Tracking Hub Command Interface

Version 1.8

Viz Virtual Studio

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Created on

2025/09/11

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1 Communication with Tracking Hub

Tracking Hub provides a command interface similar to that offered by Viz Engine. The default port is `20000`.

1.1 Command Syntax

```
<token> <location>[*<property>]* <command> [<parameter>]*
```

Where:

- **<token>:** The token tells the receiver how to interpret the message, if an answer is expected etc.
- **<location>:** Reference to an object or a collection of objects.
- **<property>:** Reference property or properties or member objects contained in the root object or collection.
- **<command>:** The command to be executed on the property or object.
- **<parameter>:** Command parameter or parameters.

1.2 Tokens

> 0	Client receives and answers carrying the same token.
-1	Client receives no answer.
-2	(only for message *from* Tracking Hub) Reserved for notifications.
-3	(only for message *from* Tracking Hub) Status message.

1.3 Answer

You always get a string as an answer. It starts with a status code followed by the actual content (for example, XML) or an error message.

```
(0|1) [string|xml|message]
```

0	Failure	Followed by an optional error message.
1	Success	Followed by an optional status message or an answer in a prearranged format.

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1.4 Long Pattern for Answer Handling

```
if (answer != null) {
    // Handle error answer
    if (CommandMessage.IsFailure(answer)) {
        if (CommandMessage.IsErrorMessage(answer)) {
            Log.Error("{0} returned an error: {1}", command,
CommandMessage.ExtractMessage(answer));
            return;
        }
    }

    // Handle success answer
    if (CommandMessage.IsSuccess(answer)) {
        // HANDLE VALID ANSWER HERE
        return;
    }
    Log.Error("{0} returned an invalid answer", command);
} else {
    // No answer at all
    Log.Error("{0} returned no answer", command);
}

This pattern is implemented in: CommandMessage.IsSuccess(string answer, string
command)
```

1.5 Short Pattern for Answer Handling

```
if (CommandMessage.IsFailure(answer)) {
    // REPORT ERROR HERE
    return; // then bail out
}
```

1.6 Failure Messages

> ⚠ **Note:** Any command message may fail and return an error. It is because of the command interface having changed with a new version of Tracking Hub.

The most common generic error messages are:

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1.6.1 Unknown Location

```
0 Unknown location: <location>
```

Returned if the top level location of the command message is unknown.

1.6.2 Unknown Property

```
0 Unknown property: <location>[*<property>]*
```

Returned if command message starts with a known location, but contains an unknown property in the following property path.

1.6.3 Unknown Command

```
0 Unknown command: <location>[*<property>]* <command>
```

Returned if command message starts with a known location and valid property path, but ends on an unknown command.

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2 Commands

2.1 MAIN

Tracking Hub matching, available ports, IPs, etc. (MAIN*):

```
MAIN*COMPORTS GET = <portname>[,<portname>]*
MAIN*PARAMETERLIST GET = <parametername>[,<parametername>]*
MAIN*PROTOCOLS GET = <protocolname>[,<protocolname>]*

MAIN*LOCAL_IPS GET = <ip>[,<ip>]*
MAIN*VIZ_IP SET <ip> or <adaptername>
            GET = <adaptername>
MAIN*TRACKING_IP SET <ip> or <adaptername>
                 GET = <adaptername>

MAIN*CONFIGURATIONS GET = [<name>[,<name>]*]?

//MAIN START not used
//MAIN STOP  not used
//MAIN*RUNNING GET = <bool> not used

MAIN*WRITE_LOG_FILE SET <bool>
                    GET = <bool>
MAIN*FORWARD_LOG SET <bool>
                 GET = <bool>

MAIN*LICENSE SET <key>
             GET = <name>,<number of cameras>,<days left> (name is either Cameras or
Dongle, -1 means unlimited cameras/days)

MAIN*DEBUGLEVEL SET <int>   (range is  1 ... 10, 1 only emergency, 10 all)
                GET = <int>

MAIN*DEBUGLEVEL++
MAIN*DEBUGLEVEL--
```

2.2 CONFIG

Store configuration on the Tracking Hub machine:

```
CONFIG EXISTS = 0|1
CONFIG SAVE
CONFIG LOAD
CONFIG SET = <name>
```

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```
CONFIG GET = <name>

CONFIG RESET

CONFIG*BASE SAVE
CONFIG*BASE DISMISS
```

2.3 STUDIO

Base studio configuration (STUDIO*):

```
STUDIO GET = <xml>

STUDIO*MODE SET FREE|AV|VIZ
            GET = SET
STUDIO*FREQUENCY SET 50|60|59.94
                 GET = SET
STUDIO*SHAPE SET LSHAPE_LEFT|LSHAPE_RIGHT|USHAPE|WALL|HOLE
             GET = SET
STUDIO*CYC SET <xml>
           GET = SET
STUDIO*TIMING GET = <bool>
STUDIO*SENDDELAY GET = <int> [in ms]
                 SET   <int> [in ms]
STUDIO*BUSYLOOP  GET = <int> [type]
                 SET   <int> [type]
```

2.4 TEMPLATES

Templates stored on the Tracking Hub machine (TEMPLATES*):

```
TEMPLATES*COUNT GET = <amount of templates>
TEMPLATES LIST = <name1, name2, . . .>
TEMPLATES*<name> GET = <xml>
TEMPLATES*<name> SET <xml>
TEMPLATES*<name> DELETE
TEMPLATES*<name> LOAD = <xml>
TEMPLATES*<name> USE <name>
TEMPLATES*<name> SAVE <ts_name1 ts_name2 . . . rig_name1 rig_name2 . . . 1 2>
```

2.5 TRACKING SYSTEMS

Tracking Systems set up on the Tracking Hub machine (TRACKING_SYSTEMS*)

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```
TRACKING_SYSTEMS*COUNT GET = <number of tracking systems>

TRACKING_SYSTEMS CREATE <name>
TRACKING_SYSTEMS DELETE <name>
TRACKING_SYSTEMS XMLFILES GET = <string>
TRACKING_SYSTEMS*<idx/name> GET = <xml>
TRACKING_SYSTEMS*<idx/name> CONNECT
TRACKING_SYSTEMS*<idx/name> DISCONNECT
TRACKING_SYSTEMS*<idx/name>*INDEX GET = <index>

TRACKING_SYSTEMS*<idx/name>*NAME SET <name>
                                 GET = <name>
TRACKING_SYSTEMS*<idx/name>*SLOTINDEX SET <slotindex>
                                    GET = <slotindex>
TRACKING_SYSTEMS*<idx/name>*PROTOCOL SET <protocolname>
                                    GET = <protocolname>
TRACKING_SYSTEMS*<idx/name>*NETUSE SET <netuse>
                                  GET = <netuse>
TRACKING_SYSTEMS*<idx/name>*COMPORT SET <name>
                                   GET = <name>
TRACKING_SYSTEMS*<idx/name>*BAUDRATE SET <baud>
                                    GET = <baud>
TRACKING_SYSTEMS*<idx/name>*PARITY SET <baud>
                                  GET = <baud>
TRACKING_SYSTEMS*<idx/name>*STOPBITS SET <baud>
                                    GET = <baud>
TRACKING_SYSTEMS*<idx/name>*DATASIZE SET <baud>
                                    GET = <baud>
TRACKING_SYSTEMS*<idx/name>*HOST SET <ip>
                                 GET = <ip>
TRACKING_SYSTEMS*<idx/name>*PORT SET <port>
                                 GET = <port>
TRACKING_SYSTEMS*<idx/name>*XMLFILE SET <string>
                                   GET = <string>

TRACKING_SYSTEMS*<idx/name>*STATUS GET = DISCONNECTED|NOT_RECEIVING|BAD_TIMING|
GOOD_TIMING

//only in running mode
TRACKING_SYSTEMS*<idx/name>*PARAMETERS GET = <parametername>[,<parametername>]*

TRACKING_SYSTEMS*<idx/name>*SENDRAWDATA SET <bool>

TRACKING_SYSTEMS*<idx/name>*RAWDATA_OFFSET <parametername> ACT

TRACKING_SYSTEMS*<idx/name>*RAWDATA_OFFSET <parametername> SET <int>

// not in use any longer
//TRACKING_SYSTEMS*<idx/name>*SENDDELAY GET = <ms>
//                                      SET <ms>

//this command switches hexdumplogging
```

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```
TRACKING_SYSTEMS*<idx/name>*HEXLOG SET <bool>
                                   GET = <bool>

TRACKING_SYSTEMS*<idx/name>*TICKCOUNT SET <parametername, value>[,<parametername,
value>]
                                      GET = <parametername, value>[,<parametername,
value>]

TRACKING_SYSTEMS*<idx/name>*RCVTIMECORR SET <bool>
                                        GET = <bool>
```

2.6 LATTICES

Lattices set up on the Tracking Hub machine (LATTICES*):

```
LATTICES*COUNT GET = <zero-based index>
LATTICES CREATE <name>
LATTICES DELETE <name>
LATTICES LENSFILES GET = <string>
LATTICES LENSFILES RELOAD
LATTICES*<idx/name> CREATE PARENT|CHILD <childname>
LATTICES*<idx/name> GET = <xml>

LATTICES*<idx/name>*INDEX GET = <index>
LATTICES*<idx/name>*NAME SET <string>
                         GET = <string>
LATTICES*<idx/name>*FILTER_ZOOM SET <bool>
                                GET = <bool>

LATTICES*<idx/name>*TYPE SET SIMPLE_CAM|OBJECT|LATTICE
                         GET = SIMPLE_CAM|OBJECT|LATTICE

LATTICES*<idx/name>*SLOTINDEX SET <slotindex>
                              GET = <slotindex>

LATTICES*<idx/name>*<parameter>*NAME SET <string>
                                     GET = <string>
                                *OFFSET SET <float>
                                        GET = <float>
                                *INVERT SET <bool>
                                        GET <bool>
                                *DELAY SET <float>
                                       GET <float>
LATTICES*<idx/name>*TRACKINGDELAY SET <frames(float)>
LATTICES*<idx/name>*VISUAL_XML SET <xml>
                               GET = <xml>
LATTICES*<idx/name>*CALIBRATION SET <bool>
                                GET = <bool>
LATTICES*<idx/name>*CALIBRATIONDONE GET = <bool>
```

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```
LATTICES*<idx/name>*CALIBRATION_RANGE GET = <zoom_min> <zoom_max> <zoom> <focus_min>
<focus_max> <focus>
LATTICES*<idx/name>*LENSRANGE SET <lensrange_min> <lensrange_max>
                              GET = <lensrange_min> <lensrange_max>

LATTICES*<idx/name>*SCALEVAUES SET <ScXNear, ScXWide, ScYNear, ScYWide>
                               GET = <ScXNear, ScXWide, ScYNear, ScYWide>

LATTICES*<idx/name>* LENSFILE SET <string>
                              GET = <string>

LATTICES*<idx/name>* LENSFILE_LENSEXT SET <string>
                                      GET = <string>
```

2.7 SERVICES

Services set up on the Tracking Hub machine (SERVICES*):

```
SERVICES*COUNT GET = <zero-based index>
SERVICES*BY_INDEX*<idx> GET = <xml>
                        START
                        STOP
SERVICES*BY_INDEX*<idx>*SLOTINDEX GET = <slotindex>
                                  SET <slotindex>
SERVICES*BY_INDEX*<idx>*RUNNING GET = <bool>

SERVICES*BY_ID*<service_id> GET = <xml>
                            START
                            STOP
SERVICES*BY_ID*<service_id>*SLOTINDEX GET = <slotindex>
                                      SET <slotindex>
SERVICES*BY_ID*<service_id>*RUNNING GET = <bool>

SERVICES ADD PARAMETER ALL                          <ip> <port> = <service_id>
SERVICES ADD PARAMETER             <lattice_name>  <ip> <port> = <service_id>
SERVICES ADD TRACKING_TIMING       <ts_name>       <ip> <port> = <service_id>
SERVICES ADD COMMUNICATION_TIMING  <service_id>    <ip> <port> = <service_id>
SERVICES ADD CAMERA                <lattice_name>  <ip> <port> <cameranumber> =
<service_id>
SERVICES ADD OBJECT                <lattice_name>  <ip> <port> = <service_id>
SERVICES ADD TIMECODE              <timcode>       <ip> <port> = <service_id>

SERVICES REPLACE <service_id> (TRACKING_TIMING|COMMUNICATION_TIMING) (<ts_name>|
<service_id>)    <ip> <port>                = <service_id>
SERVICES REPLACE <service_id> (PARAMETER|OBJECT|TIMCODE)             (<lattice_name>|
<timcode>)  <ip> <port>                 = <service_id>
SERVICES REPLACE <service_id> CAMERA
<lattice_name>             <ip> <port> <cameranumber> = <service_id>
SERVICES REMOVE <service_id>
SERVICES REMOVE_ADDR <ip>
```

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```
SERVICES REMOVE_ALL
```

2.8 ROUTERS

Configure routers controlled by Tracking Hub (ROUTERS*):

2.8.1 List Available Router Models

```
ROUTERS*MODEL_LIST GET = <model>[,<model>]*
```

2.8.2 Manage Routers

```
ROUTERS ADD <model> <name> = <index>
ROUTERS REMOVE <name> | <index>
ROUTERS*COUNT GET = <count>
```

2.8.3 Configure Individual Routers

```
ROUTERS*<idx/name> GET = <xml>
ROUTERS*<idx/name>*INDEX GET = <index>
ROUTERS*<idx/name>*NAME SET <string>
                        GET = <string>
ROUTERS*<idx/name>*MODEL SET <model>
                         GET = <model>
ROUTERS*<idx/name>*AB_MODE SET <mode>
                           GET = <mode>
ROUTERS*<idx/name>*NETUSE SET <netuse>
                          GET = <netuse>
ROUTERS*<idx/name>*COMPORT SET <name>
                           GET = <name>
ROUTERS*<idx/name>*BAUDRATE SET <baud>
                            GET = <baud>
ROUTERS*<idx/name>*PARITY SET <baud>
                          GET = <baud>
ROUTERS*<idx/name>*STOPBITS SET <baud>
                            GET = <baud>
ROUTERS*<idx/name>*DATASIZE SET <baud>
                            GET = <baud>
ROUTERS*<idx/name>*HOST SET <ip>
                        GET = <ip>
ROUTERS*<idx/name>*PORT SET <port>
                        GET = <port>
ROUTERS*<idx/name> CONNECT
```

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```
ROUTERS*<idx/name> DISCONNECT
ROUTERS*<idx/name>*CONNECTED GET = <boolean>
ROUTERS*<idx/name>*INPUTS*<idx>*NAME SET <string>
                                    GET = <string>
ROUTERS*<idx/name>*OUTPUTS*<idx>*NAME SET <string>
                                     GET = <string>
ROUTERS*<idx/name>*CURRENT_PRESET SET <string>
                                  GET = <string>
```

2.8.4 Configure Presets of Individual Routers

```
ROUTERS*<idx/name>*PRESETS CREATE <name> = <index>
ROUTERS*<idx/name>*PRESETS DELETE <name>|<index>
ROUTERS*<idx/name>*PRESETS*COUNT GET = <count>
ROUTERS*<idx/name>*PRESETS*<idx/name> GET = <xml>
ROUTERS*<idx/name>*PRESETS*<idx/name>*NAME SET <string>
                                          GET = <string>
ROUTERS*<idx/name>*PRESETS*<idx/name> CONNECT <input-index> <output-index>
ROUTERS*<idx/name>*PRESETS*<idx/name> DISCONNECT <input-index> <output-index>
ROUTERS*<idx/name>*PRESETS*<idx/name>*CAMERAS ADD <ip> <port> <cameranumber> =
<index>
ROUTERS*<idx/name>*PRESETS*<idx/name>*CAMERAS REMOVE <index>
ROUTERS*<idx/name>*PRESETS*<idx/name>*CAMERAS*COUNT GET = <int>
ROUTERS*<idx/name>*PRESETS*<idx/name>*CAMERAS*<idx> GET = <xml>
ROUTERS*<idx/name>*PRESETS*<idx/name>*GPIIO ADD <devicename> <port> <pin> <pressed>
                                           GET  = <devicename> <port> <pin>
<pressed>
ROUTERS*<idx/name>*PRESETS*<idx/name>*GPIIO REMOVE
ROUTERS*<idx/name>*MANUAL_CONTROL GET = <xml>

ROUTERS*<idx/name>*MANUAL_CONTROL*ENABLED SET <boolean>
                                         GET = <boolean>

ROUTERS*<idx/name>*MANUAL_CONTROL CONNECT <input> <output>
ROUTERS*<idx/name>*MANUAL_CONTROL DISCONNECT <input> <output>
```

2.8.5 Delays per Router

```
ROUTERS*<idx/name>*PRESET_DELAY SET <double>
                                GET = <double>

ROUTERS*<idx/name>*ENGINE_DELAY SET <double>
                                GET = <double>
```

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2.9 GPIIO

GPIIO used on the Tracking Hub machine (gpiio).

```
GPIIO*COUNT GET = <count>

GPIIO*MONITOR START
GPIIO*MONITOR STOP
GPIIO*MONITOR GET = <boolean>

GPIIO*<idx/name> GET = <devicename> <count inputports> <count outputports>

GPIIO*<idx/name>*INDEX GET = <index>
GPIIO*<idx/<name>*NAME GET = <string>

Notifications (only sent from Tracking Hub) if gpi triggered when monitoring is on
GPIIO*MONITOR PRESSED  <devicename> <port> <pin>
GPIIO*MONITOR RELEASED <devicename> <port> <pin>
```

2.10 POST

Setup of the Tracking Hub post system.

2.10.1 Set the Timecode Sources for Live and Post

```
POST*LIVE_SOURCE SET  <string>
                 GET = <string>
POST*POST_SOURCE SET <string>
                 GET = <string>
POST*TIMECODE_SOURCES GET <string>[,<string>]*
```

2.10.2 Session Commands

```
POST*SESSION CREATE <string>(create a new session)
             START (starts recording)
             STOP (stops recording)
             GET_LIST = <string>[,<string>]
             LOAD <string>
             DELETE <string>
             INFO_GET = <string>;[,<string>]*
```

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2.10.3 Notifications

Loading saved session file progress as a percentage `FILE_PROGRESS <float>`. Loading of saved session file is complete `FILE_FINISH`.

2.10.4 Recording and Replay Commands

```
POST*PARAMETER_RECORDING GET <Parameter Name> = 1 (recording on) | 0 (recording off)
                         SET <Parameter Name> <0|1>
POST*PARAMETER_REPLAY GET <Parameter Name> = 1 (replay on) | 0 (replay off)
                      SET <Parameter Name> <0|1>
                      GET_DELAY <Parameter Name> = <float>
                      SET_DELAY <float>

TRACKING_SYSTEMS*<name>*RECORDING GET = 1 (recording on) | 0 (recording off)
                                  SET <0|1>
TRACKING_SYSTEMS*<name>*REPLAY GET = 1 (replay on) | 0 (replay off)
                               SET <0|1>
TRACKING_SYSTEMS*<index>*RECORDING GET = 1 (recording on) | 0 (recording off)
                                   SET <0|1>
TRACKING_SYSTEMS*<index>*REPLAY GET = 1 (replay on) | 0 (replay off)
                                SET <0|1>
TRACKING_SYSTEMS*<name>*REPLAY GET_DELAY = <float>
                               SET_DELAY <float>
TRACKING_SYSTEMS*<index>*REPLAY GET_DELAY = <float>
                                SET_DELAY <float>

SERVICES*RECORDING GET <service id> = 1 (recording on) | 0 (recording off)
                   SET <service id> <0|1>
SERVICES*REPLAY GET <service id> = 1 (replay on) | 0 (replay off)
                SET <service id> <0|1>
SERVICES*REPLAY GET_DELAY <service id> = <float>
SERVICES*REPLAY SET_DELAY <service id> <delay>
```

2.11 LENSFILE

Lensfile, load, save and change on the Tracking Hub machine (LENSFILE*).

```
LENSFILE*LOGIN <pwd> = <xml_lensfile> ??? correct error handling ???
LENSFILE*NEW
LENSFILE*LOCK <service_id> = <LockID>
LENSFILE*UNLOCK <LockID >
LENSFILE*XML_GET <LockID > = <xml_lenfsile>
LENSFILE*SELECT <lensfilename> =  lenfile (binary) loaded for edit
LENSFILE*SAVE <LockID,>
```

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```
LENSFILE*SAVEAS <LockID, name>

LENSFILE*GROUP SELECT <LockID  parameter>
LENSFILE*GROUP NEW <LockID  parameter>
LENSFILE*GROUP ADD < LockID , parameter >
LENSFILE*GROUP DELETE < LockID , parameter>
LENSFILE*GROUP PARAMETERMOVE <LockID , parameter groupID >
LENSFILE*GROUP PARAMETERMOVE <LockID , parameter >   //move into a new group

LENSFILE*PARAMETER<parameter>VALUEADD< LockID , zoom,focus >
LENSFILE*PARAMETER<parameter>VALUEDEL< LockID , zoom,focus >
LENSFILE*PARAMETER<parameter>VALUECHANGE< LockID , zoom,focus,newvalue>

LENSFILE*ACTIVE GET = all active services

LENSFILE*PROXY SEND<LockID,string>
LENSFILE*PROXY REQ < LockID string> = <answer>
```

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