

IP camera audio protocol

Introduction

To visit the IP camera, we need two protocols: IP camera operation protocol and audio transmission protocol and video transmission protocol.

Users login in the IP camera and operate its audio by operation protocol. After opening the audio and video, transfer the audio and video data by using audio and video transfer protocol.

Both of these two protocols are on the basis of TCP.

Data Type Definition

Data Type	Length (unit: Byte)	Byte order
INT8	1	
INT16	2	Low order is at front, high order is at back
INT16_R	2	High order is at front, Low order is at back
INT32	4	Low order is at front, high order is at back
INT32_R	4	High order is at front, Low order is at back
BINARY_STREAM	N	

Command Format

Different protocols are composed with different commands. But all of them comply with the same format.

Composition	type	description
The head of the Protocol	BINARY_STREAM[4]	operation protocol: "MO_O"
		Camera's video transmission protocol: "MO_V"
operation code	INT16	Use to distinct different commands in the same protocol
reserve	INT8	=0
reserve	BINARY_STREAM[8]	

Text length	INT32	Text length of command
reserve	INT32	
Text	BINARY_STREAM[n]	Text of command

Operation protocol

Login_Req (Command of login request)

- 1) Send the login request to the camera
- 2) operation code: 0
- 3) Sending direction: user → IP camera
- 4) Text field: no field

Login_Resp (Command of login response)

- 1) IP camera's response of login
- 2) operation code: 1
- 3) Sending direction: IP camera → user
- 4) Text field :

numeric field	type	description
Result	INT16	0:ok
		It will refuse when over the maximum number of connections
IPcamera's ID	BINARY_STREAM[13]	When result = 0, this numeric field exists
Reserve	BINARY_STREAM[4]	When result = 0, this numeric field exists
Reserve	BINARY_STREAM[4]	When result = 0, this numeric field exists
system firmware version of the ip camera	BINARY_STREAM[4]	When result = 0, this numeric field exists

Verify_Req (command of verify request)

- 1) When the monitoring camera users receive in response to the consent of the login, they should send this verify request command to the cameras immediately to show that the legitimacy of their own.

- 2) operation code: 2
- 3) Sending direction: ipcamera → user
- 4) Text numeric field:

numeric field	type	description
User	BINARY_STREAM[13]	
Camera's password	BINARY_STREAM[13]	

Verify_Resp (command of verify response)

- 1) camera's response of verify
- 2) operation code: 3
- 3) Sending direction: ipcamera → user
- 4) Text numeric field:

numeric field	type	description
result	INT16	0: correct verify
		1: user wrong
		5:pwd err
reserve	INT8	When result = 0, this numeric field exists

Keep_Alive (Keep Alive Command)

- 1) Keep_Alive Command is the command of keeping connection between users and ipcameras by sending it per minute. If do not send for 2 minutes to each other, the connection will be cut off.
- 2) operation code: 255
- 3) Sending direction: user <--> ipcamera
- 4) Text numeric field: no

Video_Start_Req (Command of start request video)

- 1) the user send the video start request to the camera。
- 2) operation code: 4
- 3) operation code: user → ipcamera
- 4) Text numeric field:

numeric field	type	description
reserve	INT8	=1

Video_Start_Resp (Command of response of receive video)

- 1) The cameras response of video start request.
- 2) operation code: 5
- 3) Sending direction: ipcamera → user
- 4) Text numeric field:

numeric field	type	description
Result	INT16	0: agree
		2: refuse due to over the maximum number of connections
data connection ID	INT32	when result = 0 and without audio and video data transmission before, this numeric field exists; It is used to mark ID of the data connection.

Video_End (Command of ending video request)

- 1) The user send this command to the camera to end the receiving of video.
- 2) operation code: 6
- 3) Sending direction: user → ipcamera
- 4) Text numeric field: no

Audio_Start_Req (Command of asking receive audio)

- 1) Users send this command to camera; in order to asking receive audio.
- 2) operation code: 8
- 3) Sending direction: user → camera
- 4) Text numeric field:

numeric field	type	description
reserve	INT8	=1

Audio_Start_Resp (Command of response of receive audio)

- 1) The camera's response of audio start request.
- 2) operation code: 9
- 3) Sending direction: ipcamera → user
- 4) Text numeric field:

numeric field	type	description
Result	INT16	0: agree

		2: refuse due to over the maximum number of connections
		7: the camera do not support this function
data connection ID	INT32	when result = 0 and without audio and video data transmission before, this numeric field exists; It is used to mark ID of the data connection.

Audio_End (Command of stop receiving audio)

- 1) The user stop receiving of audio
- 2) operation code: 10
- 3) Sending direction: user → ipcamera
- 4) Text numeric field: no

Talk_Start_Req (Command of request audio talk)

- 1) The user request to audio talk
- 2) operation code: 11
- 3) Sending direction: user → ipcamera
- 4) Text numeric field:

numeric field	type	description
camera's audio buffer time(s)	INT8	>= 1

Talk_Start_Resp (Command of response of audio talk)

- 1) The camera's response to talk star request
- 2) operation code: 12
- 3) Sending direction: ipcamera → user
- 4) Text numeric field:

numeric field	type	description
Result	INT16	0: agree
		2: refuse due to over the maximum number of connections; and only allow one user to talk at the same time
		7: camera does not support this function
data connection ID	INT32	when result = 0 and without audio and video data transmission before, this numeric field exists; It is used to mark ID of the data connection.

Talk_End (Command of ending audio talk)

- 1) The user send this command to end the talking。
- 2) operation code: 13
- 3) Sending direction: user → ipcamera
- 4) Text numeric field: no

Alarm_Notify (Command of notify of alarm)

- 1) The camera sends this command to notify the alarm
- 2) operation code: 25
- 3) Sending direction: ipcamera → user
- 4) Text numeric field:

numeric field	type	description
type of alarm	INT8	0: alarm stop
		1: motion detection
		2: outside alarm
reserve	Int16	
reserve	Int16	
reserve	Int16	
reserve	Int16	

Audio and Video Transmission Protocol

Login_Req (Command of request of login)

- 1) The user send this command to login the camera。
- 2) operation code: 0
- 3) Sending direction: user → ipcamera
- 4) Text numeric field:

numeric field	type	description
data connection ID	INT32	If ID incorrect, disconnected automatically

Video_Data (Command of video data)

- 1) The cameras transfer video data。
- 2) operation code: 1

3) Sending direction: ipcamera → user

4) Text numeric field:

numeric field	type	description
timestamp (10ms)	INT32	
Frame per sec (s)	INT32	From 1970.1.1 to current time
reserve	INT8	
video's length	INT32	
video data	BINARY_STREAM(n)	

Audio_Data (Command of audio data)

1) The cameras transfer audio data。

2) operation code: 2

3) Sending direction: ipcamera → user

4) Text numeric field:

numeric field	type	description
timestamp (10ms)	INT32	
SN of packet	INT32	increase from zero
Gather time sec (s)	INT32	From 1970.1.1 to current time
audio format	INT8	=0: adpcm
Data length	INT32	=160
Data content	BINARY_STREAM(n)	

Talk_Data (Command of audio talk data)

1) The audio talk data that users send

2) operation code: 3

3) Sending direction: user →ipcamera

4) Text numeric field:

numeric field	type	description
timestamp (1ms)	INT32	GetTickCount()
SN of packet	INT32	increase from zero
Gather time sec (s)	INT32	From 1970.1.1 to current time
audio format	INT8	=0: adpcm
Data length	INT32	=160
Data content	BINARY_STREAM(n)	