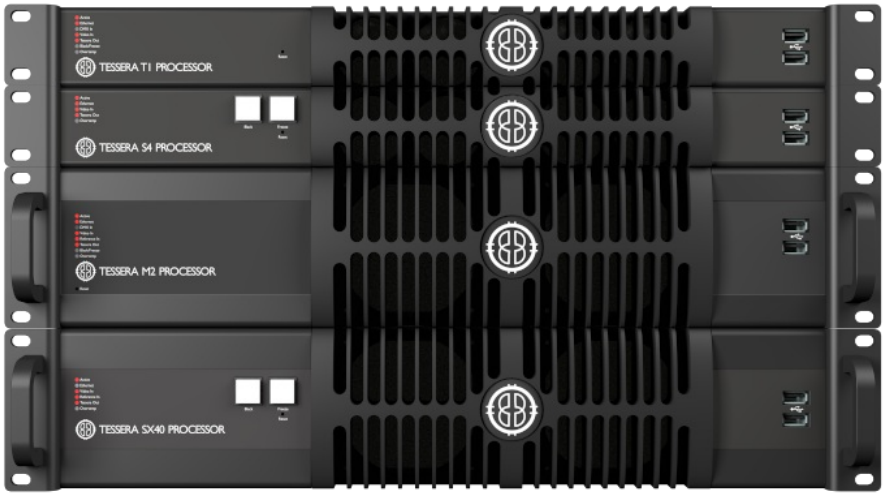
TESSERA PROCESSING IP CONTROL API

SOFWARE VERSION: 3.1.0.BETA4



CONTENTS

1. INTRODUCTION

As of version 3.1.0 Tessera processors support remote query and control/triggering functionality over a variety of IP-based protocols via a filesystem-like, RESTful API. This document describes how to access the information available and the format in which it is presented.

The API currently focuses on functionality needed for runtime control of the processor, it does not seek to offer all functions of the processor UI. More functionality will be added in future releases.

In order to use IP control it must be enabled in the Live Control tile in the processor user interface. The processor on the client must be on the same network and have a compatible IP address configuration.

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SUPPORTED PROTOCOLS

The following protocols are supported by the Tessera API:

- **HTTP** - standard requests via an HTTP client (e.g. web browser)
- **Commandline TCP socket** - Telnet-style text-based commands sent over TCP

Examples of use of each protocol are detailed after the generic control section. All paths, tags and commands are case-insensitive for all protoocols.

2. API

DATA TYPES

The following endpoint data types are supported:

- **string**: text string of up to 128 UTF-8 encoded characters
- **bool**: boolean state, true or false
- **integer**: signed 16-bit integer, range -32768 to 32767
- **float**: floating point value
- **enum**: string enumeration representing one of a discrete set of possible values

COMMANDS

- **get**: get one or more endpoints' value(s)
- **set**: set a endpoint or group of endpoints' value(s)
- **list**: show a summary of available endpoints starting from any position in the API tree
- **help**: show help text for an endpoint or directory detailing what the endpoint represents, d format and range

Examples of each command are given in the protocol section.

ACCESS SPECIFIERS

The following access specifiers are supported:

- **R/W**: the endpoint is both readable and writable
- **R/O**: the endpoint is read-only and may not be written to
- **W/O**: the endpoint is write-only and may not be read

ERRORS

The following errors may be returned as the result of a command operation:

- **Path not found**: the requested endpoint path was not recognised
- **Bad operation**: operation was not valid, e.g. trying to set a read-only endpoint
- **Not supported**: not supported by the hardware platform or not yet implemented
- **Missing input parameter**: required input parameters are missing or malformed
- **Bad input parameter type**: one of the input parameters had an incorrect type or format
- **Bad input parameter value**: one of the input parameters had an invalid/out of range value
- **Access denied**: insufficient privilege level for the requested operation
- **No project loaded**: the target processor does not have a project loaded
- **Object not found**: the requested object (e.g. panel) was not found
- **Operation failed**: general runtime failure

DYNAMIC PATHS

Some paths in the API are dynamic in that they depend on the project configuration. For example, accessing groups properties depends on what groups have been created in the project. The dynamic sections in the tree are marked with brackets, for example {number}.

3. FULL ENDPOINT REFERENCE

API TREE STRUCTURE

```
api/
  groups/
    items/
      {number}/
        brightness
        colour-temperature
        dark-magic/
          enabled
        gains/
          blue
          green
          intensity
          red
        gamma
        global-colour-override
        global-gains-override
        name
        puretone/
          enabled
  input/
    active/
      refresh-rate
      resolution/
        height
        width
      source/
        port-number
        port-type
  output/
    global-colour/
      brightness
      colour-temperature
      dark-magic/
        enabled
      gains/
        blue
        green
        intensity
        red
      gamma
      puretone/
        enabled
    network/
      cable-redundancy/
        loops/
          {loop-number}/
            state
      failover/
        settings/
          enabled
          modes/
            on-button-press
            on-partner-fail
            on-partner-video-fail
            prefer-primary
          role
        state/
          is-active
          is-partner-present
          partner-absence-duration
          partner-name
          partner-serial
          partner-video-absence-duration
  override/
    blackout/
```

```
        enabled
        fade-time
    freeze/
        enabled
    test-pattern/
        enabled
        format
        type
panels/
    items/
        {serial}/
            type
    statistics/
        associated-count
        error-count
        online-count
presets/
    active/
        name
        number
    items/
        {number}/
            name
            status
processing/
    colour-correct/
        enabled
    colour-replace/
        enabled
    curves/
        enabled
    osca/
        module-correction-enabled
        seam-correction-enabled
    scaler/
        enabled
system/
    current-date-time
    processor-type
    software-version
    uptime
```

ENDPOINTS DESCRIPTION

GROUPS

GROUP BRIGHTNESS

Path: **groups/items/{number}/brightness**
Description: Gets or sets the group output brightness/luminance
Data type: float
Range: 0 - 10000
Access Specifier: ReadWrite

GROUP COLOUR TEMPERATURE

Path: **groups/items/{number}/colour-temperature**
Description: Gets or sets the group colour temperature
Data type: float
Range: 2000 - 11000
Access Specifier: ReadWrite

GROUP DARK MAGIC ENABLED

Path: **groups/items/{number}/dark-magic/enabled**
Description: Enables or disables group Dark Magic
Data type: bool

Access Specifier: ReadWrite

GROUP BLUE GAIN

Path: **groups/items/{number}/gains/blue**
Description: Gets or sets the value of the group blue gain
Data type: float
Range: 0 - 100
Access Specifier: ReadWrite

GROUP GREEN GAIN

Path: **groups/items/{number}/gains/green**
Description: Gets or sets the value of the group green gain
Data type: float
Range: 0 - 100
Access Specifier: ReadWrite

GROUP INTENSITY GAIN

Path: **groups/items/{number}/gains/intensity**
Description: Gets or sets the value of the group intensity gain
Data type: float
Range: 0 - 100
Access Specifier: ReadWrite

GROUP RED GAIN

Path: **groups/items/{number}/gains/red**
Description: Gets or sets the value of the group red gain
Data type: float
Range: 0 - 100
Access Specifier: ReadWrite

GROUP OUTPUT GAMMA

Path: **groups/items/{number}/gamma**
Description: Gets or sets the group gamma value
Data type: float
Range: 0.2 - 4.0
Access Specifier: ReadWrite

GROUP GLOBAL COLOUR OVERRIDE

Path: **groups/items/{number}/global-colour-override**
Description: Enables or disables group global colour override
Data type: bool
Access Specifier: ReadWrite

GROUP GLOBAL GAINS OVERRIDE

Path: **groups/items/{number}/global-gains-override**
Description: Enables or disables group global gains override
Data type: bool
Access Specifier: ReadWrite

GROUP NAME

Path: **groups/items/{number}/name**
Description: Gets or sets the group name
Data type: string
Access Specifier: ReadWrite

GROUP PURE TONE ENABLED

Path: **groups/items/{number}/puretone/enabled**
Description: Enables or disables group PureTone
Data type: bool
Access Specifier: ReadWrite

INPUT

INPUT REFRESH RATE

Path: **input/active/refresh-rate**
Description: Active video input refresh rate
Data type: float
Range: 23.5 - 241.0
Access Specifier: ReadOnly

INPUT RESOLUTION HEIGHT

Path: **input/active/resolution/height**
Description: Active video input height
Data type: int
Range: 32 - 4096
Access Specifier: ReadOnly

INPUT RESOLUTION WIDTH

Path: **input/active/resolution/width**
Description: Active video input width
Data type: int
Range: 32 - 4096
Access Specifier: ReadOnly

INPUT PORT NUMBER

Path: **input/active/source/port-number**
Description: Which physical port instance is currently enabled for video input. For example, SDI A = port 1, SDI B = port 2. The available number of port instances for any port type will vary based on the processor hardware variant.
Data type: int
Range: 1 - 2
Access Specifier: ReadWrite

INPUT PORT TYPE

Path: **input/active/source/port-type**
Description: Which physical port instance is currently enabled for video input. The available types will vary based on the processor hardware variant.
Data type: enum
Supported values: dvi, hdmi, sdi
Access Specifier: ReadWrite

OUTPUT

OUTPUT BRIGHTNESS

Path: **output/global-colour/brightness**
Description: Write -1 to reset output brightness to calculated common maximum for available fixtures.
Data type: float
Range: -1 - 10000
Access Specifier: ReadWrite

OUTPUT COLOUR TEMPERATURE

Path: **output/global-colour/colour-temperature**
Description: Gets or sets the output colour temperature
Data type: float
Range: 2000 - 11000
Access Specifier: ReadWrite

DARK MAGIC ENABLED

Path: **output/global-colour/dark-magic/enabled**
Description: Enables or disables the processor's Dark Magic feature

Data type: bool
Access Specifier: ReadWrite

BLUE GAIN

Path: **output/global-colour/gains/blue**
Description: Gets or sets the value of the output blue gain
Data type: float
Range: 0 - 100
Access Specifier: ReadWrite

GREEN GAIN

Path: **output/global-colour/gains/green**
Description: Gets or sets the value of the output green gain
Data type: float
Range: 0 - 100
Access Specifier: ReadWrite

INTENSITY GAIN

Path: **output/global-colour/gains/intensity**
Description: Gets or sets the value of the output intensity gain
Data type: float
Range: 0 - 100
Access Specifier: ReadWrite

RED GAIN

Path: **output/global-colour/gains/red**
Description: Gets or sets the value of the output red gain
Data type: float
Range: 0 - 100
Access Specifier: ReadWrite

OUTPUT GAMMA

Path: **output/global-colour/gamma**
Description: Gets or sets the value of the output gamma
Data type: float
Range: 0.2 - 4.0
Access Specifier: ReadWrite

PURE TONE ENABLED

Path: **output/global-colour/puretone/enabled**
Description: Enables or disables PureTone
Data type: bool
Access Specifier: ReadWrite

REDUNDANTCABLELOOPSTATE

Path: **output/network/cable-redundancy/loops/{loop-number}/state**
Description: Current state of cable loop redundancy on the processor
Data type: enum
Supported values: loop-found, no-loop-found, incorrect-loop-found, one-to-many-error
Access Specifier: ReadOnly

FAILOVER ENABLED

Path: **output/network/failover/settings/enabled**
Description: Enables or disables failover mode on the processor
Data type: bool
Access Specifier: ReadWrite

BUTTON PRESS FAILOVER MODE ENABLED

Path: **output/network/failover/settings/modes/on-button-press**
Description: Enables or disables failover to backup processor when the processor's Blackout/Freeze buttons are

pushed
Data type: bool
Access Specifier: ReadWrite

PARTNER FAILOVER MODE ENABLED

Path: **output/network/failover/settings/modes/on-partner-fail**
Description: Enables or disables partner processor failover when processor failure is detected (e.g. the processor loses power)
Data type: bool
Access Specifier: ReadWrite

PARTNER VIDEO FAILOVER MODE ENABLED

Path: **output/network/failover/settings/modes/on-partner-video-fail**
Description: Enables or disables partner processor failover on video signal loss
Data type: bool
Access Specifier: ReadWrite

PREFER PRIMARY FAILOVER MODE ENABLED

Path: **output/network/failover/settings/modes/prefer-primary**
Description: If prefer primary processor failover mode is activated, when primary processor is functioning correctly, it will be automatically always be the active processor
Data type: bool
Access Specifier: ReadWrite

FAILOVER ROLE

Path: **output/network/failover/settings/role**
Description: Is processor's failover role Primary or Backup
Data type: enum
Supported values: primary, backup
Access Specifier: ReadOnly

FAILOVER IS ACTIVE

Path: **output/network/failover/state/is-active**
Description: Whether failover is active on the processor
Data type: bool
Access Specifier: ReadOnly

FAILOVER PARTNER IS ONLINE

Path: **output/network/failover/state/is-partner-present**
Description: Whether the backup processor is currently online and detected
Data type: bool
Access Specifier: ReadOnly

FAILOVER PARTNER ABSENCE DURATION

Path: **output/network/failover/state/partner-absence-duration**
Description: How long the backup processor has been absent for
Data type: string
Access Specifier: ReadOnly

FAILOVER PARTNER NAME

Path: **output/network/failover/state/partner-name**
Description: Name of the backup processor
Data type: string
Access Specifier: ReadOnly

FAILOVER PARTNER SERIAL

Path: **output/network/failover/state/partner-serial**
Description: Serial number of the backup processor
Data type: string
Access Specifier: ReadOnly

FAILOVER PARTNER VIDEO ABSENCE DURATION

Path: **output/network/failover/state/partner-video-absence-duration**
Description: Time since backup processor video source was last detected
Data type: string
Access Specifier: ReadOnly

OVERRIDE

BLACKOUT ENABLED

Path: **override/blackout/enabled**
Description: Enables or disables blackout
Data type: bool
Access Specifier: ReadWrite

BLACKOUT FADE TIME

Path: **override/blackout/fade-time**
Description: The value of the blackout fade time. The fade time may be adjusted between zero (snap) and 10 seconds
Data type: float
Range: 0.0 - 10.0
Access Specifier: ReadWrite

FREEZE ENABLED

Path: **override/freeze/enabled**
Description: Enables or disables video freeze
Data type: bool
Access Specifier: ReadWrite

TEST PATTERN ENABLED

Path: **override/test-pattern/enabled**
Description: Enables or disables test pattern output function
Data type: bool
Access Specifier: ReadWrite

TEST PATTERN FORMAT

Path: **override/test-pattern/format**
Description: Format of the generated test pattern
Data type: enum
Supported values: from-input, standard-dynamic-range, perceptual-quantiser, hybrid-log-gamma
Access Specifier: ReadWrite

TEST PATTERN TYPE

Path: **override/test-pattern/type**
Description: Determines which test pattern to generate. Defaults to SMPTE bars
Data type: enum
Supported values: brompton, brompton-overlay, red, green, blue, cyan, magenta, yellow, white, black, grid, scrolling-grid, checkerboard, scrolling-checkerboard, colour-bars, gamma, gradient, scrolling-gradient, strobe, smpte-bars, scrolling-smpte-bars, custom, forty-five-degree-grid, scrolling-forty-five-degree-grid
Access Specifier: ReadWrite

PANELS

PANEL TYPE

Path: **panels/items/{serial}/type**
Description: Panel type name
Data type: string
Access Specifier: ReadOnly

ASSOCIATED PANELS COUNT

Path: **panels/statistics/associated-count**
Description: The number of panels currently being controlled by the processor
Data type: int
Range: 0 - 2200
Access Specifier: ReadOnly

ERROR PANELS COUNT

Path: **panels/statistics/error-count**
Description: The number of online panels currently reporting an error state
Data type: int
Range: 0 - 2048
Access Specifier: ReadOnly

ONLINE PANELS COUNT

Path: **panels/statistics/online-count**
Description: The number of online panels currently detected by the processor
Data type: int
Range: 0 - 2048
Access Specifier: ReadOnly

PRESETS

ACTIVE PRESET NAME

Path: **presets/active/name**
Description: Name of the currently active preset
Data type: string
Access Specifier: ReadOnly

ACTIVE PRESET NUMBER

Path: **presets/active/number**
Description: Set to activate a preset
Data type: string
Access Specifier: ReadWrite

PRESET NAME

Path: **presets/items/{number}/name**
Description: Processor preset name
Data type: string
Access Specifier: ReadWrite

PRESET STATUS

Path: **presets/items/{number}/status**
Description: Preset activation status
Data type: bool
Access Specifier: ReadOnly

PROCESSING

14-WAY COLOUR CORRECT ENABLED

Path: **processing/colour-correct/enabled**
Description: Enables or disables the processor's 14-Way Colour Correct feature
Data type: bool
Access Specifier: ReadWrite

COLOUR REPLACE ENABLED

Path: **processing/colour-replace/enabled**
Description: Enables or disables the processor's Colour Replace feature
Data type: bool
Access Specifier: ReadWrite

CURVES ENABLED

Path: **processing/curves/enabled**
Description: Enables or disables the processor's Colour Curves feature
Data type: bool
Access Specifier: ReadWrite

OSCA MODULE CORRECTION ENABLED

Path: **processing/osca/module-correction-enabled**
Description: Enables or disables OSCA module correction
Data type: bool
Access Specifier: ReadWrite

OSCA SEAM CORRECTION ENABLED

Path: **processing/osca/seam-correction-enabled**
Description: Enables or disables OSCA seam correction
Data type: bool
Access Specifier: ReadWrite

SCALER

Path: **processing/scaler/enabled**
Description: Enables or disables scaler
Data type: bool
Access Specifier: ReadWrite

SYSTEM

CURRENT DATE AND TIME

Path: **system/current-date-time**
Description: Current date/time of processor in yyyy-MM-dd hh:mm:ss 24 hour format
Data type: string
Access Specifier: ReadOnly

PROCESSOR TYPE

Path: **system/processor-type**
Description: Processor hardware model
Data type: enum
Supported values: m2, s4, s8, t1, t8, sx40
Access Specifier: ReadOnly

SOFTWARE VERSION

Path: **system/software-version**
Description: Current version of software in format x.y.z
Data type: string
Access Specifier: ReadOnly

UPTIME

Path: **system/uptime**
Description: Time since processor boot in DDd HHh MMm SSs format
Data type: string
Access Specifier: ReadOnly

4. PROTOCOL EXAMPLE USAGE

HTTP

IP Control functionality over HTTP on port 80 is accessed via the **/api** path root to distinguish it from other web services.

All commands are accessible via the regular HTTP verbs GET (for read, list and help operations) and PUT (for set). There is also query-parameter based support for accessing all operations exclusively via GET for older clients that do not support extra verbs.

PUT request body data is passed/returned in standard JSON object format. If a PUT request returns a MissingInputParam error, a likely cause is that the JSON of the request body is either malformed or missing.

GET

Use GET verb with target path. Example to get input video refresh rate:

```
        Client:
        GET http://SERVERADDRESS/api/input/active/refresh-rate

    Server:
        HTTP/1.1 200 OK
        Content-Type: application/json
        { refresh-rate: 60 }
```

SET (ENDPOINT)

Use PUT verb including data to set in a "data" tag in a JSON body. Example to set output brightness:

```
    Client:
        PUT http://SERVERADDRESS/api/output/global-colour/brightness
        Content-Type: application/json
        { "data": 5000 }

    Server:
        HTTP/1.1 200 OK
        Content-Type: application/json
        { "brightness": 5000 }
```

Alternative using GET verb only: pass the value to set as a "set=" query parameter.

```
    Client: GET http://SERVERADDRESS/api/output/global-colour/brightness?set=5000
```

SET (DIRECTORY)

Pass the directory path, set=1 and one or more endpoint subpath=value as query parameters. Example to switch video input source to first SDI port:

```
    Client:
        PUT http://SERVERADDRESS/api/input/active/source
        Content-Type: application/json
        {
            "data" : {
                "port-type": "SDI",
                "port-index": 0
            }
        }

    Server:
        HTTP/1.1 200 OK
        Content-Type: application/json
        {
            "source": {
                "port-type": "SDI",
                "port-index": 0
            }
        }
```

Alternative using GET verb only: pass "set=1" as a query parameter along with all endpoint subpaths/values to set.

```
    Client: GET http://SERVERADDRESS/api/input/active/source?set=1&port-type=SDI&port-index=
```

LIST

Use GET verb passing "list=1" as a query parameter

```
 Client:
    GET http://SERVERADDRESS/api/override?list=1

Server:
    HTTP/1.1 200 OK
    Content-Type: application/json
    {
       "override":{
          "blackout":{
             "enabled":"Enable blackout",
             "fade-time":"Time taken to fade to black when blackout enabled"
          },
          "freeze":{
             "enabled":"Enable video freeze"
          },
          "test-pattern":{
             "enabled":"Enable test pattern output function",
             "format":"Format of the generated test pattern",
             "type":"Type of test pattern to generate."
          }
       }
    }
```

HELP

Use GET verb passing "help=1" as a query parameter

```
Client:
    GET http://SERVERADDRESS/api/override?help=1

Server:
    HTTP/1.1 200 OK
    Content-Type: application/json
    {
       "override":{
          "blackout":{
             "enabled":{
                "Access Specifier":"R/W",
                "Details":"Enables or disables blackout",
                "Name":"Blackout Enabled",
                "Summary":"Enable blackout",
                "Type":"Boolean"
             },
             "fade-time":{
                "Access Specifier":"R/W",
                "Details":"The value of the blackout fade time. The fade time
                may be adjusted between zero (snap) and 10 seconds",
                "Name":"Blackout Fade Time",
                "Summary":"Time taken to fade to black when blackout enabled",
                "Type":"Float (range: 0 - 10)"
             }
          },
          "freeze":{
             "enabled":{
                "Access Specifier":"R/W",
                "Details":"Enables or disables video freeze",
                "Name":"Freeze Enabled",
                "Summary":"Enable video freeze",
                "Type":"Boolean"
             }
          }
       }
    }
```

TELNET/TCP SOCKET

Commandline access may be achieved by connecting on TCP port 23.

Commands, paths and parameters should be separated by spaces. Data is returned as human-readable formatted text.

GET

Example to get input video refresh rate:

```
Client:
```

```
        get /input/active/refresh-rate
    Server:
        refresh-rate=60
```

SET (DIRECTORY)

Set video input source to first SDI port

```
    Client:
        set /input/active/source port-type=SDI,port-index=0
    Server:
        /source/
            port-type=SDI
            port-index=0
```

LIST

```
    Client:
        list /project/properties
    Server:
        /properties/
            blackout-fade-time: Time in seconds to fade to black
            test-pattern-format: Format of applied test pattern
```