Yeti Manual

Version 1.0

Table of Contents

Specifications

General		
Height (mm)	56	
Width (mm)	94	
Depth (mm)	119	
Power	USB	Standard type B connector, (cable not included) 2A or more recommended.
MIDI In	5-pin DIN	Cable not included
Video Out	HDMI	1080p60 up to 1920x1080 screen size. Cable not included
Display	4 character 14-segment LED	
Supported video formats		
Most H264 based format work. Audio playback **not** supported.		
Supported pre roll image formats		
JPEG is the only supported format. Due to an OS bug they must be bigger than 8KB.		

Operating a Yeti

Back Panel
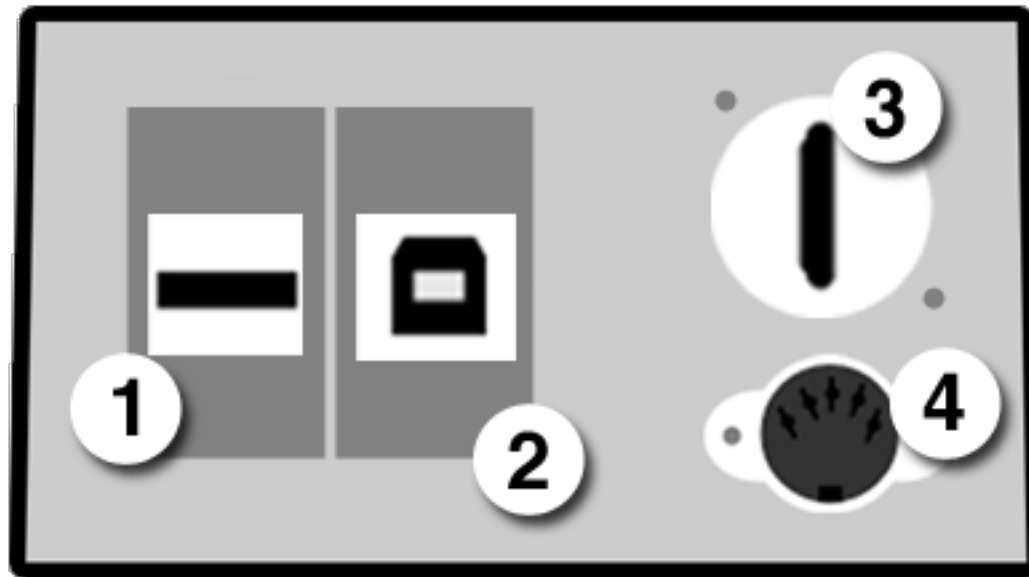
No.	Name	Function
1	USB Data	Plug storage containing your scenes
2	USB Power	Connect to per adapter
3	HDMI Out	Connect to screen/projector
4	MIDI IN	Connect to your sequencer

Display

The Yeti is equipped with a 4 character LED segment display that has several functions:

- When the Yeti is ready to load scenes but hasn't detected any, it blinks "****";

- When the Yeti is loading a scene it blinks the scene name;

- When a scene has been successfully loaded and initialized the screen displays the scene name;

- When the Yeti receives a MIDI event that could trigger an action the screen displays a code for troubleshooting purposes:

  - **Note On**: "Nxxx" where xxx is the note number;

- **Note Off**: "Oxxx" where xxx is the note number;

- **Control Change**: "Cxxx" where xxx is the controller value;

- **Program Change**: "Pxxx" where xxx is the program number

- **System Message**: "Sxxx";

- **MIDI Channel change:** "CHxx" where xx is the new MIDI channel (values 1-16);

- **Mode change**: "MDxx" where xx is the new mode number if it is legal, "ERR" if it is not.

Setting Up

The setup process of a Yeti unit is very simple:

1. Connect your HDMI cable to the port located on the back (must be done before powering up otherwise the Yeti will not output any video);

2. Connect the MIDI cable to the port located on the back of the unit;

3. Insert the USB mass storage device containing your scenes (scenes drive from now on) to the port located on the back of the unit (optional, can be done after booting);

4. Power up the unit connecting the USB power cable to the port;

5. If you haven't inserted your scenes drive then, after the booting process, you'll have the screen blinking four stars;

6. If you have inserted your scenes drive then, after boot, you'll have the screen displaying the name of the first scene in alphabetical order.

7. If you haven't inserted your scenes drive then do it. Th Yeti will load the first scene in alphabetical order and display its name on the screen.

Your unit is now ready to go.

Updating

Yeti firmware can be updated. The update process is very straightforward with a couple caveats:

1. Download the patch (either the last version or an archived one);

2. Copy the patch on to a pen drive;

3. Insert the pen drive into your Yeti;

4. Connect your Yeti to a screen via HDMI;

5. Power up;

6. Wait until the screen displays "Update OK" message.

And now for the caveats:

- Do not power off the Yeti during the whole update process;

- Please make sure that the drive contains only the relevant patch. The drive can contain your scenes.

Basic Concepts

MIDI to Video

Yeti is a video player box that lets you control the playback of video clips via MIDI. To achieve this, videos are associated to MIDI notes and standard MIDI events are translated into transport commands. For example a Note On event for note G2 causes the video associated with that note (if any) to play and a Note Off event for note D3 causes the video associated with that note to pause, if it was being played. The complete list of supported mappings of MIDI events can be found in the relevant section, but the mechanism just described is the core of Yeti functionality. Since MIDI gives us 128 notes you might think that there are 128 slots for video clips at your disposal. Unfortunately this is not the case. Due to limited processing resources, the Yeti lets you map a maximum of 5 notes at a time but, fear not, there is a way around this limitation and that way is called scenes.

Scenes Explained

Scenes are a way to organize your video assets grouping them together, they are built using the librarian software. A scene can contain up to 128 videos (some modes lower this limit because some special notes are reserved). Loading a scene only requires the appropriate MIDI event to be transmitted by your sequencer (the exact event depends on the active mode). That will cause the Yeti to discard any currently loaded scene (abruptly cutting whatever it was playing) and initialise the new one. The whole process takes approximately one to four seconds, depending on the number of videos you decided to preload (more about preloading soon). While loading scene the Yeti will display what is called a pre-roll image, that you will have associated with the scene being loaded or a black screen. Once this process is completed, the Yeti will start listening for MIDI events and play the new videos.

Warning: due to an OS bug pre-roll images must be bigger than 8KB.

Video Playback Parameters

There are aspects of a video clip behaviour that you can control by configuring its playback parameters in the librarian software.

Midi Note

Videos are associated to MIDI notes. Every note can be associated to zero or one. Notes are identified by their MIDI number.

Loop at End

What happens when the Yeti reaches the end of a video clip? You have two choices:

- You can have it loop back to the beginning;

- You can have it pause on the last frame until a new clip is triggered or a restart command is received by the Yeti.

Off-Screen Behaviour

When a video clip is replaced on screen by another one (triggered by a Note On event) you can decide its off-screen behaviour. Your choices are:

- The clip pauses and, if triggered again, it will resume playing from where it was interrupted;

- The clip rewinds and, if triggered again, it will restart from the beginning;

- The clip keeps (virtually) playing and, if triggered again, it will resume as if it hadn't been interrupted.

Full Screen Scaling

If you have a small format clip and you're not very concerned with the quality of its playback you can decide to have it displayed at the biggest possible size.

Preloading

If you want to be able to play a video you have to load it first. If you want it to be loaded as soon as its scene is loaded (preload it) you just have to mark it for preloading. Remember, since you can have as many as four videos loaded at any time, there is a limit of four video marked for preloading in each scene.

Video not marked for preloading can be dynamically loaded while the Yeti is playing but, since there is a hard limit of four loaded videos, you could be forced to unload a loaded video to free up resources. Dynamic load and unload happen in the background and don't affect video playback.

Video Playback Controls

The Yeti lets you affect video playback through a set of controls:

- Play at normal speed

- Freeze Frame (Pause)

- Fast Forward (2x speed)

- Slow Motion (0.5x speed)

- Restart

- Seek Forward (3 seconds)

- Seek Backwards (3 seconds)

Modes

Video playback controls and scene selection are assigned to MIDI messages through modes. A mode is a particular mapping of playback controls and scene selection to MIDI messages, the Yeti supports several modes (and more can be added via firmware updates) to support different scenarios.

Yeti Native Mode

The Yeti Native Mode is suited for use with full blown MIDI sequencers with CC sequencing capability. Mapping is explained in the table below.

Message type	Message Data		Description
Note On	*Note*	*Velocity*	

Message type	Message Data		Description
	All	Non 0	If a video associated with note exists then: • If it has never been played play it from the start. If a different video is playing hide it. • If it has but it has been replaced by another, resume play according to configuration • If it's being played do nothing • If it was paused (frozen) resume playing. If it doesn't do nothing
	All	0	Freeze (pause) video associated with note if it is currently playing. If it isn't or there is no video associated with note number no action is taken.
Note Off	*Note*	*Velocity*	
	All	All	Freeze (pause) video associated with note if it is currently playing. If it isn't or there is no video associated with note number no action is taken.
Control Change	*CC Number*	*CC Value*	
	14	All	Seek to start of currently playing video.
	15	All	Seek forward three seconds if possible.
	16	All	Seek backwards three seconds if possible.
	17	All	Play current video in fast forward.
	19	All	Play current video in slow motion.
	20	All	Play current video at normal speed.
	22	All	Reinit scene without displaying the pre-roll image (if any). This functionality is meant for editing not for live use.
	24	All	Load scene indexed by CC value
	25	All	Load video associated with CC value
	26	All	Unload video associated with CC value
Program Change	*PC Number*		
	All		Ignored

Channel voice messages

Message type	Description
Omni Mode On	The Yeti will listen to all MIDI channels
Omni Mode Off	The Yeti will listen to its configured channel only
All Notes Off	Freeze frame

Channel status messages

Message type	Description
Continue	Resume paused video (if any)
Pause	Pause currently playing video (if any)
Stop	See Pause

System messages

MPC500 Mode

MPC have a built in maximum sample length (even in MIDI file play mode), when the limit is reached a Note Off message is sent. In order to support arbitrary video lengths MPC500 mode ignores Note Offs. Freeze frame is supported through 0-velocity Note On messages. Everything else is like Native Mode.

General Step Sequencer Mode

If your MIDI sequencer doesn't support CC sequencing, Step Sequencer Mode conveniently maps all playback controls and scene selection to velocity values. Note On messages for a special note (MIDI number 127) are used instead of CCs. Notes 25 and 26 are used to load/unload videos. Additionally Note Off messages are ignored, freeze frame is supported through 0-velocity Note On messages. Channel status messages and system messages keep the same meaning they had in native mode.

Message type	Message data		Description
Note On	*Note*	*Velocity*	
	All except control notes	Non 0	If a video associated with note exists then: • If it has never been played play it from the start. If a different video is playing hide it. • If it has but it has been replaced by another, resume play according to configuration • If it's being played do nothing • If it was paused (frozen) resume playing. If it doesn't do nothing
	All except control notes	0	Message has the same meaning as Note Off.
	Control note 127		
		14	Seek to start of currently playing video.

| Message type	Message data		Description
		15	Seek forward three seconds if possible.
		16	Seek backwards three seconds if possible.
		17	Play current video in fast forward.
		19	Play current video in slow motion.
		20	Play current video at normal speed.
		22	Reinit scene without displaying the pre roll image (if any). This functionality is meant for editing not for live use.
		40-127	Select scene with index ranging from 0 to 87
	Control note 25	All	Load video associated with velocity
	Control note 26	All	Unload video associated with velocity
Program Change	*Ignored*		
Control Change	*Ignored*		
Note Off	*Ignored*		

Channel Voice Messages

System Configuration

Yeti system configuration consists of two parameters: MIDI channel and active mode. Values are set via MIDI CCs and saved on persistent storage upon change.

Attention: configuration CC messages are always interpreted regardless of the active mode.

Parameter	Controller Number	Controller Value
MIDI Channel	21	Legal values are 1-16
Active Mode	23	Legal values are: • 0 (Native Mode) • 1 (Step Sequencer Mode) • 2 (MPC500 Mode)

The Librarian
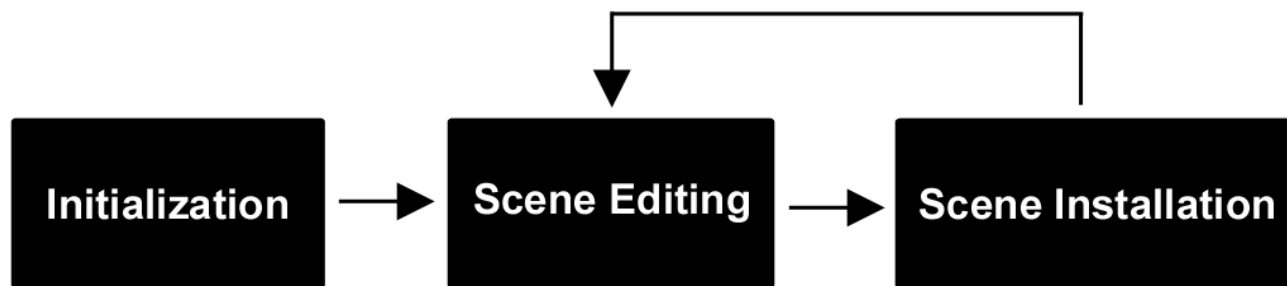
Librarian basic workflow

Overview

The Yeti librarian helps you manage your video assets and make them ready for use in your performances. The basic idea is to manage and store your scenes in a base folder on your computer and to install them on USB drives for use with your Yeti unit.

Obtaining

The Yeti librarian is available together with this manual and the firmware updates in the Downloads section of our website.

Its source code is freely available at https://github.com/xciollax/VSEL

Installation

Microsoft Windows 10 (64bit)

Installation on a Windows 10 system is quite straightforward: you just have to unzip the archive file you downloaded on your PC, any location will be Ok.

The Yeti librarian depends on a Microsoft library that is not installed by default. If starting the program triggers a system error about missing VCRUNTIME140.dll all you have to do is download the 64 bit version of Microsoft Visual C++Redistributable for Visual Studio 2017 from https://visualstudio.microsoft.com/downloads and run the installer (vc_redist.x64.exe) you will find in your Downloads folder.

macOS

Open the disk image you downloaded on your Mac (VSEL.dmg) and drag the VSEL app to your application folder (or to any other folder).

Initialisation

Before you can start using the librarian you have to set up a base folder that will contain the scenes you are going to create. The first time you open the software you will be requested to create a new base folder or select an existing one. Keep in mind that you will be able to change this setting at any time.
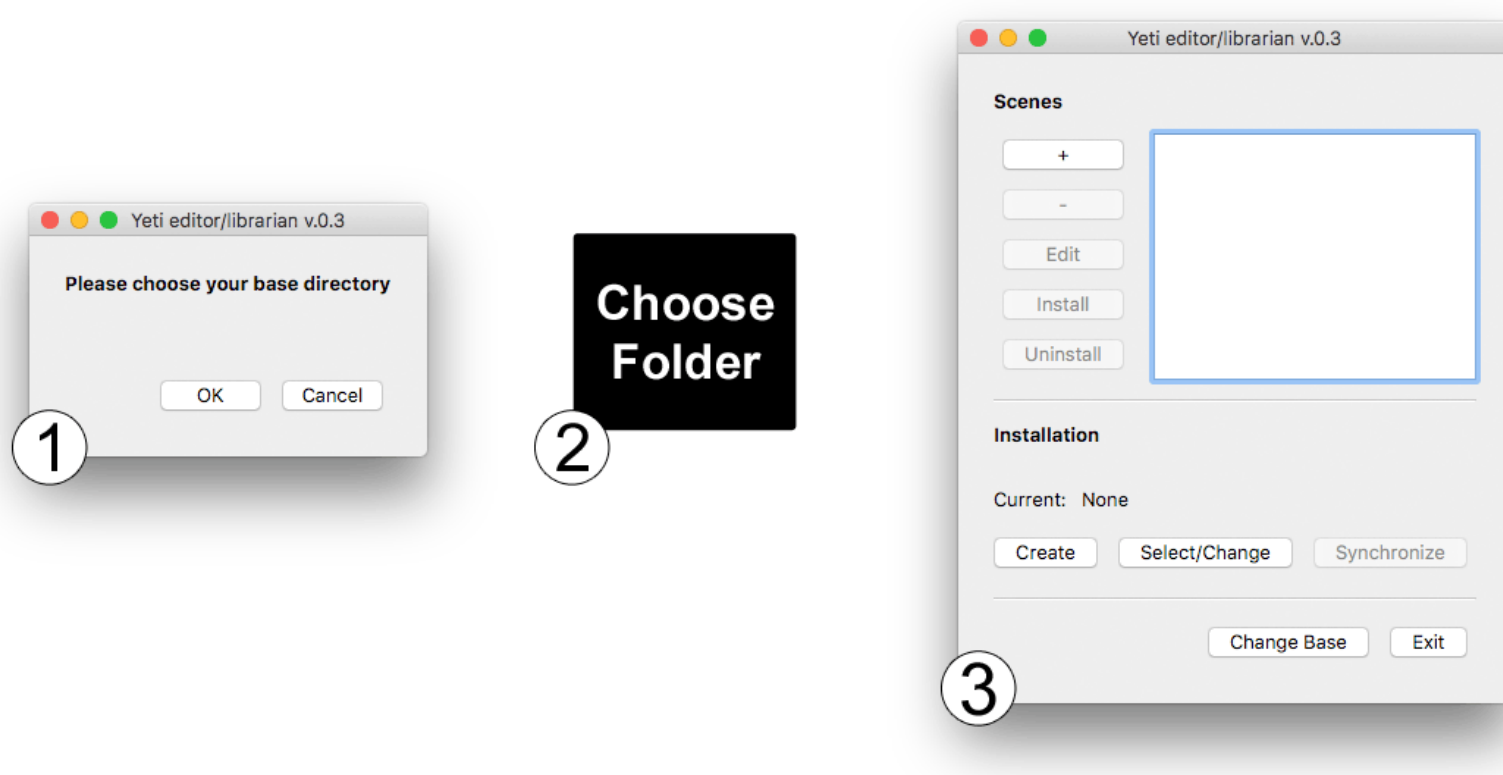
1. Press the OK button;

2. Choose an empty folder or create a new one;

3. Done. Now you're ready to create your scenes.

Creating and Modifying Scenes

Once the librarian has been initialised, you are ready to start creating your scenes. Initially the scenes form will be empty and you'll be able to just add a new one.

Pressing the "+" button you will start the scene creation process. The first step is choosing your new scene's name.
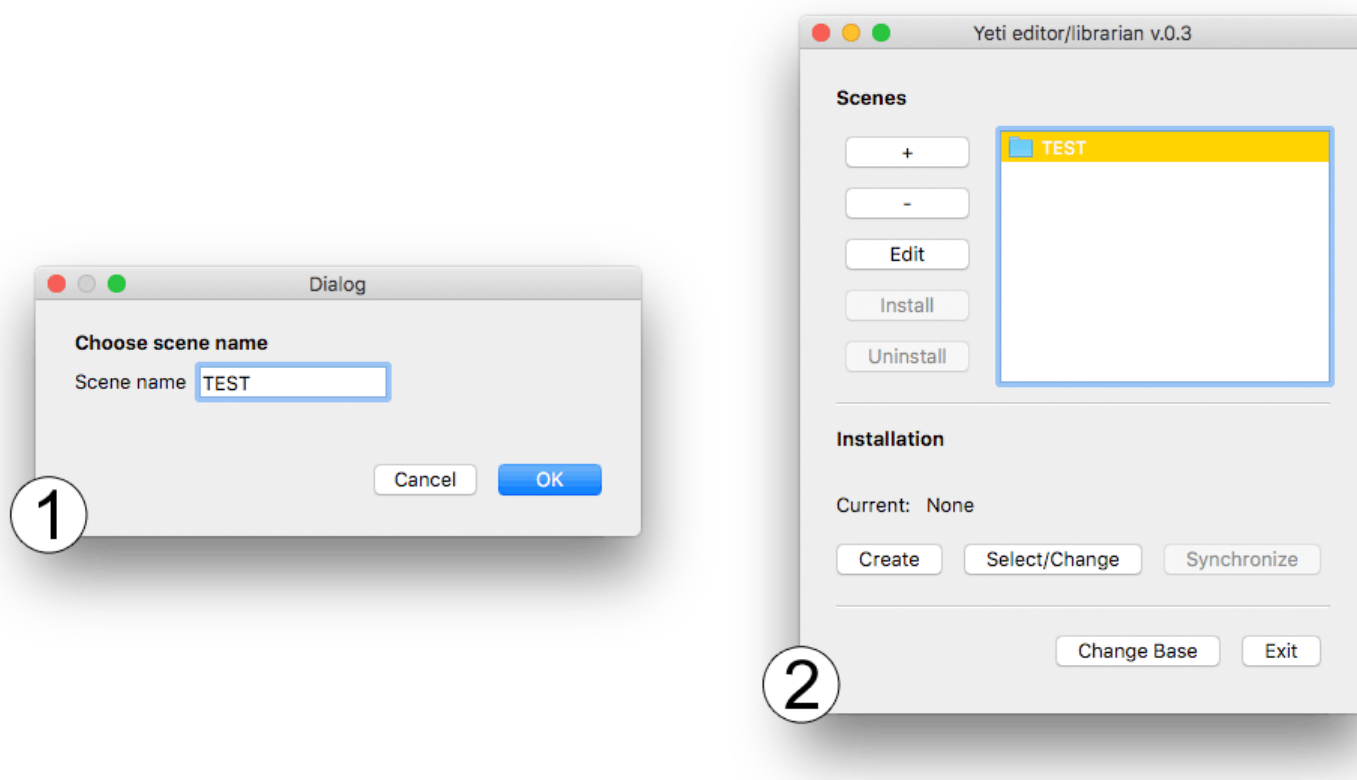
Create a new scene

1. Choose a name for your new scene;

2. Done. Now you can add video clips and a pre-roll image to your newly created scene.

Since Yeti's screen is four characters wide, your scene name is limited to four characters too. Legal characters are letters (lower and upper cases are allowed), numbers and symbols "-", "_", "+", "#". Scene names must be unique.

Now it's time to edit our new (and empty) scene: first of all we'll add a new video to our scene.
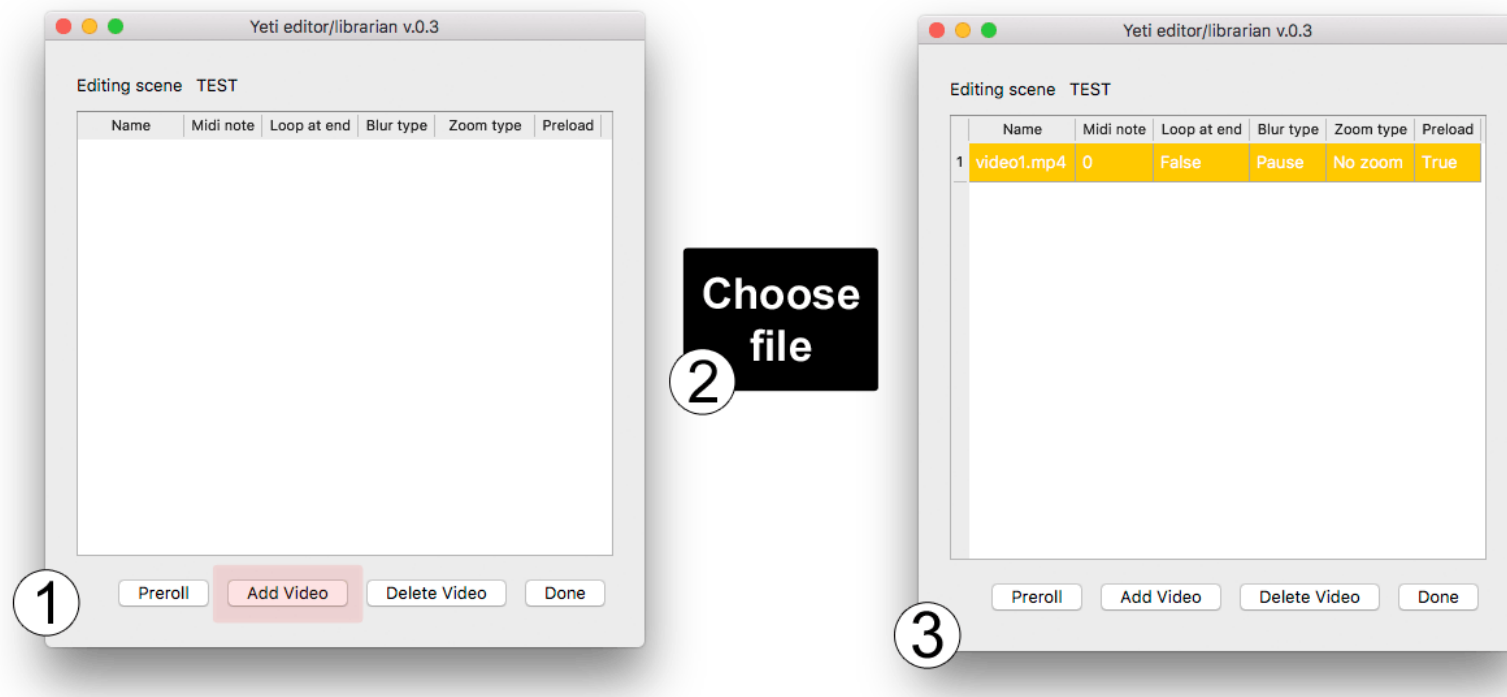
Add video to scene

1. Press the "Add Video" button;

2. Choose a video file from your hard disk;

3. Now your scene contains video. All video playback parameters are set to their default values.

Clicking on the relevant playback parameter you can change its value.

1. Assign a MIDI note to your video. Notes are selected by number and each note can only be assigned to one single video;

2. Select the desired behaviour when the end of your video is reached. More about "Loop at End" feature here;

3. Select the desired behaviour when your video is replaced by another one. More about "Blur Type" here;

4. Choose if you want your video to be zoomed to fit the screen. More about full screen scaling here;

5. Choose if you want your video to be loaded as soon as the scene is loaded (preloaded). More about preloading here.

Editing scene   TEST   ①

	Name	Midi note	Loop at end	Blur type	Zoom type	Preload
1	video1.mp4	45 ⌄	False	Pause	No zoom	True

Editing scene   TEST   ②

	Name	Midi note	Loop at end	Blur type	Zoom type	Preload
1	video1.mp4	45	✓ False / True	Pause	No zoom	True

Editing scene   TEST   ③

	Name	Midi note	Loop at end	Blur type	Zoom type	Preload
1	video1.mp4	45	False	Pause / Rewind / Virtual play	om	True

Editing scene   TEST   ④

	Name	Midi note	Loop at end	Blur type	Zoom type	Preload
1	video1.mp4	45	False	Pause	Full screen / No zoom	

Editing scene   TEST   ⑤

|	Name	Midi note	Loop at end	Blur type	Zoom type	Preload
1	video1.mp4	45	False	Pause	Full scr...	False / ✓ True

Video parameter selection

Then we'll add a pre-roll image to the scene.
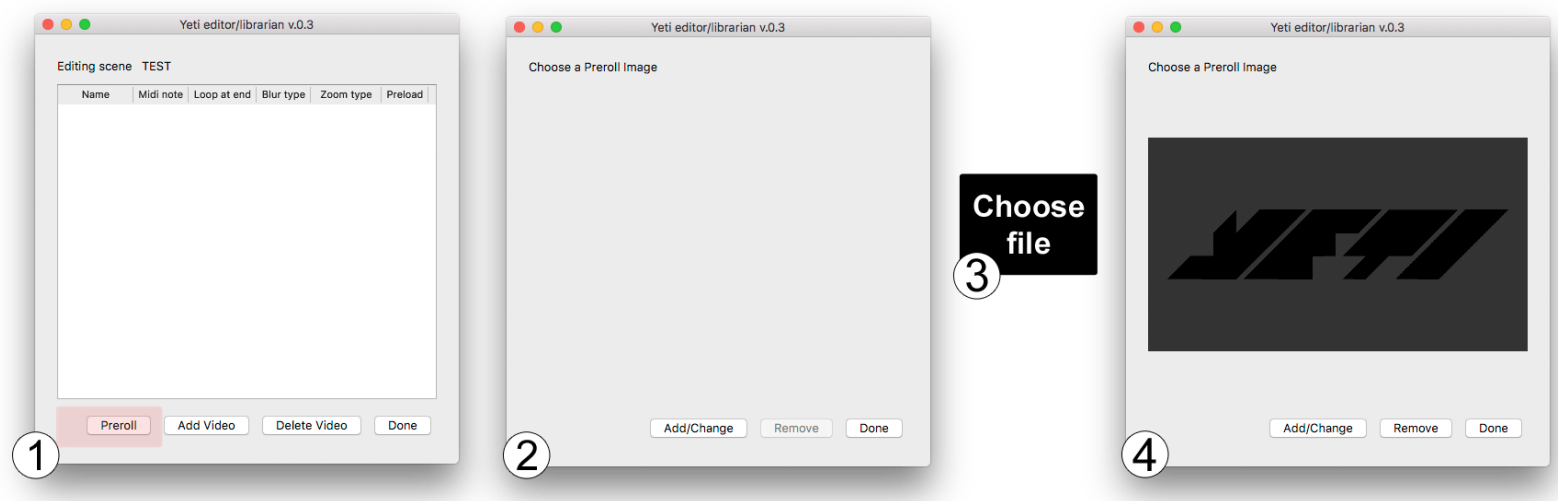
Add a pre-roll image

1. Press the "Preroll" button;

2. Press the "Add/Change" button;

3. Choose a jpeg image file from your hard disk;

4. Now your scene contains a pre-roll image (and the librarian shows you a preview).

Installing Your Scenes on a USB Drive
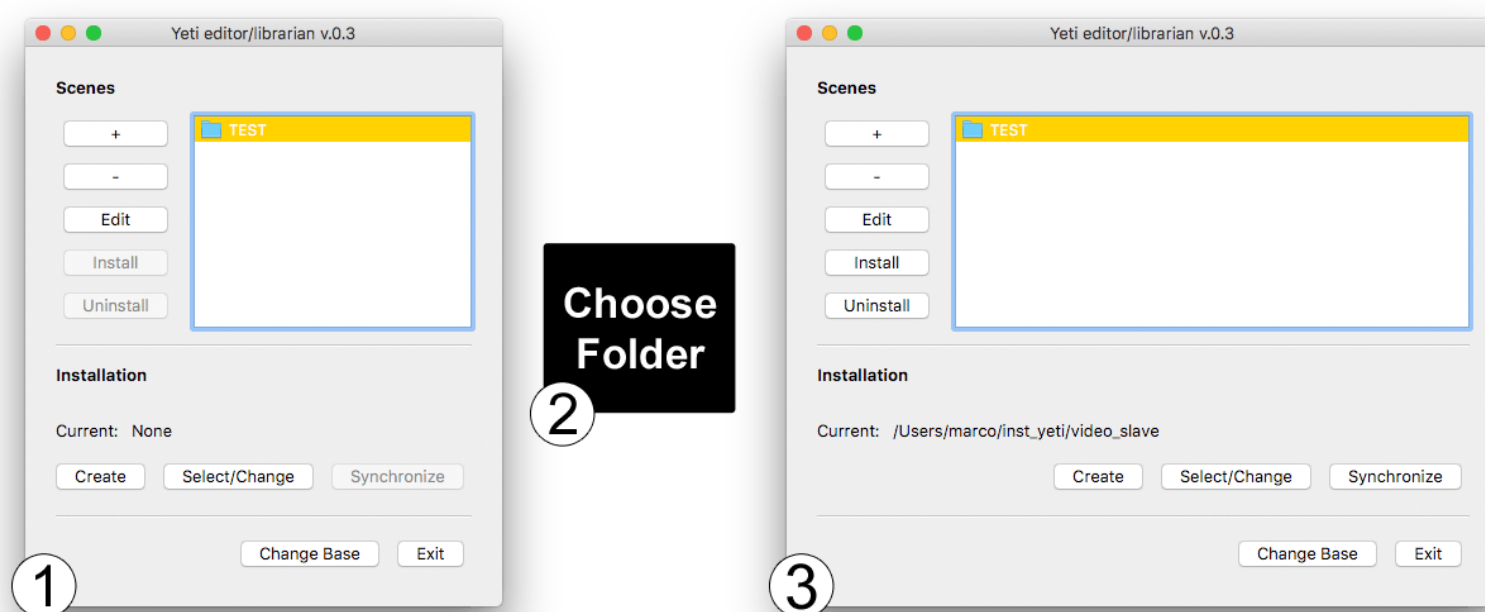
Create/Choose an Installation

Once you have created your scenes you can install them on a removable USB drive to use them in your show. You do this by creating an installation on your USB drive and copying as many scenes as you want to the newly created installation. Alternatively you can select an existing installation and modify its contents. Every USB drive can contain strictly one installation only.

Creating a New Installation

1. On the scenes window press the "Create" button;

2. Choose the folder on your USB drive that will contain the installation;

3. Now you can install scenes in your newly created installation.

Selecting an Existing Installation

1. On the scenes window press the "Select/Change" button;

2. Select an existing installation folder on your USB drive;

3. Now you can install/uninstall scenes in/from your newly created installation.

Synchronising an Installation

If you just want to make sure your installation contains all your scenes (and nothing else) you only need to press the "Synchronise" button. Your installation will be wiped clean and all your scenes will be installed.

Installing Selected Scenes

If you don't want to install all your scenes you can add the ones you need one by one selecting them and pressing button "Install". If you want to make sure that a scene is not installed, select it and press button "Uninstall".

By Hand

You can create your scenes and load your video on a USB drive (or on your PC and then copy them on an USB drive later) without using the Librarian. You just have to:

- Create a folder hierarchy that a Yeti unit can recognise as an an installation;

- Rename your video files to tell the Yeti the values of the playback parameters for your videos.
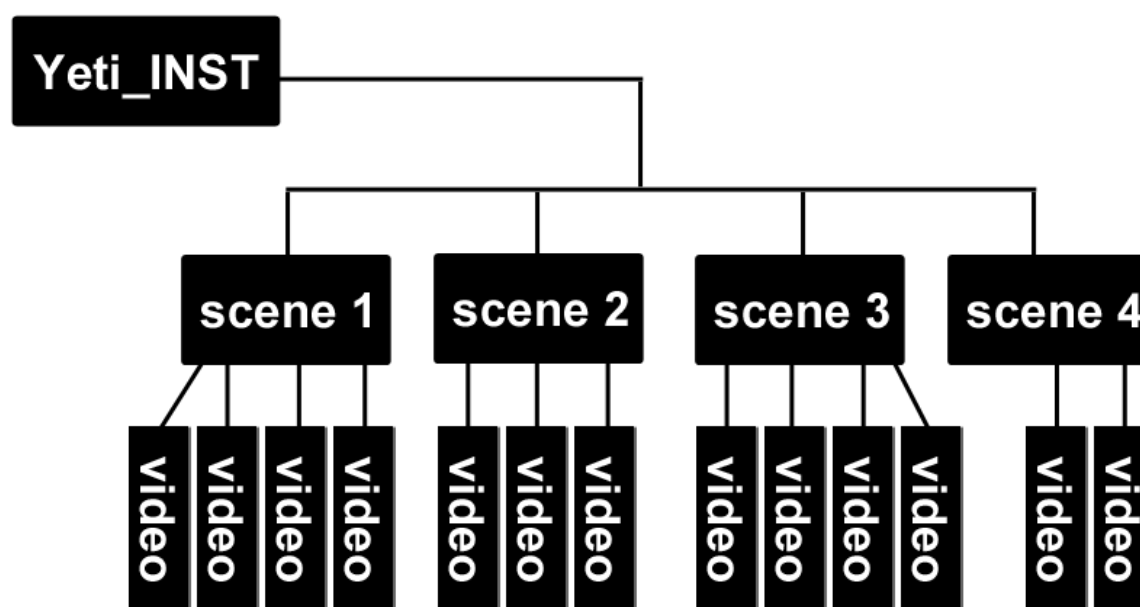
Folder Hierarchy Setup

Your scenes must reside in a root folder called "Yeti_INST". All videos that make up a scene must reside in a folder with the same name as the scene (remember, only four characters are allowed).

Video Files Naming

Playback parameter values for a video (more about playback parameters here) are encoded in its file name. To be playable by a Yeti, video file names must adhere to this structure (angle brackets are for clarity and must **not** be part of the name):

<MIDI Note>-<Blur Type>-<Loop at End>-<Fullscreen>-<Preload>.<extension>

Legal parameter values are listed in the table below.

Paramenter Name	Legal values
MIDI Note	A number in the range 0 - 127
Blur Type	0 : pause when off screen 1 : rewind when off screen 2 : virtual play when off screen
Loop at End	0 : pause, do not loop 1: loop back to start
Fullscreen	0 : scale video to fit screen 1: do not scale video
Preload	0 : do not preload video 1 : preload video
Extension	Original file name extension