

# BEYOND OSC

BEYOND offer control by means of OSC protocol. BEYOND act as server, what mean that it execute commands (messages) sent by OSC Client. There are many OSC Client applications for various platforms. Typically OSC Client application allow to create or adjust User Interface that will generate the messages. BEYOND will receive and execute the message. BEYOND has ready for use OSC Server that do not require any configuration or settings. You (client application) need to send the message corresponding address and corresponding arguments. Information about OSC messages is below.

## OSC Message

OSC Message contains 3 parts:

1. Ordered List ItemAddress. Address is a string and define what functionality the message will have.
2. Type Tag String. Type Tag String define the types of arguments that comes inside the message.
3. Argument(s). the value that comes with message.

As example, for control of master position. The address is `/beyond/master/livecontrol/position`. Together with the address the OSC Client must send 2 or 3 values - X, Y (optional Z) axis. As example, in TouchOSC you will need to enter the address and define the value range (min, max). The value and its type will be added automatically by TouchOSC.

## Supported Argument types

BEYOND support integer number (i), float point number (f), and string (s). Other data types ignored. You need to ensure that OSC client send correct type of argument to BEYOND.

Supported addressing schemes.

Characters: `, / [ ] { } * ? ! ' ' #` are used for address format and can not be used in names. These characters has special functionality:

- Pattern matching (from OSC specification)
- `'?'` in the OSC Address Pattern matches any single character
- `'*'` in the OSC Address Pattern matches any sequence of zero or more characters
- `[abcde]` - any of specified characters. In example - a,b,c,d,e
- `[ad-fx]` - `"-"` means a series of characters. In example: a,d,e,f,x
- `[!abc]` - `"!"` means inversion. in example we have `"all except a,b,c"`. In all other places `"!"` can not be used.
- `{aaa,bcd}` - means any of strings separated by comma. In example: aaa or bcd

Extended syntax when use OSC servers in PangoScript. (not relating to OSC clients such as TouchOSC, Lemur and so on)

It is possible to use OSC syntax in PangoScript. You type an address and arguments. Scripter will analyze and supply for execution into BEYOND OSC servers. You can use variables of script inside address. Variable name should be inside < >

### Example:

```
var MyVariable
MyVariable = 0
/beyond/zone/<MyVariable>/select 1
```

## Direct servers

This kind of server provide a direct access to internal object of BEYOND. No extra layers, or something in between. BEYOND receive the OSC packet, analyze the address and if the address point on direct server, the BEYOND execute it right after the address parsing. Such servers has fixed address part and number of arguments.

| Server: DMX Input             |                  |  |
|-------------------------------|------------------|--|
| Address                       | Argument type(s) | Commentary   |
| /beyond/dmx                   | fff..f           | Gateway. array of f (floats) goes to DMX output. value 0..255. "-1" is special "undefined" state |
| Server: Beams                 |                  |  |
| Address                       | Argument type(s) | Commentary   |
| /beyond/beams                 | fff..f           | Gateway. Control beams. Works as brightness control per beam. 0 - off. 255 - on.                 |
| Server: Channels              |                  |  |
| Address                       | Argument type(s) | Commentary   |
| /beyond/channels              | fff..f           | Gateway. Control channels. Value range 0..1  |
| Server: MULTI TOUCH interface |                  |  |
| Address                       | Argument type(s) | Commentary   |
| /beyond/touch/x               | f                | value 0..1.  |
| /beyond/touch/y               | f                | value 0..1.  |
| /beyond/touch/z               | f                | value 0..1, means a pressure. 1 full pressure. 0 - off   |

## Live Control Parameters

There are a few areas where used Live Control object:

```
/beyond/master/...
/beyond/cue/...
/beyond/zone/...
/beyond/projector/...
/beyond/protrack/...
```

example of full path to Live Control:

```
/beyond/master/livecontrol/size
/beyond/cue/0/0/livecontrol/size
/beyond/zone/0/livecontrol/size
/beyond/projector/0/livecontrol/size
/beyond/spatial/0/livecontrol/size
/beyond/smart/0/livecontrol/size
```

## NOTE 1

```
/beyond/protrack/ - here can be used index or name of protrack-object
/beyond/zone/ - here can be used index or name of zone-object
```

In the table below a list of functions (ending name of the address):

| Function      | Type | Commentary  |
|---------------|------|---|
| size          | f    | -400..400 - one size for all 3 axis                             |
| sizeX         | f    | -400..400   |
| sizeY         | f    | -400..400   |
| sizeZ         | f    | -400..400   |
| zoom          | f    | 0..100  |
| posX          | f    | -32768 .. 32768 . Coordinate for output 16 bit                  |
| posY          | f    | -32768 .. 32768 . Coordinate for output 16 bit                  |
| posZ          | f    | -32768 .. 32768 . Coordinate for output 16 bit                  |
| angleX        | f    | -360*8 .. 360*8 . 8 rounds                                      |
| angleY        | f    | -360*8 .. 360*8 . 8 rounds                                      |
| angleZ        | f    | -360*8 .. 360*8 . 8 rounds                                      |
| rotoX         | f    | -360*4 .. 360*4 . 4 rounds per second                           |
| rotoY         | f    | -360*4 .. 360*4 . 4 rounds per second                           |
| rotoZ         | f    | -360*4 .. 360*4 . 4 rounds per second                           |
| brightness    | f    | 0..100  |
| visiblepoints | f    | 0..100  |
| colorslider   | f    | 0..255  |
| anispeed      | f    | 0..400  |
| scanrate      | f    | 10..200. 100 default  |
| red           | f    | 0..255  |
| green         | f    | 0..255  |
| blue          | f    | 0..255  |
| alpha         | f    | 0..255  |
| fx1           | f    | -1..47. -1 means stop. 0..47 - effect index. 48 effects per row |
| fx2           | f    | -1..47. -1 means stop. 0..47 - effect index. 48 effects per row |
| fx3           | f    | -1..47. -1 means stop. 0..47 - effect index. 48 effects per row |
| fx4           | f    | -1..47. -1 means stop. 0..47 - effect index. 48 effects per row |

|           |      |  |
|-----------|------|--|
| fx1action | f    | 0..100. effect action. 100 means fill action                             |
| fx2action | f    | 0..100. effect action. 100 means fill action                             |
| fx3action | f    | 0..100. effect action. 100 means fill action                             |
| fx4action | f    | 0..100. effect action. 100 means fill action                             |
| size      | ff   | size by x,y axis. -400..400  |
| pos       | ff   | position by x,y axis. -32768 .. 32768                                    |
| size      | fff  | size by x,y,z axis. -400..400  |
| pos       | fff  | position by x,y,z axis. -32768 .. 32768                                  |
| angle     | fff  | angle by x,y,z axis  |
| roto      | fff  | rotation speed by x,y,z axis   |
| fx        | ffff | four FX indexes. -1 means stop. 0..47 - effect index. 48 effects per row |

## Server: MASTER

/beyond/master/livecontrol/...

## Server: CUE

/beyond/cue/#/#/livecontrol/... require two indexes - page and cue

## Server: ZONE

| Function                       | Type | Commentary                                 |
|--------------------------------|------|--|
| /beyond/zone/#/select          | f    | 0-undelect. 1-select, 2-toggle state       |
| /beyond/zone/#/mute            | f    | 0-default, unmuted. 1-mute. 2-toggle state |
| /beyond/zone/#/livecontrol/... |      |  |

# is the index of the zone

## Server: PROJECTOR

| Function                            | Type | Commentary            |
|-------------------------------------|------|-----------------------|
| /beyond/projector/#/livecontrol/... |      |                       |
| /beyond/projector/#/sizex           | f    | -100..100             |
| /beyond/projector/#/sizey           | f    | -100..100             |
| /beyond/projector/#/posx            | f    | -100..100             |
| /beyond/projector/#/posy            | f    | -100..100             |
| /beyond/projector/#/swapxy          | f    | 0-off, 1-on, 2-toggle |
| /beyond/projector/#/invx            | f    | 0-off, 1-on, 2-toggle |
| /beyond/projector/#/invy            | f    | 0-off, 1-on, 2-toggle |

# is index of the spatial defined in UI

## Server: ProTrack

| Function                           | Type     | Commentary   |
|------------------------------------|----------|--|
| /beyond/protrack/#/select          | f        | 0-unselect. 1-select 2-toggle state  |
| /beyond/protrack/#/mute            | f        | 0-default, unmuted. 1-mute. 2-toggle state   |
| /beyond/protrack/#/livecontrol/... |          |  |
| /beyond/protrack/#/CODENAME        | CODENAME | is a name of "daemon" script defined inside protrack object. Function "start" the scripter |

# is index or NAME of the protrack object defined in Setup dialog

## Server: FIXTURE

/beyond/fixture/NAME/FUNCTION

"**NAME**" is index or NAME of the FIXTURE object defined in Setup dialog. "**FUNCTION**" is name of function that exists in the Fixture

## OSC to PangoScript GATEWAY

Server transform the OSC message to the command first and then the command goes to execution. The command appear in the system in the same way as it could be from the keyboard, or the mouse. This kind of servers also has fixed address and corresponding set of arguments. Actually, the address of such OSC server is a way to describe BEYOND command. And it was main intention - to give OSC the ability to do the same what the Script can do. Both parts (OSC and Script) produce a Command at the end, and why not to mix both worlds.

Address of message and number of arguments should correspond to the PangoScript command. Available following addressing:

```
/beyond/general/...
/beyond/master/...
/beyond/cue/...
/beyond/zone/...
/beyond/projector/...
/beyond/protrack/...
```

"general" use for variety of script commands. All others are for specific features of object, or for live control (see above)

The "general" serve contain embedded Scripter-object that always exists. Basically, you supply a command into embedded scripter and then it wait for the next command

| Address | Type | Commentary |
|---------|------|------------|
|---------|------|------------|

|                          |           |  |
|--------------------------|-----------|--|
| /beyond/general/CueDown  | ii or iii |  |
| /beyond/general/CueUp    | ii or iii |  |
| /beyond/general/PauseCue | iii       |  |

/beyond/general/RestartCue|ii| /beyond/general/StopAllNow|-| /beyond/general/StopAllSync|f|  
 /beyond/general/StopAllAsync|f| /beyond/general/StopCueNow|ii| /beyond/general/StopCueSync|iif|  
 /beyond/general/StopZone|iif| /beyond/general/StopZonesOfProjector|i| /beyond/general/BlackOut|-|  
 /beyond/general/EnableLaserOutput|-| /beyond/general/DisableLaserOutput|-|  
 /beyond/general/MasterPause|i| /beyond/general/VirtualLJ|i| /beyond/general/VLJFX|ii|  
 /beyond/general/BeatTap|-| /beyond/general/SetBpm|f| /beyond/general/SetBpmDelta|f|  
 /beyond/general/BeatResync|-| /beyond/general/OneCue|-| /beyond/general/OnePer|-|  
 /beyond/general/MultiCue|-| /beyond/general/Transition|i| /beyond/general/ClickSelect|-|  
 /beyond/general/ClickToggle|-| /beyond/general/ClickRestart|-| /beyond/general/ClickFlash|-|  
 /beyond/general/ClickSoloFlash|-| /beyond/general/ClickLive|-| /beyond/general/TimerBeat -  
 /beyond/general/AudioBeat - /beyond/general/ManualBeat - /beyond/general/ClickScrollZoom f  
 /beyond/general/ClickScrollSize f /beyond/general/ClickScrollFade f /beyond/general/ClickScrollVPoints f  
 /beyond/general/ClickScrollScanRate f /beyond/general/ClickScrollColor f  
 /beyond/general/ClickScrollAniSpeed f /beyond/general/ClickScrollR f /beyond/general/ClickScrollG f  
 /beyond/general/ClickScrollB f /beyond/general/ClickScrollA f /beyond/general/SetLimiterProfile i  
 /beyond/general/SetLimiterPerZone i /beyond/general/SetLimiterPerGrid i  
 /beyond/general/SetLimiterFlash i /beyond/general/SetLimiterHold i /beyond/general/SetLimiterBeam i  
 /beyond/general/SetLimiterDMX i /beyond/general/SetLimiterShow i  
 /beyond/general/MasterTransitionIndex i /beyond/general/MasterTransitionTime f  
 /beyond/general/MasterTransition i /beyond/general/DisplayPopup ANY TTS  
 /beyond/general/DisplayPreview si /beyond/general/MasterSpeed f /beyond/general/UnselectAllSmart -  
 /beyond/general/SelectSmart ANY TTS /beyond/general/UnselectSmart ANY TTS  
 /beyond/general/ToggleSelectSmart ANY TTS /beyond/general/UnmuteAllSmart -  
 /beyond/general/MuteSmart ANY TTS /beyond/general/UnmuteSmart ANY TTS  
 /beyond/general/ToggleMuteSmart ANY TTS /beyond/general/UnselectAllFixt - /beyond/general/SelectFixt  
 ANY TTS /beyond/general/UnselectFixt ANY TTS /beyond/general/ToggleSelectFixt ANY TTS  
 /beyond/general/UnmuteAllZone - /beyond/general/MuteZone ANY TTS /beyond/general/UnmuteZone ANY  
 TTS /beyond/general/ToggleMuteZone ANY TTS /beyond/general/MuteSelected i  
 /beyond/general/UnselectAllZones - /beyond/general/SelectZone ANY TTS  
 /beyond/general/SelectZoneName ANY TTS /beyond/general/UnselectZone ANY TTS  
 /beyond/general/UnselectZoneName ANY TTS /beyond/general/ToggleSelectZone ANY TTS  
 /beyond/general/ToggleSelectZoneName ANY TTS /beyond/general/MuteSelectedZones i  
 /beyond/general/SetGridSize ii /beyond/general/MasterPauseTime i /beyond/general/StoreZoneSelection -  
 /beyond/general/ReStoreZoneSelection - /beyond/general/SelectGrid i /beyond/general/SelectTabName s  
 /beyond/general/SelectTab i /beyond/general/SelectNextTab - /beyond/general/SelectPrevTab -  
 /beyond/general/SelectPageName - /beyond/general/SelectPage i /beyond/general/SelectNextPage -  
 /beyond/general/SelectPrevPage - /beyond/general/SelectAllCat - /beyond/general/SelectCatName s  
 /beyond/general/SelectCat i /beyond/general/SelectNextCat - /beyond/general/SelectPrevCat -  
 /beyond/general/FocusCell ii /beyond/general/FocusCellIndex i /beyond/general/StartCell -  
 /beyond/general/ReStartCell - /beyond/general/StopCell - /beyond/general/ShiftFocus i  
 /beyond/general/MoveFocus ii /beyond/general/SelectCue s /beyond/general/StartCue s  
 /beyond/general/StopCue s /beyond/general/LoadCue s /beyond/general/LoadWorkspace s  
 /beyond/general/SetPage i /beyond/general/GetPage - /beyond/general/SelectMidi i

/beyond/general/MidiOut iii /beyond/general/DmxOut AnyTTS 'ii', base channel, value, value, value... and so on. /beyond/general/ChannelOut ii /beyond/general/OscOut Any TTS sii ClickCode:'OscOut "/beam1/xy", -5, 100 set beam 1 position to [-5,100]';), /beyond/general/StopZoneByName s /beyond/general/StopProjectorByName s /beyond/general/ControlMaster - /beyond/general/ControlCue ii /beyond/general/ControlZone i /beyond/general/ControlTrack i /beyond/general/ControlProjector i /beyond/general/ControlSmart i /beyond/general/StopCode s /beyond/general/CallMenu s Server: MIDI DEVICES CONTROL /midi/close - close all 4 ports /midi/open - open all 4 ports /midi/index f - set current device index, 0..3 /midi/sysex fff...f - send sysex to current (index) device /midi/CODENAME - codename is name of script defined in "daemons" of the MIDI MAPPING. Works for current only /midi/1/... or /midi/<devicename>/... /midi/2/... /midi/3/... /midi/4/... /midi/1/devicein s /midi/1/deviceout s /midi/1/sysex fff...f /midi/1/CODENAME codename is name of script defined in "daemons" of the MIDI MAPPING. Here the device index specified. so, no need to set pair-index. Server: PROJECTION ZONE SETUP /beyond/zonesetup/zone f - set index of current zone /beyond/zonesetup/nextzone - increase index (go to next zone) /beyond/zonesetup/prevzone decrease index (go previews zone) /beyond/zonesetup/param f set index of current parameter - size, pos, etc /beyond/zonesetup/nextparam /beyond/zonesetup/prevparam /beyond/zonesetup/ax f /beyond/zonesetup/ay f /beyond/zonesetup/bx f /beyond/zonesetup/by f /beyond/zonesetup/x f equal to ax /beyond/zonesetup/y f equal to ay /beyond/zonesetup/xsize f /beyond/zonesetup/ysize f /beyond/zonesetup/xposition f /beyond/zonesetup/yposition f /beyond/zonesetup/zrotation f /beyond/zonesetup/xlinearity f /beyond/zonesetup/ylinearity f /beyond/zonesetup/xsymmetry f /beyond/zonesetup/ysymmetry f /beyond/zonesetup/xsymmetryoffset f /beyond/zonesetup/ysymmetryoffset f /beyond/zonesetup/xkeystone f /beyond/zonesetup/ykeystone f /beyond/zonesetup/xpincussion f /beyond/zonesetup/ypincussion f /beyond/zonesetup/xpincussionoffset f /beyond/zonesetup/ypincussionoffset f /beyond/zonesetup/xbow f /beyond/zonesetup/ybow f /beyond/zonesetup/xbowoffset f /beyond/zonesetup/ybowoffset f /beyond/zonesetup/xshear f /beyond/zonesetup/yshear f Server: Universe window /u/ Layout Name / Object Name / Property Name Universe window is the most flexible because the content defined exclusively by BEYOND User. The name of Layout, same as name of Object inside the Layout are completely used defined. /value i,f,ii, ff define value of object. Designed for sliders and buttons. An object such as XY Par require two coordinates, the OCS Client should send two integer of floats. /x i,f equal to "value", define the value of slider /y i,f define Y value for object such as XY Pad /visible i,f control visibility of object. Value above 0.01 will make it visible, below 0.01 - invisible /selected i,f control Selected state of object. Value above 0.01 will make it Selected, below 0.01 - un selected. Used with Zone, Fixture objects in layouts /minvalue i,f define minimum value of slider /maxvalue i,f define maximum value of slider /timeshift i,f define time shift property of component /dropduration i,f duration of drop effect in seconds /radius i,f radius of spatial effect /caption s define caption text of object. /start tart script execution /stop stop script execution /LabelName This allow do a jump to Label defined in the scripts. Labels used with GOTO commands. You also can execute goto by means of this message OSC to Script servers. This section assume that you already checked the information about BEYOND Commands. The Command of BEYOND contain information about the recipient of the command, code of operation, and the list of arguments. The Command may be addressed to various objects inside BEYOND such as Cue, Projection Zone, Master Live Control, etc. So, BEYOND has a gateway that allow transform OSC messages directly to the Command and send the Command to execution. The initial addresses of gateway are below: /cue /zone /projector /master /general Lets consider for example Cue server. /cue/ The addressing the cue we need to supply the page index and the cue index inside the page. The final address looks like this: /cue/pageindex/cueindex/commandname where: pageindex is number that define index of the page cueindex is a number that define index of cue inside the page commandname is the name of operator that can be found in document about the PangoScript. What happens technically is this. The Command is

an object with a few properties. The OSC server create Command object and start to initialize the properties of the object, one by one. "/cue" prefix tell that the recipient is cue. Page index, Cue index point on exact cue. So, we have two more numbers for Command object. After this, we have Command name as string. the Server find the command code by the command name and as a result initialize corresponding property of Command object. The list of arguments from OSC message directly goes into Command object, without analysis. So, we initialize the Command object by the data from OSC message and send to execution. Exactly this is a purpose of the gateway - to transform OSC message to the Command. The code of execution check all arguments and addressing and if something is not correct, then the Command may be blocked completely. All will depends on exact situation. Example of the OSC address for this server: /cue/1/2/sizeX (f) /cue/0/0/position (fff) What commands can be served by /cue/ server? The most definitely is the Live Control group commands, and FX. The command like cue start, or cue stop, is an area of /general/ server OSC to Object server. Address of server start from prefix /object . After this follow name of object and finally the name of property. As example, we have object Main Graphics (projection zone) and it has property SizeX. The address for access is /object/maingraphics/sizeX The message must comes with one value (argument). It could be string or number.

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