



SAMSUNG IP CAMERA SDK

RTSP API Development Guide

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1. SAMSUNG IP CAMERA SDK

Samsung Electronics IP Camera SDK has variable Application Programming Interface (API).

This SDK enables you to obtain images, audio stream, control IP camera functions (PTZ, Alarm I/O, etc.), set/get internal parameter values and much more. The purpose of the SDK is to make it easier for developers to build applications that support Samsung Electronics IP Cameras.

SAMSUNG IP CAMERA SDK consists of:

- HTTP API
- Standard RTP/RTSP API
- VNP (Samsung Video Security Network Protocol) API
- ActiveX Control API (For Windows Application Development)
- XNS API (For Windows Application Development)

As above, there are different ways whereby an application can interface with Samsung IP Cameras:

- Using low level protocol directly (HTTP API, RTP/RTSP API, VNP API)
- Using Windows development tools (XNS API, ActiveX API)

1.1 HTTP API

This API specifies the HTTP-based application programming interface (API) to integrate Samsung IP Cameras with 3rd Party Applications.

The HTTP API provides the functionality for requesting single and multi-part JPEG images and for getting and setting internal parameter values.

MPEG-4 and audio stream can not be obtained by HTTP API.

More information can be found in the "HTTP API" document.

1.2 Standard RTP/RTSP API

This API describes the standard RTSP-based application programming interface (API) to integrate Samsung IP Cameras with 3rd Party Applications.

Using this API, application can receive MJPEG, MPEG-4 video and one-way AUDIO stream from IP Camera.

1.3 VNP (Samsung Video Security Network Protocol) API

This API describes the Samsung own VNP protocol-based application programming interface (API) to integrate Samsung IP Cameras with 3rd Party Applications.

Using this API, application can receive MJPEG, MPEG-4 and H.264 video from IP Camera.

Also, VNP API can support bi-directional audio communication.

More information can be found in the “VNP API” document.

1.4 ActiveX Control API

The ActiveX Control API enables easy integration of viewing MPEG-4, MJPEG and H.264 streams directly in Microsoft Internet Explorer, Visual Basic, Delphi and other Windows applications.

Also, ActiveX API can support bi-directional audio communication.

ActiveX Control is worked by Samsung VNP protocol for network communication.

More information can be found in the “ActiveX Control API” document.

1.5 XNS API

The XNS API which is based on Win32 MFC style enables Windows Based Application development for viewing MPEG-4, MJPEG and H.264 streams from Samsung IP Cameras.

Also, XNS API can support bi-directional audio communication.

XNS API is worked by Samsung VNP protocol for network communication.

More information can be found in the “XNS API” document.

1.6 Supported IP Camera List

Model Name	Feature	Firmware
SNC-B2315	D1 Real-time Dual codec IP Camera	v2.01 and above
SNC-B5395	D1 Real-time Dual codec IP Anti-Vandal Dome Camera	v2.01 and above
SNC-M300	3 Mega Pixel IP Camera	v2.01 and above
SNC-C6225	10x Zoom PTZ Mini Speed Dome IP Camera (Anti-Vandal)	v1.00 and above
SNC-C7225	10x Zoom PTZ Mini Speed Dome IP Camera (Outdoor)	v1.00 and above
SNC-C7478	36x Zoom PTZ Speed Dome IP Camera (Wall-Mount Type)	v1.00 and above
SNC-C7478C	36x Zoom PTZ Speed Dome IP Camera (Ceiling-Mount Type)	v1.00 and above
SNC-B2331	H.264 4CIF Real-time Triple codec IP Camera	Not ready yet
SNC-B5368	H.264 4CIF Real-time Triple codec IP mini Dome Camera	Not ready yet
SNC-B2335	H.264 4CIF Real-time Triple codec IP Camera with video analysis function	Not ready yet
SNC-B5399	H.264 4CIF Real-time Triple codec IP Anti-Vandal Dome Camera with video analysis function	Not ready yet

2. Standard RTP/RTSP API

2.1 Overview

This document specifies the external RTSP-based application programming interface of the Samsung IP camera with firmware version 2.0 and above.

This API describes the RTSP-based application programming interface (API) to integrate Samsung IP camera with 3rd Party Applications.

For RTP data packet header, it can be referred in RTP (RFC 3550) standard.

RTSP (Real Time Streaming Protocol) is a control protocol for media streams delivered by a media server. RTSP can be considered a “remote control” providing commands such as play and pause.

In contrast to HTTP, RTSP supports UTF-8. Hence UTF-8 encoded characters can be used directly, for example in the text string parameter.

2.2 Reference

RTSP protocol

- [Real Time Streaming Protocol - RFC 2326](#)

RTP protocol

- [Real Time Transport Protocol - RFC 3550](#)

SDP protocol

- [Session Description Protocol - RFC 2327](#)

2.3 RTSP API

The RTSP URL is **rtsp://<Device IP>/mpeg4/media.smp** where <Device IP> is the host name or IP address of the IP Camera. The DESCRIBE, SETUP, OPTIONS, PLAY, PAUSE and TEARDOWN methods are supported. The RTSP protocol is described in RFC 2326.

Default RTSP connection port is 554. This port can be changed by using HTTP/CGI command if it is necessary.

[Syntax]

REQUEST

```
COMMAND URI RTSP/1.0<CRLF>
field1: value1<CRLF>
field2: value2<CRLF>
...
<CRLF>
```

RESPONSE

```
RTSP/1.0 CODE DESCRIPTION<CRLF>
field1: value1<CRLF>
field2: value2<CRLF>
...
<CRLF>
```

The following header fields are accepted by all commands. Other header fields are silently ignored (unless stated otherwise in the sections below).

Field	Description
Authorization	Authorization information from the client.
CSeq	Request sequence number.
Session	Session identifier (returned by server in SETUP response).
Content-Length	Length of content.
User-Agent	Player information from the client.

The following header fields can be generated for all responses by the RTSP server.

Field	Description
CSeq	Response sequence number (Matches the sequence number of the request).
Session	Session identifier.
WWW-Authenticate	Authentication from client requested.
Date	Response timestamp(GMT)

2.4 RTSP Login

For the first, application sends “DESCRIBE” command without “Authorization” header, then IP camera responses with 401 (Unauthorized).

At this moment, this response includes “WWW- Authenticate” header which indicates the information for MD5 authentication.

With this MD5 information, application should make “Authorization” header and resends “DESCRIBE” command including “Authorization” header.

This is a standard method for RTSP communication.

Developer can test Samsung IP camera with Quick Time Player or VLC Player.

When RTSP port is 554;

For MPEG-4 stream : **rtsp://<Device IP>/mpeg4/media.smp**

For MJPEG stream : **rtsp://<Device IP>/mjpeg/media.smp**

For H.264 stream : **rtsp://<Device IP>/h264/media.smp**

When RTSP port is not 554;

For MPEG-4 stream : **rtsp://<Device IP>:<Port>/mpeg4/media.smp**

For MJPEG stream : **rtsp://<Device IP>:<Port>/mjpeg/media.smp**

For H.264 stream : **rtsp://<Device IP>:<Port>/h264/media.smp**

<Note> Audio stream will be transferred together with video stream as default.

Default ID and PW of IP Camera : root and 4321

[Example]

```
DESCRIBE rtsp://10.240.56.200/mpeg4/media.smp RTSP/1.0
CSeq: 1
Accept: application/sdp
Bandwidth: 384000
Accept-Language: de-DE
User-Agent: QuickTime/7.4.5 (qtver=7.4.5;os=Windows NT 5.1Service Pack 3)

RTSP/1.0 401 Unauthorized
CSeq: 1
Date: Mon Nov 10 07:56:19 2008 GMT
WWW-Authenticate: Digest realm="NET-i", nonce="000000000000000000000000BD8A803"

DESCRIBE rtsp://10.240.56.200/mpeg4/media.smp RTSP/1.0
CSeq: 2
Accept: application/sdp
Bandwidth: 384000
Accept-Language: de-DE
User-Agent: QuickTime/7.4.5 (qtver=7.4.5;os=Windows NT 5.1Service Pack 3)
Authorization: Digest username="root", realm="NET-i",
nonce="000000000000000000000000BD8A803", uri="/mpeg4/media.smp",
response="57ad59428ee61e3456715d5a313f6524"

RTSP/1.0 200 OK
CSeq: 2
Date: Mon Nov 10 07:56:19 2008 GMT
Content-Base: rtsp://10.240.56.200:554/mpeg4/media.smp/
Content-Type: application/sdp
Content-Length: 634

v=0
i=samsung
o=- 1223473567541207 1223473567541215 IN IP4 10.240.56.228
s=Media Presentation
c=IN IP4 0.0.0.0
```

```
b=AS:384064
t=0 0
a=control:*
a=isma-compliance:1,1.0,1
a=range:npt=now-
m=video 60024 RTP/AVP 96AS:384000
a=rtp96 MP4V-ES/90000
a=control:trID=v
a=cliprect480,720
a=framesize:96 720-480
a=fmtp:96 profile-level-
id=3;config=000001B003000001B50D6040402F000001000000012000C48DC0005E0040074000
80009001EC316843C1463F000001B2656D347620362E322E312E3000C1FF
a=mpeg4-esid:201
a=x-envivio-verid:00022159
a=framerate:30.0
m=audio 60026 RTP/AVP 0
b=AS:64
a=rtpmap:0 PCMU/8000
a=control:trackID=a
```

2.5 OPTION Command

The OPTIONS command returns a list of supported RTSP commands.

[Example]

REQUEST

```
OPTIONS rtsp://10.240.56.200/mpeg4/media.smp RTSP/1.0
CSeq: 5
Authorization: Digest username="john", realm="NET-i", nonce=" 000000000000000000000000BD8A803",
uri="/mpeg4/media.smp", response="57ad59428ee61e3456715d5a313f6524"
User-Agent: QuickTime/7.4.5 (qtver=7.4.5;os=Windows NT 5.1Service Pack 3)
```

RESPONSE

```
RTSP/1.0 200 OK
CSeq: 5
Date: Thu Dec 31 16:08:41 2009 GMT
Public: DESCRIBE, SETUP, TEARDOWN, PLAY, PAUSE, OPTIONS
```

2.6 DESCRIBE Command

The DESCRIBE command returns the SDP (RFC 2327) description for the URI.

The DESCRIBE command accepts the following additional header field:

Field	Description
Accept	List of content types that client supports (application/sdp is the only supported type).

The DESCRIBE command generates the following additional header fields:

Field	Description
Content-Type	Type of content (application/sdp).
Content-Length	Length of SDP description.
Content-Base	If relative URLs are used in the SDP description, then this is the base URL.

[Example]

REQUEST

```
DESCRIBE rtsp://10.240.56.200/mpeg4/media.smp RTSP/1.0
CSeq: 2
Accept: application/sdp
Bandwidth: 384000
Accept-Language: de-DE
User-Agent: QuickTime/7.4.5 (qtver=7.4.5;os=Windows NT 5.1Service Pack 3)
Authorization: Digest username="john", realm="NET-i", nonce=" 00000000000000000000000000BD8A803",
uri="/mpeg4/media.smp", response="57ad59428ee61e3456715d5a313f6524"
```

RESPONSE

```
RTSP/1.0 200 OK
CSeq: 2
Date: Mon Nov 10 07:56:19 2008 GMT
Content-Base: rtsp://10.240.56.200:554/mpeg4/media.smp/
Content-Type: application/sdp
Content-Length: 634
```

```
v=0
i=samsung
o=- 1223473567541207 1223473567541215 IN IP4 10.240.56.228
s=Media Presentation
c=IN IP4 0.0.0.0
b=AS:384064
t=0 0
a=control:*
a=isma-compliance:1,1.0,1
a=range:npt=now-
m=video 60024 RTP/AVP 96AS:384000
a=rtp96 MP4V-ES/90000
a=control:trID=v
a=cliprect480,720
a=framesize:96 720-480
a=fmtp:96 profile-level-
id=3;config=000001B003000001B50D6040402F000001000000012000C48DC0005E0040074000
80009001EC316843C1463F000001B2656D347620362E322E312E3000C1FF
a=mpeg4-esid:201
a=x-envivio-verid:00022159
a=framerate:30.0
m=audio 60026 RTP/AVP 0
b=AS:64
a=rtpmap:0 PCMU/8000
a=control:trackID=a
```

2.7 SETUP Command

The SETUP command configures the delivery method for the data.

The SETUP command requires and generates the following additional header field:

Field	Description
Transport	Specifies how the data stream is transported. Supported variants: RTP/AVP;unicast;client_port=port1-port2 RTP/AVP;multicast;client_port=port1-port2

The response returns a session identifier that should be used with stream control commands to the server (PLAY, PAUSE, TEARDOWN). Even the Session header can include a timeout parameter, RTSP server dose not care timeout parameter. So, it can be ignored. RTP ports can be configurable by using HTTP/CGI command if it is necessary.

[Example]

REQUEST

```
SETUP rtsp://10.240.56.200:554/mpeg4/media.smp/trackID=v RTSP/1.0
CSeq: 3
Transport: RTP/AVP;unicast;client_port=6970-6971
x-retransmit: our-retransmit
x-dynamic-rate: 1
x-transport-options: late-tolerance=2.900000
User-Agent: QuickTime/7.4.5 (qtver=7.4.5;os=Windows NT 5.1Service Pack 3)
Authorization: Digest username="john", realm="NET-i", nonce=" 000000000000000000000000BD8A803",
uri="/mpeg4/media.smp", response="57ad59428ee61e3456715d5a313f6524"
Accept-Language: de-DE
```

RESPONSE

```
RTSP/1.0 200 OK
CSeq: 3
Date: Mon Nov 10 07:56:20 2008 GMT
Session: 13304;timeout=60
Transport: RTP/AVP/UDP;unicast;client_port=6970-6971;server_port=60024-60025
```

2.8 PLAY Command

The PLAY command starts (or restarts if paused) the data delivery to the client.

The PLAY command generates the following additional header fields:

Field	Description
Range	Specifies the range of time being played. Since only live streams are used, the specified time will always begin now and have no stop time.
RTP-Info	Information about the RTP stream. More specifically, it includes the next RTP sequence number that will be used.

[Example]

REQUEST

```
PLAY rtsp://10.240.56.200/mpeg4/media.smp RTSP/1.0
CSeq: 5
Range: npt=0.000000-
x-prebuffer: maxtime=2.000000
Session: 13304
User-Agent: QuickTime/7.4.5 (qtver=7.4.5;os=Windows NT 5.1Service Pack 3)
Authorization: Digest username="john", realm="NET-i", nonce=" 00000000000000000000000000BD8A803",
uri="/mpeg4/media.smp", response="57ad59428ee61e3456715d5a313f6524"
```

RESPONSE

```
RTSP/1.0 200 OK
CSeq: 5
Date: Mon Nov 10 07:56:20 2008 GMT
Session: 13304
Range: ntp=0.000-
RTP-Info: url=rtsp://10.240.56.200:554/mpeg4/media.smp/trackID=v;seq=0,
url=rtsp://10.240.56.200:554/mpeg4/media.smp/trackID=a;seq=0
```

2.9 PAUSE Command

The PAUSE command pauses the data delivery from the server.

[Example]

REQUEST

```
PAUSE rtsp://10.240.56.200/mpeg4/media.smp RTSP/1.0
CSeq: 6
Session: 13304
User-Agent: QuickTime/7.4.5 (qtver=7.4.5;os=Windows NT 5.1Service Pack 3)
Authorization: Digest username="john", realm="NET-i", nonce=" 000000000000000000000000BD8A803",
uri="/mpeg4/media.smp", response="57ad59428ee61e3456715d5a313f6524"
```

RESPONSE

```
RTSP/1.0 200 OK
CSeq: 6
Date: Mon Nov 10 07:56:30 2008 GMT
Session: 13304
```

2.10 TEARDOWN Command

The TEARDOWN command terminates the data delivery from the server.

[Example]

REQUEST

```
TEARDOWN rtsp://10.240.56.200/mpeg4/media.smp RTSP/1.0
CSeq: 7
Session: 13304
User-Agent: QuickTime/7.4.5 (qtver=7.4.5;os=Windows NT 5.1Service Pack 3)
Authorization: Digest username="john", realm="NET-i", nonce=" 00000000000000000000000000BD8A803",
uri="/mpeg4/media.smp", response="57ad59428ee61e3456715d5a313f6524"
```

RESPONSE

```
RTSP/1.0 200 OK
CSeq: 7
Date: Mon Nov 10 07:56:30 2008 GMT
Session: 13304
```