

VAPIX® VERSION 3

Parameter Management



Parameter Management

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1 Overview

1.1 Description

The HTTP-based interface provides the functionality for getting and setting internal parameter values. This document describes the general syntax and values that are used to request and configure/alter parameters. There are two types of parameters. Dynamic parameters and non-dynamic parameters. All parameters are managed through the CGI `param.cgi`. The CGI-requests are then handled by the built-in web server in the Axis product.

All VAPIX® references are available at <http://www.axis.com/vapix>

Note

When requesting a parameter `root` is not needed in the request.

1.1.1 Non-dynamic parameters

Non-dynamic parameters are pre-configured and already exist in your Axis product. A non-dynamic parameter has one or more values. Some non-dynamic parameters are configurable and some are read only. A non-dynamic parameter has the following syntax:

```
ParentGroup.Parameter
```

Non-dynamic parameter groups can also have subgroups:

```
ParentGroup.Subgroup.Parameter
```

Example 1:

A non-dynamic parameter in a subgroup.

```
Properties.PTZ.DriverManagement
```

1.1.2 Dynamic parameters

Dynamic parameters are created at runtime. A dynamic parameter has the following syntax:

```
ParentGroup.P#.Parameter
```

The `P` in the second part refers to the first letter of the parent group. The group number `#` is added dynamically by the system in your Axis product. The last part `Parameter` is the actual parameter name.

Parameter groups can also have dynamic subgroups:

```
ParentGroup.P#.Subgroup.S#.Parameter
```

Example 2:

A dynamic parameter in a subgroup.

```
PTZ.Preset.P0.Position.P1.Name
```

1.1.3 URL Encoding

The URL for a request shall use the character encoding ISO/IEC 8859-1. The URL for a request must follow the standard way of writing a URL, (RFC 3986: Uniform Resource Identifiers (URI) Generic Syntax); that is, spaces and other reserved characters (";", "/", "?", ":", "@", "&", "=", "+", ",", and "\$") within a `<argument>` or a `<value>` must be replaced with `%<ASCII hex>`.

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1.1.4 User access rights

User access rights for CGI requests are determined by group membership.

User group	Description
viewer	Users with viewer, operator or administrator rights can access this parameters.
operator	Users with operator or administrator rights can access this parameters.
admin	Users with administrator rights can access this parameters.

1.2 Prerequisites

1.2.1 Identification

Property: `Properties.API.HTTP.Version=3`

Firmware: 5.00 and later.

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2 HTTP API

To handle the parameters of an Axis product you need to request the CGI `param.cgi`. This needs to be followed by the argument `action` and a valid value.

Access control: The CGI can be accessed by all users, but some requests require operator or admin rights.

Method: GET/POST

Syntax:

```
http://<servername>/axis-cgi/param.cgi?  
<argument>=<value> [&<argument>=<value>...]
```

With the following arguments and values:

Argument	Valid values	Description
<code>action=<string></code>	add remove update list listdefinitions	Add, remove, update or list parameters. See the following subsections for more information and examples. add = Add new parameters. remove = Delete parameters. update = Update parameters. list = List parameters. listdefinitions = Get parameter listing in XML-format.
<code>usergroup=<string></code>	anonymous viewer operator admin	Get a certain user access level. This might be necessary if the browser has cached the credentials or if "anonymous viewer login" is enabled. anonymous = Anybody on the network could access the Axis product (but not the admin tools) and without to log in. viewer = Viewer access rights. operator = Operator access rights. admin = Admin access rights.

Additional arguments depending on selected action.

2.1 Request "list"

The `list` request is used to list the parameters and their values. See also *page 9*.

Access control: Parameter dependent. The CGI can be accessed by all users, but a user can only list parameters that are accessible to that user (determined by access control of the parameter).

Syntax:

```
http://<servername>/axis-cgi/param.cgi?action=list [&<argument>=<value>...]
```

With the following arguments and values:

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Argument	Valid values	Description
<code>group=<string></code>	<code><group[.name]></code> <code>[,<group[.name]>...]</code>	Get the value of the parameter named <code><group>.<name></code> . If <code><name></code> is omitted, all the parameters of the <code><group></code> are returned. The parameters must be entered exactly as they are named in the Axis product. Wildcard (*) can be used when listing parameters. See example below. If this parameter is omitted, all parameters in the device are returned.
<code>responseformat=<string></code>	<code>rfc</code>	Get the HTTP response format according to RFC 1945. This argument should always be used.

Example 1:

List the Network parameters.

```
http://myserver/axis-cgi/param.cgi?action=list&group=Network
```

Example 2:

List the names of all ImageSource parameters (this request requires operator access).

```
http://myserver/axis-cgi/param.cgi?action=list&group=ImageSource.*.Name
```

2.1.1 Response "list"

1. Success

A list of parameter-value pairs is returned.

Response:

HTTP Code: 200 OK
Content-Type: text/plain

Body:

```
<parameter>=<value>  
<parameter>=<value>  
...
```

Example 3:

Properties query response (only a small part of the response is shown here).

```
root.Network.Media=auto  
root.Network.Autoneg=normal  
root.Network.Enabled=yes
```

2. Error

If the CGI request includes an invalid parameter, an error message is returned.

Response:

HTTP Code: 200 OK
Content-Type: text/plain

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Body:

```
# Error: <description>
```

2.2 Request "listdefinitions"

The `listdefinitions` request is used to list the parameters and their values. The response includes parameter name, value, security level, nice name and valid values (where applicable).

Access control: Parameter dependent. The CGI can be accessed by all users, but a user can only list parameters that are accessible to that user (determined by the parameter security level).

Syntax:

```
http://<servername>/axis-cgi/param.cgi?action=listdefinitions  
[&<argument>=<value>...]
```

With the following arguments and values:

Argument	Valid values	Description
<code>listformat=<string></code>	xmlschema	Response format.
<code>group=<string></code>	<code><group[.name]></code>	Get the parameter named <code><group>.<name></code> . If <code><name></code> is omitted, all the parameters of the <code><group></code> are returned. The parameters must be entered exactly as they are named in the Axis product. Wildcards (*) can be used when listing parameters. See example below. If this parameter is omitted, all parameters in the device are returned.

Example 4:

List the Properties parameters.

```
http://myserver/axis-cgi/param.cgi?action=listdefinitions  
&listformat=xmlschema&group=Properties
```

Example 5:

List parameters using wildcards.

```
http://myserver/axis-cgi/param.cgi?action=listdefinitions  
&listformat=xmlschema&group=ImageSource.*.Name
```

2.2.1 Response "listdefinitions"

Successful request: Response in XML format

Response:

HTTP Code: 200 OK

Content-Type: text/xml

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Body:

```
<?xml version="1.0" encoding="iso-8859-1" ?>
<parameterDefinitions [attributes] >
  <model> [string] </model>
  <firmwareVersion> [int.int] </firmwareVersion>
  <group name="[string]">
    [additional group name start-tags]
    parameter
    parameter
    ...
    [additional group name end-tags]
  </group>
  ...
</parameterDefinitions>
```

Where parameter=

```
parameter name="[string]" value="[value]" securityLevel="[int]"
  niceName="[string]"
  type [attributes] >
    ...
  </type>
</parameter>
```

Parameter information is contained in the `<parameter>` element. The attribute "value" contains the current parameter value. All valid values and their type (integer, bool, enum, string) are listed within the `<type>` element. See examples below.

The security level (attribute `securityLevel`) consists of 4 integers in order create, delete, read and write (e.g. 7007). To perform an action on a parameter a user must have an access right equal to or higher than the corresponding security level of that parameter. The following integers are used:

Security level	Description
0	Unprotected, but it is not possible to access the Axis product from outside without at least viewer rights.
1	Viewer access
4	Operator access
6	Administrator access
7	Root access. Internal parameters that can be changed by firmware applications or by root editing the configuration files directly.

Example 6:

The `Properties.API.HTTP` parameter. Security level 7707 means that all users can read this parameter, but root access is required to create, delete and write the parameter.

HTTP Code: 200 OK

Content-Type: text/xml

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Body:

```
<?xml version="1.0" encoding="iso-8859-1" ?>
<parameterDefinitions
  xmlns="http://www.axis.com/ParameterDefinitionsSchema"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.axis.com/ParameterDefinitionsSchema
  http://www.axis.com/vapix/http_cgi/parameterdefinitions.xsd"
  version="1.0">
  <model>AXIS P1311</model>
  <firmwareVersion>5.00</firmwareVersion>
  <group name="Properties">
    <group name="API">
      <group name="HTTP">
        parameter name="Version" value="3" securityLevel="7707"
          niceName="Version">
          <type readonly="true" const="true">
            <int />
          </type>
        </parameter>
      </group>
    </group>
  </group>
</parameterDefinitions>
```

Example 7:

The `AudioSource.A0.AudioEncoding` parameter. This parameter has 3 valid values. Security level 7714 means that root access is required to create/delete the parameter, reading requires viewer rights and writing requires operator rights.

Body (only a portion of the body is shown here):

```
<group name="AudioSource">
  <group name="A0">
    <parameter name="AudioEncoding" value="g711" securityLevel="7714"
      niceName="Audio encoding">
      <type>
        <enum>
          <entry value="g711" niceValue="G711 &micro;-law" />
          <entry value="g726" niceValue="G726" />
          <entry value="aac" niceValue="AAC" />
        </enum>
      </type>
    </parameter>
  </group>
</group>
```

Example 8:

The `Image.I0.Appearance.Compression` parameter is an integer with valid values between 0 and 100.

HTTP Code: 200 OK

Content-Type: text/xml

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Body (only a portion of the body is shown here):

```
<group name="Image">
  <group name="I0">
    <group name="Appearance">
      <parameter name="Compression" value="50" securityLevel="7744"
        niceName="Compression">
        <type>
          <int min="0" max="100" maxlen="3" />
        </type>
      </parameter>
    </group>
  </group>
</group>
```

2.3 Request "update"

The update request is used to update already existing parameters with new parameter values.

Access control: Parameter dependent. The CGI can be accessed by users with operator or admin rights, but operators can only update parameters that are accessible to operators.

Syntax:

```
http://<servername>/axis-cgi/param.cgi?action=update
[&<argument>=<value>...]
```

With the following arguments and values:

Argument	Valid values	Description
<code><string>=<string></code>	<code><group.name>=<value></code>	Assign <code><value></code> to the parameter <code><group.name></code> . The <code><value></code> must be URL-encoded when it contains non-alphanumeric characters. The parameters must be entered exactly as named in the Axis product.

Example 9:

Set the default image resolution to 320x240 pixels.

```
http://myserver/axis-cgi/param.cgi?action=update
&Image.I0.Appearance.Resolution=320x240
```

Example 10:

Set the maximum number of viewers to 5.

```
http://myserver/axis-cgi/param.cgi?action=update&Image.MaxViewers=5
```

2.3.1 Response "update"

The update action produces one of the following responses.

1. Success

Response:

HTTP Code: 200 OK

Content-Type: text/plain

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Body:

```
OK
```

2. Failure

Response:

HTTP Code: 200 OK

Content-Type: text/plain

Body:

```
# Error: Error setting '<group.name>' to '<value>'!
```

2.4 Request "add"

The add request is used to add new parameters. The parameters are only applicable for dynamic parameter groups such as motion detection windows and stream profiles.

Access control: operator

Syntax:

```
http://<servername>/axis-cgi/param.cgi?action=add  
[&<argument>=<value>...]
```

With the following arguments and values:

Argument	Valid values	Description
template=<string>	<template> ¹	The template is a file describing all parameters for this group. Use the specified <template> when creating the new group. See examples below.
group=<string>	<group>	Specify the parent group. The parent group defines where in the parameter structure the new group will be created. For example, if adding a stream profile (template=streamprofile) and specify group=Streamprofile the new group will be available as Streamprofile.S<number>. Where <number> is the unique number for the group (see return values below). The character before <number> is generated from the last section of the group name. E.g. Streamprofile will generate the character S.

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<code><string>=<string></code>	<code><group.name>=<value></code>	Set a parameter in the newly created group. As the group number is not known before the group is created, the id-number is simply left out, see the examples below. The new group number is created dynamically and can be any number. This is why all parameters are specified to set without any group number. The base path to the parameter is specified as <code><group>.<uppercase first letter of group>.<parameter name></code> .
<code>force=<string></code>	<code>yes</code>	Exceed limits set for adding to dynamic parameter groups. Example: A dynamic parameter group can be configured for up to 10 parameters. The <code>force</code> parameter can be used to exceed this maximum number of parameters.

1. Product/release-dependent. Check the product's release notes.

Example 11:

Create a new stream profile under the group `Streamprofile` and set the name to "My profile".

```
http://myserver/axis-cgi/param.cgi?action=add
&template=streamprofile
&group=StreamProfile
&StreamProfile.S.Name=myprofile
&StreamProfile.S.Description=My%204CIF%20profile
&StreamProfile.S.Parameters=videocodec%3dh264%26resolution%
3d4CIF%26text%3d1%26textstring%3d4CIF%2520profile
```

A listing of the new group will output the following:

```
root.StreamProfile.S8.Name=myprofile
root.StreamProfile.S8.Description=My%204CIF%20profile
root.StreamProfile.S8.Parameters=videocodec=h264&resolu-
tion=4CIF&text=1&textstring=4CIF%20profile
```

Note

In this example the id is `S8`. This can be any number, depending on if other streamprofiles were added before. Parameters that are not specified in the request will have their default values.

2.4.1 Response "add"

The add action produces one of the following responses.

1. Success:

Response:

HTTP Code: 200 OK

Content-Type: text/plain

Body:

```
<entry> OK
```

2. Failure – No group created

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The group could not be created due to missing or erroneous CGI arguments.

Response:

HTTP Code: 200 OK

Content-Type: text/plain

Body:

```
<additional error information>
# Request failed: <error message>
```

Failure – Parameters could not be set

The group was created, but the specified parameters could not be set.

Response:

HTTP Code: 200 OK

Content-Type: text/plain

Body:

```
<additional error information>
# Error: <error message>
<entry> OK
```

2.5 Request "remove"

The `remove` parameter is used to delete already existing parameters. The parameter is only applicable for dynamic parameter groups such as motion detection windows and stream profiles.

Access control: operator

Syntax:

```
http://<servername>/axis-cgi/param.cgi?action=remove
[&<argument>=<value>...]
```

With the following arguments and values:

Argument	Valid values	Description
group=<string>	<group>[, <group>, ...]	Delete the specified group(s).

Example 12:

Delete stream profile groups S7 and S8.

```
http://myserver/axis-cgi/param.cgi?action=remove
&group=StreamProfile.S7,StreamProfile.S8
```

2.5.1 Response "remove"

The `remove` action produces one of the following responses.

1. **Success**

Response:

HTTP Code: 200 OK

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Content-Type: text/plain

Body:

```
OK
```

2. Failure

Response:

HTTP Code: 200 OK

Content-Type: text/plain

Body:

```
<additional error information>  
# Request failed: <error message>
```


