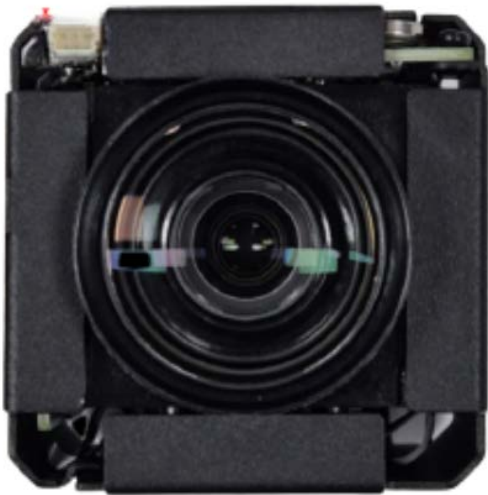


USER MANUAL

- SZ-G10
- 10x IP Zoom Module



Designed	Checked	Approved

REVISION HISTORY

Date	Revision	Description
2024.01.	0.1	preliminary
2024.10.30	0.2	Add I/O Pin Voltage Information
2025.01.15	0.3	Add "how to connect the zoom module"



Index

- 1. Feature.....4
- 2. Precaution.....5
- 3. Specification.....6
- 4. Dimension.....9
- 5. Connector.....10
- 6. Interface Diagram.....13
- 7. How to connect the zoom module.....14
- 8. Function.....15
- 9. RESTful API list.....17



1. Feature

- 1/3" Sony Global shutter CMOS image sensor
 - Active pixel 1,920(H) x 1,080(V)
- Lens
 - Optical 10x, Digital 10x(TBD)
 - Focal length : $f = 4.8\text{mm} \sim 48\text{mm}$
- Ethernet
 - support Onvif
 - Restful API
- Smart Motion Detection(TBD)
 - Human / Vehicle detection via simple deep learning
- M-Sync
 - Different zoom blocks can be synchronized.

2. Precaution

- Do not use this apparatus near water or in damp places
- the device can be operated 12V
- Follow all the instructions.

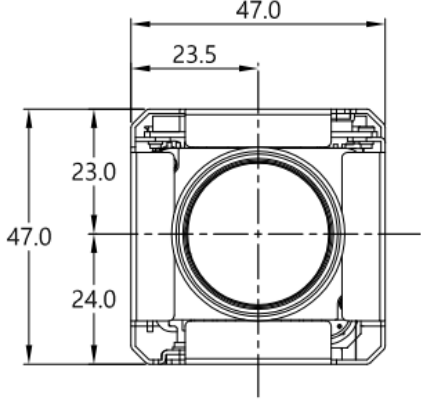
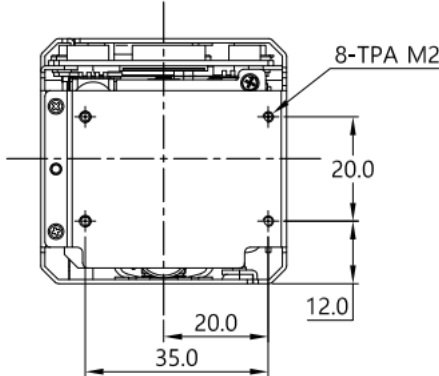
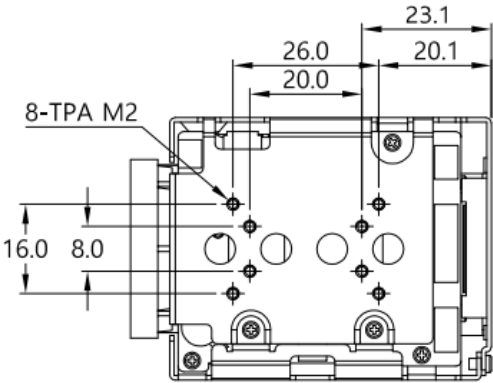
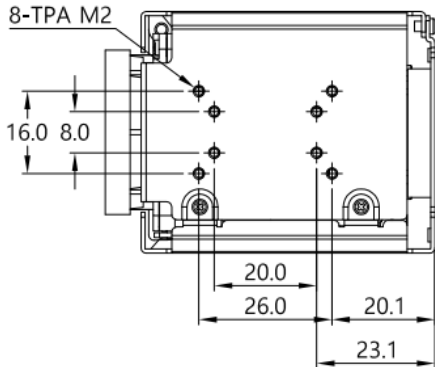
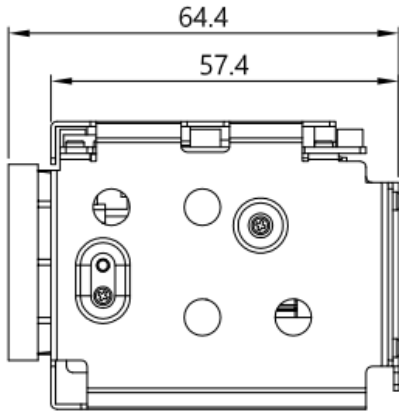
3. Specification

Image Sensor	
Sensor	1/3" Sony Pregius Sensor (Global)
Total pixels	2064(H) x 1,592(V) = 3.2M Pixels
Effective pixels	1,920(H) x 1,080(V) = 2M Pixels
Resolution	1920x1080
Frame Rate	60/50 fps, 30/25 fps
Min. illumination	Color: 0.03 Lux @ (F1.7, AGC ON), BW: 0Lux (IR LED)
Lens	
Zoom Ratio	Optical 10x Digital 10x(TBD)
Focal Length	f = 4.8mm ~ 48mm
Aperture ratio	F1.7(wide) ~ F3.1(tele)
Angle Of View	H : 62°(W) ~ 7.6°(T) V : 36.4°(W) ~ 4.4°(T) D : 69.2°(W) ~ 8.6°(T)
Min. Distance	1m(Wide), 2m(Tele)
Iris	dc auto iris(TBA)
IR Cut Filter	On / Off
Function	
Control Mode	- Auto Focus Mode(Zoom Trigger, Timer Trigger, One Push) - Manual Mode(Slide Control, One Push)
Presets	256 zoom/focus presets(TBA)
Day & Night	Auto, Day, Night, Ext-in
D&N Levels	10 levels (without Ext-in)
Electronic Shutter Speed	1/25(30)/1/50(60) ~ 1/5,000
White Balance Modes	Auto, Manual (3 steps or more)
Exposure Modes	- Auto Mode - Manual Mode - Indoor Mode 50Hz / 60Hz(Flicker-Free)

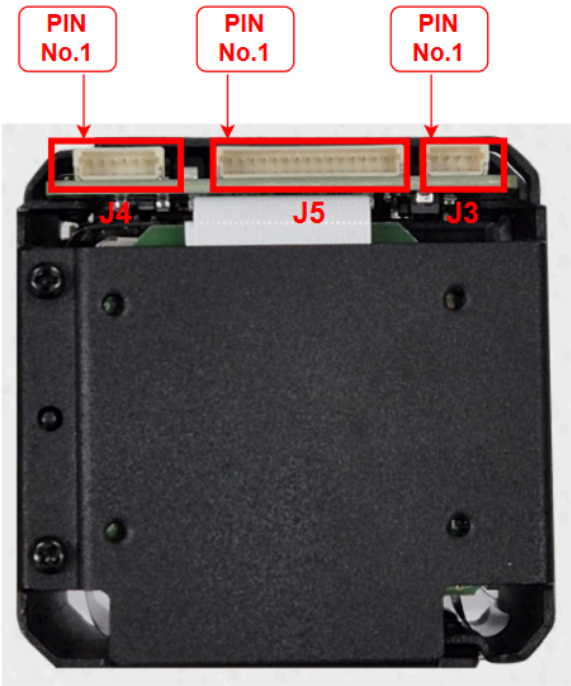
Gain control	Auto / Manual
WDR	On / Off
BLC	On / Off
HLC	On / Off
DNR	2D&3D
Defog	Off / Low / Middle / High(TBA)
DIS	On / Off (TBA)
Mirror	Off, Vertical Flip, Horizontal Flip, H+V Flip (180 degree rotation)
Privacy Mask	Max 8 Zones
Motion detection	32 x 18 cell / AI motion detection(TBA)
Output Format	H.265 / H.264 / MJPEG
Bitrate	512~15000 kbps
Streaming	Quadruple (x4) IP Streaming Main Stream : up to 1920 x 1080 Second Stream : up to 1280 x 720 Third Stream : up to 640 x 480(TBA) JPEG : 1920 x 1080
OSD	Title, Date, Resolution
Main UI	Web-based GUI
System Mode	NTSC / PAL
Audio	
Compression	G.711
Sampling rate	8Khz
Input & Output	1 Line In / 1 Line Out
Network	
Interface	10BASE-T/100BASE-TX
Protocol	IPv4, IPv6, IGMP, ICMP, ARP, TCP, UDP, DHCP, RTP, RTSP, RTCP, DNS, NTP, SMTP, FTP, UPnP(TBA), HTTP, HTTPS, SSL/TLS
Security	Password protection, IP address filtering, Hhttps encryption, brute force delay protection
control protocol	HTTP RESTful API, Onvif

General	
External devices	1x Alarm input 1x Alarm output 1x D&N input(Ext-in) 1x PWM output(lighting control) 1x UART
External Storage	Micro SD(optional) *support up to 2TB
Power Supply	12V(8 ~ 15V)
Power consumption	Max. 3.6W
Storage Temperature	-20°C ~ +60°C (Humidity < 90%RH, Non-condensing)
Operating Temperature	-10°C ~ +50°C (Humidity < 90%RH, Non-condensing)
Dimension	47 x 47 x 64.4 (WxHxD)
Weight	155g
Certifications	NA

4. Dimension

FRONT	REAR
	
TOP	BOTTOM
	
SIDE	
	

5. Connector



J3 / Reference part - SM04B-SRSS-TB (JST) / Housing - SHR-04V-S-B / Terminal - SSH-003T-P0.2-H		
No	PIN Name	Description
1	Power 12V In	DC Power IN
2	Power 12V In	DC Power IN
3	GND	Ground
4	GND	Ground
J4 / Reference part - SM06B-SRSS-TB (JST) / Housing - SHR-06V-S-B / Terminal - SSH-003T-P0.2-H		
No	PIN Name	Description
1	RJ45-1	10/100 Network TXP
2	NA	
3	RJ45-2	10/100 Network TXN
4	RJ45-3	10/100 Network RXP
5	NA	
6	RJ45-6	10/100 Network RXN

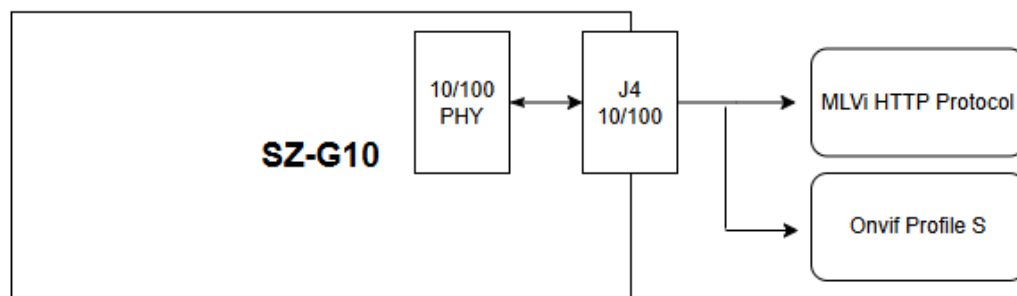
J5 / Reference part - SM15B-SRSS-TB (JST) / Housing - SHR-15V-S-B / Terminal - SSH-003T-P0.2-H		
No	PIN Name	Description
1	ALARM IN	3.3V / Pull up 10k ohms
2	ALARM OUT	5V / Pull up 10k ohms
3	GND	
4	UART TX	CMOS 3.3V
5	UART RX	CMOS 3.3V
6	RS485_DIR	for RS-485 transceiver Direction (3.3V)
7	H Sync	for M-Sync (1.8V)
8	V Sync	for M-Sync (1.8V)
9	ADKEY	max 1.8V (pull up 10k ohms)
10	GND	
11	FACTORY RESET	Reset : Low (GND) Normal : Open(3.3V / pull up 4.7k ohms)
12	GND	
13	AUDIO IN	LINE IN (1Vrms)
14	AUDIO OUT	LINE OUT (0.5Vrms)
15	GND	



J6 / Reference part - SM03B-SRSS-TB (JST) / Housing - SHR-03V-S-B / Terminal - SSH-003T-P0.2-H		
No	PIN Name	Description
1	IR_ADC	Day/Night Ext - In (ADC / 0~5V)
2	LED_PWM	for IR Dimming (3.3V)
3	GND	

6. Interface Diagram

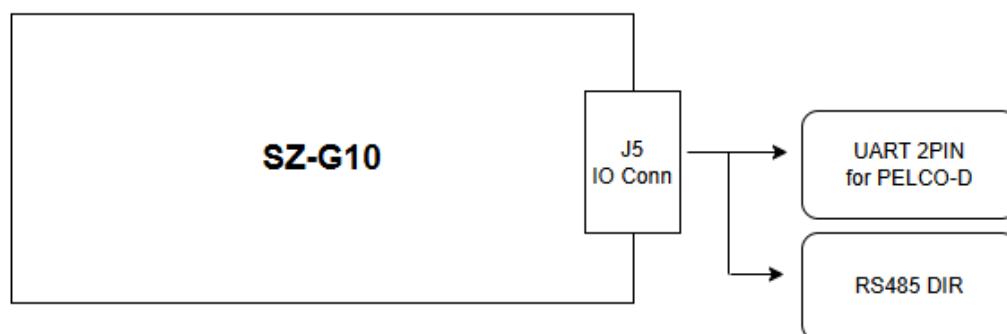
6.1. Network



*Note

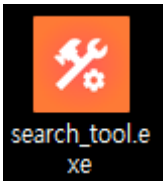
The cable connecting to the J4 connector must be made of a twist pair cable.

6.2. UART

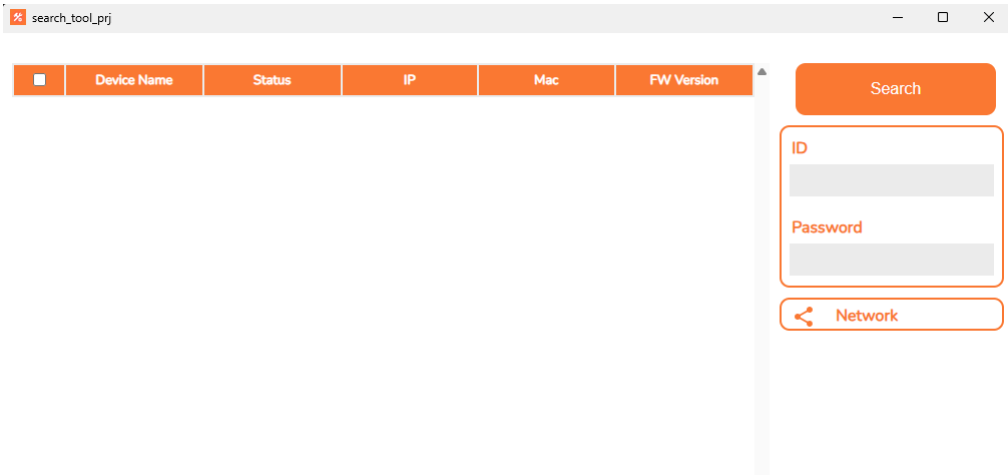


7. How to connect the zoom module

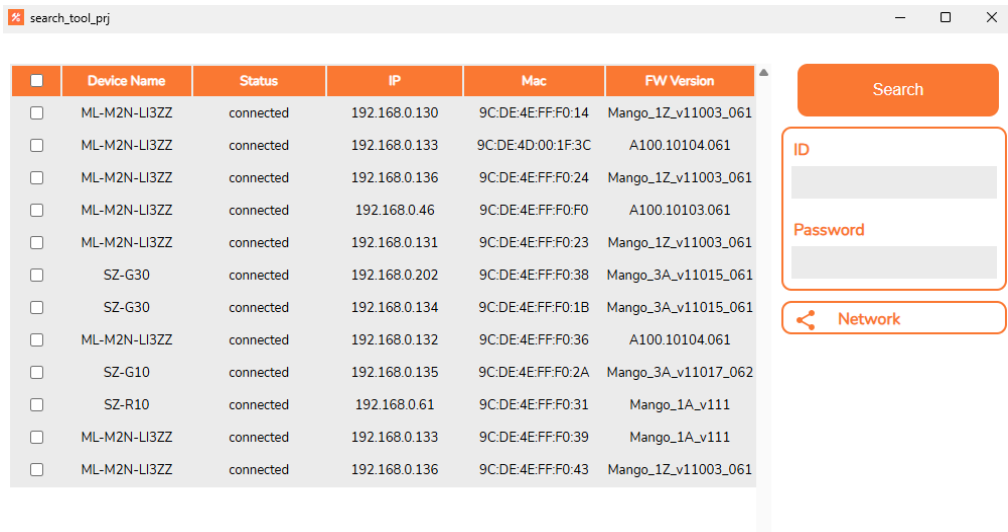
7.1. Execution Search Tool.exe



7.2. You can show the GUI in the picture below.



7.3. Click “Search”



7.4. If user want to change ip setting, input ID / Password, and then, user can setup ip setting

search_tool_prj

☐	Device Name	Status	IP	Mac	FW Version
☐	ML-M2N-LI3ZZ	connected	192.168.0.130	9C:DE:4E:FF:F0:14	Mango_1Z_v11003_061
☐	ML-M2N-LI3ZZ	connected	192.168.0.133	9C:DE:4D:00:1F:3C	A100.10104.061
☐	ML-M2N-LI3ZZ	connected	192.168.0.136	9C:DE:4E:FF:F0:24	Mango_1Z_v11003_061
☐	ML-M2N-LI3ZZ	connected	192.168.0.46	9C:DE:4E:FF:F0:F0	A100.10103.061
☐	ML-M2N-LI3ZZ	connected	192.168.0.131	9C:DE:4E:FF:F0:23	Mango_1Z_v11003_061
☐	SZ-G30	connected	192.168.0.202	9C:DE:4E:FF:F0:38	Mango_3A_v11015_061
☐	SZ-G30	connected	192.168.0.134	9C:DE:4E:FF:F0:1B	Mango_3A_v11015_061
☐	ML-M2N-LI3ZZ	connected	192.168.0.132	9C:DE:4E:FF:F0:36	A100.10104.061
☐	SZ-G10	connected	192.168.0.135	9C:DE:4E:FF:F0:2A	Mango_3A_v11017_062
☐	SZ-R10	connected	192.168.0.61	9C:DE:4E:FF:F0:31	Mango_1A_v111
☐	ML-M2N-LI3ZZ	connected	192.168.0.133	9C:DE:4E:FF:F0:39	Mango_1A_v111
☐	ML-M2N-LI3ZZ	connected	192.168.0.136	9C:DE:4E:FF:F0:43	Mango_1Z_v11003_061

Search

ID

Password

Network

Type

DHCP

IP

0 . 0 . 0 . 0

Gateway

0 . 0 . 0 . 0

Netmask

0 . 0 . 0 . 0

IP Setup

7.5. User can show stream via web browser / RTSP stream viewer(VLC player)

8. Function

8.1. Zoom

8.1.1. Zoom ratio

Optical Zoom : Max x10.

8.1.2. Position zoom

User can control the zoom with absolute zoom values.

8.1.3. Continuous zoom

User can control the zoom with relative zoom values.

8.2. Focus

8.2.1. Auto Focus

User can set focus area with 16x16 cell

8.2.2. One push

Find the best focus on current zoom position

8.2.3. Focus initialize

The device initializes the lens when powered on. The user can initialize the Lens using the API or the home button in the Web UI.

8.2.4. Macro mode(only for SZ-G10M)

For near focus under 1m, After active on "Macro mode", Do one push.

If the current zoom position is not widest, zoom position will be changed widest.

8.3. Image

8.3.1. Exposure

Full Auto with Auto Iris and Shutter Speed. User can turn on/off AGC and Digital Slow Shutter feature.

8.3.2. White balance

This mode computes the white balance value output using color information from the entire screen. It outputs the proper value using the color temperature.

8.4. Codec

8.4.1. Stream

8.4.1.1. Codec type is H.265/H.264/MJPEG

8.4.1.2. Max resolution / Bitrate

8.4.1.2.1. First stream is up to 1920 x 1080 / 15000 kbps

8.4.1.2.2. Second stream is 1280 x 720 / 8000 kbps

8.4.1.2.3. Third stream is 640 x 480 / 3000kbps

8.4.2. SVC-T

Depending on the network conditions, the video can be transmitted at different frame rates. For example, when the network bandwidth is low, only the basic layer is transmitted to maintain the low frame rate video, and when the bandwidth is sufficient, the advanced layer is additionally transmitted to provide the higher frame rate video.

8.5. OSD(On Screen Device)

There is 3 kind of OSD

- Video resolution
- System title
- System date

8.6. ROI

8.6.1. 32 x 18 area

8.6.2. The area set as ROI can be viewed in higher quality than the area not set.

8.7. Event

8.7.1. Area of Motion / Tampering is 32 x 18 cell

8.7.2. Send an alarm to set email and ftp according to event/tampering.

8.8. Network

8.8.1. IPV4

8.8.1.1. It can be set to DHCP or a static IP address.

8.8.2. IPV6

8.8.3. Port

8.8.3.1. Default port of http is 80

8.8.3.2. Default port of https is 443

8.8.3.3. Default port of rtsp is 554

9. RESTful API list

*refer Appendix A.



Appendix A



Version History

Version	Description
1.0.1	Add system.health.cpu field to /app/v1/deviceInformation API response. Masking specific pattern strings in sample data
1.0.0	• Added Authentication Overview • Detailed API Descriptions Added: Login, Logout, Check Session, SDP, IP Setup, OSD Setup, Reboot, Factory Reset • Lens Control API Documentation • Expanded Firmware Upgrade API List: Firmware Upload, Device Firmware Upgrade



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Index

HTTP API(AH, H)

Appendix A

Copyright

Index

Authentication Information

JWT

Assign authentication information to the HTTP Authorization header

Access Permission Type

API Response Status

Status Codes

General API

1. /app/v1/login

POST /app/v1/login

2. /app/v1/logout

POST /app/v1/logout

3. /app/v1/session/check

PUT /app/v1/session/check

4. /app/v1/stream/sdp

GET /app/v1/stream/sdp

5. /app/v1/deviceInformation

GET /app/v1/deviceInformation

6. /app/v1/system/reboot

PUT /app/v1/system/reboot

7. /app/v1/system/factoryDefault

POST /app/v1/system/factoryDefault

8. /app/v1/media/video/osd

GET /app/v1/media/video/osd

POST /app/v1/media/video/osd

9. /app/v1/network/ipSetup

GET /app/v1/network/ipSetup

POST /app/v1/network/ipSetup

Lens Control API

1. /app/v1/camera/lens

GET /app/v1/camera/lens

2. /app/v1/camera/lens/focus/mode

PUT /app/v1/camera/lens/focus/mode

3. /app/v1/camera/lens/focus/enableZoomAf

PUT /app/v1/camera/lens/focus/enableZoomAf

4. /app/v1/camera/lens/zoom/position

PUT /app/v1/camera/lens/zoom/position

5. /app/v1/camera/lens/focus/position

PUT /app/v1/camera/lens/focus/position

6. /app/v1/camera/lens/focus/home

PUT /app/v1/camera/lens/focus/home

7. /app/v1/camera/lens/focus/onepush

PUT /app/v1/camera/lens/focus/onepush

Firmware Upgrade API

Description Of Firmware Upgrade Process

1. /app/v1/upload/firmware

POST /app/v1/upload/firmware

2. /app/v1/system/firmware

GET /app/v1/system/firmware

3. /app/v1/system/firmware/upgrade

POST /app/v1/system/firmware/upgrade
4. /app/v1/system/firmware/upgradeState
GET /app/v1/system/firmware/upgradeState



Authentication Information

For API calls that require authentication, authentication information is needed. Below is a description of the necessary information for authentication and how to handle the authentication token.

JWT

Session information required for API requests that need authentication is managed using JWT (https://en.wikipedia.org/wiki/JSON_Web_Token). A JWT consists of `header`, `payload`, and `signature`, which distinguish session information.

After entering the users `ID` and `Password` and successfully logging in, you obtain the token information as shown below.

```
{
  "token": "<token_value>"
}
```

For more details, refer to the `2. /app/v1/login` API description.

Assign authentication information to the HTTP Authorization header

For API calls that require authentication, the JWT token must be assigned to the HTTP Authorization header. It should be assigned in the format `Authorization: Bearer <JWT Token>`.

Below is an example of an HTTP request header with the authentication information assigned.

```
GET /app/v1/deviceInformation HTTP/1.1
...
Authorization: Bearer <token_value>
...
```

Access Permission Type

APIs have the following access permissions.

Permission	Details
noAuth	No authentication information is required.
Authentication	Requests must be made with a valid authentication token.
setup	Requests must be made with a valid authentication token that has setup permissions.
reboot	Requests must be made with a valid authentication token that has reboot permissions.

Regardless of the permission information, when authenticated with an `administrator` account, all APIs can be accessed.

API Response Status

Status Codes

Status Code	Description
200 OK	Successful state when the request is successful and there is response data.
204 OK	Successful state when the request is successful and there is no response data.
400 Bad Request	Invalid request data.
401 Unauthorized	Authentication required.
403 Forbidden	Login locked state.
500 Internal Server Error	Server encountered an error processing the request.



General API

1. /app/v1/login

POST /app/v1/login

Attribute	Details
Description	Authenticate user information and return the authentication token. If login attempts fail more than 5 times, login attempts for that ID are blocked for a certain period.
Permissions	Requires noAuth permission.
Request Content-Type	application/json
Response Content-Type	application/json

Request Fields

Field	Type	Description	Valid Values/Range	Optional
userId	string	User input ID	0 - 16	N
userPassword	string	User input Password encrypted with SHA256 one-way encryption string (The request example below is an example of <code>asdfqwer</code> encrypted with SHA256 one-way encryption)	0 - 256	N

Request Example

```
{
  "userId": "<user_id>",
  "userPassword": "<password_encryption>"
}
```

Response Status

- 200 OK
- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden

Response Fields

Field	Type	Description	Optional
token	string	Token for maintaining the authentication session	N

Response Example

```
{
  "token": "<token_value>"
}
```

2. /app/v1/logout

POST /app/v1/logout

Attribute	Details
Description	Discard the authentication token.
Permissions	Requires authentication.
Request Content-Type	-
Response Content-Type	-

Request Example

```
{}
```

Response Status

- 204 OK

3. /app/v1/session/check

PUT /app/v1/session/check

Attribute	Details
Description	Verify if the authentication token is valid.
Permissions	Requires authentication.
Request Content-Type	-
Response Content-Type	-

Response Status

- 204 OK : Authentication information is valid
- 401 Unauthorized : Authentication information is not valid

4. /app/v1/stream/sdp

GET /app/v1/stream/sdp

Attribute	Details
Description	Returns Main Stream RTSP SDP file information.

Attribute	Details
Permissions	Requires noAuth permission.
Request Content-Type	-
Response Content-Type	text/plain

Response Status

- 200 OK

Response Example

```
v=0
s=STREAMING_SERVER_Q
i=Session description protocol
t=0 0
a=type:broadcast
o=- 1 1 IN IP4 <IP>
c=IN IP4 0.0.0.0
m=video 0 RTP/AVP 98
a=rtpmap:98 H265/90000
a=control:rtsp://<IP>/<VIDEO_URI>
m=application 0 RTP/AVP 100
a=rtpmap:100 VND.ONVIF.METADATA/8000
a=control:rtsp://<IP>/<META_URI>
```

5. /app/v1/deviceInformation

GET /app/v1/deviceInformation

Attribute	Details
Description	Retrieves overall information about the device, including network, stream, and system.
Permissions	Requires authentication.
Request Content-Type	application/json
Response Content-Type	application/json

Response Status

- 200 OK
- 400 Bad Request
- 401 Unauthorized

Response Fields

Field	Type	Description
network.httpActivation	boolean	HTTP activation status
network.httpPort	int	HTTP port number
network.httpsActivation	boolean	HTTPS activation status
network.httpsPort	int	HTTPS port number
network.rtspPort	int	RTSP port number
network.ipv4.dhcpActivation	boolean	DHCP activation status for IPv4
network.ipv4.dnsDhcpActivation	boolean	DNS DHCP activation status for IPv4
network.ipv4.ip	string	IPv4 address
network.ipv4.linklocal	string	Link-local IPv4 address
network.ipv4.gateway	string	IPv4 gateway address
network.ipv4.subnetmask	string	IPv4 subnet mask
network.ipv4.dns.primary	string	Primary DNS server for IPv4
network.ipv4.dns.secondary	string	Secondary DNS server for IPv4
network.ipv6.useType	int	IPv6 use type
network.ipv6.dnsDhcpActivation	boolean	DNS DHCP activation status for IPv6
network.ipv6.dns.primary	string	Primary DNS server for IPv6
network.ipv6.dns.secondary	string	Secondary DNS server for IPv6
network.ipv6.gateway	string	IPv6 gateway address
network.ipv6.ip	string	IPv6 address
network.ipv6.linklocal	string	Link-local IPv6 address
network.ipv6.prefixLength	int	IPv6 prefix length
system.version.firmware	string	Firmware version
system.modelName	string	Model name
system.mac	string	MAC address
system.time.year	int	Year
system.time.month	int	Month
system.time.day	int	Day
system.time.hour	int	Hour
system.time.min	int	Minute
system.time.sec	int	Second

Field	Type	Description
system.time.isDst	boolean	Daylight saving time status
system.time.osdString	string	On-screen display time string
system.health.cpu.temperatureC	int	CPU Temperature (Celsius)
system.health.cpu.temperatureF	int	CPU Temperature (Fahrenheit)
stream[].activation	boolean	Stream activation status
stream[].rtspUrl	string	RTSP URL
stream[].resolution.width	int	Resolution width
stream[].resolution.height	int	Resolution height
stream[].fps	int	Frames per second (stream 1)

Response Example

```
{
  "network": {
    "httpActivation": true,
    "httpPort": 80,
    "httpsActivation": false,
    "httpsPort": 443,
    "rtspPort": 554,
    "ipv4": {
      "dhcpActivation": false,
      "dnsDhcpActivation": true,
      "ip": "<IPv4>",
      "linklocal": "<IPv4>",
      "gateway": "<IPv4>",
      "subnetmask": "<IPv4>",
      "dns": {
        "primary": "<IPv4>",
        "secondary": "<IPv4>"
      }
    },
    "ipv6": {
      "useType": 0,
      "dnsDhcpActivation": true,
      "dns": {
        "primary": "",
        "secondary": ""
      },
      "gateway": "",
      "ip": "",
      "linklocal": "",
      "prefixLength": 64
    }
  },
  "system": {
    "version": {
      "firmware": "firmware_version"
    }
  }
}
```

```

    },
    "modelName": "modelName",
    "mac": "FFFFFFFFFFFF",
    "time": {
        "year": 2025,
        "month": 7,
        "day": 24,
        "hour": 9,
        "min": 10,
        "sec": 35,
        "isDst": true,
        "osdString": "24-07-2037 09:10:35"
    },
    "health": {
        "cpu": {
            "temperatureC": 0,
            "temperatureF": 0
        }
    }
},
"stream": [
    {
        "activation": true,
        "rtspUrl": "stream1",
        "resolution": {
            "width": 1920,
            "height": 1080
        },
        "fps": 30
    },
    {
        "activation": false,
        "rtspUrl": "stream2",
        "resolution": {
            "width": 1280,
            "height": 720
        },
        "fps": 30
    },
    {
        "activation": false,
        "rtspUrl": "stream3",
        "resolution": {
            "width": 640,
            "height": 360
        },
        "fps": 30
    }
]
}

```

6. /app/v1/system/reboot

PUT /app/v1/system/reboot

Attribute	Details
Description	Restart the device.
Permissions	Requires reboot permission.
Request Content-Type	application/json
Response Content-Type	application/json

Response Status

- 200 OK
- 401 Unauthorized

Response Fields

Field	Type	Description	Optional
result	int	Whether the authentication request was successful 1: Success	N

Response Example

```
{
  "result":1
}
```

7. /app/v1/system/factoryDefault

POST /app/v1/system/factoryDefault

Attribute	Details
Description	Reset the device to factory default state. Initialize the settings by specifying the settings category you want to initialize. If you want to initialize all settings, request by omitting the dbSelection field. If network information is updated, the HTTP request may be interrupted.
Permissions	Requires setup permission.
Request MIME Type	application/json
Response MIME Type	application/json
Request Body	Required JSON object with the following fields:

Request Fields

Field	Type	Description	Optional
dbSelection	object	Category selection to initialize.	Y
dbSelection.user	boolean	Select User Information Initialization	Y
dbSelection.system	boolean	Select System Information Initialization	Y
dbSelection.network	boolean	Select Network Information Initialization	Y
dbSelection.event	boolean	Select Event Information Initialization	Y
dbSelection.camera	boolean	Select Camera(Encoder) Information Initialization	Y
dbSelection.onvif	boolean	Select Onvif Information Initialization	Y
dbSelection.action	boolean	Select Action Information Initialization	Y

Request Example

```
{
  "dbSelection": {
    "user": true,
    "system": true,
    "network": true,
    "event": true,
    "camera": true,
    "onvif": true,
    "action": true
  }
}
```

Response Status

- 204 OK
- 401 Unauthorized

8. /app/v1/media/video/osd

GET /app/v1/media/video/osd

Attribute	Details
Description	Query OSD settings. The showType field means the following values. 0 : Do not display. 1: Marked on Top Left. 2: Marked on Top Right. 3: Mark on Bottom Left. 4: Mark on Bottom Right.
Permissions	Authentication
Request MIME Type	application/json
Response MIME Type	application/json

Response Status

- 200 OK
- 400 Bad Request
- 401 Unauthorized

Response Data Fields

Field	Type	Description
system	object	System configuration
system.systemTitleShowType	int	Defines how the system title is displayed
system.videoResolutionShowType	int	Defines how the video resolution is displayed
system.videoTimeShowType	int	Defines how the video time is displayed

Response Example

```
{
  "system": {
    "systemTitleShowType": 1,
    "videoResolutionShowType": 1,
    "videoTimeShowType": 1
  }
}
```

POST /app/v1/media/video/osd

Attribute	Details
Description	Set OSD. The showType field must be assigned the following values. 0 : Do not display. 1: Marked on Top Left. 2: Marked on Top Right. 3: Mark on Bottom Left. 4: Mark on Bottom Right.
Permissions	setup
Request MIME Type	application/json
Response MIME Type	application/json

Request Fields

Field	Type	Description	Valid Values/Range	Optional
system	object	System configuration settings		N

Field	Type	Description	Valid Values/Range	Optional
system.systemTitleShowType	uint	Determines where the system title is displayed	0 - 4	N
system.videoResolutionShowType	uint	Determines where the video resolution is displayed	0 - 4	N
system.videoTimeShowType	uint	Determines where the video time is displayed	0 - 4	N

Request Example

```
{
  "system": {
    "systemTitleShowType": 1,
    "videoResolutionShowType": 1,
    "videoTimeShowType": 1
  }
}
```

Response Status

- 204 OK
- 400 Bad Request
- 401 Unauthorized

9. /app/v1/network/ipSetup

GET /app/v1/network/ipSetup

Attribute	Details
Description	Look up IP settings.
Permissions	Authentication
Request MIME Type	application/json
Response MIME Type	application/json

Response Status

- 200 OK
- 400 Bad Request
- 401 Unauthorized

Response Data Fields

Field	Type	Description
ipv4	object	IPv4 configuration

Field	Type	Description
ipv4.dhcp	boolean	DHCP activation status for IPv4
ipv4.ipAddr	string	IPv4 address (e.g., "192.168.0.100")
ipv4.gateway	string	IPv4 gateway address (e.g., "192.168.0.1")
ipv4.subnet	string	IPv4 subnet mask (e.g., "255.255.255.0")
ipv4.dns	object	DNS configuration for IPv4
ipv4.dns.primary	string	Primary DNS server for IPv4 (e.g., "192.168.0.1")
ipv4.dns.secondary	string	Secondary DNS server for IPv4 (e.g., "0.0.0.0")
ipv4.linklocal	string	Link-local IPv4 address (e.g., "169.254.10.42")
ipv6	object	IPv6 configuration
ipv6.useType	uint	IPv6 use type (0: Not Use, 1: Manual)
ipv6.ipAddr	string	IPv6 address (e.g., "2001:db8::1")
ipv6.prefixLength	uint	IPv6 prefix length
ipv6.gateway	string	IPv6 gateway address (e.g., "fe80::1")
ipv6.dns	object	DNS configuration for IPv6
ipv6.dns.primary	string	Primary DNS server for IPv6
ipv6.dns.secondary	string	Secondary DNS server for IPv6
ipv6.linklocal	string	Link-local IPv6 address (e.g., "fe80::1")
port	object	Port configuration
port.http	uint	HTTP port number (e.g., 80)
port.https	uint	HTTPS port number (e.g., 443)
port.rtsp	uint	RTSP port number (e.g., 554)

Response Example

```
{
  "ipv4": {
    "dhcp": true,
    "ipAddr": "<IPv4>",
    "gateway": "<IPv4>",
    "subnet": "<IPv4>",
    "dns": {
      "primary": "<IPv4>",
      "secondary": "<IPv4>"
    },
    "linklocal": "<IPv4>"
  },
  "ipv6": {
```

```

    "useType": 0,
    "ipAddr": "",
    "prefixLength": 64,
    "gateway": "",
    "dns": {
      "primary": "",
      "secondary": ""
    },
    "linkLocal": ""
  },
  "port": {
    "http": 80,
    "https": 443,
    "rtsp": 554
  }
}

```

POST /app/v1/network/ipSetup

Attribute	Details
Description	Set IP information and Port information. Ports cannot overlap each other. Http : a value greater than 80 or 1024. Https : values greater than 443 or 1024. Rtsp : a value greater than or equal to 554 or 1024.
Permissions	setup
Request MIME Type	application/json
Response MIME Type	application/json

Request Fields

Field	Type	Description	Valid Values/Range	Optional
ipv4	object	IPv4 configuration		N
ipv4.dhcp	boolean	DHCP activation status for IPv4		N
ipv4.ipAddr	string	IPv4 address (e.g., "192.168.0.100")	0 - 16	N
ipv4.gateway	string	IPv4 gateway address (e.g., "192.168.0.1")	0 - 16	N
ipv4.subnet	string	IPv4 subnet mask (e.g., "255.255.255.0")	0 - 16	N
ipv4.dns	object	DNS configuration for IPv4		N
ipv4.dns.primary	string	Primary DNS server for IPv4 (e.g., "8.8.8.8")	0 - 16	N

Field	Type	Description	Valid Values/Range	Optional
ipv4.dns.secondary	string	Secondary DNS server for IPv4 (e.g., "8.8.4.4")	0 - 16	N
ipv6	object	IPv6 configuration		N
ipv6.useType	uint	IPv6 use type (0: Not Use, 1: Manual)	0 - 2	N
ipv6.ipAddr	string	Manual IPv6 address (e.g., "2001:db8::1")	0 - 64	N
ipv6.prefixLength	uint	Manual IPv6 prefix length	0 - 128	N
ipv6.gateway	string	Manual IPv6 gateway address (e.g., "fe80::1")	0 - 64	N
ipv6.dns	object	DNS configuration for IPv6		N
ipv6.dns.primary	string	Primary DNS server for IPv6 (e.g., "2001:4860:4860::8888")	0 - 64	N
ipv6.dns.secondary	string	Secondary DNS server for IPv6 (e.g., "2001:4860:4860::8844")	0 - 64	N
port	object	Port configuration		N
port.http	uint	HTTP port number	0 - 65535	N
port.https	uint	HTTPS port number	0 - 65535	N
port.rtsp	uint	RTSP port number	0 - 65535	N

Request Example

```
{
  "ipv4": {
    "dhcp": true,
    "ipAddr": "<IPv4>",
    "gateway": "<IPv4>",
    "subnet": "<IPv4>",
    "dns": {
      "primary": "<IPv4>",
      "secondary": "<IPv4>"
    }
  },
  "ipv6": {
    "useType": 1,
    "ipAddr": "<IPv6>",
    "prefixLength": 64,
    "gateway": "<IPv6>",
    "dns": {
      "primary": "<IPv6>",
      "secondary": "<IPv6>"
    }
  },
  "port": {
    "http": 80,
```

```
"https": 443,  
"rtsp": 554  
}  
}
```

Response Status

- 204 OK
- 400 Bad Request
- 401 Unauthorized



Lens Control API

API list that handles Lens.

1. /app/v1/camera/lens

GET /app/v1/camera/lens

Attribute	Details
Description	Request the lens settings.
Permissions	Authentication
Request MIME Type	application/json
Response MIME Type	application/json
Response Status	200 OK

Response Status

- 200 OK
- 401 Unauthorized

Response Data Fields

Field	Type	Description
focus.position	int	Focus position value
focus.roi.left	int	Focus roi - left position
focus.roi.top	int	Focus roi - top position
focus.roi.right	int	Focus roi - right position
focus.roi.bottom	int	Focus roi - bottom position
focus.mode	int	Focus mode
focus.afInterval	int	Auto-focus interval
focus.enableManualZoomAF	boolean	Enable manual zoom auto-focus
zoom.position	int	Zoom position value
iris.position	int	Iris position value

Response Example

```
{
  "focus": {
    "position": 0,
    "roi": {
      "left": 8,
      "top": 9,
```



```

        "right": 8,
        "bottom": 9
    },
    "mode": 0,
    "afInterval": 5,
    "enableManualZoomAF": true
},
"zoom": {
    "position": 0
},
"iris": {
    "position": 0
}
}

```

2. /app/v1/camera/lens/focus/mode

PUT /app/v1/camera/lens/focus/mode

Attribute	Details
Description	Sets the focus operation mode.
Permissions	setup
Request MIME Type	application/json
Response MIME Type	application/json

Request Fields

Field	Type	Description	Valid Values/Range	Optional
mode	uint	Specifies the focus mode. 0 : Auto Focus 1 : Manual 2 : Macro	0 - 2	N

Request Example

```

{
  "mode": 2
}

```

Response Status

- 204 OK
- 400 Bad Request
- 401 Unauthorized

3. /app/v1/camera/lens/focus/enableZoomAf

PUT /app/v1/camera/lens/focus/enableZoomAf

Attribute	Details
Description	Enable Auto Focus behavior upon Zoom changes.
Permissions	setup
Request MIME Type	application/json
Response MIME Type	application/json

Request Fields

Field	Type	Description	Valid Values/Range	Optional
enable	boolean	true : Automatically focuses on Zoom changes. false : does not automatically focus on Zoom changes.	0 - 1	N

Request Example

```
{
  "enable": true
}
```

Response Status

- 204 OK
- 400 Bad Request
- 401 Unauthorized

4. /app/v1/camera/lens/zoom/position

PUT /app/v1/camera/lens/zoom/position

Attribute	Details
Description	Change the Zoom by specifying the Position value.
Permissions	setup
Request MIME Type	application/json
Response MIME Type	application/json

Request Fields

Field	Type	Description	Valid Values/Range	Optional
position	uint	Manual zoom position	0 - 1000	N

Request Example

```
{
  "position": 1000
}
```

Response Status

- 200 OK
- 400 Bad Request
- 401 Unauthorized

Response Data Fields

Field	Type	Description
focus.position	int	Focus position reflected by Zoom change

Response Example

```
{
  "focus": {
    "position": 0
  }
}
```

5. /app/v1/camera/lens/focus/position

PUT /app/v1/camera/lens/focus/position

Attribute	Details
Description	Change the focus by specifying the location value. It changes when Focus mode is manual.
Permissions	setup
Request MIME Type	application/json
Response MIME Type	application/json

Request Fields

Field	Type	Description	Valid Values/Range	Optional
position	uint	Manual focus position	0 - 10000	N

Request Example

```
{
  "position": 10000
}
```

Response Status

- 204 OK
- 400 Bad Request
- 401 Unauthorized

6. /app/v1/camera/lens/focus/home

PUT /app/v1/camera/lens/focus/home

Attribute	Details
Description	Change Zoom and Focus to their initial state.
Permissions	setup
Request MIME Type	application/json
Response MIME Type	application/json

Response Status

- 200 OK
- 400 Bad Request
- 401 Unauthorized

Response Data Fields

Field	Type	Description
zoom.position	int	Zoom position reflected by home operation
focus.position	int	Focus position reflected by home operation

Response Example

```
{
  "zoom": {
    "position": 0
  },
  "focus": {
    "position": 0
  }
}
```

7. /app/v1/camera/lens/focus/onepush

PUT /app/v1/camera/lens/focus/onepush

Attribute	Details
Description	Specifies the area in the image to be focused in rectangular coordinates.
Permissions	setup
Request MIME Type	application/json
Response MIME Type	application/json

Request Fields

Field	Type	Description	Valid Values/Range	Optional
left	uint	Focus roi - left position	0 - 15	N
top	uint	Focus roi - top position	0 - 15	N
right	uint	Focus roi - right position	0 - 15	N
bottom	uint	Focus roi - bottom position	0 - 15	N

Request Example

```
{
  "left": 0,
  "top": 0,
  "right": 15,
  "bottom": 15
}
```

Response Status

- 200 OK
- 401 Unauthorized

Response Data Fields

Field	Type	Description
focus.position	int	Focus position reflected by onepush operation

Response Example

```
{
  "focus": {
    "position": 0
  }
}
```

Firmware Upgrade API

The firmware upgrade process follows a certain sequence. Below is a description of the general process of Firmware upgrade and the related API specifications.

Description Of Firmware Upgrade Process

Firmware upgrade mainly proceeds through the steps of `Firmware file upload` -> `Firmware upgrade request` -> `Firmware upgrade status check`.

- 1. Firmware file upload: Call the `1. /app/v1/upload/firmware` API to upload the firmware file.
- 2. Firmware upgrade request: If the correct firmware file has been uploaded, call each firmware upgrade request API to start the firmware upgrade.
- 3. Firmware upgrade status check: After the upgrade request, periodically check the firmware upgrade status to confirm it.

For detailed explanations of the firmware upgrade process, refer to the descriptions of each API.

1. /app/v1/upload/firmware

POST /app/v1/upload/firmware

Attribute	Details
Description	Upload the firmware file. If the firmware file size is too large or an upload error occurs, a 500 error or failure message is returned.
Permissions	Requires noAuth permission.
Request Content-Type	application/octet-stream
Response Content-Type	text/plain
Response Status	200 OK , 500 Internal Server Error

Request Example

<FW FILE BINARY DATA>

Response Fields

Message	Description
Success to save the file. REQUEST_URI:/app/v1/upload/firmware	Success

Message	Description
Failed to save the file. REQUEST_URI:/app/v1/upload/firmware	Fail

Response Example

```
Success to save the file.
REQUEST_URI:/app/v1/upload/firmware
```

2. /app/v1/system/firmware

GET /app/v1/system/firmware

Attribute	Details
Description	Retrieves the firmware information of the device.
Permissions	Requires authentication.
Request Content-Type	application/json
Response Content-Type	application/json

Response Status

- 200 OK
- 401 Unauthorized

Response Fields

Field	Type	Description
version	string	Current firmware version

Response Example

```
{
  "version": "firmware_version"
}
```

3. /app/v1/system/firmware/upgrade

POST /app/v1/system/firmware/upgrade

Attribute	Details
Description	If the firmware file has been uploaded, start upgrading the device. Upon successful upgrade request, the device will restart and proceed with the upgrade. After restarting, the firmware upgrade results can be checked.
Permissions	Requires setup permission.

Attribute	Details
Request Content-Type	application/json
Response Content-Type	application/json

Request Fields

Field	Type	Description	Optional
withFactoryReset	boolean	If true, the device will be reset to factory default state upon successful firmware upgrade.	Y

Request Example

```
{
  "withFactoryReset": true
}
```

Response Status

- 200 OK : Request successful
- 400 Bad Request : File is missing or incorrect
- 401 Unauthorized : No permission

4. /app/v1/system/firmware/upgradeState

GET /app/v1/system/firmware/upgradeState

Attribute	Details
Description	After the device upgrade is completed, check the upgrade results.
Permissions	Requires noAuth permission.
Request Content-Type	application/json
Response Content-Type	application/json

Response Status

- 200 OK

Response Fields

Field	Type	Description
result	int	Status result value. 0 : "None state." -1 : "Upgrade failed." 1 : "Upgrade Succeed." 2 : "Upgrading..."

Field	Type	Description
resultCaption	string	A string describing the upgrade state. (Value is the same as the result field description.)
rate	int	Upgrade progress rate. This field is returned when the result is "Upgrading..." (Optional)

Response Example

```
{
  "result": 1,
  "resultCaption": "Upgrade succeeded."
}
```

