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| Communication Protocol |
| Communication Protocol Specification for the UltraPlayer project. |

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# Inxex

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# Document Description

Describes the protocol used between UltraPlayer and UltraPlayerCommander applications. UltraPlayer is the application that plays multimedia. It acts as a Tcp server and from the time it is launched can accept clients. In the other hand, UltraPlayerCommander acts as a client to the UltraPlayer, supplying it with instructions on what to do.

For the rest of the document UltraPlayer will be referred as “server” and UltraPlayerCommander as “client”.

## Messaging Life Cycle

Server listens to a specified port and waits to accept clients. When a client is accepted, client sends the request message using the protocol described in this document. Server gets the message, serves and responds with a response. Then client closes the connection and server waits for the next client.

# General Stracture

Messages are sent from the client one at a time and each message gets a response. This allows a big number of clients to sent instruction to the player.

## Messaging Details

All messages are encoded in ASCII and are unencrypted.

Communication is based on actions, requested actions and responded actions. Both requests and responses have a header, same for each action set, followed by a body which is optional and differs from action to action. Headers are to increase communication integrity.

Message form:

* Request: [Header][Data\*]
* Response: [Header][StatusCode][Data\*]

\*Optional

The “Protocol Actions” section in this document describes all available message types and in addition describes each one in the “request” and “response” subsections.

All numeric parameters are four (4) digits long except if another length is specified. Numbers below 10000 have preceding zeros (e.g. 0005). All values are decimal.

# Protocol Actions

Below are listed all message types with their specifications. Many of the request/response parts include parts in brackets “[]”. Those are information parts and are described in the “Information Parts” section.

Responses after header are followed by a status code. This is described in the “Status Codes” section below.

## Set player type

Sets the player playback type

Header: PT

### Request:

Body: [PlayerType]

* PlayerType: One of the following. Case sensitive
  + aud: Initiates audio player
  + mid: Initiates midi player
  + svi: Initiates Single Video Player
  + mvi: Initiates Multi Video Player

### Response

Body: [StatusCode]

## Set Image Addon

Sets an image on top of video. Used only on Single Player mode.

Header: SI

### Request:

Body: [VisibleObjectPart][ImageFilename]

* ImageFilename: Full path and file name of the image.

### Response:

Body: [StatusCode]

## Set Text Addon

Sets a piece of text on top of video. Used only on Single Player mode.

Header: ST

### Request

*Not implemented*

### Response

*Not implemented*

## Remove Addon

Removes the specified addon. Used only on Single Player mode.

Header: RA

### Request:

Body: [AddonId]

* AddonId: The id of the addon to remove. Numeric value.

### Response:

Body: [StatusCode]

## Play

Request for playback. It can contain from 1 to 16 media files at the same time.

Header: PL

### request

Body: [TrackPart]…

* There can be 1 to 16 track parts, one next to another.

### Response

Body: [StatusCode]

## Stop

Stops playback.

Header: SP

### Request

Body: -

### Response

Body: [StatusCode]

## Pause

Pauses playback.

Header: PA

### request

Body: -

### Response

Body: [StatusCode]

## Resume

Resumes playback

Header: RS

### request

Body: -

### Response

Body: [StatusCode]

## Seek

Seeks in playback. If multiple files are playing, the playback time is the one of the longest file.

Header: SK

### request

Body: [Milliseconds]

* Milliseconds after playback started. No matter the length of that part. Numeric value.

### Response

Body: [StatusCode]

## Volume

Sets the volume of the playback. Scale is linear.

Header: VE

### Request

Body: [Volume]

* Volume: Three digit long value. Values below 100 have preceding zeros. Numeric value.

### Response

Body: [StatusCode]

## Set Rate

Sets the playback rate on video. Scale is linerar.

Header: RT

### Request

Body: [Rate]

* Rate: Value indicating the playback rate. Numeric value

### Response

Body: [StatusCode]

## Termination

Instructs the player to terminate after stopping playback. Response is sent just before player terminates.

Header: DE

### request

Body: -

### Response

Body: [StatusCode]

## Window Layout

Moves the playback window.

Header: WL

### request

Body: [MonitorId][LayoutPart]

* MonitorId: Available monitor IDs can be retrieved via the “DISPLAY DEVICE INFO” message. Numeric value.

### Response

Body: [StatusCode]

## Video Layout

Moves video streams on the playback window. Only used in Multi Video mode.

Header: VL

### request

Body: [VisibleLayoutPart]…

* VisibleLayoutPart: 1 to 16 parts next to each other

### Response

Body: [StatusCode]

## Display device Info

Gets a list with details for all display devices on the player’s system.

Header: DI

### Request

Body: -

### Response

Body: [StatusCode][DisplayDevicePart]

* DisplayDeviceParts: 1 to 10 parts next to each other.

## Sound Fx

Sets sound effects for audio.

Header: SF

### Request

Body: [Effect]…

There can be 1 to 8 sound effect data. All information parts that start with “effect” can be added here.

### Response

Body: [StatusCode]

## Sound 3d

Sets 3D sound parameters for audio.

Header: S3

### Request

Body: [DopplerFactor][RollOffFactor][MinDistance][MaxDistance][SourceX][SourceY][SourceZ]

* DopplerFactor: Range 0-10. Semi logarithmic. Numeric value.
* RollOffFactor: Range 0-10. Semi logarithmic. Numeric value.
* MinDistance: Minimum audible distance. Semi logarithmic. Numeric value.
* MaxDistance: Maximum audible distance. Semi logarithmic. Numeric value.
* SourceX: Coordinate X of sound source. Numeric value.
* SourceY: Coordinate X of sound source. Numeric value.
* SourceZ: Coordinate X of sound source. Numeric value.

### Response

Body: [StatusCode]

## Midi Properties

Sets the midi properties.

Header: MP

### Request

Body: [ReverbState][ChorusState][Tempo]

* ReverbState: “1” is effect is enabled, “0” otherwise.
* ChorusState: “1” is effect is enabled, “0” otherwise.
* Tempo: Range 0.1-10. Numeric value.

### Response

Body: [StatusCode]

## Midi output Port Info

Gets information about system’s midi output ports.

Header: MO

### Request

Body: -

### response

Body: [Delimiter Part][PortName]…

* There can be several sets of DelimiterPart+PortName
* PortName: Midi output port description.

## Set Midi Output Port

Sets the midi output port.

Header: SO

### Request

Body: [PortName]

* PortName: Midi output port description retrieved using MidiOutputPortInfo message.

### Response

Body: [StatusCode]

## Set Dls

Associates a .dls file with the midi playback instruments.

Header: DS

### Request

Body: [DlsFilename]

* DlsFilename: The full path of the dls file.

### Response

Body: [StatusCode]

## Set Frequency

Sets the frequency of the wav file.

Header: FQ

### Request

Body: [Frequency]

* Frequency value in Hz. Values from 100 to 100.000. Long numeric type

### Response

Body: [StatusCode]

# Status Codes

## Success

Message: OK

Description: Everything went ok; request was served without any errors.

## Failure

Message: ER

Description: In case something went wrong but it is acceptable. Server can continue without a problem.

## Bad Response

Message: BD

Description: Is sent when something goes terribly wrong indicating internal server failure. It’s not sure that server can continue serving without any problems.

Client provides bad response also in case of time out or if the response doesn’t make sense (random data). The last two are not actual responses but client provides it to inform user.

# Information Parts

## Delimiter Part

Message: Double colon (::). It is added on parameters without standard length, in order for parser to split message.

## Layout Part

Message: [X][Y][WIDTH][HEIGHT]

* X: Distance in percentage from the left border of the area.
* Y: Distance in percentage from the top border of the area.
* WIDTH: Percentage width of the area.
* HEIGHT Percentage height of the area.

\*All values are numeric.

## Visible Layout Part

Message: [LayoutPart][ALPHA]

* ALPHA: Transparency. 0 for transparent whilst 255 for opaque. Numeric value.

## Visible Object Part

Message: [ID][VisibleLayoutPart]

* ID: positive 4 digits long. Numeric value.

## Track Part

Message: [Delimiter Part][Id][Filename]

* Id: Number 1 to 16. Numeric value.
* Filename: Full path of the media file

## Display Device Part

Message: [MonitorId][LayoutPart]

* MonitorId: Unique id that identifies a monitor. Same as in Display Settings on Control panel. Numeric value.

## Effect Chorus

Message: [Delimiter Part]CH[wetDryMix][depth][feedback][frequency][delay][EffectWaveformPart][EffectPhasePart]

* wetDryMix: Range: 0 to 100. Numeric value.
* depth: Range: 0 to 100. Numeric value.
* feedback: Range: -99 to 99. Signed numeric value.
* frequency: Range: 0 to 10.
* delay: Range: 0 to 20.

## Effect Compressor

Message: [Delimiter Part]CM[gain][attack][release][threshold][ratio][preDelay]

* gain: Range: -60 to 60. Numeric value.
* attack: Range: 0 to 500. Numeric value.
* release: Range: 50 to 3000. Numeric value.
* threshold: Range: -60 to 0. Numeric value.
* ratio: Range: 1 to 100. Numeric value.
* preDelay: Range: 0 to 4. Numeric value.

## Effect Distortion

Message: [Delimiter Part]DS[gain][edge][postEqCenterFreq][postEqBandwidth][preLowpassCutoff]

* gain: Range: -60 to 0.Signed numeric value.
* edge: Range: 0 to 100.Signed numeric value.
* postEqCenterFreq: Range: 100 to 8000.Signed numeric value.
* postEqBandwidth: Range: 100 to 8000.Signed numeric value.
* preLowpassCutoff: Range: 100 to 8000.Signed numeric value.

## Effect Echo

Message: [Delimiter Part]EC[wetDryMix][feedback][leftDelay][rightDelay][panDelay]

* wetDryMix: Range: 0 to 100.Signed numeric value.
* feedback: Range: 0 to 100.Signed numeric value.
* leftDelay: Range: 1 to 2000.Signed numeric value.
* rightDelay: Range: 1 to 2000.Signed numeric value.
* panDelay: Range: 0 to 1.Signed numeric value.

## Effect Flanger

Message: [Delimiter Part]FL[wetDryMix][depth][feedback][frequency][delay][EffectWaveformPart][EffectPhasePart]

* wetDryMix: Range: 0 to 100.Signed numeric value.
* depth: Range: 0 to 100.Signed numeric value.
* feedback: Range: -99 to 99.Signed numeric value.
* frequency: Range: 0 to 10.Signed numeric value.
* delay: Range: 0 to 4.Signed numeric value.

## Effect Gargle

Message: [Delimiter Part]GA[rate][EffectWaveformPart]

* rate: Range: 1 to 1000.Signed numeric value.

## Effect ParamEq

Message: [Delimiter Part]EQ[centerFreq][bandwidth][gain]

* centerFreq: Range: 80 to 16000.Signed numeric value.
* bandwidth: Range: 1 to 36.Signed numeric value.
* gain: Range: -15 to 15.Signed numeric value.

## Effect Reverb

Message: [Delimiter Part]RV[inGain][reverbMix][reverdTime][highFreqRtRatio]

* inGain: Range: -96 to 0.Signed numeric value.
* reverbMix: Range: -96 to 0.Signed numeric value.
* reverdTime: Range: 0 to 3000.Signed numeric value.
* highFreqRtRatio: Range: 0 to 1.Signed numeric value.

## Effect Phase Part

Message: [PhaseDegrees]

* PhaseDegrees: Number of degrees. Signed numeric value.

## Effect Waveform Part

Message: [WaveformType]

* WaveformType: One of the following.
  + - T: Triangle
    - Q: Square
    - S: Sine

# Examples

## Set Image

Request: SI000100330042003400290150c:\test.png

Alpha

Layout part

Visible layout part

Id

Visible object part

Filename

Header

Response: SIOK

Status code

Header