Sound2Light Tool

Version 0.0.2.1.0.8
March 1st, 2017

Overview

The Sound2Light tool converts live audio signals to trigger events that can be sent as OSC messages. It can reproduce the sound-to-light function of the NT/NTX consoles with systems of the Eos-, Cobalt- and ColorSource-families. It can also be remotely controlled by OSC.

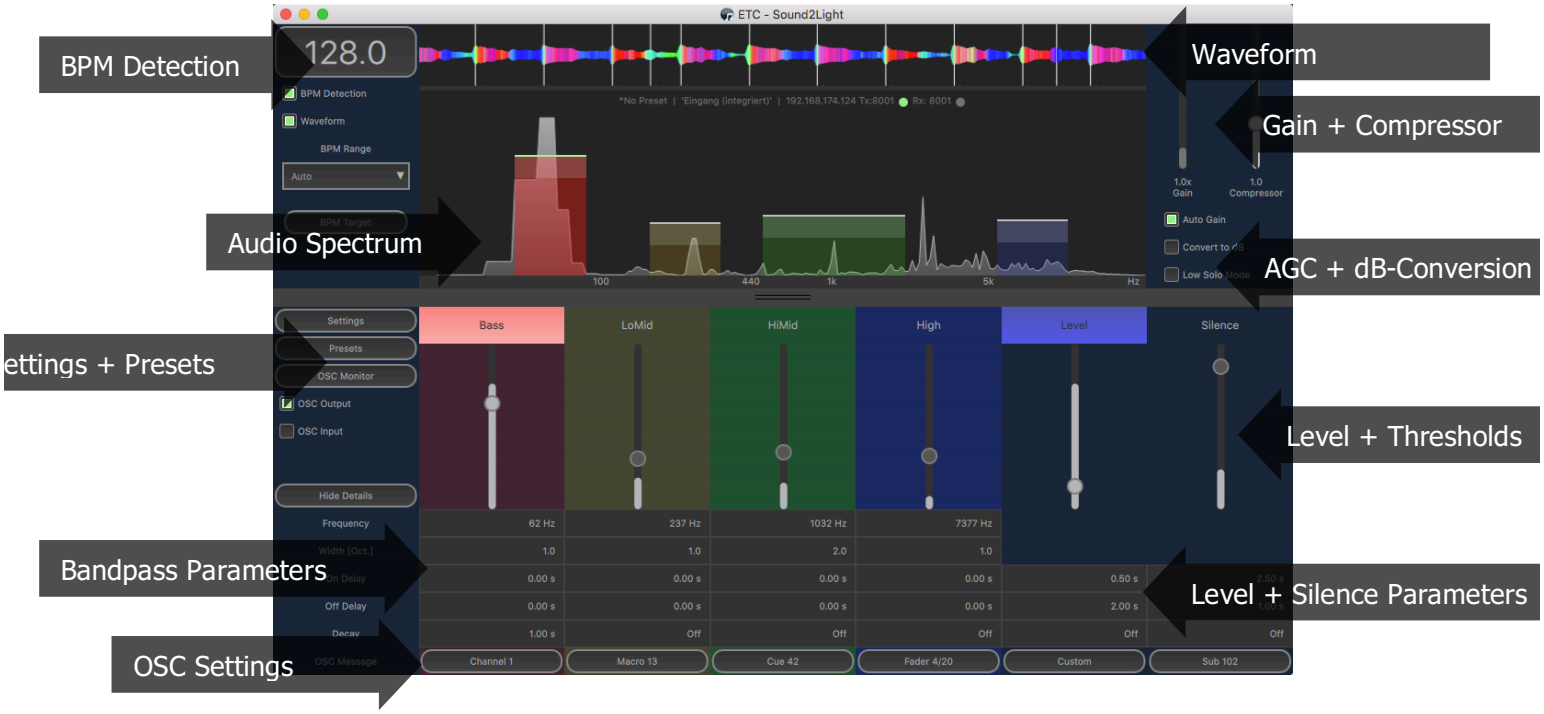
There are four bandpass filters that can be used to pick a range of the spectrum and control one of the consoles parameters using its amplitude. The tool also includes a BPM Detector, which can be used to control the speed of one or multiple effects.

Software-Download

- The software can be downloaded for Windows and Mac from the following link:
  - https://github.com/ElectronicTheatreControlsLabs/Sound2Light/releases

Installation

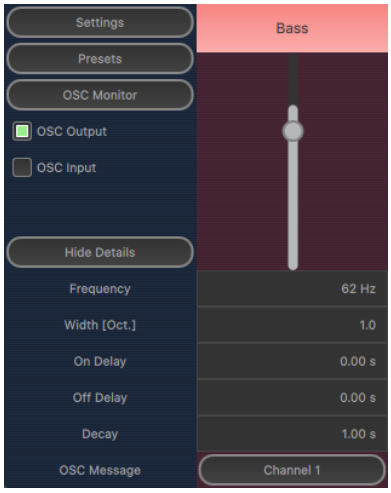
- Download and run the installer as mentioned above.
- If necessary, a previous installation will be removed, but the previous settings will be reused.



Basic Usage

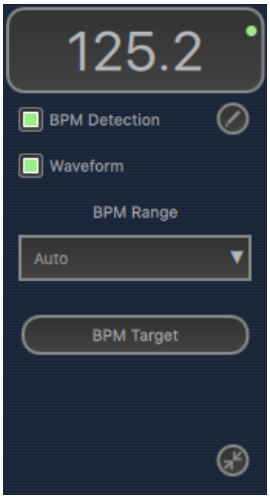
- Set OSC **IP-address and port** as well as audio input soure and console type in **Settings** (see **Settings** section below)
- Adjust **Gain** according to the audio input level or activate Automatic Gain Control (AGC)
- Adjust **Compressor** as desired to tame peaks in the signal
- Change the **Bandpass Parameters** using the numerical settings or by dragging the Bandpass preview in the spectrum (width can be changed by holding CTRL on Windows / CMD on Mac, or by using a **two-finger pinch gesture** on a touchscreen)
- To change the triggering behavior set the **On** and **Off Delay**
- Set the **Decay Time** to limit the maximum duration of a trigger signal
- Open the **OSC** message dialog by clicking the button at the bottom of a band, and configure the OSC messages (see section *OSC* below)
- To use BPM detection, press **BPM Target** on the left and chose the effects you want to control

Bandpass Filters and Level-Trigger



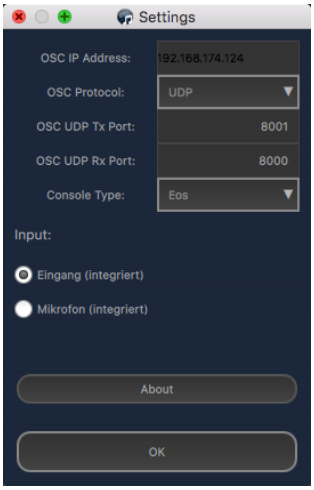
- Four bandpass filters, as well as the level and silence channels can each send a distinct trigger signals
- **Slider:** set the the value that is used as a threshold for on / off signals, or as an upper boundary for continuous values
- **Frequency** (bandpass only): middle frequency of the bandpass filter
- **Width** (bandpass only): width of the bandpass filter (measured in octaves)
- **On Delay:** time to delay the On message (On message will only be sent after the signal has been above the threshold for the given time)
- **Off Delay:** time to delay the Off message (Off message will only be sent after the signal has been below the threshold for the given time)
- **Decay:** maximum time untill the off message is sent (decay = 0 will be ignored)
- **OSC Message:** configure the OSC messages (see below)

BPM-Detection



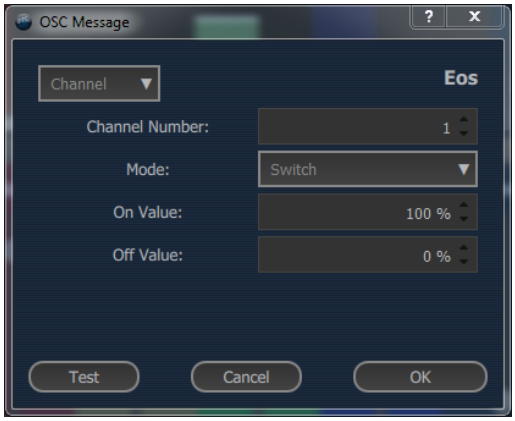
- The software can detect the the tempo of a signal in beats per minute
- You can also tap the BPM number or press Return rhythmically to enter a tempo. BPM Detection will deactivate, and the number will turn red. Turn BPM Detection back on again or press escape to resume automatic detection. *Please make sure to use short taps on the mouse or keyboard*
- **Manual Value:** Press the little pencil to enter a manual BPM to be sent
- **BPM Detection**: Toggle the detection on or off
- **Waveform:** Toggle the waveform display
- **BPM Range**: The range in which the resulting BPM should reside. The original value might be doubled or bisected to fit in this range. "Auto" allows the algorithm to choose the tempo freely. Be aware that a person can feel that a song has double or half the tempo of what another person or algorithm has determined, so you might need to choose a range depending on your personal preference.
- **BPM Target**: configure the OSC messages (see "OSC Messages for BPM")

Settings



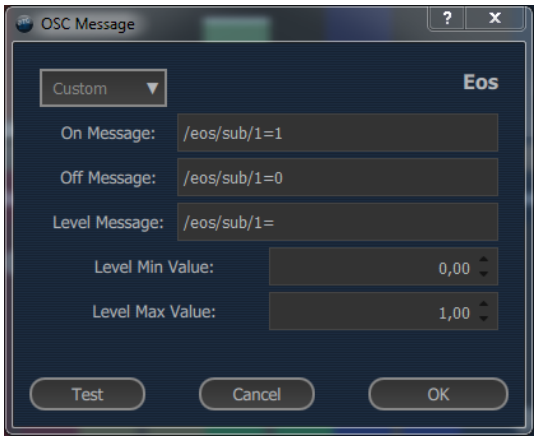
- **OSC IP Address:** IP address of the console
    - If the target is a local Eos Nomad software, the IP address displayed in the Shell Settings / Network of the nomand software must be used
- **OSC Protocol:** Protocol for sending and receiving OSC (see "Console Settings" section below, default: TCP 1.0)
- **OSC Ports:** Ports to send and receive OSC messages (Standard: UDP Tx 8001 (Rx Port of the console), UDP Rx 8000, TCP 3032)
- The dot in the upper area of the spectrum indicates the connection state (red = not connected, grey = idle, green = sending message)
- **Console Type:** Type of the targeted console (affects the OSC message dialog). Changing this parameter will not affect any OSC Messages currently set.
- **Input:** Audio Source
    - i.e. **Microphone / Line** Input of an internal soundcard or external Audio-Interface
    - To use the audio output as an input devices within Windows the "Stereo Mix" device must be activated (Right click on the speaker icon in the taskbar -> Recording Devices -> right click empty space -> Show disabled devices -> Right click "Stereo Mix" -> enable)
- **OSC Output** (on the left of the main window): enable or disable Trigger OSC output
- **OSC Input** (on the left of the main window): enables OSC remote control input
- **Low Solo Mode** (on the right of the main window): only the lowest of the active Triggers will go off

Using Predefined OSC Messages for Bandpass Filters



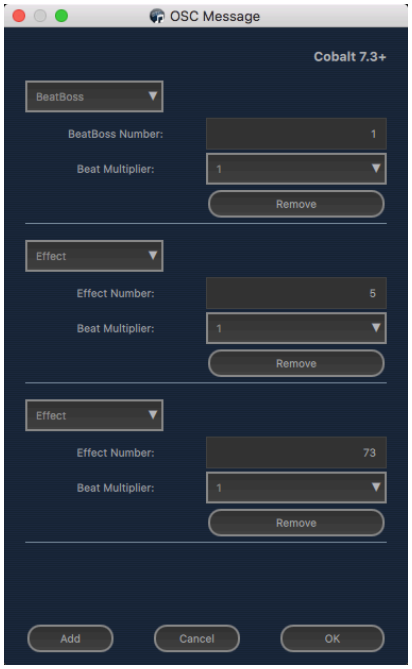
- Open the OSC message dialog by clicking the respective button under the trigger settings
- Choose a **Message Type** in the upper left
- Change the **Parameter** on the right
- Test the message with the **Test button** (an On message will be sent when the button is pressed, an Off message when released)
- For channels, groups and submasters you can choose between sending **On and Off signals (Switch)** when the threshold is reached or **continuous values (Level)** based on the level within the filter
    - The threshold is also the upper boundary of the level for the continuous values

Custom OSC Messages for Bandpass Filters



- Choose **Custom** as message type
- **On Message:** message to be sent when the level reaches the threshold
    - Format: „/<path>/<command>=<argument>"
- **Off Message:** message to be sent when the level falls below the threshold or after the decay time
    - Format: „/<path>/<command>=<argument>"
- **Level Message:** message that is used to transmit the continuous values
    - Format: „/<path>/<command>="
- **Level Min Value:** value of level messages to be sent at silence
    - Typical 0.0
- **Level Max Value:** value of level messages to be sent at the threshold value
    - Typical 1.0 or 100, depending on message target
- **Examples** (also covered by predefined messages):
    - Flash Eos Channel 1:
        - On Message: /eos/chan/1=100
        - Off Message: /eos/chan/1=0
    - Trigger Eos Macro 5:
        - On Message: /eos/macro/fire=5
    - Continuously control Eos Channel 2 between 0% and 80%:
        - Level Message: /eos/chan/2=
        - Level Min Value: 0.00
        - Level Max Value: 80.00
    - Continuously control Eos Submaster 1 between 0% and 100%:
        - Level Message: /eos/sub/1=
        - Level Min Value: 0.00
        - Level Max Value: 1.00

OSC Messages for BPM



- Open the BPM Target Dialog **BPM Target**
- Hit **Add** to add as many targets as you desire to control
- When Controlling a Cobalt with Software version 7.3, choose between controlling a BeatBoss or Effect for each target. All other consoles only support controlling effects
- **Effect Number/BeatBoss Number:** The number of the effect or Beatboss (please mind that every effect or BeatBoss can only be chosen once)
- **Beat Multiplier:** A custom factor that will be applied to the BPM before transmitting it to the console. For example, to run a chase effect at double speed (*think eight-notes*) select a Multiplier of **2**
- **Remove:** removes the target

Please be aware, that when assigning a BeatBoss to an Effect on cobalt, the effects rate turns into a multiplier of the BeatBoss' value. Please pay attention not to accidentally send the bpm to both an Effect and his BeatBoss, as this might lead to unexpected results.

Controlling Effects on EOS requires the console language to be set to english

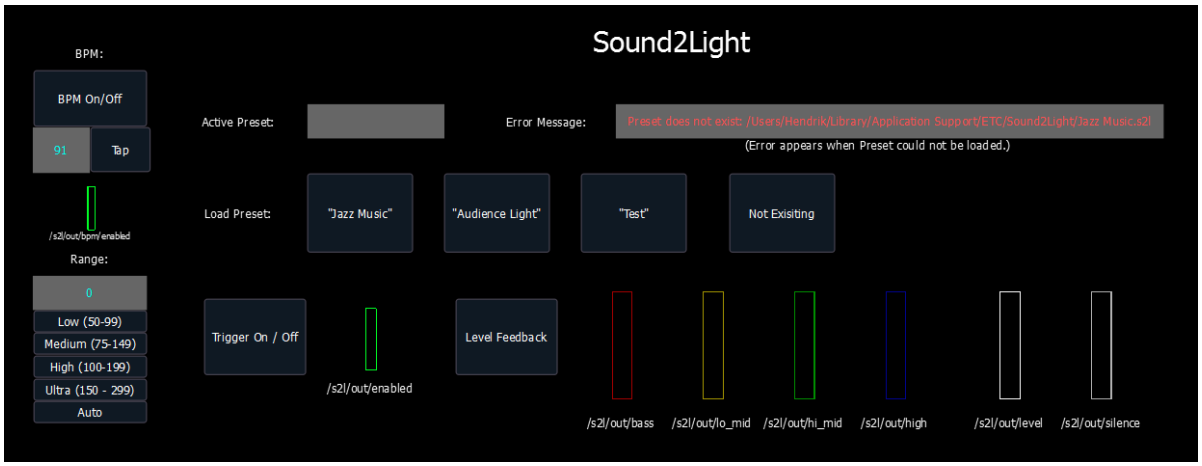
Presets

- Most parameters can be saved as a preset for later recall
- A preset does **not** contain the following settings:
  - OSC IP address, port and protocol type
  - "Send OSC" status
  - Audio Input Device
- The Preset dialog can be opened with the button "Presets" on the left side of the main window
- **Preset List:** opens a list of all presets, which can be loaded by clicking on the name or deleted by clicking on the trashcan icon
  - The currently loaded preset is highlighted blue in case there are unsaved changes, or green otherwise
- **Save:** saves the current settings to the loaded preset
- **Save As:** saves the current settings as a new preset
- **Load From File:** loads a preset from a "*.s2l" file
- **Reset:** resets all parameters to factory defaults

OSC Remote Control

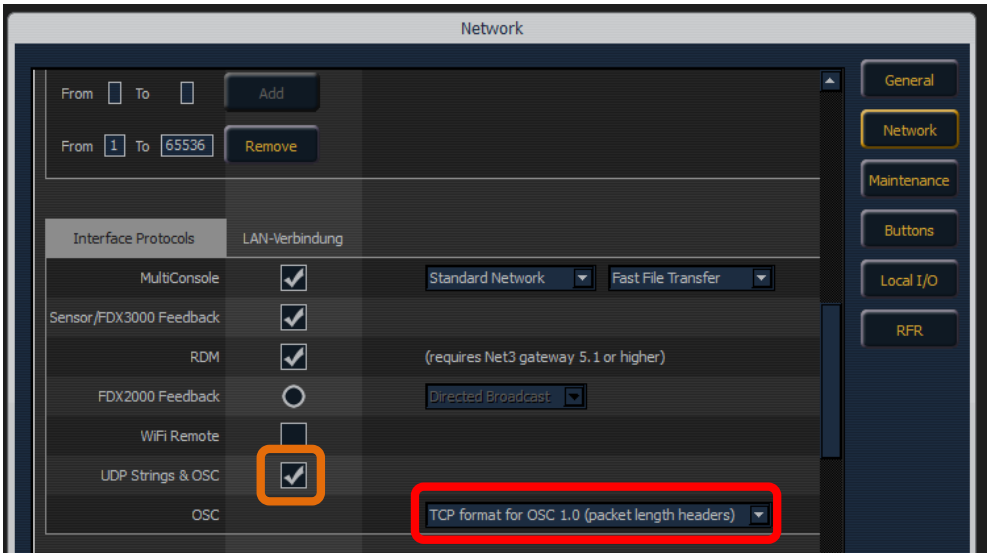
- The Sound2Light software does not only send OSC messages based on the triggers, it can also be remotely controlled over OSC (i.e. from an Eos Magic Sheet)
- It is possible to control the state of the Trigger Output, load Presets and change all parameters of the BPM Detection.
- Optionally the level of the six triggers can be sent as feedback messages (Level Feedback).
- The detected BPM will be transmitted as well as a feedback message.
- An example Magic Sheet is available inside an EOS Showfile (*Sound2Light_Magic_Sheet_Example.esf*, see screenshot below).
- Supported OSC messages:
    - */s2l/enabled=1* to activate or *=0* to deactivate Trigger Output
    - */s2l/enabled/toggle* to toggle Trigger Output
    - */s2l/preset=<Preset Name>* to load a Preset (<Preset Name> without path and suffix)
    - */s2l/level_feedback=1* to activate or *=0* to deactivate Level Feedback messages
    - */s2l/level_feedback/toggle* to toggle Level Feedback messages
    - */s2l/bpm/enabled=1* to activate or *=0* to deactivate BPM Detection
    - */s2l/bpm/enabled/toggle* to toggle BPM Detection
    - */s2l/bpm/range=<zahl>* to set the lower bound for BPM Values (50, 75, 100 or 150. 0 for Auto)
    - */s2l/bpm/tap* to tap the bpm manually
- OSC Feedback:
    - */s2l/out/enabled* -> state of the Trigger Output (1 or 0)
    - */s2l/out/active_preset* -> name of the active Preset (String)
    - */s2l/out/bpm/enabled* -> state of the BPM Detection (1 oder 0)
    - */s2l/out/bpm/range* -> lower bound for BPM Values (50, 75, 100 or 150. 0 for Auto)
    - */s2l/out/bpm* -> the detected BPM Value
- OSC Level Feedback (needs to be activated beforehand, see command above):
    - */s2l/out/bass* -> volume in Bass band (0-1)
    - */s2l/out/lo_mid* -> volume in LoMid band (0-1)
    - */s2l/out/hi_mid* -> volume in HiMid band (0-1)
    - */s2l/out/high* -> volume in High band (0-1)
    - */s2l/out/level* -> total volume (0-1)
    - */s2l/out/silence* -> "silence" (0-1)

Example Magic Sheet:



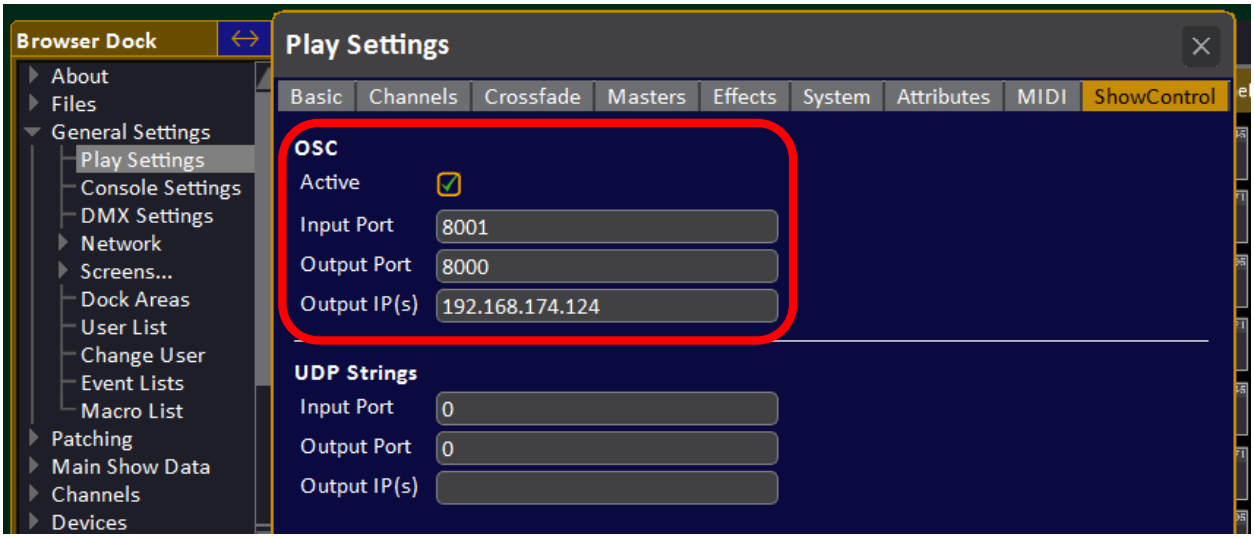
Console Settings (Eos)

- Use Eos or Eos Nomad **version 2.3.3** or later
- Shell Settings / Network:
  - Choose "TCP format for OSC 1.0 […]"
  - (Only for UDP transmission: activate „UDP Strings & OSC")
- Eos Show Settings / Show Control:
  - Activate „String Rx" and „String and OSC Tx"
  - (Only for UDP transmission: set OSC Rx Port to 8001, Tx to 8000 and set OSC Tx IP Address to that of the Sound2Light client)



Console Settings (Cobalt)

- Browser -> General Settings -> Play Settings
  - Enable **Active** checkbox
  - Set **Input Port** to 8001
  - Set Output Port to 8000
  - Set **Output IP** to the IP address of the Sound2Light tool
  - Choose **UDP** as the Protocol and **Cobalt 7.2** or **Cobalt 7.3+** depending on the version as the Console Type in the Sound2Light tool settings



Console Settings (ColorSource)

- Setup -> Settings -> Console
  - Set **OSC Remote Control IP** to the IP address of the Sound2Light tool
  - Set **Send Port** to 8000
  - Set **Rec. Port** to 8001
  - Choose **UDP** as the Protocol and **ColorSource** as the Console Type in the Sound2Light tool settings