

# **Jünger Level Magic**

FLUX:: Immersive

2/6/23

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# 1 Level Magic

[Product Page](#) | [Shop Page](#)



LevelMagic (TM) is a comprehensive Real Time and Offline loudness measurement, correction and management processor. Designed to meet the requirements of the global broadcast and media industry it is compliant with all current worldwide loudness standards. The algorithm is highly adaptive to the structure of the incoming audio and requires only a small number of parameters to be set by the user. The result is audio compliant with the selected standard, but free of any unwanted artefacts such as pumping, breathing or distortion.

Based on the ITU-R BS.1770(-1/2/3) standard, LevelMagic(TM) provides compatibility with EBU R128, ATSC A/85, ARIB TR-B32, FREE TV OP-59 and Portaria 354.

## 2 General Settings

### 2.1 Bypass (1)

When pressed, the inputs are routed directly to the outputs.

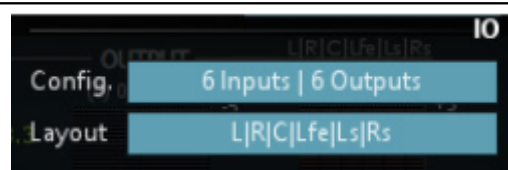
### 2.2 Plug-In Settings (2)

Pressing the cogwheels opens a settings window providing a range of general settings as well as a direct access button to the user manual.

- Input / Output: IO Config & Layout is not always available ... it is always displayed but can only be edited in some configuration and Format.

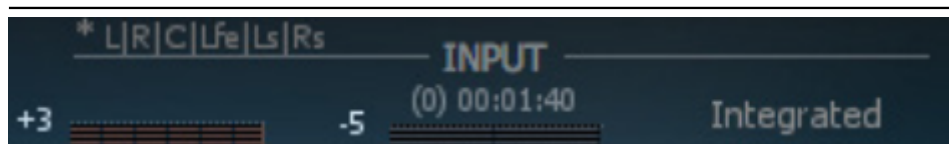


*Stereo Configuration*



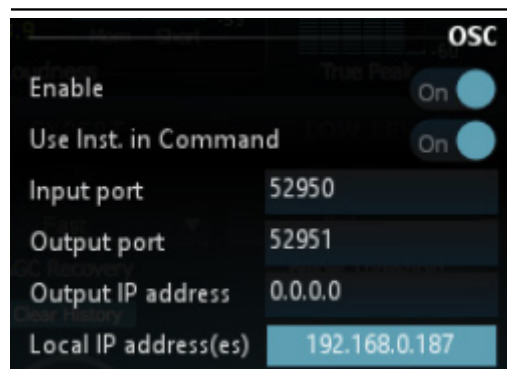
*Multichannel (5.1) Configuration*

- Config: Current I/O configuration. Config is only available in certain VST hosts; typically hosts with limited capabilities for handling multichannel configurations.
- Layout: Available I/O routings based on current I/O configuration. Layout is available for editing if more than two input channels are available. If the Layout is changed from the default value, an asterisk \* is displayed next to the Layout information in the Input section.



*I/O Layout information*

- User Interface - Maximum Meter(s) Refresh: Enables/Disables the max refresh rate of the plug-in's metering.
- Processing - Report Latency: Enables/Disables latency reporting to the host.
- Automation - Multi thread: Enables/Disables Multi-thread Automation, which is only available in VST. It forces the plugin to handle the parameters changes in a separate thread to avoid using the audio processing thread, if the host is doing this, which is typically the case in Nuendo and Cubase. If CPU spikes are experienced in the audio processing (DSP performance monitor) it may help to enable this feature. It is not available in AAX as Protools is already handling parameters changes in separate threads, as does AU plug-ins.
- OSC (Open Sound Control): Enables/Disables OSC control & mapping of the plug-in's parameters. More information on how to use and setup OSC can be found under "Open Sound Control" in this document.



OSC Settings

- Version Information: Plug-in version and build number information.
- User Manual / Credits: Quick link to the User Manual. Plug-in creation credits.

## 2.3 Current Selected Preset (3)

Displays the current selected preset name. Clicking the arrow opens a new window accessing the built-in preset manager.

## 2.4 Loudness Mode (4)

- Level This is a Jünger Audio proprietary level based process with the purpose to maintain an anticipated operating level. The algorithm is intellectual property of Jünger Audio.

- ITU BS.1770-1 Loudness based measurement. Several filters and RMS weighting are used to get a loudness equivalent result. Starting from the well-known A, B, C weighting curves (DIN-IEC 651) the ITU did further research into the relationship of frequencies, their overall levels, their peak levels and the duration of signals, to develop the best representation of human loudness perception.
- ITU BS.1770-2 and ITU BS.1770-3 The ITU BS.1770-1 frequency weighted measurement has been extended by a gating function.

The EBU PLOUD-Group developed a gating function to exclude quiet sections from the measurement to prevent possible loudness under-read. An example is background noise, which does not contribute to the loudness perception as much as louder signals. This gating function consists of an absolute threshold at -70LUFS and a relative threshold 10LU below the absolute gated level.

This involves the necessity to recalculate the whole measurement with every subsequent block.

- EBU R128 This is a work-to-rule based on ITU BS.1770-3.

To characterize an audio signal the measurements of Program Loudness, Loudness Range and Maximum True Peak Level are used. The Program Loudness level is normalized to -23LUFS with a permitted deviation of +/- 1LU.

The measurement includes a gating method as specified in ITU BS.1770-2/-3 (EBU Tech Doc 3341). Loudness Range (LRA) measures the variation of loudness over the measurement interval. It is supplementary to the measurement of overall (integrated) loudness. Units are LU (EBU Tech Doc 3342). The maximum permitted True Peak Level of a program during production is -1dBTP.

Loudness Mode	Country	Corresponds To	Default Loudness Target	Default Maximum Permitted
Level	JA proprietary	JA proprietary	-13dBFS	-1dBTP
ITU BS.1770-1	International	ITU BS.1770-1	-24LKFS	-2dBTP
ITU BS.1770-2	International	ITU BS.1770-2	-24LKFS	-2dBTP
ITU BS.1770-3	International	ITU BS.1770-3	-24LKFS	-2dBTP
EBU R128	Europe	EBU R128	-23LUFS	-1dBTP
ARIB TR-B32	Japan	ITU BS.1770-3	-24LKFS	-2dBTP
ATSC A/85 (2011)	USA	ITU BS.1770-1	-24LKFS	-2dBTP
ATSC A/85 (2013)	USA	ITU BS.1770-3	-24LKFS	-2dBTP
Free TV OP-59	Australia	ITU BS.1770-3	-24LKFS	-2dBTP
Portaria 354	Brazil	ITU BS.1770-3	-23LKFS	-2dBTP

- Summary, Available Modes

!> Important note: Systems working in ITU BS.1770-1 mode do not feature a gating function. Thus its output readings may vary from meters compliant to EBU R128 or ITU BS.1770-2/-3. Further keep in mind that the gate is only applicable to the integrated or program loudness measurement and not used for short-term or momentary measurements.

## 2.5 Link Mode (5)

The link function connects all the parameters of the processed channels and links the control circuits of the processing blocks in order to maintain the sound balance of these channels.

Two link options are available for stereo and surround processing:

- Stereo Mode: Linked/Unlinked
- Surround Mode (Only affecting the LFE channel): Linked/Unlink LFE

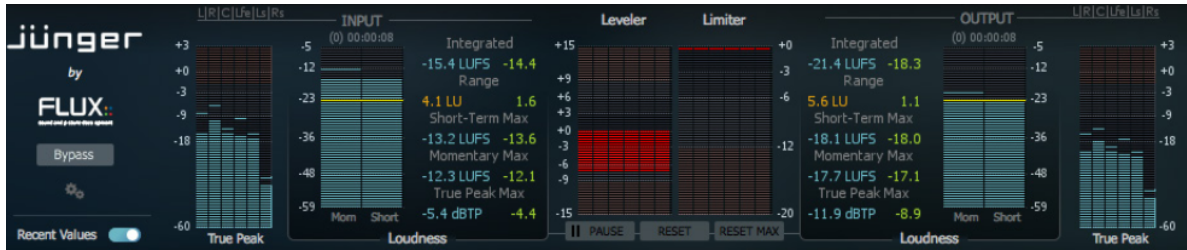


Stereo Mode - Unlinked

## 2.6 Recent Values (6)

When pressed, the results of the recent loudness measurement cycle, before Reset (8) was pressed, are displayed.





The recent values are the values displayed in Green to the right of the RT values.

## 2.7 Pause / Continue (7)

When pressed, the current loudness measurement cycle is paused/resumed.

The time markers under Input and Output displays the effective duration of the current measurement cycle; pause periods are not calculated into the effective duration.

## 2.8 Reset (8)

When pressed, a new loudness measurement cycle is started and the current one is ended. The current values are stored in Recent Values (6) right before Reset is pressed. Level Magic

## 2.9 Reset Max (9)

Resets only the 'max-parameters' (Short-Term Max, Momentary Max, True Peak Max) without ending the loudness measurement cycle. The measurement of the integrated loudness and the loudness range will not be affected.

## 2.10 Input Gain Enable (10)

When pressed, the main Input Gain is enabled.

Value Range: ON / OFF

## 2.11 Input Gain (11)

Adjusts the main Input Gain.

Value Range: -20 / +20 dBFS

## 2.12 Leveler Enable (12)

When pressed, the leveler processing is enabled.

Value Range: ON / OFF

## 2.13 Leveler Processing Profile (13)

The leveling process is designed to always deliver an as neutral and well sounding result as possible, and an option to further improve its neutrality is provided by selecting one of the five given presets to match the actual content of the processed audio signal.

Processing Profile Presets:

- Live Fastest response
- Speech Fast response
- Pop Medium response
- Uni Slow response
- Classic Slowest response

## 2.14 Leveler Loudness Target (14)

Please Note - This parameter is available in all modes except the Level mode.

The Loudness Target is the target level of the whole leveling process according to the ITU/EBU regulations.

ITU has defined the unit of measure to LKFS (Loudness, K-weighted, referenced to digital Full Scale, averaged out over the duration of the piece), and EBU has defined the unit of measure to LUFS (Loudness Units, relative to digital Full Scale). LKFS and LUFS are different unit names for the same measure, which are fully compatible.

Value Range: 0 / -50 LKFS/LUFS

## 2.15 Leveler Operating Level (14)

Please Note - This parameter is only available in the Level mode.

The signal is balanced around this operating level to achieve a consistent loudness impression for the listener. In order to preserve the natural dynamics of the program the balancing process does not, as far as it's possible, affect single peaks.

Value Range: 0 / -50 dBFS

## 2.16 Leveler Time (15)

The Leveler Time parameter controls the speed at which LevelMagic(TM) attempts to reach the loudness target. This setting should not be confused with the attack time of a conventional sound processor.

As the leveling process is a self-adjusting system the Leveler Time is not an absolute term but rather an initial value that could exceed the numerical value many times. When setting the Time it is necessary to take the overall function of the system into account. Production duties may require faster time settings, while ingest or play-out correction systems may require slower settings.

Value Range: 10 sec. / 2h

## 2.17 Leveler Max Gain (16)

The Leveler Max Gain parameter controls the maximum permitted gain change to reach the target level. Limiting the maximum amount of gain can be advantageous in order to minimize the risk of overly boosting noise and other unwanted signals.

The maximum attenuation is not affected by this setting. The system regulates the maximum attenuation adaptively to the signal structure.

Value Range: 0 / +40 dB

## 2.18 Leveler Freeze Level (17)

The Leveler Freeze Level function holds the amount of gain or attenuation if the signal level drops below this threshold.

It works in a similar way to a hold function in other sound processors.

An example:

> Assuming the process applies a gain change of 10 dB to achieve target loudness, the input level will suddenly drop below freeze level. The gain change remains in its last state until the signal returns above Freeze Level. This behaviour is different to the Processing Threshold (28) where the gain change would return to its neutral state if the level falls below threshold.

It is necessary to always set Freeze Level above the Processing Threshold to prevent unwanted release behaviour.

Value Range: -20 / -60 dBFS

## 2.19 Transient Processor Response (18)

The response of the Transient Processor is a highly self-adjusting process reacting adaptively to the incoming signal structure.

The response can be adjusted in three presets from a more vital to a more relaxed setting but is also depending on the Limiter Processing setting. This means that the overall handling of transients and peaks is determined by the parameters of the Transient Processor and the Limiter.

Response Presets:

- Soft
- Mid
- Hard

## 2.20 Transient Processor Max Gain (19)

The Transient Processor can be limited to a maximum processing gain range. Sometimes a hard setting with a very limited gain range can sound more natural than a softer response at full gain range. Adjusting the Transient Processor according to the designated overall behaviour of the LevelMagic(TM) process will improve its neutral processing character.

Value Range: 0 / +15 dB Level Magic

## 2.21 Limiter Enable (20)

When pressed, the Limiter processing is enabled.

Value Range: ON / OFF

## 2.22 Limiter Processing Profile (21)

The limiting process is designed to always deliver an as neutral and well sounding result as possible, and an option to further improve its neutrality is provided by selecting one of the five given presets to match the actual content of the processed audio signal.

Processing Profile Presets:

- Live Fastest response
- Speech Fast response
- Pop Medium response
- Uni Slow response
- Classic Slowest response

Please note that the limiter setting will have an impact on the Transient Processor.

## 2.23 Limiter Max True Peak (22)

The Limiter Max True Peak sets the threshold for the system's true peak limiter. Its fast detection system with a 2ms lookahead time characterizes its response as a full brick wall limiter, not only for the obvious sample peaks but also for the hidden inter-sample peaks.

Value Range: -20 / 0 dBTP

## 2.24 Expert Mode Enable (23)

When pressed, the Expert Mode is enabled.

Initially LevelMagic(TM) runs as a 'set-up and forget' processor delivering supreme leveling results. To improve the result of the process even further, the option to adjust a range of 'internal' parameters is provided. Once these parameters are set they remain active even if the Expert Mode is disabled.

Value Range: ON / OFF

## 2.25 Expert Mode AGC Recovery (24)

All gain changes are processed adaptively to the incoming audio signal. Under normal conditions this adaptive reaction is completely sufficient. Though, in certain configurations it may be necessary to have a faster recovery or release time.

An example: > If LevelMagic(TM) is configured to work without gain or with just a very small amount of positive gain, then returning to unity from heavy attenuation can take quite some time. If a very loud part (above target) is followed by a quiet section (right at or below target), the recovery from damping will lead to an unnatural fade-in effect for the quiet section. In order to decrease this effect and accelerate the fade-in time, AGC Recovery can be set to [Fast] and will then be >accelerated up to fifteen times its normal speed.

The result sounds almost similar to if an audio engineer rides the fader to correct unwanted level jumps and thus becomes very natural and well accepted by the listener. This setting is most helpful for setups where no positive gain (AGC amplification) is allowed. The effect works relative to the Leveler Time setting and hence is more obvious for short Leveler Time values.

Value Range: Normal / Fast

## 2.26 Expert Mode Clear History (25)

This is a triggered action that resets the dynamic processing without any release time. Imagine a short circuit to the timing circuits of an analog dynamic processor, which discharges the whole system and immediately returns the dynamic gain to its neutral state.

This function is useful to reset the process when switching programs (e.g. from movie to commercial breaks).

## 2.27 Expert Mode Initial Dynamic Gain (26)

This parameter directly depends on the Clear History trigger.

Instead of resetting the dynamic gain, it can be preloaded to a desired value the moment Clear History is triggered. The preload value is specified by the Initial Dynamic Gain parameter. This helps to reduce attack time artifacts if switching programs incorporates a known and undesired level jump. It is not necessary to exactly predict the level difference between the programs but already helpful to set up a few dB in the right direction.

An example: > The level jump from a movie to a commercial break is usually around 6dB. Resetting LevelMagic(TM) at the transition point helps to even-out the difference. Still, the process needs some attack time to build up a damping of 6dB, which can be audible depending on the program structure. If the gain is reset to a damping value between -4 to -6dB instead, the attack time is much shorter and artifacts will fall below the perception threshold. In many cases an Initial Dynamic Gain value of +/-3 dB is sufficient to create transitions with seamless loudness.

Value Range: -40 / +15 dB

## 2.28 Expert Mode Low Level Behaviour - Below Threshold (27)

The Low Level Behaviour parameters define what happens if the level drops below the Processing Threshold.

In continuous operation the Below Threshold mode should remain in [Release]. In this case the dynamic gain slowly returns to its neutral state in case of signal absence, and a returning signal would start a new processing period with its lead-in attack time. This may not be desired, especially in production applications where transport operations introduce unnatural gaps. In those cases setting the Below Threshold mode to [Hold] will pause the dynamic processing at the last value until the signal returns. Returning signals are treated just like continuous signals.

This function has some similarities to the Freeze Level but works with a different designation as it is meant to keep processing fluent over signal loss.

Value Range: Release / Hold

## 2.29 Expert Mode Low Level Behaviour - Processing Threshold (28)

This parameter sets the threshold for when to activate the processing.

Value Range: -20 / -80 dBFS

Default Value: -70 dBFS

## 3 Preset Management

LevelMagic provides two preset sections (32) referred to as section A and section B, offering simultaneous access to two full sets of parameter settings. Clicking the A section (bottom left) or the B section (bottom right), or clicking the arrow in the Current Selected Preset (3) display, opens a new window accessing the built-in preset manager.

### 3.1 Save Preset (29)

Save replaces the selected preset by a new one under the same name featuring the current settings. If you want to keep an existing preset without your new modifications, just select an empty place into the preset list, enter a new name for this modified preset featuring the current settings and press Save.

### 3.2 Recall Preset (30)

Once a preset is selected from the preset list in the preset manager window it must be explicitly loaded into one of the A or B sections by using the recall button.

Double clicking a preset in the preset list automatically recalls the preset to a slot and then the preset manager window will close. Opening the preset manager clicking the A section (bottom left), recalls the preset into the A section, opening it clicking the B section (bottom right), recalls the preset into the B section. Opening the preset manager clicking the arrow in the Current Selected Preset (3) display recalls the preset into the section currently selected by the Preset A/B Switch (34). Information about where the preset will be recalled is displayed to the right of the Preset Manager label (top left in the Preset Manager window).

A preset is effective only after it has been recalled.

### 3.3 Copy A / Copy B (31)

The current parameters of a section are copied to the other one. The section A or B is re-initialized with the current values and the Preset A/B Switch (34) is set to the corresponding section.



### **3.4 Loaded Preset Name (32)**

Displays the current selected preset name.

Clicking the arrow opens a new window accessing the built-in preset manager.

### **3.5 Open Preset Manager (33)**

Opens a new window accessing the built-in preset manager.

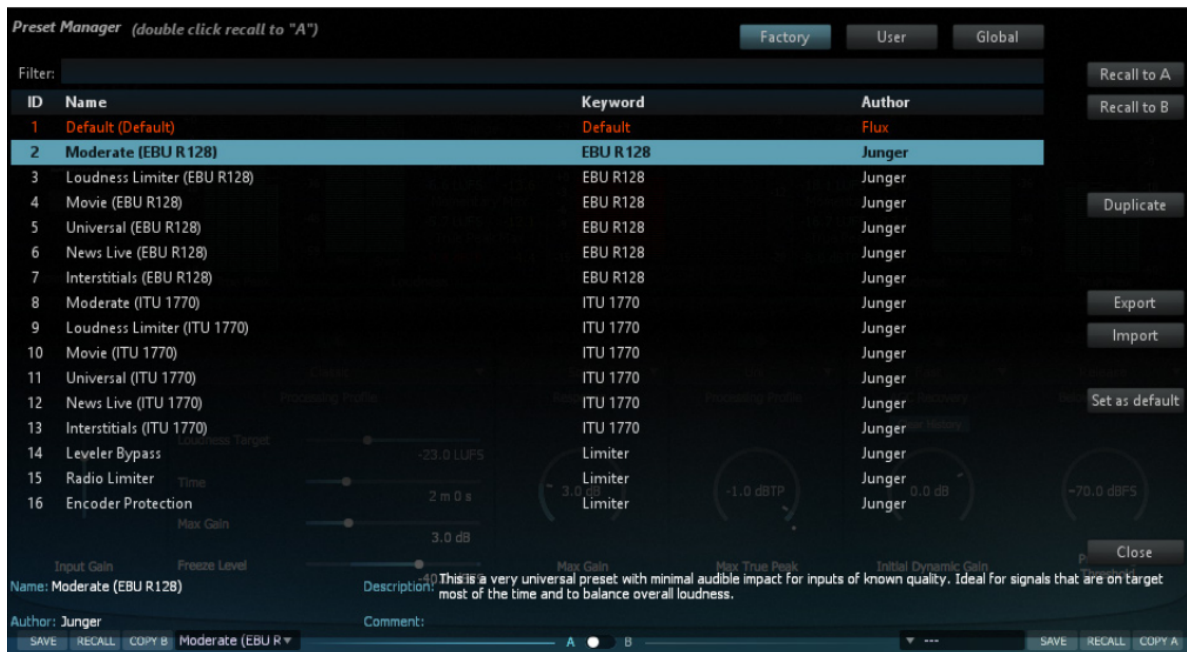
### **3.6 Preset A/B Switch (34)**

Toggles between the full set of parameter settings from section A and B.

## 4 Preset Manager Window

The preset manager contains three preset banks:

- Factory bank - Contains factory presets. Saving presets in the Factory bank is not allowed, but any of the Factory presets can be recalled into a preset section and then saved into the User bank instead.
- User Bank - Contains user presets only.
- Global bank - Contains Global presets. A Global preset is a complete snapshot with all the settings from both of the preset sections as well as the position of the Preset A/B Switch (34).



Preset Manager - Factory Bank



## Preset Manager - User Bank

Additional controls in the preset manager window

Bank

**Recall A** Loads the selected preset into the corresponding slot.

Factory, User, Global

**Recall B** Loads the selected preset into the corresponding slot.

Factory, User, Global

**Update** Saves the current settings into the selected preset

User, Global

**New** Saves the current settings into a new preset.

User, Global

**Duplicate** Creates a copy of the selected preset and saves it to the preset bank.

Factory, User, Global

**Edit** Allows for editing of the preset meta properties.

User, Global

**Delete** Removes the selected preset.

User, Global

**Export** Creates a file with the content of the current preset bank.

Factory, User, Global

Additional controls in the preset manager window		Bank
<b>Import</b>	Import the content of a preset bank file to the preset bank. - Add: Adds the content in the preset bank file to the preset bank. - Replace: Replaces the content in the preset bank with the content from the preset bank file. - Merge: Updates the preset in the bank if the preset in the file originates from it, else it's just added.	Factory, User, Global
<b>Set as default</b>	Makes the currently selected preset the default preset	Factory, User, Global
<b>Export default</b>	Exports only the default preset to a file. To import the default preset file for another user or machine, it has to be named DefaultPreset.xml and placed in: USER-NAME/Documents/Flux/Nameoftheplugin/ and will then override the default preset if any.	Factory

## 4.1 Preset Protection

When saving or editing a preset an option to protect the preset is presented. The preset protection, if engaged, permits only the original preset author to disable the protection and edit the preset. This means that you can protect your presets in a multi-user configuration. Protected presets can only be modified using the session used for their creation. If used in another user session they can only be imported or deleted.

# 5 Specifications

## 5.1 Availability

LevelMagic(TM) is available in the following configurations:

- Native Mono/Stereo - AU / VST / AAX Native / AAX AudioSuite
- Add-on Option: Native Multichannel 5.1 - AU / VST / AAX Native / AAX AudioSuite

## 5.2 Processing Specifications

- 64-bits internal floating point processing.
- Sampling rates in 44.1, 48, 88.2 and 96 KHz
- Audio I/O in Mono, Stereo and Multichannel 5.

## 5.3 Compatibility

All major native formats are supported.

### 5.3.1 Windows - Vista, 7 and 8 all in both 32 and 64 bits\*. (XP v.2.4 / 32 bit only)

- VST (2.4)
- AAX Native\*
- AAX AudioSuite\*

### **5.3.2 Mac OS X (Intel) - 10.7, 10.8 and 10.9 in both 32 and 64 bits\*.**

- VST (2.4)
- AU
- AAX Native\*
- AAX AudioSuite\*

#### **##Software Licence Requirements**

In order to use the software one of the following alternatives is required

- An ilok.com user account and an iLok USB Smart Key. More information: <http://www.ilok.com/>
- A Flux:: USB Dongle (Available in our online store).

## **5.4 More Information**

For more information about LevelMagic(TM) and the rest of our product line, visit our website: <http://flux.audio/>

- LevelMagic(TM) AAX Native & AAX AudioSuite supports 32 bit in Pro Tools 10.3.5 and 64 bit in Pro Tools 11.

## 6 Open Sound Control (OSC)

How to use the OSC protocol with LevelMagic(TM)

### 6.1 The OSC protocol

The OSC protocol is a way of controlling devices via the network. Here we present a way of taking control of the LevelMagic(TM) plug-in using this protocol.

### 6.2 Using the Bonjour protocol, Zero Conf

If your control device uses Bonjour or Zero conf protocol configuration will be quick and simple. Just select Flux::OSC in the ZeroConf device of your controller. Then, write the output port and IP address of your device in the labels of the plug-in. Remember that in the output port label of the plug-in you should write the input port of your controller and in the output address of the plug-in you should write the IP address of your device.

### 6.3 Configuring OSC parameters manually.

The following parameters are used to configure OSC manually in LevelMagic(TM)

- Network configuration: OSC is a network based protocol so make sure that both your controller and the host are connected to the same network.
- OSC Enable: When turned on this parameter creates a thread for receiving and sending OSC messages. This thread is multi-instances. This means that this will control all the instances of the plug-in. For example, if you have four LevelMagic(TM) opened, all the communication and control via OSC will be done via this one configured thread. You just have to be sure that the following parameters are well configured.
- Input Port: This is the port where the plug-in will be receiving OSC messages (the output of your control surface)
- Output Port: This is the port where the plug-in will send feedback to (the input of your control surface).

- Output IP Address: This is the address of destination of the outgoing OSC packets of the plug-in. You should write here the IP address of your controller

The image below presents the different OSC parameters used for configuration.



## 6.4 Feedback from the plug-in to the controller

The Flux:: OSC manager will send feedback to your controller. These are the different situations when you will receive feedback:

- When a parameter begins to be edited  
In this situation, the plug-in will send the following OSC messages:
  - Address Pattern: /NumberOfInstance/ControlBeginEdit
  - Argument: Name of the parameter.
  - Type: String
- When the edition of a parameter ends
  - Address Pattern: /NumberOfInstance/ControlEndEdit
  - Argument: Name Of the parameter
  - Type: String
- When a value is changed  
When a parameter is changed in the plug-in by any mean (OSC, mouse, automation or other... ) Flux :: Osc will send a message with the new value of the parameter and the instance number of the plug-in it belongs to.
  - Address Pattern: /NumberOfInstance/ParameterName
  - Argument: Float from 0 to 1, represents the value of the parameter.



- Type: Float
- When creating a new instance
  - When a new instance of a plug-in is created Flux:: OSC will send the following message:
    - Address Pattern: /NewInstanceRegisteredWithNumber
    - Argument: The number assigned to the new instance created.
    - Type: Float
- When an instance of a plug-in is destroyed
  - Address Pattern: /InstanceUnregisteredWithNumber
  - Argument: Represents the index of the instance that was destroyed.
  - Type: Float,

## 6.5 Using multiple controllers and advanced configurations

Flux :: OSC gives you the possibility to use multiple controllers for one instance of a plug-in and have a particular feedback for each one. If you want to use multiple controllers refer to the use of the /TalkToMeOnPort Command found under “Commands”.

## 6.6 Commands

### 6.6.1 How to use the commands

At first you have to know what an OSC message is composed of. Mainly, these two parts: The Address Pattern and the Argument.

For controlling parameters Flux:: only supports arguments of float type so make sure that the arguments you are sending via your controller are Floats. Float arguments must always be from 0 to 1 for controlling a parameter so you don’t have to deal with scale conversion.

### 6.6.2 The LevelMagic(TM) OSC commands

When OSC is enabled in the Plug-in Settings (2) the file “OSC\_Dict.xml” is automatically created in:

/Documents/Flux/LevelMagic

This is a properties dictionary with each parameter that can be controlled and mapped using OSC. The commands in the dictionary includes a ”Translation” attribute that can be used in order translate the OSC name into the Flux:: internal parameter name in both directions.

### 6.6.3 Global Commands

Global commands allow you to access to some additional information. These commands don't need an instance number. These are the available additional commands: - Address Pattern: /GetDeviceInfo - Type: Float - Value: 1 - Explanation: Get all the names of the controllable parameters

- Address Pattern: /TalkToMeOnPort
- Type: Float
- Value: Port Number
- Explanation: This command is very strong. It will store the IP address and the port in argument as an endpoint. All the different messages will be sent to this endpoint. This command is very useful for using many controllers.
- Address Pattern: /GetCurrentValues
- Type: Float
- Value: 1
- Explanation: This command will send all the current values of the different instances of a plug-in. The structure of the sent OSC messages is the same as the one for controlling them.
- Address Pattern: /GetNumberOfInstances
- Type: Float
- Value: 1
- Explanation: This command returns the opened number of instances of a plug-in. If you have five LevelMagic(TM) opened this command will return 5.