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# Canvas JSON API specification

| Version | Date | Changes | | Author(s) |
|---|---|---|---|---|
| 1.0 | 23-04-2021 | First release | P&I | Hans Crijns |
| 1.1 | 09-06-2021 | Fixed minor errors/typo's | P&I | Hans Crijns |

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# Introduction

This document describes the CTOUCH ‘Remote Management API’ and it’s details. This document primary focusses on the Riva screen, but is written with applicability to future products in mind.

## API Overview

The API consists of a HTTP server running on the screen which reacts to JSON-requests. The JSON requests contain a hash, timestamp and command, the response is JSON as well and consist of version, type and result field. In case the server cannot respond in the right way, it will send an error message. All these are described in more detail in the next few chapters.

# Interface

- Request should be sent via a HTTP POST

- Request URL is: <ip-address>:<port>/managementapi

- With port being 8110

- Normally the response should be within 500ms.

Response with HTTP Status Code:

| HTTP Status Code | Situation |
|---|---|
| 400 | If not able to process request at all (malformed request) |
| 401 | If token is not valid |
| 200 | All other cases |

The response should always contain a body text. See below for the different type of responses.

- Timestamp: current time, in ISO 8601 format

- Hash: SHA-256 of timestamp + token

- Type api_request commands: get / set

Next to checking the hash, also the timestamp can be validated. If timestamp differs more than X hours for current time of screen, the request will be replied with an error message.

## Location of IP address and token

For the CTOUCH Canvas screen, the IP address used in the requests is the screen’s IP address,. This can be found in (yellow) Settings menu in Ethernet submenu, or in the Dealer menu in the Device info submenu.

The API Token is needs to be enabled in the Dealer menu in the Control Settings submenu with the ‘API token’ item.

After this is done, the API token is available in the Dealer menu in the device Info submenu as 8 digit/character 'Token Number'

## Security

The API requests run over http with the transmitted data not secret nor sensitive. An authentication mechanism is used to make sure the request comes from an authorized source.

The API provides a basic authorization/authentication mechanism using a authentication token based hash, generated at random by the screen and consisting of 8 characters. The token is be generated by the screen and stored on the mainboard. All API requests need to contain a hash based on this token and data from within the request.

Resetting of the token is not possible from a remote location: The user has to be physically present at the screen. When Remote Management API is disabled (in the dealer menu) and re-enabled later, a new token will be generated (this is also the way to "reset" the token)

## Read / Get

### Example of reading value

Read requests (for status or configuration information):

```
{"api_request": {
        "hash": "ba059253dd5b2878f4dca2427af4edd20b373accf33afa43b68d2f46c0044c20",
        "timestamp": "2019-08-14T13:56:32.427Z",
        "command": {
                "type":"get",
                "value_of": "Source"
        }
}}

# In these examples 6wfx9j1t is used as token to calculate the hash value
# above hash is SHA256("2019-08-14T13:56:32.427Z6wfx9j1t")
```

Response (in body):

```
{"api_response": {
        "version" : "1.0",
        "type" : "get",
        "result": {
                "Source" : "HDMI1"
        }
}}
```

### Example of reading object

A example with ConfigExport object:

```
{"api_request": {
        "hash": "ba059253dd5b2878f4dca2427af4edd20b373accf33afa43b68d2f46c0044c20",
        "timestamp": "2019-08-14T13:56:32.427Z",
         "command": {
                "type":"get",
                "value_of": "ConfigExport"
        }
}}
```

Response: (in body)

```
{"api_response": {
        "version" : "1.0",
        "type" : "get",
        "result": {
                "ConfigExport" : {
                        "PictureMode": "Dymamic","Contrast": 80,"Brightness": 65, etc
                }
        }
}}
```

## Write / Set

### Example of setting single value

Write requests for configuration settings:

```
{"api_request": {
        "hash": "cf1dafdc67bcb4904be45f020b059b17977177cdcae24bfa90e00c25ba184675",
        "timestamp": "2019-08-14T14:16:09.835Z",
        "command": {
                "type":"set",
                "Source": "HDMI1"
        }
}}
```

Response: (in body)

```
{"api_response": {
        "version" : "1.0",
        "type":"set",
        "result": {
                "Source": "HDMI1" – echo request
        }
}}
```

## Error response

Above examples show the response in case of a valid request. If the request cannot be carried out an error message will be replied: (in body)

```
{"api_response": {
        "version" : "1.0",
        "type":"error",
        "result": {
                "message": "Unknown key",
                "error-code": 30
        }
}}
```

Error-codes:
10 – Not authorized  - also return HTTP-Status Code 401  instead of 200
11 – Request outdated - also return HTTP-Status Code 401  instead of 200
20 – Invalid document - also return HTTP-Status Code 400  instead of 200
30 – Unknown key
40 – Invalid key value combination

## Command overview

| Key | RD | WR | Values |
|---|---|---|---|
| ***Picture*** | | | |
| PictureMode | X | X | Dynamic/Standard/Soft/User |
| Contrast | X | X | 0-100 |
| Brightness | X | X | 0-100 |
| Sharpness | X | X | 0-100 |
| Saturation | X | X | 0-100 |
| Backlight | X | X | 0-100 |
| Energy Mode | X | X | Auto/Normal/Balanced/Dynamic/Eco |
| ColorTemp | X | X | Cool/Normal/Warm/User |
| ZoomMode | X | X | P2P/16:9 |
| | | | |
| ***Sound*** | | | |
| SoundMode | X | X | Standard/Music/Movie/Sports/User |
| Balance | X | X | 0-100 |
| Treble | X | X | 0-100 |
| Bass | X | X | 0-100 |
| AVC | X | X | On/Off |
| Surround | X | X | On/Off |
| SPDIFMode | X | X | RAW/PCM |
| MaxVolume | X | X | 0-100 |
| HumanPresenceDetection | X | X | On/Off |
| | | | |
| ***Input*** | | | |
| HDMI1 | X | X | On/Off |
| HDMI2 | X | X | On/Off |
| HDMI3 | X | X | On/Off |
| USB-C | X | X | On/Off |
| DP | X | X | On/Off |
| VGA | X | X | On/Off |

| | | | |
|---|---|---|---|
| OPS | X | X | On/Off |
| SlideIn | X | X | On/Off |
| Audio | X | X | On/Off |
| AutoSwitchSource | X | X | On/Off |
| HDMIEDID | X | X | 1.4/2.0 |
| HDMICEC | X | X | On/Off |
| HDMIARC | X | X | On/Off |
| Touch | X | X | On/Off |
| | | | |
| ***Power*** | | | |
| NoSignalPowerOff | X | X | Off/1m/3m/5m/10m/15m/30m/45m/60m |
| StartUpByExternal | X | X | On/Off |
| OnTimerPeriod | X | X | Once/Everyday/MonToFri/MonToSat/SatToSun |
| OnTimerTime | X | X | 00:00 – 23:59 |
| OffTimerPeriod | X | X | Once/Everyday/MonToFri/MonToSat/SatToSun |
| OffTimerTime | X | X | 00:00 – 23:59 |
| PowerOnMode | X | X | Direct/Stand-by/Memory |
| PowerOnSource | X | X | Memory/HDMI1/HDMI2/HDMI3/USB-C/DP/VGA/PC/Audio |
| PowerOnVolume | X | X | Memory/0-100  (combination with Preset value) |
| PowerOnOPSDirect | X | X | On/Off |
| CTOUCHButton | X | X | On/Off |
| | | | |
| ***General*** | | | |
| DateTime | X | X | ISO8601-format |
| Language | X | X | English/French/Nederlands/Deutsch |
| IRLock | X | X | On/Off |
| NetworkLock | X | X | On/Off |
| | | | |
| ***Connectivity*** | | | |
| UARTBaudRate | X | X | 1200/4800/9600/19200/38400/57600/115200 |
| UARTID | X | X | 0-255 |
| SettingsMenuPincode | X | X | On/Off |

| | | | |
|---|---|---|---|
| ScreenMutePeroid | X | X | Off/5m/10m/15m |
| USBCEthernet | X | X | On/Off |
| SlideInEthernet | X | X | On/Off |
| OPSEthernet | X | X | On/Off |
| DockEthernet | X | X | On/Off |
| WakeOnLan | X | X | On/Off |
| USB | X | X | On/Off/TouchOnly |
| | | | |
| ***Control*** | | | |
| Source | X | X | HDMI1/HDMI2/HDMI3/USB-C/DP/VGA/PC/Audio |
| Freeze | X | X | On/Off |
| Volume | X | X | 0-100 |
| Volume_Mute | X | X | On/Off |
| Backlight_Mute | X | X | On/Off |
| Power | X | X | On/Off |
| | | | |
| ***Info*** | | | |
| ProductName | X | - | CTOUCH Canvas |
| API_Version | X | - | 0-255 |
| DisplayInfo | X | - | Device model, Serial Number, Resolution, STM firmware, Main firmware |
| DisplayUsage | X | - | Total operation time |

## Python example test code

```
import datetime, hashlib, requests

# Install and use:
# 1. Download Python at https://www.python.org/downloads/
# 2. Install requests from commandline: pip install requests
# 3. Copy script and execute from commandline(example): python jsontest.py

## Send get or set command to screen
def getset(ipval, tokenval, cmdval, parameterval, value = ''):
        timestamp = datetime.datetime.utcnow().strftime('%Y-%m%dT%H:%M:%S.%f')[:3] + 'Z'
        hv = (timestamp + tokenval).encode('utf-8')
        hashval = hashlib.sha256(hv).hexdigest()

        if cmd == 'get':
                payload =
{'api_request':{'hash':hashval,'timestamp':timestamp,'command':{'type':'get','value_of':paramete
rval}}}
        else:
                payload =
{'api_request':{'hash':hashval,'timestamp':timestamp,'command':{'type':'set', parameterval:
value}}}

        try:
                r = requests.post(url = 'http://' + ipval + ':8110/managementapi', json = payload,
timeout = 3)
        except Exception as e:
                sys.exit("Error: No (good) reponse from screen; Possibly wrong IP address used?")
        return(r.json())

## Example execution of getset-function
if __name__ == "__main__":
        ip = '192.168.108.70'
        token = 'bz7gm494'
        parameter = 'Source'
        setvalue = 'HDMI2'

        # Get command example
        cmd = 'get'
        gvalue = getset(ip, token, cmd, parameter)
        print(gvalue)

        # Get command example
        cmd = 'set'
        svalue = getset(ip, token, cmd, parameter, setvalue)
        print(svalue)
```

Notes:

- Indentation is important in Python; Copy indentation exactly from above
- Some lines (payload and requests lines) are overflowing into a next line in this document, when using the code code: place them on one line! (just copy and paste into .py file)
- Make sure you update ‘ip’ and ‘token’ to values from your screen