have an anamorphic lens which you only want to move into the light path for scope movies.

You might also want to switch your projector's lamp/laser into "high power" mode when playing 3D movies, but not when playing 2D movies.

Now if you want to have optimal settings for each of these conditions, in all possible combinations, how many memory banks will you need? And then when you want to change one setting for one of the conditions, in how many memory banks do you need to do this modifications? And how do you remember which memory bank was intended for which combination of conditions?

8.2 Profile Groups & Profiles

Envy's profile group system was designed to easily fulfill complex needs with great ease of use. Understanding the concept might take a bit of effort, but once you understood it, the concept opens up endless flexibility.

The intended setup is that you have one "profile group" for each topic/purpose. There are already predefined profile groups for "Source Devices" and "Displays". Plus there are some more profile groups that automatically switch based on the properties of the incoming video signal (e.g. resolution or frame rate). Each profile group has one or multiple "profiles". E.g. the "Source Devices" profile group would have one profile each for your Blu-Ray player, your cable TV box, your streaming device and your Linux based network player. You would also name these profiles accordingly. So the name of the profile group is "Source Devices", and the first profile would be named e.g. "Oppo Blu-Ray Player".

8.3 Inherited vs Overwritten Options

Each profile is "transparent" by default. It basically does nothing. All options of all settings and configuration pages are set to "inherit" from the underlying base settings/configuration.

What this means is that you can start by creating all the profile groups and profiles that you think useful, and they don't actually do anything just yet.

In the next step, you can actually define what you want the profiles to achieve. For example, let's say you want to activate some "compression artifact removal", but only for your cable TV box. How can you do that? It's very easy: You open the Envy "Artifact Removal" Settings Menu page, then you add your "Source Devices -> Cable TV Box" profile to this settings page, and finally you modify the "Compression Artifacts" option for this specific profile.

All other options will still stay at their default value of "Inherit", so the whole "Source Devices -> Cable TV Box" profile only changes one option and leaves everything else completely untouched.

The secret sauce of the whole concept is that all profiles by default are fully "transparent", and only options you forcefully overwrite make any difference.

This transparent nature of profiles also makes it possible to have multiple profile groups and profiles active at the same time, without any conflicts.