Ref. No.20250521

Application Note

For i-PRO Network Camera

For ONVIF® Profile T / Profile S / Profile G / Profile M

Ver. 1.3

i-PRO Co., Ltd.

Revision History

Ver.	Date	Chapter #	Comment	Trigger
1.3	2025/05/21	8.1.5	Added washer command Added autofocus command	
		9.1	Added Impact detection and Casing open detection	
		9.3.5	Added explanation of Impact detection	
		9.3.6	Added explanation of Casing open detection	
1.2	2024/08/29	14.2	Added Functions for Extension Software that does not support Analytics.	
		15.1	Added documentation for Extension Software.	
1.1	2024/01/1	6.2.10	Reword. Added note on multi-sensor cameras in Analytics Configuration	
1.0	2022/10/24		first edition	

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1. Introduction

This document describes the ONVIF application guide for i-PRO network camera. It mentions some clues to integrate the i-PRO network camera through ONVIF interface.

This document doesn’t give an explanation of ONVIF specification itself and the information using the ONVIF interface. Please refer to i-PRO network camera operating instruction manual as well.

1.1. Definitions

Term	Description
ONVIF	Organizations promoting standardization of communication between IP-based physical security products ONVIF specification are published on the ONVIF website.
Native setting	Setting that is standard installed in a camera that can be controlled without going through ONVIF. Native settings are operated from the http(s):// (IP address) / setting screen or IP Camera –Command Interface. This document does not describe detailed methods and contents of Native setting. Please see the Network Camera Operation Instruction Manual, CGI Instruction Manual.
Browser	A browser is a web setting screen. The screen that displays the IP address of the camera on a web browser and moves to the setting screen is described as a browser. The sentence "Please change parameter A via the browser" means "Please change the value of parameter A on the web setting screen of the camera", that is, "Please change the value of parameter A of the native settings". ..

2. General

2.1. "User name/Password" setup now required upon first time access

Please register user name / password from the browser.

ONVIF connection becomes possible after user name password setting.

2.2. Index

List of specifications described in this document:

3. Device discovery

3.1. Scope

3.1.1. SetScopes, AddScopes

The maximum number of Scope is 20.

Corresponding default scope:

default scope	Description
onvif://www.onvif.org/Profile/G **onvif://www.onvif.org/Profile/M** **onvif://www.onvif.org/Profile/Streaming** **onvif://www.onvif.org/Profile/T**	Indicates ONVIF Profile support status. The supported Protile varies depending on the model.
onvif://www.onvif.org/hardware/(model)	(model) is the model number of the camera.
onvif://www.onvif.org/location/office	Fixed string "office"
onvif://www.onvif.org/name/i-PRO_(model)	(model) is the model number of the camera.

4. Device service

4.1. Network

4.1.1. SetHostname

If hostname is set through DHCP after setting with this command, it will be overwritten. Hostname will be set by the latest operation of manual setting or DHCP setting.

4.1.2. SetDNS

The network camera can have up to 2 DNS addresses for IPv4 and up to 2 DNS addresses for IPv6, total 4 addresses. If more than 4 addresses are set, they will be ignored.

Regarding DHCPv6 only getting IP address function is available, getting DNS (v6) address is not supported. Client need to set the DNS manually.

When the camera is set to DHCP mode and fromDHCP flag of SetDNS is true, manually setting IP address will be ignored.

4.1.3. SetNTP

Only one NTP address is available. If there are more than one address in SetNTP, the excess of that will be ignored.

As there is no definition of NTP port number in ONVIF specification, the following way to set the port number can be available in i-Pro camera.

```
IPv4Address = "10.0.0.100:234"
IPv6Address = "[2001:12:34:56::1]:234"
DNSName     = "ntp.test.co.jp:234"
```

4.1.4.SetDynamicDNS

TSIG is not supported.
In ServerUpdate, DHCPv6 (RFC4704) is not supported.

4.1.5.SetNetworkInterfaces

4.1.5.1. MTU

MTU value cannot be changed. Client receive an error if the value other than 1500 is set.

4.1.5.2. IPv4

IPv4 address cannot be disabled. If client set

```
IPv4 - Enabled = false
```

Camera will return an error.

The number of IPv4 address set manually is one. If further address is set, it will be ignored.

4.1.5.3. IPv6

IPv6 address cannot be disabled. If client set

```
IPv6 - Enabled = false
```

Camera will ignore the setting and return with no error (Previous values are remained).

The number of IPv6 address set manually is one. If further address is set, it will be ignored.
The prefix of the manually configured IPv6 address must be "64". The camera returns an error for other prefixes.

AcceptRouterAdvert parameter cannot be changed to "false".

Configurable values for DHCP parameter are "Stateful" or "Off", if "Stateless" or "Auto" is set to the parameter, the camera will send an error. As described in 4.1.2, this camera only supports getting IP address function, if client specify "Stateful", client will fail to get DNS address from DHCP.

4.1.6.SetNetworkProtocols

Either HTTP, HTTPS, HTTP + HTTPS must be set

Enable both HTTP and HTTPS

```
name="HTTP", Enabled = true
name="HTTPS", Enabled = true
```

Enable HTTPS, disable HTTP:

```
name="HTTP", Enabled = false
name="HTTPS", Enabled = true
```

Disable HTTPS, enable HTTP:

```
name="HTTP", Enabled = true
name="HTTPS", Enabled = false
```

If both HTTP and HTTPS are set to "false", the camera returns an error.

```
name="HTTP", Enabled = false
name="HTTPS", Enabled = false
```

4.1.7.SetNetworkDefaultGateway

Only one default gateway address is available. If there are more than one address in this method, it will be ignored.
IPv6 address is not supported. If it is specified, camera will return error.

When a camera is in DHCP (v4) mode set by SetNetworkInterface, this camera cannot set IPv4 address manually with SetNetworkDefaultGateway. If it’s specified the camera will return an error.

4.1.8.SetZeroConfiguration

ZeroConfiguration which is the return value of GetCapabilities () or GetServiceCapabilities () indicates correspondence to SetZeroConfiguration() and GetZeroConfiguration().

ZeroConfiguration is disabled in later firmware since Dec. 2013. The capability is informed in ZeroConfiguration.

4.2. Security

4.2.1. Username token

The camera authenticates the user ID set for the camera via a browser.
The user level set in the camera via a browser applies to ONVIF user level, and vice versa.
Existing user levels and ONVIF user levels match as follow.

Native setting	User-level via a ONVIF
Admin :	Administrator
Control :	Operator
Live :	User

The following is the user authentication table for each level of commands. From the browser user can set user authentication to ON/OFF, command authentication is changed according to the setting.

	Native setting User auth. = On				Native setting User auth. = Off			
	Administrator	Operator	User	No-auth	Administrator	Operator	User	No-auth
Administrator command	Yes	No	No	No	Yes	No	No	No
Operator command	Yes	Yes	No	No	Yes	Yes	Yes	Yes
User command	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Anonymous command	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Please refer to the "Support Command Reference Chart" for the access level of each commands.

4.2.2.TLS

If the key is not generated, TLS is disabled. In order to generate a self-signed certificate or a SSL Server certificate, key need to be generated in advance. User can generate the key only from browser or through CGI because i。
t takes some time.
Camera can have one self-signed certificate and one SSL Server certificate and TLS uses either one. If both the self-signed certificate and SSL Server certificate are valid, SSL Server certificate will be used.
Client authentication is not supported.
To enable HTTPS, please set it from browser or with "SetNetworkProtocols" .

4.3. Input/Output

"RelayOutputs" is set to "disabled" by default, as a client can confirm this setting through "GetCapabilities" command. In order to set the RelayOutput enabled, please set Alarm-[Terminal alarm 3] to AUX output. After the setting, the value of "IO-RelayOutputs" will be changed to 1.
Similarly, "InputConnectors" have to be set by the browser.

4.3.1. SetRelayOutputSettings

i-Pro camera allows the parameter value as follows.

```
Properties – Mode = Bistable
Properties – IdleState = open
```

When other settings are specified, the camera will return an error.

5. Imaging Service

5.1. WD and BLC

Super Dynamic function (WD) and BLC are run exclusively. A camera with Super Dynamic function can be set WideDynamicRange but not BacklightCompensation. A camera without Super Dynamic function can be set BacklightCompensation but not WideDynamicRange.

5.2. Native Setting and GetImagingSettings parameter binding

Correspondence table between native Image adjust settings and GetImagingSettings parameter.

Native setting Image adjust*		GetImagingSettings Output parameter	Description
Basic	Stabilizer On Off	Extension. ImageStabilization. Mode ON OFF	
Basic adjustment	Brightness 0-255*[1] 0-127*[1]	Brightness 0-127	
	Chroma gain level 0 - 255	ColorSaturation 0 - 255	
	Sharpness level 0 - 31	Sharpness 0 - 31	
	DNR 0 - 255	Extension. Extension. Extension. NoiseReduction.Level 0.0 - 1.0	
Super Dynamic(SD)	On/Off On Off	WideDynamicRange. Mode ON OFF	
	Level 0~31	WideDynamicRange. Level null or 0~31	NULL when Mode is OFF, 0~31 when Mode is ON

[1] Different models have different ranges of values for native settings.

Native setting Image adjust*		GetImagingSettings Output parameter	Description
Day & Night	Day & Night(IR)	IrCutFilter	
	For models with IR Light: *1 Off On(IR Light Off) On(IR Light On) Auto1(IR Light Off) Auto2(IR Light On) Auto3(SCC) For models without IR Light: *1 Off On Auto1(Normal) Auto2(IR Light) Auto3(SCC)	 OFF ON AUTO	Please refer to chapter 8.1.5.1 for the setup procedure.
	Level	IrCutFilterAutoAdjustment. BoundaryOffset	
	*Models with the following menus*1 Low High	 -1 - 0 0 - 1	
	*Models with the following menus*1 0 1 2 3	 1 – 0.5 -0.5 – 0 0.0 – 0.5 0.5 – 1.0	
	Dwell time	IrCutFilterAutoAdjustment. ResponseTime	
	2s 10s 30s 1min	PT2S PT10S PT30S PT60S	

Native setting Image adjust*		GetImagingSettings Output parameter	Description
White balance	ATW1/ATW2/AWC	WhiteBalance. Mode	
	ATW1/ATW2 AWC	AUTO MANUAL	
	Red gain	WhiteBalance. CrGain	
	0-255	0-255	
	Blue gain	WhiteBalance. CbGain	
	0-255	0-255	
Detailed setting	Auto contrast adjust	Extension. Extension. Extension. ToneCompensation.Mode	
	On Off(Manual)	AUTO ON	
	Contrast level	Extension. Extension. Extension. ToneCompensation. Level	In the case of native 128, ToneCompensation Level is 0.5
	0-255	0.0-1.0	
	Fog compensation	Extension. Extension. Extension. Defogging. Mode	
	On Off	ON OFF	
	Leve	Extension. Extension. Extension. Defogging. Level	When native is 4, ToneCompensation Level is 0.5
	0~8	0.0~1.0	
	Pedestal level	Contrast	
	0-255	0-255	

Image/Audio>Image quality>Image adjust

Example of GetImagingSettings response:

```
<GetImagingSettingsResponse xmlns="http://www.onvif.org/ver20/imaging/wsdl">
  <ImagingSettings>
    <tt:Brightness>64</tt:Brightness>
    <tt:ColorSaturation>128</tt:ColorSaturation>
    <tt:Contrast>128</tt:Contrast>
    <tt:Focus>
      <tt:AutoFocusMode>AUTO</tt:AutoFocusMode>
      <tt:NearLimit>1.5</tt:NearLimit>
      <tt:FarLimit>0</tt:FarLimit>
    </tt:Focus>
    <tt:IrCutFilter>AUTO</tt:IrCutFilter>
    <tt:Sharpness>16</tt:Sharpness>
    <tt:WideDynamicRange>
      <tt:Mode>ON</tt:Mode>
      <tt:Level>29</tt:Level>
    </tt:WideDynamicRange>
    <tt:WhiteBalance>
      <tt:Mode>AUTO</tt:Mode>
      <tt:CrGain>128</tt:CrGain>
      <tt:CbGain>128</tt:CbGain>
    </tt:WhiteBalance>
    <tt:Extension>
      <tt:ImageStabilization>
        <tt:Mode>OFF</tt:Mode>
      </tt:ImageStabilization>
      <tt:Extension>
        <tt:IrCutFilterAutoAdjustment>
          <tt:BoundaryType>Common</tt:BoundaryType>
          <tt:BoundaryOffset>-1</tt:BoundaryOffset>
          <tt:ResponseTime>PT10S</tt:ResponseTime>
        </tt:IrCutFilterAutoAdjustment>
        <tt:Extension>
          <tt:ToneCompensation>
            <tt:Mode>ON</tt:Mode>
            <tt:Level>0.5</tt:Level>
          </tt:ToneCompensation>
          <tt:Defogging>
            <tt:Mode>ON</tt:Mode>
            <tt:Level>0.5</tt:Level>
          </tt:Defogging>
          <tt:NoiseReduction>
            <tt:Level>0.5</tt:Level>
          </tt:NoiseReduction>
        </tt:Extension>
      </tt:Extension>
    </tt:Extension>
  </ImagingSettings>
</GetImagingSettingsResponse>
```

5.2.1.ToneCompensation and Defogging

5.2.1.1. . How Native Settings Intelligent Auto Affects ToneCompensation and Defogging

The ***Intelligent Auto*** setting in the native settings is linked to the *ToneCompensation* and *Defogging* settings in the Imaging settings Parameters.

Get=GetImagingSettings
Set=SetImagingSettings

Intelligent Auto/Native	On	Off
Auto contrast adjust/Native	Disable	Enable
ToneCompensation	Disable Get:No response. Set: Ignore	Enable Get: Response. Set: Enabled
Fog compensation/Native	Disable	Enable
Defogging	Disable Get: No response Set: Ignore	Enable Get: Response. Set: Enabled

Intelligent Auto is On:

```
(*ToneCompensation is not responded.)
(*Defogging is not responded.)
```

When ***Intelligent Auto*** is set to *On* in Native, ***Auto contrast adjust*** and ***Fog compensation*** in Native settings are disabled, *ToneCompensation* and *Defogging* in *ImagingSettings* are disabled. `GetImagingSettings()` does not return *ToneCompensation* and *Defogging*. The camera ignores this value when *ToneCompensation* and *Defogging* are specified in `SetImagingSettings()`.

Intelligent Auto is Off:

```
<tt:ToneCompensation>
  <tt:Mode>ON</tt:Mode>
  <tt:Level>0.5</tt:Level>
</tt:ToneCompensation>
<tt:Defogging>
  <tt:Mode>OFF</tt:Mode>
  <tt:Level>0.5</tt:Level>
</tt:Defogging>
```

Setting ***Intelligent Auto*** in Native to *Off* enables ***Auto contrast adjust*** and ***Fog compensation*** in Native settings, and *ToneCompensation* and *Defogging* in *ImagingSettings*. `GetImagingSettings()`

returns *ToneCompensation* and *Defogging*. When *ToneCompensation* and *Defogging* are specified in `SetImagingSettings()`, the camera sets the specified values.

5.2.1.2. Auto contrast adjust

The ***Auto contrast adjust*** in the native settings and the *Defogging* setting in *ImagingSettings* are linked.

Get=GetImagingSettings

Set=SetImagingSettings

Auto contrast adjust/Native	On	Off(Manual)
ToneCompensation.Mode/ONVIF	AUTO	ON
Defogging	Disable Get: No response. Set: Ignore	Enable Get: Response Set: Enabled

When Native's ***Auto contrast adjust*** is ***ON*** and Mode of *ToneCompensation* in *ImagingSettings* is set to AUTO:

```
<tt:ToneCompensation>
  <tt:Mode>AUTO</tt:Mode>
  <tt:Level>0.5</tt:Level>
</tt:ToneCompensation>
(*Defogging is not responded.)
```

If ***Auto contrast adjust*** in Native is set to ***ON*** or Mode of *ToneCompensation.Mode* in *ImagingSettings* is set to AUTO, *Defogging* in *ImagingSettings* is disabled. `GetImagingSettings()` does not return *Defogging*. The camera ignores this value when *Defogging* is specified in `SetImagingSettings()`.

When Native's Auto contrast adjust is Off (Manual) and Mode of ToneCompensation in ImagingSettings is ON:

```
<tt:ToneCompensation>
  <tt:Mode>ON</tt:Mode>
  <tt:Level>0.5</tt:Level>
</tt:ToneCompensation>
<tt:Defogging>
  <tt:Mode>OFF</tt:Mode>
  <tt:Level>0.5</tt:Level>
</tt:Defogging>
```

Setting Native's ***Auto contrast adjust*** to ***Off (Manual)*** or setting *ToneCompensation*'s *Mode* to ON will enable *Defogging* in *ImagingSettings*. *Defogging* is included in the `GetImagingSettings()` response. When *Defogging* is specified in `SetImagingSettings()`, the camera sets the specified values.

5.2.1.3. Linkage of fog correction and automatic contrast adjustment

The ***Fog compensation*** in the native settings and the *ToneCompensation* setting in *ImagingSettings* are linked.

Get=GetImagingSettings
Set=SetImagingSettings

Fog compensation/Native	On	Off(Manual)
Defogging. Mode /ONVIF	ON	OFF
ToneCompensation.Level	Disable Get: Level is not added Set: Error if ON and Level exists	Enable Get: Level added Set: Enabled

Fog compensation is On:

```
<tt:ToneCompensation>
  <tt:Mode>ON</tt:Mode>
  (*Level is not responded.)
</tt:ToneCompensation>
<tt:Defogging>
  <tt:Mode>ON</tt:Mode>
  <tt:Level>0.5</tt:Level>
</tt:Defogging>
```

No Level is assigned at Get, and an error is returned at Set if Mode=ON and Lecel is included.

Fog compensation is Off

```
<tt:ToneCompensation>
  <tt:Mode>ON</tt:Mode>
  <tt:Level>0.5</tt:Level>
</tt:ToneCompensation>
<tt:Defogging>
  <tt:Mode>OFF</tt:Mode>
  <tt:Level>0.5</tt:Level>
</tt:Defogging>
```

Level is assigned on Get, and is set on Set.

6. Media service

6.1. Profile

6.1.1. Share Profile with ONVIF and native settings

I-Pro cameras have the following two kinds of handling of Profile.

1) For the following models, settings via ONVIFAPI and settings via the browser are linked
   - Models other than those listed in 2)
     Values set with ONVIF-API are reflected in setting values viewed via browser.
     Values set via the browser are reflected in ONVIF setting values.

   Note: For details on relationships, see the next chapter.

     6.1.1.1 Relationship between 'Setup/Image' of native setting and VideoencoderConfiguration.token of ONVIF

     6.1.1.2 Relationship between 'Setup / Image' of native setting and ONVIF setting items
2) For the following models, settings via ONVIFAPI and settings via the browser are **not** linked
   - WV-SUD638 Series
   - The value set with ONVIF-API is not reflected in the setting value displayed in the browser. .
   - Values set via the browser are not reflected in ONVIF setting values

6.1.1.1. Relationship between 'Setup/Image' of native setting and VideoencoderConfiguration.token of ONVIF

The model sharing the setting with ONVIF and Native is defined in "6.1.1 Share Profile with ONVIF and native settings".

Correspondence table of ONVIF properties and browser setting menu on models in which the ONVIF Interface setting value is linked with the Native setting value viewed from the browser:

Native setting **Setup > image**	ONVIF VideoencoderConfiguration.token
Stream (1)	h26x_1_video
Stream (2)	h26x_2_video
Stream (3)	h26x_3_video
Stream (4)	h26x_4_video
JPEG(1)	jpeg_1_video
JPEG(2)	jpeg_2_video

multi-sensor cameras:

Native setting **Setup > image**	ONVIF VideoencoderConfiguration.token
Stream (1)	h26x_1_video h26x_1_video_ch2 h26x_1_video_ch3 h26x_1_video_ch4
Stream (2)	h26x_2_video h26x_2_video_ch2 h26x_2_video_ch3 h26x_2_video_ch4
JPEG(1)	jpeg_1_video jpeg_1_video_ch2 jpeg_1_video_ch3 jpeg_1_video_ch4

6.1.1.2. Relationship between 'Setup / Image' of native setting and ONVIF setting items

The model sharing the setting with ONVIF and Native is defined in "6.1.1 Share Profile with ONVIF and native settings".
As shown in the table below, the camera's existing settings and the ONVIF settings are linked

Native Setting JPEG (n)*	ONVIF setting	Description
Image capture size	Resolution	VideoEncoderConfiguration.Resolution
Image quality	Quality	VideoEncoderConfiguration. Quality See chapter 6.2.8"Quality" Parameter

*Setup > Image > JPEG (n)

Native setting stream (n)*	ONVIF setting	Description
Stream transmission	-	If "Stream transmission" is set to "OFF" with Native setting, video is not delivered even with the ONVIF profile linked with NativeSetting's Stream. At this time, the value of the ONVIF profile is NOT changed.
Stream encoding format	Encoding	VideoEncoderConfiguration.Encoding Media1 service cannot control H265.
Image capture size	Resolution	VideoEncoderConfiguration.Resolution
Transmission priority	(Media2) ConstantBitRate	Settings can be changed only from Media 2 See 13.2.2.3 "ConstantBitRate" Parameter)
Frame rate	FrameRateLimit	VideoEncoderConfiguration.RateControl. FrameRateLimit See 6.2.2.2"FramerateLimit" Parameter
Max bit rate (per client)	BitrateLimit	VideoEncoderConfiguration:.RateControl. BitrateLimit See 6.2.2.1"BitrateLimit" Parameter
Image quality	Quality	VideoEncoderConfiguration. Quality See 6.2.8"Quality" Parameter
Smart Coding		See 6.2.5.2"GovLength" Parameter of Smart Coding
Refresh interval	GovLength	See 6.2.5"GovLength" Parameter

Native setting stream (n)*	ONVIF setting	Description
Transmission type	Multicast	VideoEncoderConfiguration::Multicast Multicast settings is independent for ONVIF configuration and native configuration. The stream settings have a structure in which the native settings and ONVIF Profile match, but for multicast, the native settings and ONVIF work differently. See 6.2.3"Multicast" Parameter

*Setup > Image > stream (n)

6.1.2.Profile Name

The standard profile name differs depending on the model.
If you use multiple cameras, use the profile name included in the `GetProfiles()` response instead of using a fixed profile name. The `VideoSourceMode` may change the configuration of the Profile.

6.1.3.Stream

6.1.3.1. The minimum guaranteed total number of encoder instances

The number of streams that can be delivered is fixed.
`GetGuaranteedNumberOfVideoEncoderInstances()` reports the number of streams that can be delivered simultaneously.

6.1.3.2. RTSP URL format

To get the URI of the RTSP connection, send *`GetStreamUri()`* specifying Profile.
The URL format is as follows:

```
rtsp://<IP>/ONVIF/MediaInput?profile=<ProfileToken>
```

6.2. Configuration

6.2.1. Note for configuration changes

When a client change configuration during live streaming, the connection will be disconnected.
When a bit rate of G.726 is changed, all connections will be disconnected.
Set a value within the range that can be obtained with Get<configuration entity>Options.

6.2.2. "RateControl" Parameters

6.2.2.1. "BitrateLimit" Parameter

Depending on "VideoEncoder Configuration", the ranges of the bit rate that the client can set are different.

JPEG:

Max = 0, Min = 0;

H264:

When a user sets a bit rate value besides these values, the camera adopts it the nearest value from the valid bit rate. For example, when a user sets 4000kbps, the camera will choose 3072kbps.
A set of available bit rate depends on the model. The range of the available bit rate can be vary according to its resolution. Please refer to the operating instruction manual for detail.

Note: The camera chooses the smaller value than the bit rate that a user set.

6.2.2.2. "FramerateLimit" Parameter

Frame rate values supported by the camera can be obtained from GetVideoEncoderConfigurationOptions.
When a client sets a frame rate value, the camera chooses the nearest value from the specified frame rate.
For example, when a client set 19fps, the camera chooses 15fps.

Note: The camera chooses the smaller value than the frame rate that the client set.

6.2.3."Multicast" Parameter

The initial value of the multicast address is shown below.

```
Type = IPv4
IPv4Address = 0.0.0.0
Port = 0
TTL = 0
```

These initial settings above mean that multicast setting is invalid.
These initial settings are recommended when a client does not use multicast. Because the camera will allocate the band width beforehand for multicast when a client enabled multicast setting (The camera's specification).

The ONVIF Multicast setting is independent of and does not affect the Native Multicast setting.

When multicasting with RTSP, the URI changes from unicast.
After setting the multicast address of MediaConfiguration, get the URI with *GetStreamUri()*. Request multicast delivery using the obtained URI.

6.2.4."SessionTimeout" Parameter

"SessionTimeout" parameter is fixed in the camera, and the change is not supported. A client have to use "PT120S" or "PT2M" to set. Receiving other values, the camera will return without an error and it will be ignored.

6.2.5."GovLength" Parameter

6.2.5.1. "GovLength" Parameter of H.264

The value of "GovLength" is calculated by the following formula.
Refresh interval(Native) * Frame rate(Native) = GovLength(ONVIF)
e.g. 1(sec) x 15(fps) = 15(gov)

This camera manages the following Refresh interval values.

```
0.2, 0.25, 0.33, 0.5, 1, 2, 3, 4, 5 (sec)
```

The GovLength range varies depending on the fps limit.
The GovLength setting is rounded by the camera.
Example) GovLength =149→120

6.2.5.2. "GovLength" Parameter of Smart Coding

For cameras that support "smart coding", when "Smart coding" is set to "On" from the browser, the browser setting takes precedence.

- The value of GovLength is automatically rewritten, and it is reflected in the stream delivered by ONVIF.
- If you attempt to overwrite the GovLength value with the ONVIF command, an error will be returned.

6.2.6.Metadata Configuration

MetadataConfiguration holds the MetadataStream settings for the target Stream.

Response Example:

```
<tt:MetadataConfiguration token="metadata1">
    <tt:Name>MetadataConfig1</tt:Name>
    <tt:UseCount>0</tt:UseCount>
    <tt:PTZStatus>
        <tt:Status>false</tt:Status>
        <tt:Position>false</tt:Position>
    </tt:PTZStatus>
    <tt:Events>
        <tt:Filter>
            <wsnt:TopicExpression
Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet"
xmlns:tns1="http://www.onvif.org/ver10/topics" xmlns:tnsipro1 = "http://i-
pro.com/2021/onvif/event/topics">
              </wsnt:TopicExpression>
            <wsnt:MessageContent
Dialect="http://www.onvif.org/ver10/tev/messageContentFilter/ItemFilter">
              </wsnt:MessageContent>
        </tt:Filter>
    </tt:Events>
    <tt:Analytics>true</tt:Analytics>
    <tt:Multicast>
        <tt:Address>
            <tt:Type>IPv4</tt:Type>
            <tt:IPv4Address>0.0.0.0</tt:IPv4Address>
        </tt:Address>
        <tt:Port>0</tt:Port>
        <tt:TTL>0</tt:TTL>
        <tt:AutoStart>false</tt:AutoStart>
    </tt:Multicast>
    <tt:SessionTimeout>PT120S</tt:SessionTimeout>
</tt:MetadataConfiguration>
```

parameter	Support Status	Description
PTZStatus	No	Return error if specified
Events	Yes	If not specified, all events are notified。
Analytics	Yes	Cameras that support the Analytics Service can choose whether to use it or not.

MetadataStream, see Chapter 15 Metadata Stream.

6.2.7.Audio Back Channel Configuration

Bi-directional audio is supported on the basis of Back Channel Connection added to ONVIF Core Specification Ver.2.0.

Available audio codec depends on the setting of the browser. The following table shows the audio codec that will be informed by AudioDecoderConfigurationOptions. Initial setting of the codec is G.711.

Native setting		Onvif
Audio setting	Codec setting	AudioDecoderConfiguraionOptions Audio codec
OFF (initial)	NA.	G711 – 64 kbps
Option other than OFF	G711	G711 – 64 kbps
	G726 - 16kbps	G726 – 16 kbps
	G726 - 32kbps	G726 – 32 kbps
	AAC-LC - 64kbps[2]	G726 – 32 kbps

The camera accepts no tag or www.onvif.org/ver20/HalfDuplex/Auto for SendPrimacy the parameter of AudioOutputConfiguration. In the case of www.onvif.org/ver20/HalfDuplex/Auto the setting of the browser goes on to bidirectional, then the setting of the audio codec is set to G.726.
Audio Back Channel overHTTP is not supported.

[2] when AAC-LC is supported

6.2.8."Quality" Parameter

The value 0 means "Low" in quality in ONVIF while "Super Fine" in browser. The relationship between these numbers is as shown in the table below.

"VideoEncoderConfiguration.Quality"	"***Image quality"*** (Native setting)
0	9 Low
1	8
2	7
3	6
4	5 Normal
5	4
6	3
7	2
8	1 Fine
9	0 Super Fine

Please refer to chapter 13.2.8 "Quality" Parameter for a comparison table for models compatible with Media 2.

6.2.9."Rotate" Parameter

Aspect ratio (Native)	(ONVIF)VideoSourceConfiguration.Extension.Rotate
4:3	Only vertical rotation (Degree=0/180)
16:9	Can rotate (Degree=0/90/180/270)

6.2.10. Analytics Configuration

There are three AnalyticsConfigurations for cameras except for multi-sensor cameras.
Multi-sensor cameras have an AnalyticsConfiguration associated with Ch1~4 of the VideoSourceConfiguration. Different connections between VideoSourceConfiguration and AnalyticsConfiguration are not allowed.

	VideoSourceConfiguration.token	AnalyticsConfiguration.token
Ch1	VideoSourceConfig	AnalyticsConfig
Ch2	VideoSourceConfig2	AnalyticsConfig2
Ch3	VideoSourceConfig3	AnalyticsConfig3
Ch4	VideoSourceConfig4	AnalyticsConfig4

Once the Profile is associated with Metadata Configuration and Analytics Configuration, Metadata is ready to use.
See Chapter 15 for information on how to use the Metadata Stream.

6.3. OSD

6.3.1. Maximum number of OSD

Our camera has maximum two OSDs. These numbers can be gotten with GetOSDConfigulationOptions.

MaximumNumberOfOSDs	number
Total	2
PlainText	1
DateAndTime	1

6.3.2. Position

Available OSD display position is following four types defined in ONVIF standard.

```
"UpperLeft"
"UpperRight"
"LowerLeft"
"LowerRight"
```

Free position is not supported with use of Custom.

6.4. VideoSourceMode

The WV-SUD638 series automatically reboots when *FramerateLimit* is switched to 30fps or 25fps using `SetVideoSourceMode()`. Other models do not restart.

7. Streaming

7.1. Session Management

Each single session is related to the sessionID of RTSP method. The session is controlled by the SessionID in SETUP of RTSP.
When a client SETUP and PLAY to control audio and video separately the client can use it with different session ID in SETUP. In this case two sessions are consumed.

7.2. Framerate

Regarding JPEG streaming use of RTPoverRTSP and RTPoverRTSPoverHTTP in transport layer causes the camera to drop its performance. So it may stream less than user specified framerate.
In case that H.264 streaming is valid, JPEG framerate will be 5 fps.

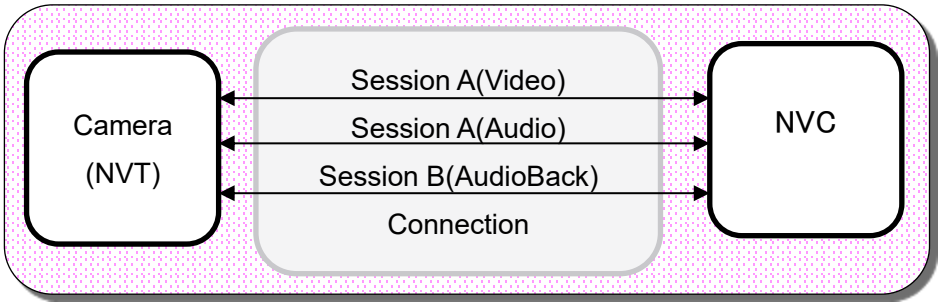
7.3. Back Channel Connection

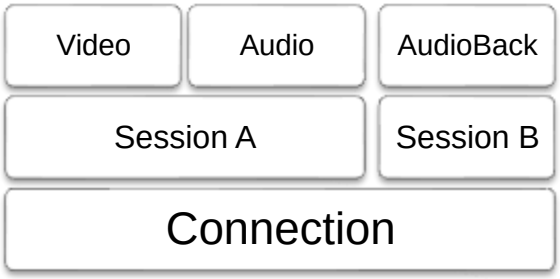
Supported Transport: UDP, RTP over RTSP.

We recommend that audio packet interval for client should be set to the same value as the setting of browser. In the case of RTP over RTSP, the interval of the audio packet should be at least the following value because of the buffer size. Our recommendation value for "RTP over RTSP" is 160ms and 320ms.

native setting	Client
Audio output interval	Audio packet interval (millisec)
160ms	160
320ms	160 - 320
640ms (initial)	160 - 640
1280ms	160 - 1280

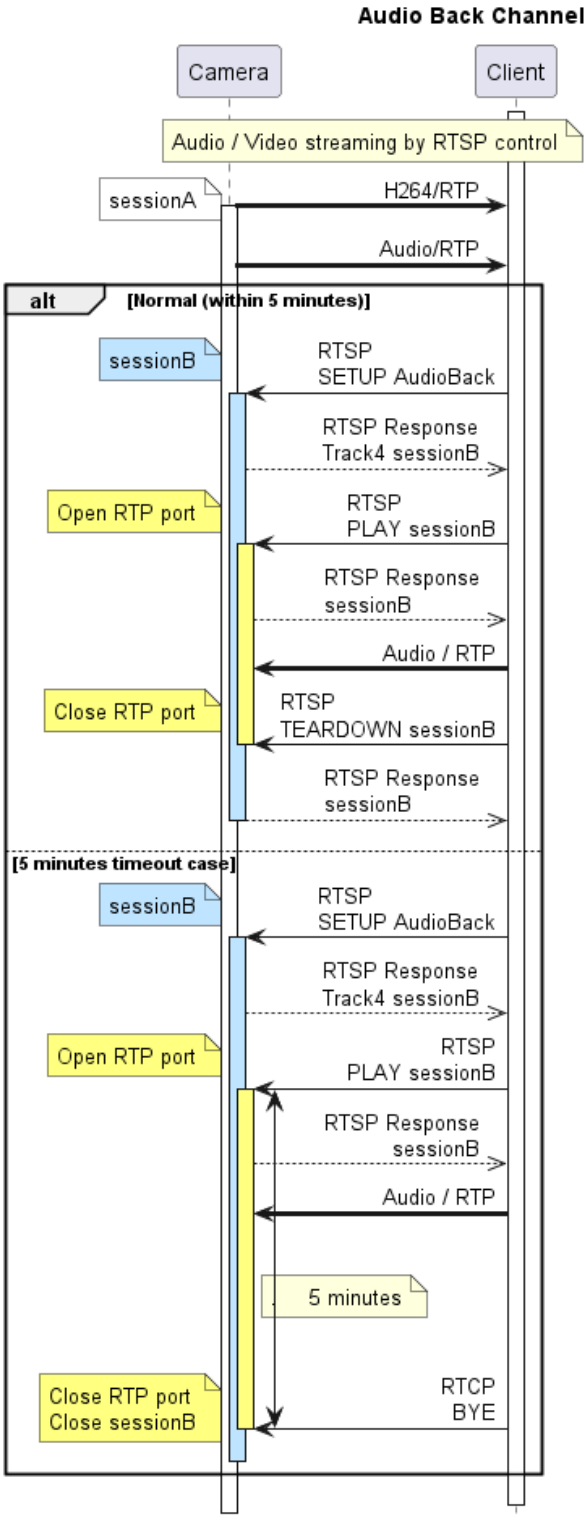
The session for Audio Back Channel should be set separately from Audio/Video session because the back channel will be disconnected in five minutes(*) by camera in order not to hold the session for a long time.
(*) It depends the setting of "Audio output duration" from browser.(1min – 1hour)





The following is the sequence of the audio back channel.

After 5 minutes of AudioBackChannel, the BackChannel session will be closed from camera. So the client should start a new session for AudioBackChannel from SETUP method.



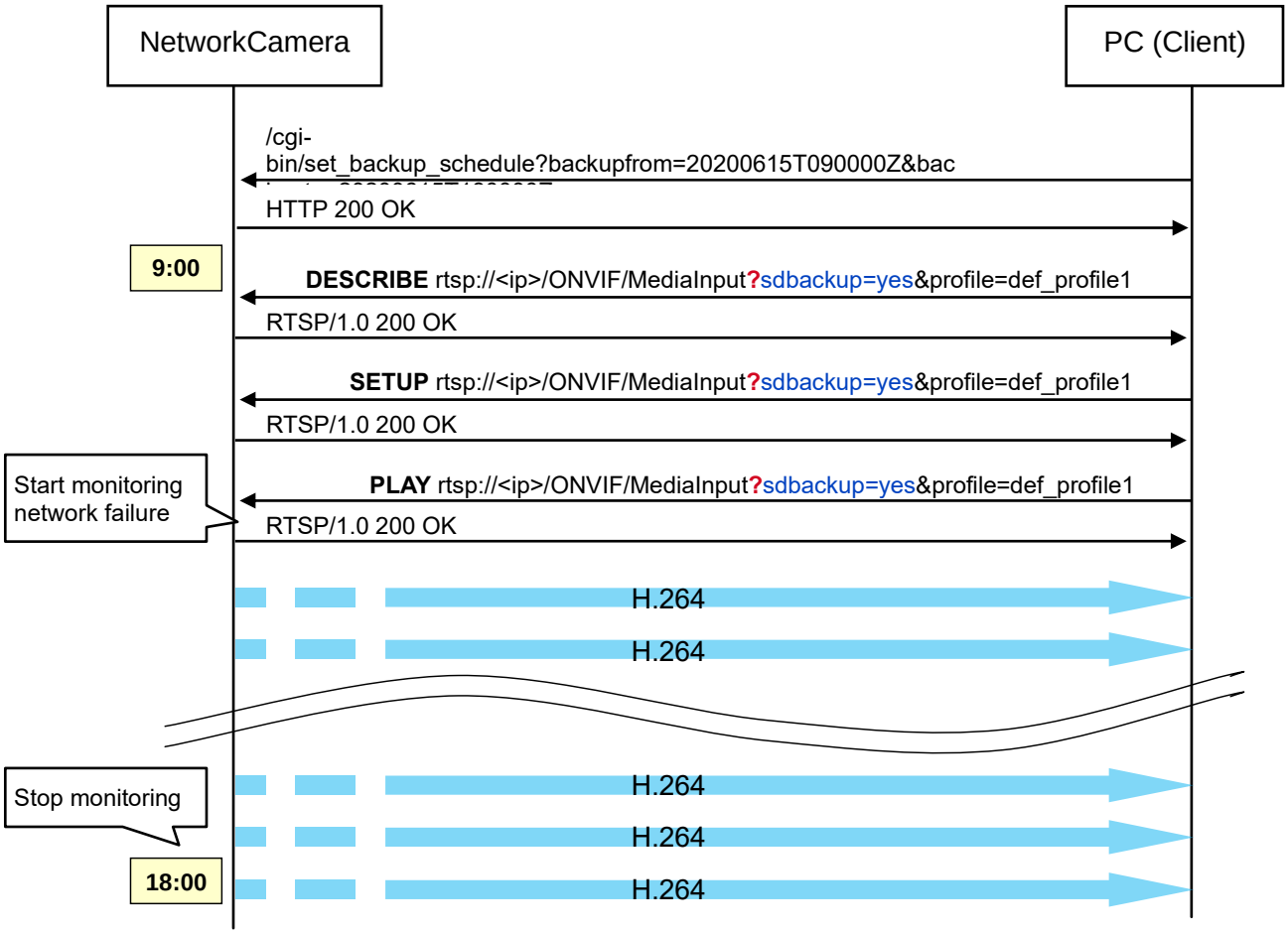
7.4. Relationship with Cropping feature

Some cameras are supporting cropping feature, but ONVIF interface is not supported. If a client want to control the streaming for cropped view, cgi interface is available. In ONVIF interface, cropping feature is not recommended because unexpected image may be sent.

7.5. Network failure trigger base SD backup

The method to record to the SD card when a network failure is detected is as follows.

1. Use the CGI interface to set the validity period of the SD card recording function for network failure detection.
2. Request an RTSP stream that contains the "sdbackup = yes" parameter during its lifetime. With this RTSP stream request, the camera will start detecting network failures, and when it detects a network failure, it will start recording the stream to the SD card.



Note:For more information on CGI, refer to the "IP Camera –Command Document".

8. PTZ Service

This camera supports "Generic" coordinate system.
The default profile has PTZConfiguration.
To control PTZ with a user profile, the client should add PTZConfiguration to the user profile.
Non-PTZ cameras (fixed cameras, omnidirectional cameras, multi-sensor cameras) support zooming from the browser, but do not support PTZ services.

Supported Space list:

kinds	Space	support
Absolute	http://www.onvif.org/ver10/tptz/PanTiltSpaces/PositionGenericSpace	Yes
	http://www.onvif.org/ver10/tptz/ZoomSpaces/PositionGenericSpace	Yes
	http://www.onvif.org/ver10/tptz/PanTiltSpaces/SphericalPositionSpace	No
	http://www.onvif.org/ver10/tptz/ZoomSpaces/PositionSpaceMillimeter	No
	http://www.onvif.org/ver10/tptz/ZoomSpaces/NormalizedDigitalPosition	No
Relative	http://www.onvif.org/ver10/tptz/PanTiltSpaces/TranslationGenericSpace	Yes
	http://www.onvif.org/ver10/tptz/ZoomSpaces/TranslationGenericSpace	Yes
	http://www.onvif.org/ver10/tptz/PanTiltSpaces/TranslationSpaceFov	No
Continuous	http://www.onvif.org/ver10/tptz/PanTiltSpaces/VelocityGenericSpace	Yes
	http://www.onvif.org/ver10/tptz/ZoomSpaces/VelocityGenericSpace	Yes
	http://www.onvif.org/ver10/tptz/PanTiltSpaces/VelocitySpaceDegrees	No
Speed	http://www.onvif.org/ver10/tptz/PanTiltSpaces/GenericSpeedSpace	Yes
	http://www.onvif.org/ver10/tptz/ZoomSpaces/ZoomGenericSpeedSpace	Yes
	http://www.onvif.org/ver10/tptz/PanTiltSpaces/SpeedSpaceDegrees	No
	http://www.onvif.org/ver10/tptz/ZoomSpaces/SpeedSpaceMillimeter	No

8.1. Use case of PTZ

8.1.1. Set PTZ configuration

1. Choose MediaProfile to control PTZ .
2. Add PTZ Configuration to the MediaProfile if the profile doesn’t have one.
   - Find available PTZConfiguration (GetPTZConfigurations)
   - Add one to MediaProfile (Media::AddPTZConfiguration, Media2::AddConfiguration)
3. Set PTZ Configuration
   - Find available node (GetNodes)
   - Check configurable parameters and their ranges (GetConfigurationOptions)
   - Set the configuration (SetConfiguration)

8.1.2. PTZ control

1. Move to absolute position
   - Confirm default coordinate space of the PTZ Configuration
   - Move the absolute position of the coordinate apace (AbsoluteMove)
2. Move continuously
   - Move continuously with velocity of the coordinate space (ContinuousMove)
   - Stop (Stop)

8.1.3. Home Position

As default, camera doesn't have home position, so a client have to set the Home position beforehand. The last number of the Preset number is reserved for the Home position.

8.1.4.Zoom

For a WV-SUD638 series supporting 1,080x zoom a client can control until 999.9x zoom by ONVIF interface.
For WV-SUD638 series, WV-X6500 Series WV-S6500 Series and WV-S6100 Series the Zoom range varies depending on the Native setting below.

- Digital zoom
- HD Extra optical zoom

To obtain and change the Native setting, refer to the "Command Document (H.265 supported models)".

Within the *XRange.Max* range of the AbsoluteZoomPositionSpace or *RelativeZoomTranslationSpace*, the Zoom magnification can be specified using *GetConfigurationOptions*() or *GetNodes*().

In the WV-SUD638 Series, WV-X6500 Series, WV-S6500 Series and WV-S6100 Series, *XRange.Max* is less than 1.

The maximum zoom ratio that can be specified with *AbsoluteMove* and *RelativeMove* is defined as follows:

Models	Digital zoom	HD Extra optical zoom	The maximum range of zoom
WV-SUD638 Series	Off	Off	0.02778
	On	Off	0.04167
	On	On	1
WV-X6500 Series WV-S6500 Series WV-S6100 Series	Off	Off	0.0625
	On	Off	0.09375
	On	On	1
Other models:	Any	Any	1

The Zoom range for models other than the WV-SUD638 series, WV-X6500 Series WV-S6500 Series and WV-S6100 Series is fixed at 0-1.

[Digital zoom] and [HD Extra optical zoom] can be found in the [Cam. Function] tab of the "PTZ" page.

8.1.5.Wiper, Washer, IR-LED, AutoFocus

Wiper control, washer control, IR-LED control and AutoFocus control can be performed using SendAuxiliaryCommand().

It is possible to input the character string obtained by GetNodes() or GetCapabilities() of PTZService.

The relationship with Native CGI control is as follows:

i-Pro Native CGI	AuxiliaryData (ONVIF)	Description
wiper=high	tt:Wiper|On	Keep wiping fast
wiper=low	tt:Wiper|Low	Keep wiping slowly
wiper=off	tt:Wiper|Off	Stop the wiper
wiper=1shot	tt:Wiper|1shot	Move wiper only once
wiper=with_washer	tt:Washer|On	Start the washer
wiper=off	tt:Washer|Off	Stop the washer
wiper=with_washer	tt:WasherProcedure|On	Start the washer
wiper=off	tt:WasherProcedure|Off	Stop the washer
auto=on	tt:AutoFocus|1shot	Start the AutoFocus
auto=on	tt:AutoFocus|1shot_ch1	Start autofocus on ch1.
auto=on	tt:AutoFocus|1shot_ch2	Start autofocus on ch2
auto=on	tt:AutoFocus|1shot_ch3	Start autofocus on ch3
auto=on	tt:AutoFocus|1shot_ch4	Start autofocus on ch4
ir_led_sync=Off	tt:IRLamp|Off	Turn off IR LED Light
ir_led_sync=AutoH	tt:IRLamp|Auto	Set IR LED Light to Auto (High)
ir_led_sync=AutoH	tt:IRLamp|Auto_High	Set IR LED Light to Auto (High)
ir_led_sync=AutoM	tt:IRLamp|Auto_Mid	Set IR LED Light to Auto (Mid)
ir_led_sync=AutoL	tt:IRLamp|Auto_Low	Set IR LED Light to Auto (Low)

8.1.5.1. How to switch "Day & Night (IR)" of native Setting with ONVIF

To switch "Day & Night (IR)" of native Setting with ONVIF, please send two commands as follows:

1. Please set the values in the table below to AuxiliaryData and send SendAuxiliaryCommand.
2. Please set the values in the table below to IrCutFilter and send SetImagingSettings().

Please send in order of 1 and 2

For example, to set "Day & Night (IR)" to "Auto 2"
First set 'tt: IRLamp | Auto_High' to AuxiliaryData of PTZService and send SendAuxiliaryCommand().
Next, set IrCutFilter of ImagingSettings to "AUTO" and send SetImagingSettings().

Native setting **Day & Night(IR)**	ONVIF PTZService 1) AuxiliaryData	ONVIF ImagingService. 2) ImagingSettings.IrCutFilter	note
Off	(no need to set)	ON	
On	(no need to set)	OFF	In the case of "Day & Night (electrical)", IrCutFilter = OFF setting is ignored by the camera.
Auto1(Normal)	tt:IRLamp|Off	AUTO	
Auto2(IR Light)	tt:IRLamp|Auto tt:IRLamp|Auto_High tt:IRLamp|Auto_Mid tt:IRLamp|Auto_Low	AUTO	
Auto3(SCC)	-	-	Cannot set Auto3(SCC) from ONVIF

For Aero PTZ (WV-SUD638), set the relay output of the native setting to "Washer control".

Procedure:

1. Get the ***Day & Night(IR)*** status of Native setting.
2. Send *SendAuxiliaryCommand*.
3. Get the ***Day & Night(IR)*** status of Native setting.
4. Send *SetImagingSettings*.
5. Get the ***Day & Night(IR)*** status of Native setting.

List of ***Day & Night(IR)*** status of Native setting in each procedure

1.[Day & Night(IR)]	2.SendAuxiliaryCommand	3.[Day & Night(IR)]	4. SetImagingSettings	5.[Day & Night(IR)]
Off	tt:IRLamp|Off	Off	IrCutFilter=ON(Day mode)	Off
			IrCutFilter=OFF(Night mode)	On
			IrCutFilter=AUTO	Auto1(Nomal)
	tt:IRLamp|Auto		IrCutFilter=ON(Day mode)	Off
			IrCutFilter=OFF(Night mode)	On
			IrCutFilter=AUTO	Auto2(IR Light)
On	tt:IRLamp|Off	On	IrCutFilter=ON(Day mode)	Off
			IrCutFilter=OFF(Night mode)	On
			IrCutFilter=AUTO	Auto1(Nomal)
	tt:IRLamp|Auto		IrCutFilter=ON(Day mode)	Off
			IrCutFilter=OFF(Night mode)	On
			IrCutFilter=AUTO	Auto2(IR Light)
Auto1(Nomal)	tt:IRLamp|Off	Auto1(Nomal)	IrCutFilter=ON(Day mode)	Off
			IrCutFilter=OFF(Night mode)	On
			IrCutFilter=AUTO	Auto1(Nomal)
	tt:IRLamp|Auto	Auto2(IR Light)	IrCutFilter=ON(Day mode)	Off
			IrCutFilter=OFF(Night mode)	On

1.[Day & Night(IR)]	2.SendAuxiliaryCommand	3.[Day & Night(IR)]	4. SetImagingSettings	5.[Day & Night(IR)]
			IrCutFilter=AUTO	Auto2(IR Light)
Auto2(IR Light)	tt:IRLamp|Off	Auto1(Nomal)	IrCutFilter=ON(Day mode)	Off
			IrCutFilter=OFF(Night mode)	On
			IrCutFilter=AUTO	Auto1(Nomal)
	tt:IRLamp|Auto	Auto2(IR Light)	IrCutFilter=ON(Day mode)	Off
			IrCutFilter=OFF(Night mode)	On
			IrCutFilter=AUTO	Auto2(IR Light)
Auto3(SCC)	tt:IRLamp|Off	Auto1(Nomal)	IrCutFilter=ON(Day mode)	Off
			IrCutFilter=OFF(Night mode)	On
			IrCutFilter=AUTO	Auto1(Nomal)
	tt:IRLamp|Auto	Auto2(IR Light)	IrCutFilter=ON(Day mode)	Off
			IrCutFilter=OFF(Night mode)	On
			IrCutFilter=AUTO	Auto2(IR Light)
-		Auto3(SCC)	IrCutFilter=ON(Day mode)	Off
			IrCutFilter=OFF(Night mode)	On
			IrCutFilter=AUTO	Auto3(SCC)

8.1.6.Generic Space

8.1.6.1. Pan range

The Pan range of Generic Space is 0 - 1 (0 - 360°). -1 - 1 (-180 - 180°) is not supported.

8.1.7.Speed settings

Speed support status varies by model.

Unsupported models: WV-SUD638 Series, WV-X6500 Series WV-S6500 Series and WV-S6100 Series

Support models: Models other than the above:

9. Event service

9.1. Notification Events

The following ONVIF standard events are supported.

Service	Type	Topic Expression
Imaging	Motion Alarm	tns1:VideoSource/MotionAlarm
	Global Scene Change	tns1:VideoSource/GlobalSceneChange/ImagingService
DeviceIO	Digital Input	tns1:Device/Trigger/DigitalInput
	Relay Output	tns1:Device/Trigger/Relay
PTZ	PresetTour status	tns1:PTZController/PTZPresetTours/Configuration
Search	Recording status	tns1:RecordingHistory/Recording/State
	Track status	tns1:RecordingHistory/Track/State
Recording	Recording job state	tns1:RecordingConfig/JobState
	Recording configuration	tns1:RecordingConfig/RecordingConfiguration
	Track configuration	tns1:RecordingConfig/TrackConfiguration
	Recording job configuration	tns1:RecordingConfig/RecordingJobConfiguration
Media2	Profile	tns1:Media/ProfileChanged
	Configuration	tns1:Media/ConfigurationChanged
Analytics	Line Detector	tns1:RuleEngine/LineDetector/Crossed
	Field Detector	tns1:RuleEngine/FieldDetector/ObjectsInside
	Loitering Detector	tns1:RuleEngine/LoiteringDetector/ObjectIsLoitering
	Motion Region Detector	tns1:RuleEngine/MotionRegionDetector/Motion
	Line crossing counting	tns1:RuleEngine/CountAggregation/Counter

i-PRO's unique events are shown below.

Type	Topic Expression
Command Alarm	tns1:UserAlarm/tnsipro1:Command/Received
remaining capacity of the SD memory card	tns1:Device/tnsipro1:SD/Capacity/Decreased
Direction Detector	tns1:RuleEngine/DirectionDetector/Moved
Impact detection	tns1:VideoSource/tnsipro1:HardwareDetector/ImpactDetect
Casing open detection	tns1:VideoSource/tnsipro1:HardwareDetector/CasingDetect

9.2. The number of event registration

This camera allows up to 6 subscription for Pull-Point Notification and total 8 subscription for Basic Notification and Pull-Point Notification.
The subscription period is up to 7 days.
When a client restart the camera, all the "Subscribe" information is discarded.
This camera doesn't support ContentExpression.

9.3. How to use event

Our camera supports some i-PRO specific events and ONVIF standard events. This chapter describes the usage of i-PRO events. The following is the namespace for the event;

```
xmlns : tnsipro1 = "http://i-pro.com/2021/onvif/event/topics"
```

9.3.1. Terminal alarm

All of the terminals are set to Off by default. Onvif specification doesn't have the terminal enable command, so user have to the terminals enabled from alarm settings page of the browser.
For Terminal alarm the following topic is defined;

```
tns1:Device/Trigger/DigitalInput
```

Terminal number is described in InputToken in the event message.

Token	Terminal number
InputPort1	Terminal1
InputPort2	Terminal2
InputPort3	Terminal3

```
<wsnt:NotificationMessage>
  <wsnt:SubscriptionReference>
    <wsa:Address>
      http://192.168.0.10/Subscription?Idx=12345
    </wsa:Address>
  </wsnt:SubscriptionReference>
  <wsnt:Topic
```

```
Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet">
    tns1:Device/Trigger/DigitalInput
  </wsnt:Topic>
  <wsnt:Message>
    <tt:Message UtcTime="2016-04-03T14:00:00Z" PropertyOperation="Initialized">
      <tt:Source>
        <tt:SimpleItem Name="InputToken" Value="InputPort1"/>
      </tt:Source>
      <tt:Data>
        <tt:SimpleItem Name="LogicalState" Value="true"/>
      </tt:Data>
    </tt:Message>
  </wsnt:Message>
</wsnt:NotificationMessage>
```

9.3.2.Motion alarm

In order to use VMD alarm "Detection area" must be registered. These setting should be configured from native.

The following ONVIF standard event is supported;

```
tns1:VideoSource/MotionAlarm
```

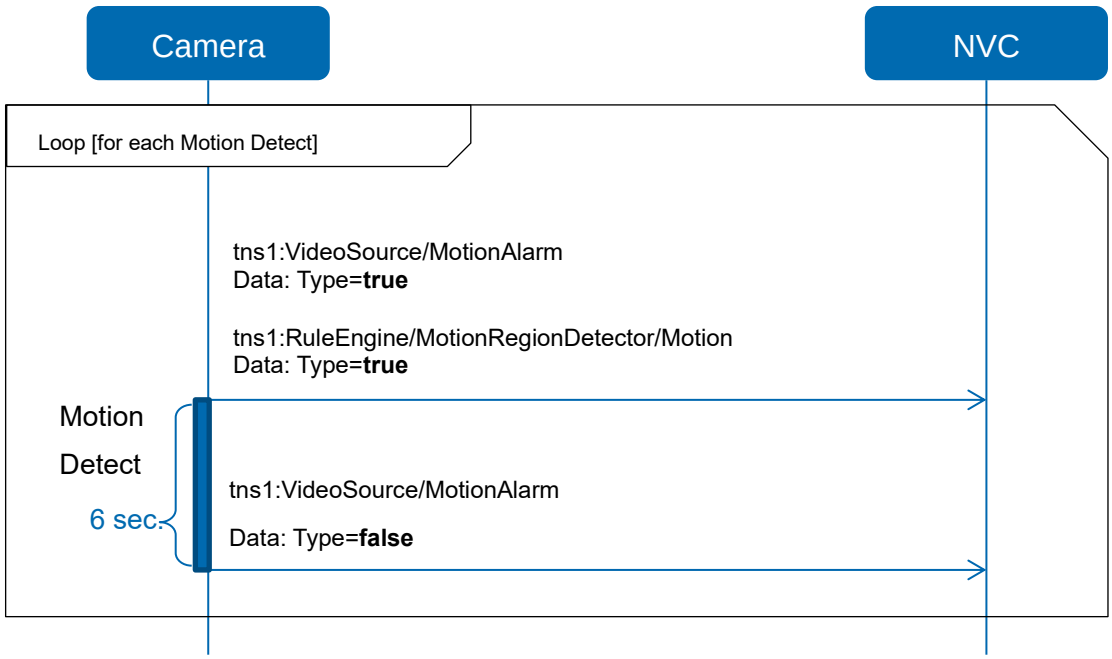
Notifies "true" when motion is detected, and notifies "false" after 6 seconds.

If the operation continues for 6 seconds or more, the end of detection will be notified after the operation ends.

"true" = VMD detected

"false" = VMD detection finished

These events are notified only the first time of the motion detection as below.



Models that support the Analytics service also support the MotionRegionDetector event.

```
tns1:RuleEngine/MotionRegionDetector/Motion
```

MotionRegionDetector only notifies when motion detection starts, but not when it ends.

Initialized event is fixed to State="false"

Changed event is fixed to State="true"

9.3.3.Command alarm

When the camera receives i-PRO original command alarm from other camera, event will be occurred. Please configure using the existing Web Interface.

For Command alarm the following topic is defined;

```
tns1:UserAlarm/tnsipro1:Command/Received
```

9.3.4.Remaining capacity of the SD memory card

Remaining SD memory card capacity notification. Please refer to the Operating Instructions manual for settings.
For this alarm the following topic is defined;

```
tns1:Device/tnsipro1:SD/Capacity/Decreased
```

9.3.5.Impact detection

An event is triggered when a shock is applied to the camera. Please configure using the existing Web Interface.
For this alarm the following topic is defined;

```
tns1:VideoSource/tnsipro1:HardwareDetector/ImpactDetect
```

Impact detection events are only supported by some cameras.

9.3.6.Casing open detection

An event occurs when the camera cover is opened or closed. Please configure using the existing Web Interface.

For this alarm the following topic is defined;

```
tns1:VideoSource/tnsipro1:HardwareDetector/CasingDetect
```

Casing open detection events are only supported by some cameras.

The following are the notifications based on the selection of ***Detection type***.

Detection type	Description
Alarm notification when the front cover both opening and closing	The camera will report '*Opened=true*' if the cover is open and '*Opened=false*' if the cover is closed..
Alarm notification continue while the front cover is open	The camera will continue to report '*Opened=true*' every time the '***Alarm deactivation time***' is reached. '*Opened=false*' is not emitted when the cover is closed.

10. Recording Service

10.1. How to use

10.1.1. Activation for storage feature

The following is the usage without recording control service. In case of starting to record via Recoding control service, these changes which are the following 2) and 3) are automatically executed.

1) Insertion of SD card
   For using storage feature, you need to firstly insert SD card.

2) Change of a encoding for recording to H.264
   Please change the setting of SD memory card from JPEG to H264 using the browser.
   Note: When the setting is changed SD card will be formatted.

3) Change of save mode to manual
   Then please change the save trigger from alert to manual. To use only search or replay service, this step can be skipped.

Note: After executing SetSystemDeafultSettings these setting will be rollback.

10.2. Bitrate Limit and GovLength

The maximum number of bitrate for H.264 recording depends on models. Please refer to the operating instruction manual for detail.If the bitrate of video encoder configuration relating to the recording is more than max bitrate, it will be adjusted automatically when recording is started.

And GovLength may be changed to the value in such a way that at least one i-frame is in a second.

10.3. Recording procedure

1. GetRecordingToken with GetRecordings.
2. Create a RecordingJob by specifying Media Profile in CreateRecordingJob.
3. To start recording, specify "Active" for Mode in SetRecordingJobMode.
4. To stop recording, specify "Idle" for Mode in SetRecordingJobMode.
5. To delete a RecordingJob, call DeleteRecordingJob.

Configuration for Recording and Track are fixed values and cannot be changed.

The following commands are not supported:

- CreateRecording
- DeleteRecording
- CreateTrack
- DeleteTrack

10.4. Multi-sensor camera recording specifications

A multi-sensor camera holds as many RecordingTokens as there are lenses. However, since the specification is to record Ch1 to Ch4 simultaneously, only one RecordingJob is used.

11. Search Service

11.1. Search filter for FindEvent

To use Recording and track for Search filter they are needed to specify separately.

12. Replay Service

12.1. Replay Session

Camera support one replay session at a time. When receiving another replay request during replay, camera send 503 Service Unavailable.

12.2. Procedure for playing back recordings

1. Record in advance (Chapter 10.3).
2. To get a RecordingToken, use GetRecordings of the Recording Service.
3. To get the recording playback URL, specify RecordingToken in GetReplayURI of Replay service
4. Make an RTSP connection
   Get RTSP DESCRIBE camera information
   RTSP SETUP Select receiving media
   Start RTSP PLAY delivery
   End RTSP TEARDOWN delivery

12.3. RTSP URL Format

The URL format for playback of the recording is as follows

```
rtsp://<ip>/ONVIF/Storage[/<ch>]
```

CH is supported only for multi-sensor cameras.
Audio redistribution is not performed with ONVIF format URLs.

12.4. RTSP Header

The RTSP headers supported by the Replay distribution are as follows

RTSP header	value	discription	support
Range	utc-time	Play range	yes
Scale	-1.0 1.0	Play direction	Only "1,0" is supported
Speed	0.5-	Speed control (Round when exceeding upper limit)	Support in increments of 0.5
Rate-Control	yes no	fps adjustment	yes
Frames	intra intra/DIGIT predicted all	Frame transmission frequency setting	Only "all" is supported
Immediate	yes no	session reset	yes
Require	onvif-replay	Fixed when playing with ONVIF	yes
Date	GMT Time	Time is specified as GMT	yes

13. Media2 Service

13.1. Profile

13.1.1. Share Profile with ONVIF and native settings

Refer to the chapter "6.1.1 Share Profile with ONVIF and native settings".

13.1.1.1. Relationship between 'Setup/Image' of native setting and VideoencoderConfiguration.token of ONVIF.

The model sharing the setting with ONVIF and Native is defined in "6.1.1Share Profile with ONVIF and native settings".

13.1.1.2. Relationship between 'Setup / Image' of native setting and ONVIF setting items.

Refer to the chapter "6-1-1 Share Profile with ONVIF and native settings" and "6.1.2 Profile Name"

As shown in the table below, the camera's existing settings and the ONVIF settings are linked

Native Setting JPEG (n)*	ONVIF setting	Description
Image capture size	VideoEncoderConfiguration.Resolution	
Image quality	VideoEncoderConfiguration.Quality	See Chapter 6.2.8"Quality" Parameter

*Setup > Image > JPEG (n)

Native setting stream (n)*	ONVIF setting	Description
Stream transmission	-	If "Stream transmission" is set to "OFF" with Native setting, video is not delivered even with the ONVIF profile linked with NativeSetting's Stream. At this time, the value of the ONVIF profile is NOT changed.
Stream encoding format	VideoEncoder2Configuration.Encoding	H265 can be acquired only when Media2 service is used
Image capture size	VideoEncoder2Configuration.Resolution	
Transmission priority	VideoEncoder2Configuration.RateControl.ConstantBitRate	Settings can be changed only from Media 2 See 13.2.2.3 "ConstantBitRate" Parameter)
Frame rate	VideoEncoder2Configuration.RateControl.FrameRateLimit.	See 6.2.2.2 "FramerateLimit" Parameter
Max bit rate (per client)	VideoEncoder2Configuration.RateControl.BitrateLimit	See 6.2.2.1"BitrateLimit" Parameter
Image quality	VideoEncoder2Co	See 6.2.8"Quality" Parameter

	nfiguration.Quality	
Smart Coding	-	If set from native, it will be reflected in the video delivered by ONVIF, but cannot be changed from ONVIF. See 6.2.5.2"GovLength" Parameter of Smart Coding
Refresh interval	VideoEncoder2Configuration :: GovLength	See 6.2.5"GovLength" Parameter
Transmission type	Multicast	Multicast settings are independent for ONVIF configuration and native configuration. See 6.2.3"Multicast" Parameter

* Setup > Image > stream (n)

13.1.2. Profile Name

Refer to the chapter "6.1.2 Profile Name"

13.1.3. Stream

13.1.3.1. The minimum guaranteed total number of encoder instances

In Media2, use *GetVideoEncoderInstances()*.

Refer to the chapter "6.1.3.1The minimum guaranteed total number of encoder instances"

13.1.3.2. RTSP URL format

To get the URI of the RTSP connection, send *GetStreamUri()* specifying Profile.

The URL format is as follows:

```
rtsp://<IP>/ONVIF/MediaInput?profile2=<ProfileToken>
```

13.2. Configuration

13.2.1. Note for configuration changes

Refer to the chapter 6.

13.2.2. "RateControl" Parameters

13.2.2.1. "BitrateLimit" Parameter

Refer to the chapter 6.2.2.1"BitrateLimit" Parameter

13.2.2.2. "FramerateLimit" Parameter

Refer to the chapter 6.2.2.2"FramerateLimit" Parameter

13.2.2.3. "ConstantBitRate" Parameter

Set ConstantBitrate to false to set VBR. Set ConstantBitrate to true to set the frame rate.

Conditions under which frame rate, VBR, CBR can be set:

(ONVIF)/ ConstantBitRate	native	Configurable
True	Frame rate	yes
False	VBR	yes
-	CBR	-

13.2.3. "Multicast" Parameter

Refer to the chapter 6.2.3"Multicast" Parameter

13.2.4. "SessionTimeout" Parameter

Refer to the chapter 6.6.2.4"SessionTimeout" Parameter

13.2.5. "GovLength" Parameter

13.2.5.1. "GovLength" Parameter

Even in the case of H265, it rounds "GovLength" Parameter like Media1.

Refer to the chapter 6.2.5.1"GovLength" Parameter of H.264

13.2.5.2. "GovLength" Parameter of Smart Coding

Refer to the chapter 6.6.2.5.2"GovLength" Parameter of Smart Coding

13.2.6. "Metadata" Configuration

Refer to the chapter 6.2.6Metadata Configuration.

13.2.7. "Audio Back Channel" Configuration

Refer to the chapter 6.2.7Audio Back Channel Configuration.

13.2.8. "Quality" Parameter

When handling a model that supports only Media 1, refer to 6.2.8 "Quality" Parameter.

Target Codecs:

- JPEG,
- H264,H265

(i-Pro Native setting)***Transmission priority***: VBR(i-Pro Native setting)

(ONVIF) ConstantBitrate= False

"Quality"(ONVIF)	"Image quality"(i-Pro Native setting)
0	9 Low
1	8
2	7
3	6
4	5 Normal
5	4
6	3
7	2
8	1 Fine
9	0 Super Fine

Target Codecs:

- H264,H265

(i-Pro Native setting)***Transmission priority***: Frame rate

(ONVIF) ConstantBitrate=true

(ONVIF)"Quality"	"Image quality" : (i-Pro Native setting)
0	Low(Motion priority)
1	
2	
3	Normal
4	
5	
6	
7	Fine(Image quality priority)
8	
9	

13.2.9. "Rotate" Parameter

Refer to the chapter 6.2.9"Rotate" Parameter.

13.2.10. Analytics Configuration

Refer to the chapter6.2.10Analytics Configuration .

13.3. OSD

13.3.1. Maximum number of OSD

Refer to the chapter 6.3.1Maximum number of OSD.

13.4. VideoSourceMode

For models compatible with Media 2, reboot does not occur due to the change of VideoSourceMode.

14. Analytics Service

14.1. How to use

To use the Analytics Service, the camera must support Profile M.
i-VMD does not support AnalyticsService. Refer to the Chapter II for more information.
Extension Software does not work when the ***image capture mode*** is 60/50 fps or 15/12.5 fps.

14.2. List of supported functions

List of ONVIF Analytics commands supported by the camera:

kind	Function	Requirement	AI-VMD (WV-XAE200W)	AI-VMD (WV-XAE300W*)
Analytics Module configuration	GetSupportedAnalyticsModules	M	Yes	Yes
	GetAnalyticsModules	M	Yes	Yes
	CreateAnalyticsModules	M	Yes	Yes
	DeleteAnalyticsModules	M	Yes	Yes
	GetAnalyticsModuleOptions	C	No	No
	ModifyAnalyticsModules	C	No	No
	GetSupportedMetadata	M	Yes	Yes
Rule configuration	GetSupportedRules	M	Yes	Yes
	GetRules	M	Yes	Yes
	CreateRules	M	Yes	Yes
	DeleteRules	M	Yes	Yes
	GetRuleOptions	C	Yes	Yes
	ModifyRules	C	Yes	Yes

* WV-XAE300W is AI-VMD/AI People Counting for 360-degree fisheye.

Requirement use the following abbreviations:
M: Mandatory, C: Conditional, O: Optional

AI-VMD refers to [AI Video Motion Detection], a Functions of Extension Software. Specifically, it refers to the following functions.

- INTRUDER
- LOITERING
- DIRECTION
- CROSS LINE ……This is not a Cross Line Counting function.

The following Extension Software Functions are not supported by the Analytics Service.

- People Counting (WV-XAE-300)
  - [Cross Line Counting] *
  - [Area Counting (Queue Management)] *
- [Occupancy detection] * (XAE-300)
- [Heat map] * (XAE-300)
- AI Face detection *
- AI People detection *
- AI Vehicle detection *
- AI Occupancy detection *
- AI Privacy Guard
- AI Scene change detection
- AI Processing Relay
- AI On-site Learning
- AI Processing Relay
- AI On-site Learning

* The response is HTTP 200, but the Create or Delete operation is not performed.

14.3. Analytics Mudule Type and Rule Type

14.3.1. Kinds for Analytics Modules

After installing Extension Software's WV-XAE200W or "AI-VMD/AI People Counting for 360-degree fisheye(WV-XAE300W)", AI-VMD is tied to the following AnalyticsModule.Name.

List of AnalyticsModule Namesupported by the camera:

"AnalyticsModule.Name"(ONVIF)	Ext. software (i-Pro Native setting)
tt:AI-VMD	AI-VMD (WV-XAE200W)
tt:AI-VMDandAIPeopleCounting	AI-VMD (WV-XAE300W)

For multi-sensor cameras, "_CH1/_CH2/_CH3/_CH4" is added after the Rule.Name string.

14.3.2. Kinds for Rule

This chapter shows the Rules supported by the camera.

ONVIF standard rules:

"Rule.Name"(ONVIF)	AI-VMD functions (Native setting)	Reference
tt:FieldDetector	INTRUDER*3, Intruder detection*4	14.3.3
tt:LineDetector	CROSS LINE*3, Cross Line detection*4	14.3.4
tt:LoiteringDetector	LOITERING*3, Loitering detection*4	14.3.5
tt:MotionRegionDetector	VMD	14.3.6

Unique i-PRO Rules:

"Rule.Name"(ONVIF)	AI-VMD functions (Native setting)	Reference
tt:DirectionDetector	DIRECTION*3	14.3.7

14.3.3. FieldDetector

To use FieldDetector, please install Extension Software WV-XAE200W or "AI-VMD/360 degree fisheye AI people counting (WV-XAE300W)".

14.3.3.1. Rule definition

The definition of Rule is shown below.

```
<tt:RuleDescription Name="tt:FieldDetector" maxInstances="8">
<tt:Parameters>
<tt:SimpleItemDescription Name="ClassFilter" Type="tt:StringList" />
<tt:SimpleItemDescription Name="PresetToken" Type="tt:ReferenseToken"/>
<tt:ElementItemDescription Name="Field" Type="tt:Polygon" />
</tt:Parameters>
 <tt:Messages IsProperty="false">
  <tt:Source>
   <tt:SimpleItemDescription Name="VideoSource" Type="tt:ReferenceToken" />
```

[3] To enable this function, please install Extension Software WV-XAE200W
[4] To enable this function, please install Extension Software "AI-VMD/360 degree fisheye AI people counting (WV-XAE300W)"

```
   <tt:SimpleItemDescription Name="AnalyticsConfiguration" Type="tt:ReferenceToken" />
   <tt:SimpleItemDescription Name="Rule" Type="xs:string" />
  </tt:Source>
  <tt:Data>
   <tt:SimpleItemDescription Name="IsInside" Type="xs:boolean" />
   <tt:SimpleItemDescription Name="ObjectId" Type="tt:StringList" />
  </tt:Data>
  <tt:ParentTopic>tns1:RuleEngine/FieldDetector/ObjectsInside</tt:ParentTopic>
</tt:Messages>
</tt:RuleDescription>
```

parameter	value	Requirement	discription
ClassFilter	Human Bicycle Vehicle	O	Specify objects to be detected as a string list
PresetToken		C	ONVIF Preset Token Name of the preset with detection conditions set Only PTZ cameras are supported.
Field		M	Field with 4 to 16 vertices represented by coordinates (x.y) If out of range is specified, round to the nearest range

Requirement use the following abbreviations:

M: Mandatory, C: Conditional, O: Optional

14.3.3.2. Event Notify Message

An example of Notify Message is shown below.

```
<wsnt:NotificationMessage>
  <wsnt:SubscriptionReference>
    <wsa:Address>http://192.168.0.10/Subscription?Idx=12345</wsa:Address>
  </wsnt:SubscriptionReference>
  <wsnt:Topic Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet">tns1:
RuleEngine/FieldDetector/ObjectsInside</wsnt:Topic>
  <wsnt:Message>
    <tt:Message UtcTime="2016-03-17T17:00:00Z">
      <tt:Source>
        <tt:SimpleItem Name=" VideoSource" Value="VideoSourceConfig"/>
        <tt:SimpleItem Name="AnalyticsConfiguration" Value="AnalyticsConfig"/>
        <tt:SimpleItem Name="Rule" Value="MyFieldDetector"/>
      </tt:Source>
      <tt:Data>
        <tt:SimpleItem Name="IsInside" Value="true">
        <tt:SimpleItem Name="ObjectId" Value="100 102 105">
      </tt:Data>
    </tt:Message>
  </wsnt:Message>
</wsnt:NotificationMessage>
```

SubscriptionReference only exists in Notify Messages.

14.3.3.3. MetadataStream>EventStream

An example Event Stream of Metadata is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<tt:MetaDataStream xmlns:tt="http://www.onvif.org/ver10/schema"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <tt:Event>
    <wsnt:NotificationMessage>
      <wsnt:Topic Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet"
        xmlns:tns1="http://www.onvif.org/ver10/topics">
    tns1: RuleEngine/FieldDetector/ObjectsInside
      </wsnt:Topic>
      <wsnt:Message>
        <tt:Message UtcTime="2016-03-17T17:00:00Z">
          <tt:Source>
            <tt:SimpleItem Name="VideoSource" Value="VideoSourceConfig"/>
            <tt:SimpleItem Name="AnalyticsConfiguration" Value="AnalyticsConfig"/>
            <tt:SimpleItem Name="Rule" Value="Rule2"/>
          </tt:Source>
          <tt:Data>
            <tt:SimpleItem Name="IsInside" Value="true"/>
            <tt:SimpleItem Name="ObjectId" Value="100 102 105"/>
            <tt:SimpleItem Name="ClassTypes" Value="Human"/>
            <tt:ElementItem Name="Image">
              <xsd:base64Binary>/9j//gBMAB (Omitted) v1/CgR//2Q==</xsd:base64Binary>
            </tt:ElementItem>
          </tt:Data>
        </tt:Message>
      </wsnt:Message>
    </wsnt:NotificationMessage>
  </tt:Event>
</tt:MetaDataStream>
```

Only the EventStream of the i-PRO original RTSP Stream (see Chapter 15.3) adds *ClassTypes* and *Image*.

If VideoAnalyticsConfiguration is specified in Profile, then AnalyticsConfiguration is appended.

parameter	value	Require ment	discription
VideoSource		M	Token name of VideoSourceConfiguration
AnalyticsConfigurati on		O	Token name of the AnalyticsConfiguration
Rule		M	Rule name (see chapter 14.4)
ObjectId		O	ID number(s) of the object(s) to be detected
IsInside	true false	M	Flag indicating inside or outside
ClassTypes	Human Bicycle Vehicle	C	Detection object
Image		C	Base64 encoded JPEG image at the time of the event

Requirement use the following abbreviations:

M: Mandatory, C: Conditional, O: Optional

14.3.4. LineDetector

To use LineDetector, please install Extension Software WV-XAE200W or "AI-VMD/360 degree fisheye AI people counting (WV-XAE300W)".

14.3.4.1. Rule definition

The definition of Rule is shown below.

```
<tt:RuleDescription Name="tt:LineDetector" maxInstances="8">
  <tt:Parameters>
    <tt:SimpleItemDescription Name="Direction" Type="tt:Direction" />
    <tt:SimpleItemDescription Name="ClassFilter" Type="tt:StringList" />
    <tt:ElementItemDescription Name="Segments" Type="tt:Polyline" />
  </tt:Parameters>
  <tt:Messages>
    <tt:Source>
      <tt:SimpleItemDescription Name="VideoSource" Type="tt:ReferenceToken" />
      <tt:SimpleItemDescription Name="AnalyticsConfiguration" Type="tt:ReferenceToken" />
      <tt:SimpleItemDescription Name="Rule" Type="xs:string" />
    </tt:Source>
    <tt:Data>
      <tt:SimpleItemDescription Name="ObjectId" Type="xs:integer" />
    </tt:Data>
    <tt:ParentTopic>tns1:RuleEngine/LineDetector/Crossed</tt:ParentTopic>
  </tt:Messages>
</tt:RuleDescription>
```

parameter	value	Requirement	discription
Direction	Right Left Any	O	Indicates direction of detection. Any refers to both directions. For direction, see the explanation in chapter A.2 Line Detector in the Analytics specification of Service specifications.
ClassFilter	Human Bicycle Vehicle	O	Specify the detection target with a string list
PresetToken		C	Supports PTZ only. Indicates a preset token.
Segments		M	Two points are indicated: the start point (x, y coordinates) and the end point (x, y coordinates).

Requirement use the following abbreviations:

M: Mandatory, C: Conditional, O: Optional

14.3.4.2. Event Notify Message

An example of Notify Message is shown below.

```
wsnt:NotificationMessage>
<wsnt:SubscriptionReference>
  <wsa:Address>http://192.168.0.10/Subscription?Idx=12345</wsa:Address>
</wsnt:SubscriptionReference>
<wsnt:Topic Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet">
  tns1:RuleEngine/LineDetector/Crossed
</wsnt:Topic>
<wsnt:Message>
  <tt:Message UtcTime="2016-03-17T17:00:00Z">
    <tt:Source>
      <tt:SimpleItem Name="VideoSource" Value="VideoSourceConfig"/>
      <tt:SimpleItem Name="AnalyticsConfiguration" Value="AnalyticsConfig"/>
      <tt:SimpleItem Name="Rule" Value="MyLineDetector"/>
    </tt:Source>
    <tt:Data>
      <tt:SimpleItem Name="ObjectId" Value="100">
      </tt:Data>
    </tt:Message>
  </wsnt:Message>
</wsnt:NotificationMessage>
```

SubscriptionReference only exists in Notify Messages.

14.3.4.3. MetadataStream>EventStream

An example Event Stream of Metadata is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<tt:MetaDataStream xmlns:tt="http://www.onvif.org/ver10/schema"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <tt:Event>
    <wsnt:NotificationMessage>
      <wsnt:Topic Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet"
        xmlns:tns1="http://www.onvif.org/ver10/topics">
  tns1:RuleEngine/LineDetector/Crossed
      </wsnt:Topic>
      <wsnt:Message>
        <tt:Message UtcTime="2016-03-17T17:00:00Z">
          <tt:Source>
            <tt:SimpleItem Name="VideoSource" Value="VideoSourceConfig"/>
            <tt:SimpleItem Name="AnalyticsConfiguration" Value="AnalyticsConfig"/>
            <tt:SimpleItem Name="Rule" Value="Rule1"/>
          </tt:Source>
          <tt:Data>
            <tt:SimpleItem Name="ObjectID" Value="100"/>
            <tt:SimpleItem Name="ClassTypes" Value="Human"/>
            <tt:ElementItem Name="Image">
              <xsd:base64Binary>/9j//gBMAB  (Omitted) v1/CgR//2Q==</xsd:base64Binary>
            </tt:ElementItem>
          </tt:Data>
        </tt:Message>
      </wsnt:Message>
    </wsnt:NotificationMessage>
  </tt:Event>
</tt:MetaDataStream>
```

Only the EventStream of the i-PRO original RTSP Stream (see Chapter 15.3) adds *ClassTypes* and *Image*.

If VideoAnalyticsConfiguration is specified in Profile, then AnalyticsConfiguration is appended.

parameter	value	Requirement	discription
VideoSource		M	Token name of VideoSourceConfiguration
AnalyticsConfiguration		O	Token name in AnalyticsConfiguration
Rule		M	Rule name (see section14.4)
ObjectId		O	ID number(s) of the object(s) to be detected
ClassTypes	Human Bicycle Vehicle	C	Object to be detected
Image		C	Base64-encoded JPEG image at the time the event occurred

Requirement use the following abbreviations:

M: Mandatory, C: Conditional, O: Optional

14.3.5. LoiteringDetector

To use LoiteringDetector, please install Extension Software WV-XAE200W or "AI-VMD/360 degree fisheye AI people counting (WV-XAE300W)".

14.3.5.1. Rule definition

The definition of Rule is shown below.

```
<tt:RuleDescription Name="tt:LoiteringDetector" maxInstances="8">
  <tt:Parameters>
    <tt:SimpleItemDescription Name="TimeThreshold" Type="xs:duration" />
    <tt:SimpleItemDescription Name="ClassFilter" Type="tt:StringList" />
    <tt:SimpleItemDescription Name="PresetToken" Type="tt:ReferenseToken" />
    <tt:ElementItemDescription Name="Field" Type="tt:Polygon" />
  </tt:Parameters>
  <tt:Messages IsProperty="false">
    <tt:Source>
      <tt:SimpleItemDescription Name="VideoSource" Type="tt:ReferenceToken" />
      <tt:SimpleItemDescription Name="AnalyticsConfiguration" Type="tt:ReferenceToken" />
      <tt:SimpleItemDescription Name="Rule" Type="xs:string" />
    </tt:Source>
    <tt:Data>
      <tt:SimpleItemDescription Name="ObjectId" Type="tt:StringList" />
      <tt:SimpleItemDescription Name="Since" Type="xs:dateTime" />
    </tt:Data>
    <tt:ParentTopic>tns1:RuleEngine/LoiteringDetector/ObjectIsLoitering</tt:ParentTopic>
  </tt:Messages>
</tt:RuleDescription>
```

parameter	value	Requirement	discription
TimeThreshold	PT10S PT20S PT30S PT60S PT120S	M	Accept range of PT10S~PT120S(PT2M). If within the range, round down to the nearest value.
ClassFilter	Human Bicycle Vehicle	O	Specify objects to be detected as a string list
PresetToken		C	ONVIF Preset Token Name of the preset with detection conditions set Only PTZ cameras are supported.
Field		O	Field with 4 to 16 vertices represented by coordinates (x.y) If out of range is specified, round to the nearest range

Requirement use the following abbreviations:

M: Mandatory, C: Conditional, O: Optional

Rounding of TimeThreshold settings

"Rule.Parameters.TimeThreshold" (ONVIF)	[Loitering detection time] (i-Pro Native setting)	
PT10S – PT19S	10sec	default setting
PT20S - PT29S	20sec	
PT30S - PT59S	30sec	
PT60S(PT1M) - PT119S	1min	
PT120S(PT2M)	2min	

14.3.5.2. Event Notify Message

An example of Notify Message is shown below.

```
<wsnt:NotificationMessage>
  <wsnt:SubscriptionReference>
    <wsa:Address>http://192.168.0.10/Subscription?Idx=12345</wsa:Address>
  </wsnt:SubscriptionReference>
  <wsnt:Topic Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet">
tns1: RuleEngine/LoiteringDetector/ObjectIsLoitering
  </wsnt:Topic>
  <wsnt:Message>
    <tt:Message UtcTime="2016-03-17T17:00:00Z">
      <tt:Source>
        <tt:SimpleItem Name="VideoSource" Value="VideoSourceConfig"/>
        <tt:SimpleItem Name="AnalyticsConfiguration" Value="AnalyticsConfig"/>
        <tt:SimpleItem Name="Rule" Value="MyLoiteringDetector"/>
      </tt:Source>
      <tt:Data>
        <tt:SimpleItem Name="ObjectId" Value="100 102 105"/>
        <tt:SimpleItem Name="Since" Value="2016-03-17T16:50:00Z"/>
      </tt:Data>
    </tt:Message>
  </wsnt:Message>
</wsnt:NotificationMessage>
```

SubscriptionReference only exists in Notify Messages.

14.3.5.3. MetadataStream>EventStream

An example Event Stream of Metadata is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<tt:MetaDataStream xmlns:tt="http://www.onvif.org/ver10/schema"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <tt:Event>
    <wsnt:NotificationMessage>
      <wsnt:Topic Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet"
        xmlns:tns1="http://www.onvif.org/ver10/topics">
tns1: RuleEngine/LoiteringDetector/ObjectIsLoitering
      </wsnt:Topic>
      <wsnt:Message>
        <tt:Message UtcTime="2016-03-17T17:00:00Z">
          <tt:Source>
            <tt:SimpleItem Name="VideoSource" Value="VideoSourceConfig"/>
            <tt:SimpleItem Name="AnalyticsConfiguration" Value="AnalyticsConfig"/>
            <tt:SimpleItem Name="Rule" Value="Rule3"/>
          </tt:Source>
          <tt:Data>
            <tt:SimpleItem Name="ObjectId" Value="100 102 105"/>
            <tt:SimpleItem Name="Since" Value="2016-03-17T16:50:00Z"/>
            <tt:SimpleItem Name="ClassTypes" Value="Human"/>
            <tt:ElementItem Name="Image">
              <xsd:base64Binary>/9j//gBMAB (Omitted) v1/CgR//2Q==</xsd:base64Binary>
            </tt:ElementItem>
          </tt:Data>
        </tt:Message>
      </wsnt:Message>
    </wsnt:NotificationMessage>
  </tt:Event>
</tt:MetaDataStream>
```

Only the EventStream of the i-PRO original RTSP Stream (see Chapter 15.3 adds *ClassTypes* and *Image*.

If VideoAnalyticsConfiguration is specified in Profile, then *AnalyticsConfiguration* is appended.

parameter	value	Requirement	discription
VideoSource		M	Token name of VideoSourceConfiguration
AnalyticsConfiguration		O	Token name of the AnalyticsConfiguration
Rule		M	Rule name (see chapter 14.4)
ObjectId		O	ID number(s) of the object(s) to be detected
Since		M	Detection start time
ClassTypes	Human Bicycle Vehicle	C	Detected object
Image		C	Base64 encoded JPEG image at the time of the event

Requirement use the following abbreviations:

M: Mandatory, C: Conditional, O: Optional

14.3.6. MotionRegionDetector

MotionRegionDetector is enabled without installing Extension Software.

For details on how to set up motion detection, please refer to chapter 9.3.2Motion alarm.

14.3.6.1. Rule definition

The definition of Rule is shown below.

```
<tt:RuleDescription Name="tt:MotionRegionDetector" maxInstances="4">
  <tt:Parameters>
    <tt:ElementItemDescription Name="MotionRegion" Type="axt:MotionRegionConfig" />
  </tt:Parameters>
  <tt:Messages IsProperty="true">
    <tt:Source>
      <tt:SimpleItemDescription Name="VideoSource" Type="tt:ReferenceToken" />
      <tt:SimpleItemDescription Name="RuleName" Type="xs:string" />
    </tt:Source>
    <tt:Data>
      <tt:SimpleItemDescription Name="State" Type="xs:boolean" />
    </tt:Data>
    <tt:ParentTopic>tns1:RuleEngine/MotionRegionDetector/Motion</tt:ParentTopic>
  </tt:Messages>
</tt:RuleDescription>
```

parameter	value	Require ment	discription
VideoSource	VideoSource	M	"VideoSource" fixed
RuleName		M	any string
State	ture false	M	Presence/absence of detection

Requirement use the following abbreviations:

M: Mandatory, C: Conditional, O: Optional

14.3.6.2. Event Notify Message

An example of Notify Message is shown below.

```
<wsnt:NotificationMessage>
  <wsnt:SubscriptionReference>
    <wsa:Address>http://192.168.0.10/Subscription?Idx=12345</wsa:Address>
  </wsnt:SubscriptionReference>
  <wsnt:Topic
Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet">tns1:RuleEngine/MotionRegionD
etector/Motion</wsnt:Topic>
  <wsnt:Message>
    <tt:Message UtcTime="2016-03-17T17:00:00Z" PropertyOperation="Initialized">
      <tt:Source>
        <tt:SimpleItem Name="VideoSource" Value="VideoSource"/>
        <tt:SimpleItem Name="RuleName" Value="VmdRule1"/>
      </tt:Source>
      <tt:Data>
        <tt:SimpleItem Name="State" Value="true">
        </tt:Data>
      </tt:Message>
    </wsnt:Message>
  </wsnt:NotificationMessage>
```

SubscriptionReference only exists in Notify Messages.

14.3.6.3. MetadataStream>EventStream

An example Event Stream of Metadata is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<tt:MetaDataStream xmlns:tt="http://www.onvif.org/ver10/schema"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <tt:Event>
    <wsnt:NotificationMessage>
      <wsnt:Topic Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet"

xmlns:tns1="http://www.onvif.org/ver10/topics">tns1:RuleEngine/MotionRegionDetector/Motion</wsnt:T
opic>
      <wsnt:Message>
        <tt:Message UtcTime="2016-03-17T17:00:00Z" PropertyOperation="Initialized">
          <tt:Source>
            <tt:SimpleItem Name="VideoSoruceConfigurationToken" Value="VideoSource"/>
            <tt:SimpleItem Name="RuleName" Value="VmdRule1"/>
          </tt:Source>
          <tt:Data>
            <tt:SimpleItem Name="State" Value="true"/>
          </tt:Data>
        </tt:Message>
      </wsnt:Message>
    </wsnt:NotificationMessage>
  </tt:Event>
</tt:MetaDataStream>
```

parameter	value	Requirement	discription
VideoSource	VideoSource	M	"VideoSource" fixed
RuleName		M	Rule name (see section 14.4)
State	ture false	M	true: detected / false: not detected

Requirement use the following abbreviations:

M: Mandatory, C: Conditional, O: Optional

14.3.7. DirectionDetector

To use DirectionDetector, please install Extension Software WV-XAE200W.

14.3.7.1. Rule definition

The definition of Rule is shown below.

```
<tt:RuleDescription Name="tt:DirectionDetector" maxInstances="8">
  <tt:Parameters>
    <tt:SimpleItemDescription Name="TimeThreshold" Type="xs:duration" />
    <tt:SimpleItemDescription Name="Direction" Type="xs:string" />
    <tt:SimpleItemDescription Name="ClassFilter" Type="tt:StringList" />
    <tt:SimpleItemDescription Name="PresetToken" Type="tt:ReferenseToken" />
    <tt:ElementItemDescription Name="Field" Type="tt:Polygon" />
  </tt:Parameters>
  <tt:Messages IsProperty="false">
    <tt:Source>
      <tt:SimpleItemDescription Name="VideoSource" Type="tt:ReferenceToken" />
      <tt:SimpleItemDescription Name="AnalyticsConfiguration" Type="tt:ReferenceToken" />
      <tt:SimpleItemDescription Name="Rule" Type="xs:string" />
    </tt:Source>
    <tt:Data>
      <tt:SimpleItemDescription Name="ObjectId" Type="tt:StringList" />
      <tt:SimpleItemDescription Name="Direction" Type="xs:string" />
    </tt:Data>
    <tt:ParentTopic>tns1:RuleEngine/DirectionDetector/Moved</tt:ParentTopic>
  </tt:Messages>
</tt:RuleDescription>
```

parameter	value	Requirement	discription
TimeThreshold	PT1S PT2S PT3S PT4S PT5S PT10S	M	Error outside the range from PT1S to PT10S Truncate to nearest value within range
Direction	Up Upper right Right Lower Right Lower Lower left Left Upper left	M	Detection direction
ClassFilter	Human Bicycle Vehicle	O	Specify a list of strings representing objects to be detected
PresetToken		C	ONVIF Preset Token name of the preset with detection conditions Supported only for PTZ cameras
Field		M	Field with 4 to 16 vertices represented by coordinates (x.y) If out of range is specified, round to the nearest range

Requirement use the following abbreviations:

M: Mandatory, C: Conditional, O: Optional

Rounding of TimeThreshold settings

"Rule.Parameters.TimeThreshold" (ONVIF)	[Direction detection time] (i-Pro Native setting)	
PT1S	1sec	AI-VMD default setting
PT2S	2sec	
PT3S	3sec	
PT4S	4sec	
PT5S~PT9S	5sec	
PT10S	10sec	

14.3.7.2. Event Notify Message

An example of Notify Message is shown below.

```
<wsnt:NotificationMessage>
  <wsnt:SubscriptionReference>
    <wsa:Address>http://192.168.0.10/Subscription?Idx=12345</wsa:Address>
  </wsnt:SubscriptionReference>
  <wsnt:Topic
Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet">tns1:RuleEngine/DirectionDete
ctor/Moved</wsnt:Topic>
  <wsnt:Message>
    <tt:Message UtcTime="2016-03-17T17:00:00Z">
      <tt:Source>
        <tt:SimpleItem Name="VideoSource" Value="VideoSourceConfig"/>
        <tt:SimpleItem Name="AnalyticsConfiguration" Value="AnalyticsConfig "/>
        <tt:SimpleItem Name="Rule" Value="MyDirectionDetector"/>
      </tt:Source>
      <tt:Data>
        <tt:SimpleItem Name="ObjectId" Value="100 102 105" />
        <tt:SimpleItem Name="Direction" Value="Up" />
      </tt:Data>
    </tt:Message>
  </wsnt:Message>
</wsnt:NotificationMessage>
```

SubscriptionReference only exists in Notify Messages.

14.3.7.3. MetadataStream>EventStream

An example Event Stream of Metadata is shown below.

```
<?xml version="1.0" encoding="UTF-8"?>
<tt:MetaDataStream xmlns:tt="http://www.onvif.org/ver10/schema"
  xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <tt:Event>
    <wsnt:NotificationMessage>
      <wsnt:Topic Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet"
        xmlns:tns1="http://www.onvif.org/ver10/topics">
tns1:RuleEngine/DirectionDetector/Moved
      </wsnt:Topic>
      <wsnt:Message>
        <tt:Message UtcTime="2016-03-17T17:00:00Z">
          <tt:Source>
            <tt:SimpleItem Name="VideoSource" Value="VideoSourceConfig"/>
            <tt:SimpleItem Name="AnalyticsConfiguration" Value="AnalyticsConfig"/>
            <tt:SimpleItem Name="Rule" Value="Rule4"/>
          </tt:Source>
          <tt:Data>
            <tt:SimpleItem Name="ObjectId" Value="100 102 105" />
            <tt:SimpleItem Name="Direction" Value="Up" />
            <tt:SimpleItem Name="ClassTypes" Value="Human" />
            <tt:ElementItem Name="Image">
              <xsd:base64Binary>/9j//gBMAB  (Omitted) v1/CgR//2Q==</xsd:base64Binary>
            </tt:ElementItem>
          </tt:Data>
        </tt:Message>
      </wsnt:Message>
    </wsnt:NotificationMessage>
  </tt:Event>
</tt:MetaDataStream>
```

Only the EventStream of the i-PRO original RTSP Stream (see Chapter 15.3) adds *`ClassTypes`* and *`Image`*.

If VideoAnalyticsConfiguration is specified in Profile, then *`AnalyticsConfiguration`* is appended.

parameter	value	Requirement	discription
VideoSource		M	Token name of VideoSourceConfiguration
AnalyticsConfiguration		O	Token name of the AnalyticsConfiguration
Rule		M	Rule name (see chapter 14.4)
ObjectId		O	ID number(s) of the object(s) to be detected
Direction	Up Upper right Right Lower Right Lower Lower left Left Upper left	M	Detection direction
ClassTypes	Human Bicycle Vehicle	C	Detected object
Image		C	Base64 encoded JPEG image at the time of the event

Requirement use the following abbreviations:

M: Mandatory, C: Conditional, O: Optional

14.4. RuleName naming rule

14.5. Fixed camera, multi-sensor camera

classification	RuleName
AI-VMD(8 areas)	Rule1 to Rule 8
VMD(4 areas)	VmdRule1 to VmdRule 4

The naming rule for AI multi-sensor shall be the same as above.
Ch identification is done from VideoSourceConfiguration Token.

14.5.1. PTZ camera

preset	regions	RuleName
AI-VMD(8 areas)	Outside preset (1)	Rule1 to Rule 8
	Presets (16)	Rule1_PR1 to Rule8_PR16
VMD(4 areas)	Outside preset (1)	VmdRule1 to VmdRule4
	Presets (16)	VmdRule1_PR1 to VmdRule4_PR16

Rule can be set for each of 17 positions.= 16 (preset) + 1 (not preset)

15. Metadata Stream

15.1. Metadata Stream Format

The format of the ONVIF MetadataStream can be found in metadatastream.xsd under Data format specifications in Network Interface Specifications.
See Chapters 14.3.3FieldDetector to 14.3.7DirectionDetector for AI-VMD EventStream examples.

See below for specific examples of EventStream/AnalyticsStream with Extension Software other than WV-XAE200W and WV-XAE300W.
Extension software interface documentation :

https://i-pro.com/products_and_solutions/en/surveillance/learning-and-support/device-integration/extension-software

15.2. ONVIF RTSP Stream

In this document, an RTSP connection via a URL that can be obtained from ONVIF *GetStreamUri()* is referred to as an RTSP Stream in ONVIF.
Some events only support RTSP Stream of i-PRO original RTSP Stream.

15.2.1. MetadataStream support status list

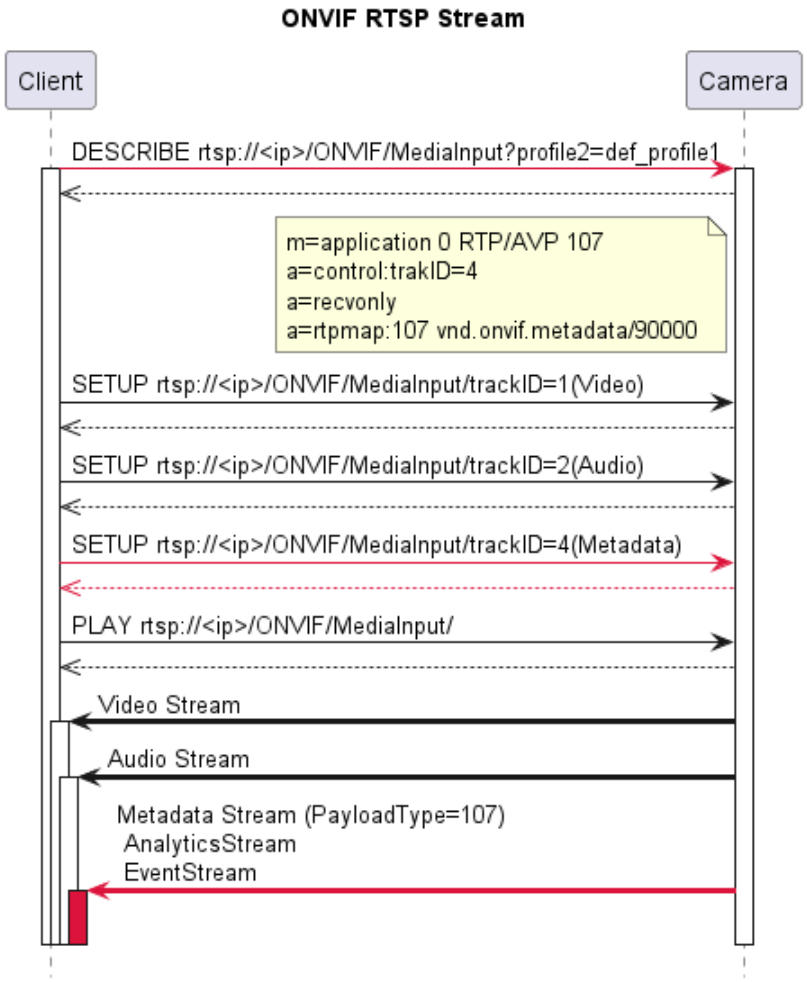
MetadataStream	nodes	AI-VMD (WV-XAE200W)	AI-VMD (WV-XAE300W)
Analytics Stream	BoundingBox	Yes	Yes
	Object Classification	Yes	Yes

MetadataStream	Events	AI-VMD (WV-XAE200W)	AI-VMD (WV-XAE300W)
Event Stream	Field Detector	Yes	Yes
	Line Detector	Yes	Yes
	Loitering Detector	Yes	Yes
	Direction Detector	Yes	No
	Motion Region Detector	Yes	Yes
	GlobalSceneChange	Yes	Yes

	AudioDetector	No*	No*

* AudioDetector is supported only for i-PRO original RTSP Stream as described in Chapter 15.3.

15.2.2. MetadataStream distribution sequence



[Preconfiguration]

1. If AnalyticsConfiguration is not included in the Profile specified by *GetStreamUri()*, set AnalyticsConfiguration to the target Profile by AddConfiguration.
2. If the Analytics flag in the MetadataConfiguration of the Profile specified by *GetStreamUri()* is false, enable the Analytics flag in SetMetadataConfiguration.

[Steps]

1. get the URL with *GetStreamUri()*
2. include "vnd.onvif.metadata" in the response SDP of RTSP DESCRIBE
3. specify "Metadata(trackID=4)" in RTSP SETUP request
4. request RTSP PLAY
5. a MetadataStream (PayloadType=107) is sent

Metadata includes events issued by cameras and content detected by AI-VMD and extended apps.

15.3. i-PRO original RTSP Stream

In this document, the original method of streaming metadata (Analytics, Event Stream) directly with RTSP parameters is referred to as "i-PRO original RTSP Stream".
The metadata format is a proprietary extension of a portion of the ONVIF format.

URIs can be flagged for MetadataStream for delivery.
EventStream has no filtering capabilities. All events are sent.

Other than multi-sensor cameras:.

```
rtsp://<ip>(/Src)/MediaInput(/h264)/stream_1?analytics=1&event=1
```

Multi-sensor cameras (Example for ch_1)

```
rtsp://<ip>(/Src)/MediaInput(/h264)/stream_1/ch_1?analytics=1&event=1
```

Multi-sensor cameras (Example for ch_2)

```
rtsp://<ip>(/Src)/MediaInput(/h264)/stream_1/ch_2?analytics=2&event=1
```

Example :

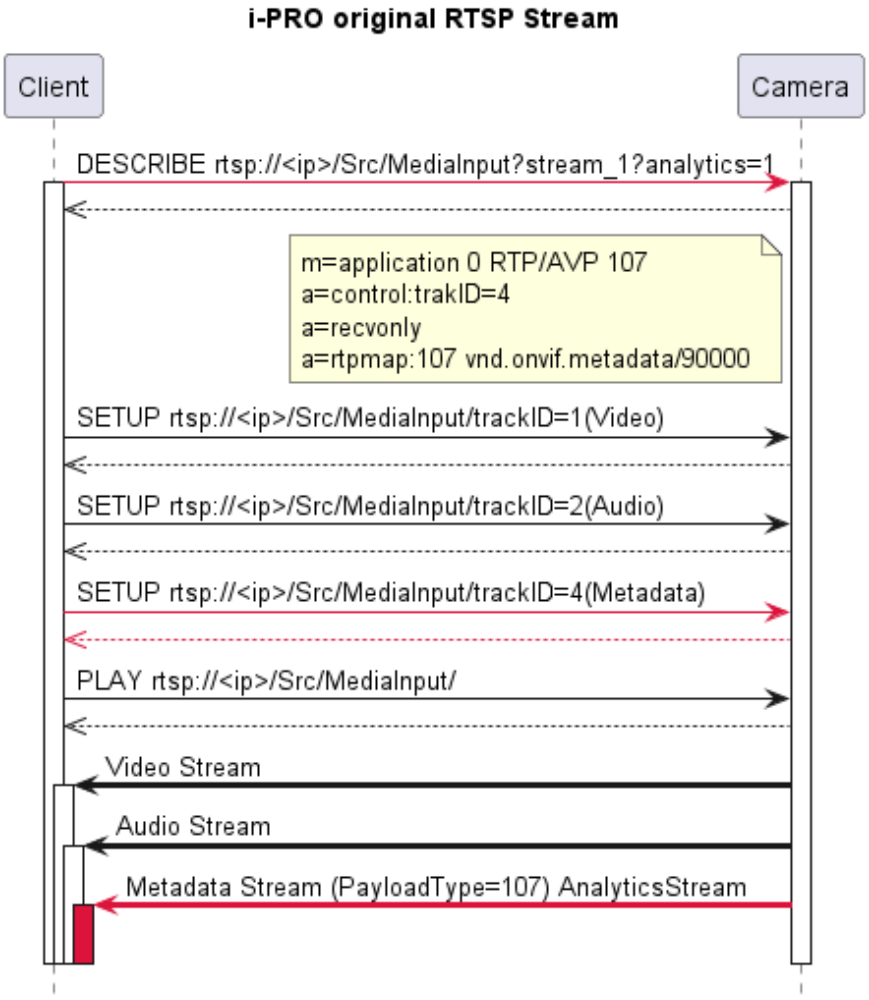
Key	value	discription
analytics	n (ch number)	Send AnalyticsStream. The same number must be specified for channel and analytics.
f	1	Send EventStream

15.3.1. MetadataStream support status list

MetadataStream	nodes	AI-VMD (WV-XAE200W)	AI-VMD (WV-XAE300W)
Analytics Stream	BoundingBox	Yes	Yes
	Object Classification	Yes	Yes

MetadataStream	Events	AI-VMD (WV-XAE200W)	AI-VMD (WV-XAE300W)
Event Stream	Field Detector	Yes	Yes
	Line Detector	Yes	Yes
	Loitering Detector	Yes	Yes
	Direction Detector	Yes	No
	Motion Region Detector	Yes	Yes
	GlobalSceneChange	Yes	Yes
	AudioDetector	Yes	Yes

15.3.2. MetadataStream distribution sequence



[Procedure]

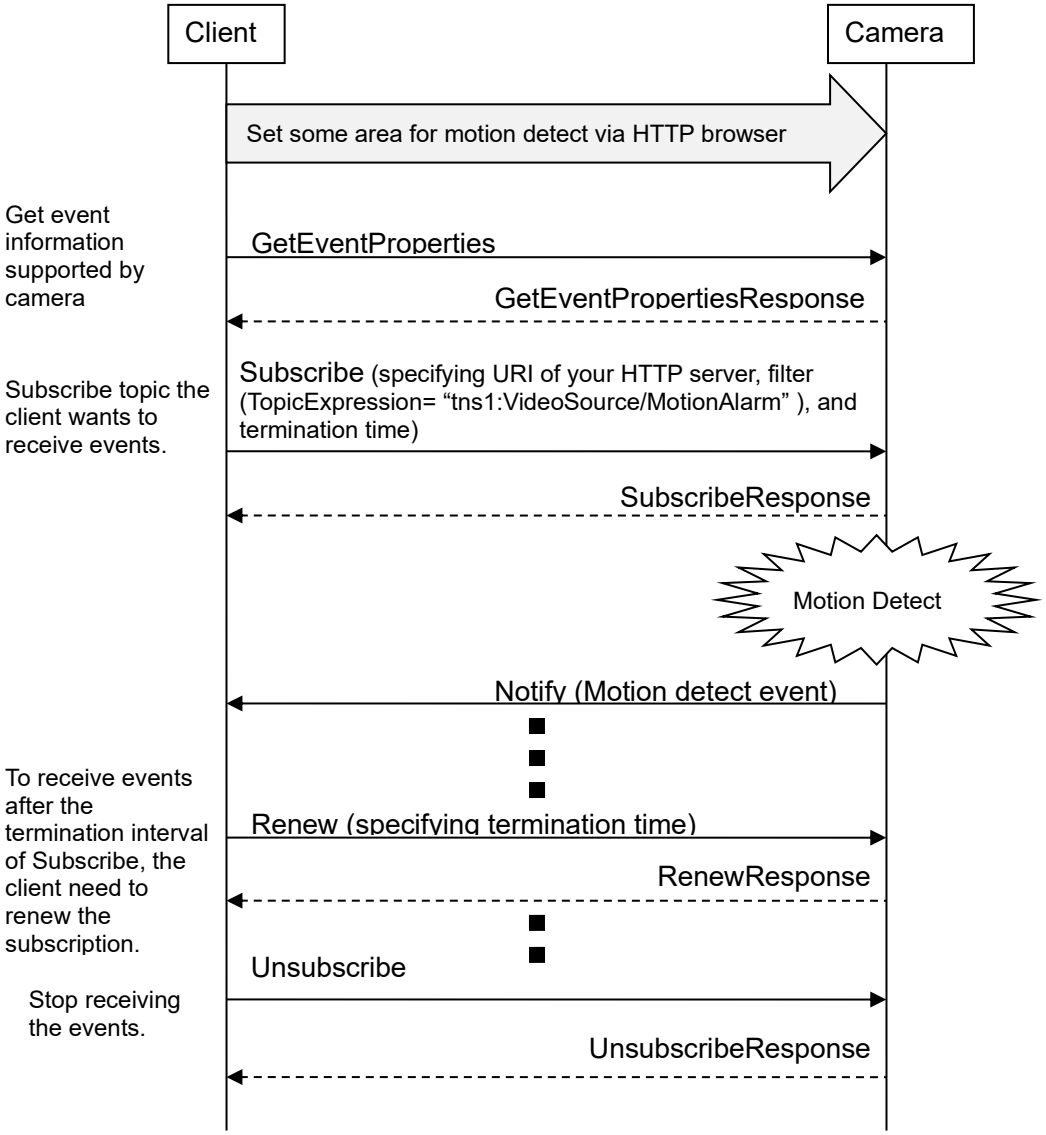
1. make an RTSP connection by specifying a URL according to the i-PRO original RTSP Stream URL format
2. include "vnd.onvif.metadata" in the response SDP of RTSP DESCRIBE
3. specify Metadata(trackID=4) in RTSP SETUP request
4. request RTSP PLAY
5. MetadataStream(PayloadType=107) is sent

Appendix

I. How to use Event service

A) Receive push type events (WS-BaseNotification)

i. Flow of receiving Motion Detect Event



ii. Example of SOAP trace

1). GetEventProperties

```
<?xml version="1.0" encoding="utf-8"?>
<soap12:Envelope xmlns:soap12="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tt="http://www.onvif.org/ver10/schema" xmlns:wsa="http://www.w3.org/2005/08/addressing"
xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd"
xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd">
  <soap12:Header>
    <wsa:Action
soap12:mustUnderstand="1">http://www.onvif.org/ver10/events/wsdl/EventPortType/GetEventPropertiesR
equest</wsa:Action>
    <wsa:MessageID>urn:uuid:299a2e0e-9a41-4aca-9dee-06d1ca916620</wsa:MessageID>
    <wsa:ReplyTo>
      <wsa:Address>http://www.w3.org/2005/08/addressing/anonymous</wsa:Address>
    </wsa:ReplyTo>
    <wsse:Security>
      <wsu:Timestamp wsu:Id="Time">
        <wsu:Created>2011-02-03T05:23:39Z</wsu:Created>
        <wsu:Expires>2011-02-03T05:23:49Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse:UsernameToken wsu:Id="User">
        <wsse:Username>admin</wsse:Username>
        <wsse:Password Type="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-
token-profile-1.0#PasswordDigest">w8DYVj1hK4RyLcuLqyFV5GIzE00=</wsse:Password>
        <wsse:Nonce>yrgktV0w/kSlagnckOOK6g==</wsse:Nonce>
        <wsu:Created>2011-02-03T05:23:39Z</wsu:Created>
      </wsse:UsernameToken>
    </wsse:Security>
    <wsa:To soap12:mustUnderstand="1">http://192.168.0.10/onvif</wsa:To>
  </soap12:Header>
  <soap12:Body>
    <GetEventProperties xmlns="http://www.onvif.org/ver10/events/wsdl" />
  </soap12:Body>
</soap12:Envelope>
```

2). GetEventPropertiesResponse

```
<?xml version="1.0" encoding="utf-8"?>
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"
xmlns:enc="http://www.w3.org/2003/05/soap-encoding" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:rpc="http://www.w3.org/2003/05/soap-
rpc" xmlns:xop="http://www.w3.org/2004/08/xop/include"
xmlns:wsa="http://www.w3.org/2005/08/addressing" xmlns:tt="http://www.onvif.org/ver10/schema"
xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2" xmlns:wstop="http://docs.oasis-open.org/wsn/t-1"
xmlns:tev="http://www.onvif.org/ver10/events/wsdl">
  <env:Header>
    <wsa:MessageID>urn:uuid:068e6052-1c36-13b2-9497-0080450da45b</wsa:MessageID>
    <wsa:RelatesTo>urn:uuid:3f5ae575-8f28-4ff0-b60f-36230574372b</wsa:RelatesTo>
    <wsa:To env:mustUnderstand="1">http://www.w3.org/2005/08/addressing/anonymous</wsa:To>
    <wsa:Action
env:mustUnderstand="1">http://www.onvif.org/ver10/events/wsdl/EventPortType/GetEventPropertiesResp
onse</wsa:Action>
  </env:Header>
  <env:Body>
    <GetEventPropertiesResponse xmlns="http://www.onvif.org/ver10/events/wsdl">

<TopicNamespaceLocation>http://www.onvif.org/onvif/ver10/topics/topicns.xml</TopicNamespaceLocatio
n>
     <wsnt:FixedTopicSet>true</wsnt:FixedTopicSet>
     <wstop:TopicSet xmlns:tns1="http://www.onvif.org/ver10/topics"xmlns:tnsipro1=" http://i-
pro.com/2021/onvif/event/topics">
       <tns1:VideoAnalytics>
         <tnsipro1:MotionDetector>
           <FigureChanged wstop:topic="true">
             <tt:MessageDescription IsProperty="false">
               <tt:Source>
                 <tt:SimpleItemDescription Name="VideoAnalytics" Type="xsd:string" />
               </tt:Source>
               <tt:Data>
                 <tt:SimpleItemDescription Name="Type" Type="xsd:string" />
               </tt:Data>
             </tt:MessageDescription>
           </FigureChanged>
         </tnsipro1:MotionDetector>
       </tns1:VideoAnalytics>
       <tns1:UserAlarm>
         <tnsipro1:Command>
           <Received wstop:topic="true">
             <tt:MessageDescription IsProperty="false">
               <tt:Source>
                 <tt:SimpleItemDescription Name="Alarm" Type="xsd:string" />
               </tt:Source>
               <tt:Data>
                 <tt:SimpleItemDescription Name="Type" Type="xsd:string" />
               </tt:Data>
             </tt:MessageDescription>
           </Received>
         </tnsipro1:Command>
       </tns1:UserAlarm>
       <tns1:Device>
         <tnsipro1:SD>
           <Capacity>
             <Decreased wstop:topic="true">
               <tt:MessageDescription IsProperty="false">
                 <tt:Source>
                   <tt:SimpleItemDescription Name="Memory" Type="xsd:string" />
                 </tt:Source>
                 <tt:Data>
                   <tt:SimpleItemDescription Name="Capacity" Type="xsd:string" />
                 </tt:Data>
               </tt:MessageDescription>
             </Decreased>
```

```
          </Capacity>
        </tnsipro1:SD>
      </tns1:Device>
      <tns1:RecordingHistory>
        <Recording>
          <State wstop:topic="true">
            <tt:MessageDescription IsProperty="true">
              <tt:Source>
                <tt:SimpleItemDescription Name="RecordingToken" Type="tt:ReferenceToken" />
              </tt:Source>
              <tt:Data>
                <tt:SimpleItemDescription Name="IsRecording" Type="xsd:boolean" />
              </tt:Data>
            </tt:MessageDescription>
          </State>
        </Recording>
        <Track>
          <State wstop:topic="true">
            <tt:MessageDescription IsProperty="true">
              <tt:Source>
                <tt:SimpleItemDescription Name="RecordingToken" Type="tt:ReferenceToken" />
                <tt:SimpleItemDescription Name="Track" Type="tt:ReferenceToken" />
              </tt:Source>
              <tt:Data>
                <tt:SimpleItemDescription Name="IsDataPresent" Type="xsd:boolean" />
              </tt:Data>
            </tt:MessageDescription>
          </State>
        </Track>
      </tns1:RecordingHistory>
      <tns1:RecordingConfig>
        <JobState wstop:topic="true">
          <tt:MessageDescription IsProperty="true">
            <tt:Source>
              <tt:SimpleItemDescription Name="RecordingJobToken" Type="tt:ReferenceToken" />
            </tt:Source>
            <tt:Data>
              <tt:SimpleItemDescription Name="State" Type="xsd:stringn" />
              <tt:ElementItemDescription Name="Information"
Type="tt:RecordingJobStateInformation" />
            </tt:Data>
          </tt:MessageDescription>
        </JobState>
      </tns1:RecordingConfig>
      <tns1:VideoSource>
        <MotionAlarm wstop:topic="true">
          <tt:MessageDescription IsProperty="false">
            <tt:Source>
              <tt:SimpleItemDescription Name="VideoSourceToken" Type="tt:ReferenceToken" />
            </tt:Source>
            <tt:Data>
              <tt:SimpleItemDescription Name="State" Type="xsd:boolean" />
            </tt:Data>
          </tt:MessageDescription>
        </MotionAlarm>
      </tns1:VideoSource>
    </wstop:TopicSet>

<wsnt:TopicExpressionDialect>http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet</wsnt:Topi
cExpressionDialect>
    <wsnt:TopicExpressionDialect>http://docs.oasis-open.org/wsn/t-
1/TopicExpression/Concrete</wsnt:TopicExpressionDialect>

<MessageContentFilterDialect>http://www.onvif.org/ver10/tev/messageContentFilter/ItemFilter</Messa
geContentFilterDialect>

<MessageContentSchemaLocation>http://www.onvif.org/ver10/schema/onvif.xsd</MessageContentSchemaLoc
```

```
ation>
    </GetEventPropertiesResponse>
  </env:Body>
</env:Envelope>
```

3). Subscribe

```
<?xml version="1.0" encoding="utf-8"?>
<soap12:Envelope xmlns:soap12="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tt="http://www.onvif.org/ver10/schema" xmlns:wsa="http://www.w3.org/2005/08/addressing"
xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd"
xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd">
  <soap12:Header>
    <wsa:Action soap12:mustUnderstand="1">http://docs.oasis-open.org/wsn/bw-
2/NotificationProducer/SubscribeRequest</wsa:Action>
    <wsa:MessageID>urn:uuid:7ec8a56e-97c9-4484-9280-0de010f96306</wsa:MessageID>
    <wsa:ReplyTo>
      <wsa:Address>http://www.w3.org/2005/08/addressing/anonymous</wsa:Address>
    </wsa:ReplyTo>
    <wsse:Security>
      <wsu:Timestamp wsu:Id="Time">
        <wsu:Created>2011-02-03T05:31:00Z</wsu:Created>
        <wsu:Expires>2011-02-03T05:31:10Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse:UsernameToken wsu:Id="User">
        <wsse:Username>admin</wsse:Username>
        <wsse:Password Type="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-
token-profile-1.0#PasswordDigest">1505c1EjzO54yS9rOXwz+c3bNVA=</wsse:Password>
        <wsse:Nonce>E6vRIg7rO0egXIwyYj31Pg==</wsse:Nonce>
        <wsu:Created>2011-02-03T05:31:00Z</wsu:Created>
      </wsse:UsernameToken>
    </wsse:Security>
    <wsa:To soap12:mustUnderstand="1">http://192.168.0.10/onvif</wsa:To>
  </soap12:Header>
  <soap12:Body>
    <Subscribe xmlns="http://docs.oasis-open.org/wsn/b-2">
      <ConsumerReference>
        <wsa:Address>http://192.168.0.111:10000/onvif/events</wsa:Address>
      </ConsumerReference>
      <Filter>
        <TopicExpression Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet"
xmlns:tns1="http://www.onvif.org/ver10/topics">tns1:VideoSource/MotionAlarm</TopicExpression>
      </Filter>
      <InitialTerminationTime>PT10M</InitialTerminationTime>
    </Subscribe>
  </soap12:Body>
</soap12:Envelope>
```

4). SubscribeResponse

```
<?xml version="1.0" encoding="utf-8"?>
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"
xmlns:enc="http://www.w3.org/2003/05/soap-encoding" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:rpc="http://www.w3.org/2003/05/soap-
rpc" xmlns:xop="http://www.w3.org/2004/08/xop/include"
xmlns:wsa="http://www.w3.org/2005/08/addressing" xmlns:tt="http://www.onvif.org/ver10/schema"
xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2" xmlns:wstop="http://docs.oasis-open.org/wsn/t-1">
  <env:Header>
    <wsa:MessageID>urn:uuid:0119875c-d680-1419-9d13-00804559a33b</wsa:MessageID>
    <wsa:RelatesTo>urn:uuid:7ec8a56e-97c9-4484-9280-0de010f96306</wsa:RelatesTo>
    <wsa:To env:mustUnderstand="1">http://www.w3.org/2005/08/addressing/anonymous</wsa:To>
    <wsa:Action env:mustUnderstand="1">http://docs.oasis-open.org/wsn/bw-
2/NotificationProducer/SubscribeResponse</wsa:Action>
  </env:Header>
  <env:Body>
    <wsnt:SubscribeResponse xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2">
      <wsnt:SubscriptionReference>
        <wsa:Address>http://192.168.0.10/onvif/Subscription?Idx=17818</wsa:Address>
      </wsnt:SubscriptionReference>
      <wsnt:CurrentTime>2011-02-03T05:36:52Z</wsnt:CurrentTime>
      <wsnt:TerminationTime>2011-02-03T05:46:52Z</wsnt:TerminationTime>
    </wsnt:SubscribeResponse>
  </env:Body>
</env:Envelope>
```

5). Notify

```
<?xml version="1.0" encoding="utf-8"?>
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"
xmlns:enc="http://www.w3.org/2003/05/soap-encoding" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:rpc="http://www.w3.org/2003/05/soap-
rpc" xmlns:xop="http://www.w3.org/2004/08/xop/include"
xmlns:wsa="http://www.w3.org/2005/08/addressing" xmlns:tt="http://www.onvif.org/ver10/schema"
xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2" xmlns:wstop="http://docs.oasis-open.org/wsn/t-1"
xmlns:tev="http://www.onvif.org/ver10/events/wsdl">
  <env:Header>
    <wsa:MessageID>urn:uuid:502a7b53-1c35-13b2-9497-0080450da45b</wsa:MessageID>
    <wsa:To env:mustUnderstand="1">http://192.168.0.51:10000/onvif/events</wsa:To>
    <wsa:Action env:mustUnderstand="1">http://docs.oasis-open.org/wsn/bw-
2/NotificationConsumer/Notify</wsa:Action>
  </env:Header>
  <env:Body>
    <wsnt:Notify>
      <wsnt:NotificationMessage>
        <wsnt:SubscriptionReference>
          <wsa:Address>http://192.168.0.20/onvif/Subscription?Idx=17972</wsa:Address>
        </wsnt:SubscriptionReference>
        <wsnt:Topic
Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet"xmlns:tns1="http://www.onvif.o
rg/ver10/topics" xmlns:tnsipro1=" http://i-
pro.com/2021/onvif/event/topics">tns1:VideoSource/MotionAlarm</wsnt:Topic>
        <wsnt:Message>
          <tt:Message UtcTime="2013-07-31T08:33:59Z">
            <tt:Source>
              <tt:SimpleItem Name="VideoSourceToken" Value="3M" />
            </tt:Source>
            <tt:Data>
              <tt:SimpleItem Name="State" Value="True" />
            </tt:Data>
          </tt:Message>
        </wsnt:Message>
      </wsnt:NotificationMessage>
    </wsnt:Notify>
  </env:Body>
</env:Envelope>
```

6). Renew

```
<?xml version="1.0" encoding="utf-8"?>
<soap12:Envelope xmlns:soap12="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tt="http://www.onvif.org/ver10/schema" xmlns:wsa="http://www.w3.org/2005/08/addressing"
xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd"
xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd">
  <soap12:Header>
    <wsa:Action soap12:mustUnderstand="1">http://docs.oasis-open.org/wsn/bw-
2/SubscriptionManager/RenewRequest</wsa:Action>
    <wsa:MessageID>urn:uuid:6012ba9e-98b7-4cee-97f6-1d7fb7ef9b69</wsa:MessageID>
    <wsa:ReplyTo>
      <wsa:Address>http://www.w3.org/2005/08/addressing/anonymous</wsa:Address>
    </wsa:ReplyTo>
    <wsse:Security>
      <wsu:Timestamp wsu:Id="Time">
        <wsu:Created>2011-02-03T05:31:18Z</wsu:Created>
        <wsu:Expires>2011-02-03T05:31:28Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse:UsernameToken wsu:Id="User">
        <wsse:Username>admin</wsse:Username>
        <wsse:Password Type="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-
token-profile-1.0#PasswordDigest">A1lMZDH7iYc1c82lBlLlGXYSMUk=</wsse:Password>
        <wsse:Nonce>cda1gOMjckWHsXZeCKrDTA==</wsse:Nonce>
        <wsu:Created>2011-02-03T05:31:18Z</wsu:Created>
      </wsse:UsernameToken>
    </wsse:Security>
    <wsa:To soap12:mustUnderstand="1">http://192.168.0.10/onvif/Subscription?Idx=17818</wsa:To>
  </soap12:Header>
  <soap12:Body>
    <Renew xmlns="http://docs.oasis-open.org/wsn/b-2">
      <TerminationTime>PT10M</TerminationTime>
    </Renew>
  </soap12:Body>
</soap12:Envelope>
```

7). RenewResponse

```
<?xml version="1.0" encoding="utf-8"?>
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"
xmlns:enc="http://www.w3.org/2003/05/soap-encoding" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:rpc="http://www.w3.org/2003/05/soap-
rpc" xmlns:xop="http://www.w3.org/2004/08/xop/include"
xmlns:wsa="http://www.w3.org/2005/08/addressing" xmlns:tt="http://www.onvif.org/ver10/schema"
xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2" xmlns:wstop="http://docs.oasis-open.org/wsn/t-1">
  <env:Header>
    <wsa:MessageID>urn:uuid:0119875e-d680-1419-9d13-00804559a33b</wsa:MessageID>
    <wsa:RelatesTo>urn:uuid:6012ba9e-98b7-4cee-97f6-1d7fb7ef9b69</wsa:RelatesTo>
    <wsa:To env:mustUnderstand="1">http://www.w3.org/2005/08/addressing/anonymous</wsa:To>
    <wsa:Action env:mustUnderstand="1">http://docs.oasis-open.org/wsn/bw-
2/SubscriptionManager/RenewResponse</wsa:Action>
  </env:Header>
  <env:Body>
    <wsnt:RenewResponse xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2">
      <wsnt:TerminationTime>2011-02-03T05:47:09Z</wsnt:TerminationTime>
      <wsnt:CurrentTime>2011-02-03T05:37:09Z</wsnt:CurrentTime>
    </wsnt:RenewResponse>
  </env:Body>
</env:Envelope>
```

8). Unsubscribe

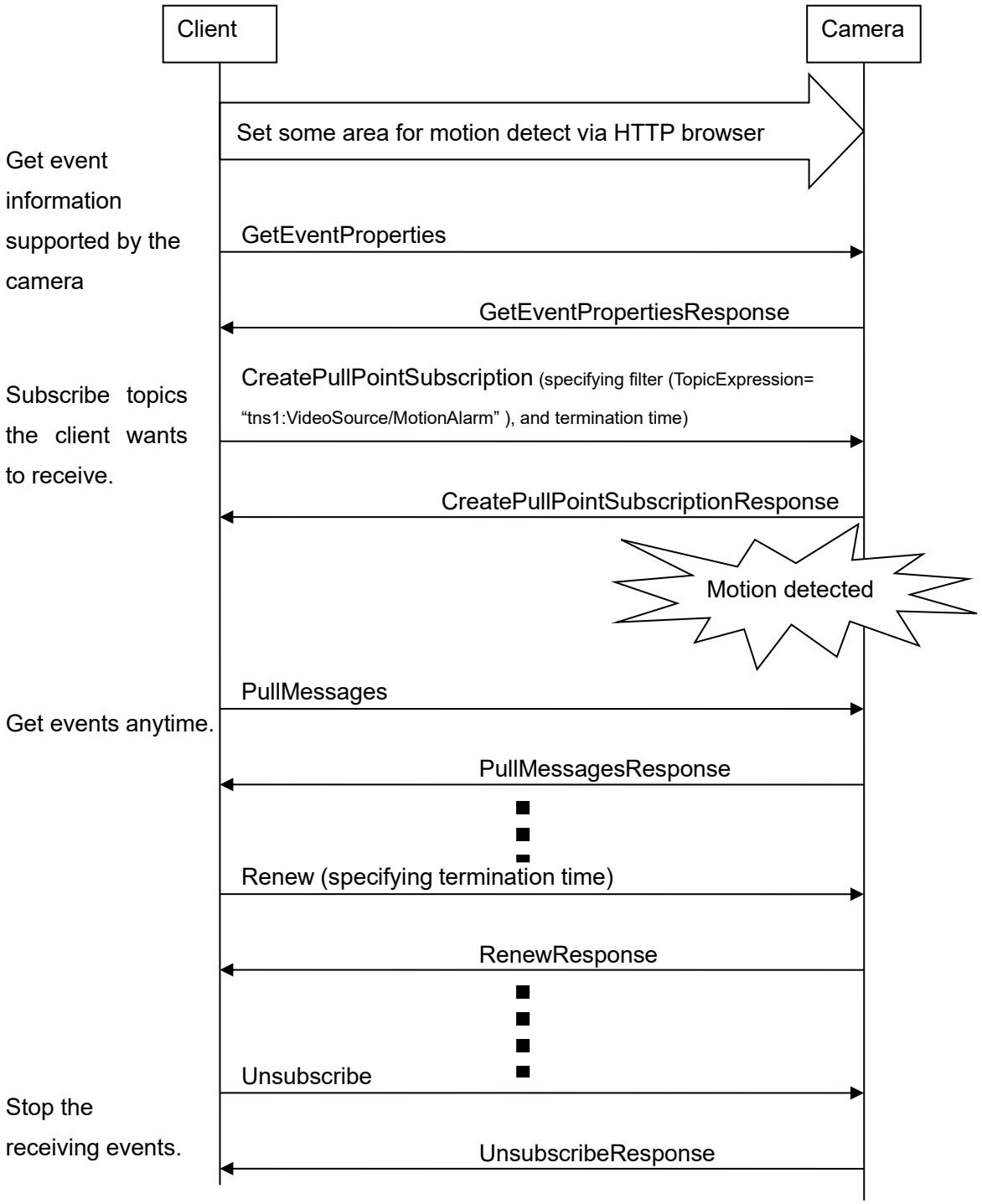
```
<?xml version="1.0" encoding="utf-8"?>
<soap12:Envelope xmlns:soap12="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tt="http://www.onvif.org/ver10/schema" xmlns:wsa="http://www.w3.org/2005/08/addressing"
xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd"
xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd">
  <soap12:Header>
    <wsa:Action soap12:mustUnderstand="1">http://docs.oasis-open.org/wsn/bw-
2/SubscriptionManager/UnsubscribeRequest</wsa:Action>
    <wsa:MessageID>urn:uuid:efa87460-e34d-427f-b81d-eff21994b412</wsa:MessageID>
    <wsa:ReplyTo>
      <wsa:Address>http://www.w3.org/2005/08/addressing/anonymous</wsa:Address>
    </wsa:ReplyTo>
    <wsse:Security>
      <wsu:Timestamp wsu:Id="Time">
        <wsu:Created>2011-02-03T05:31:24Z</wsu:Created>
        <wsu:Expires>2011-02-03T05:31:34Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse:UsernameToken wsu:Id="User">
        <wsse:Username>admin</wsse:Username>
        <wsse:Password Type="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-
token-profile-1.0#PasswordDigest">PPh5+jImR39oFcrMDVHkw6KKGsI=</wsse:Password>
        <wsse:Nonce>ADUm0HiQY023wB3WyBlHZA==</wsse:Nonce>
        <wsu:Created>2011-02-03T05:31:24Z</wsu:Created>
      </wsse:UsernameToken>
    </wsse:Security>
    <wsa:To soap12:mustUnderstand="1">http://192.168.0.10/onvif/Subscription?Idx=17818</wsa:To>
  </soap12:Header>
  <soap12:Body>
    <Unsubscribe xmlns="http://docs.oasis-open.org/wsn/b-2" />
  </soap12:Body>
</soap12:Envelope>
```

9). UnsubscribeResponse

```
<?xml version="1.0" encoding="utf-8"?>
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"
xmlns:enc="http://www.w3.org/2003/05/soap-encoding" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:rpc="http://www.w3.org/2003/05/soap-
rpc" xmlns:xop="http://www.w3.org/2004/08/xop/include"
xmlns:wsa="http://www.w3.org/2005/08/addressing" xmlns:tt="http://www.onvif.org/ver10/schema"
xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2" xmlns:wstop="http://docs.oasis-open.org/wsn/t-1">
  <env:Header>
    <wsa:MessageID>urn:uuid:0119875f-d680-1419-9d13-00804559a33b</wsa:MessageID>
    <wsa:RelatesTo>urn:uuid:efa87460-e34d-427f-b81d-eff21994b412</wsa:RelatesTo>
    <wsa:To env:mustUnderstand="1">http://www.w3.org/2005/08/addressing/anonymous</wsa:To>
    <wsa:Action env:mustUnderstand="1">http://docs.oasis-open.org/wsn/bw-
2/SubscriptionManager/UnsubscribeResponse</wsa:Action>
  </env:Header>
  <env:Body>
    <wsnt:UnsubscribeResponse xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2">
    </wsnt:UnsubscribeResponse>
  </env:Body>
</env:Envelope>
```

B) Get pull type events (Event service of ONVIF)

i. Flow of receiving Motion Detect Event



ii. Example of SOAP trace

1). CreatePullPointSubscription

```
<?xml version="1.0" encoding="utf-8"?>
<soap12:Envelope xmlns:soap12="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tt="http://www.onvif.org/ver10/schema" xmlns:wsa="http://www.w3.org/2005/08/addressing"
xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd"
xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd">
  <soap12:Header>
    <wsa:Action
soap12:mustUnderstand="1">http://www.onvif.org/ver10/events/wsdl/EventPortType/CreatePullPointSubs
criptionRequest</wsa:Action>
    <wsa:MessageID>urn:uuid:cca999f8-b0e1-4e4e-ac7e-04a074d49fbf</wsa:MessageID>
    <wsa:ReplyTo>
      <wsa:Address>http://www.w3.org/2005/08/addressing/anonymous</wsa:Address>
    </wsa:ReplyTo>
    <wsse:Security>
      <wsu:Timestamp wsu:Id="Time">
        <wsu:Created>2011-02-03T05:32:40Z</wsu:Created>
        <wsu:Expires>2011-02-03T05:32:50Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse:UsernameToken wsu:Id="User">
        <wsse:Username>admin</wsse:Username>
        <wsse:Password Type="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-
token-profile-1.0#PasswordDigest">0FVLlgsnsY4Uebmes7iHn9Yw4Qk=</wsse:Password>
        <wsse:Nonce>tDGL/U0o8UiHlkd2QguF3A==</wsse:Nonce>
        <wsu:Created>2011-02-03T05:32:40Z</wsu:Created>
      </wsse:UsernameToken>
    </wsse:Security>
    <wsa:To soap12:mustUnderstand="1">http://192.168.0.10/onvif</wsa:To>
  </soap12:Header>
  <soap12:Body>
    <CreatePullPointSubscription xmlns="http://www.onvif.org/ver10/events/wsdl">
      <Filter>
        <TopicExpression Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet"
xmlns="http://docs.oasis-open.org/wsn/b-2"
xmlns:tns1="http://www.onvif.org/ver10/topics">tns1:VideoSource/MotionAlarm</TopicExpression>
      </Filter>
      <InitialTerminationTime>PT10M</InitialTerminationTime>
    </CreatePullPointSubscription>
  </soap12:Body>
</soap12:Envelope>
```

2). CreatePullPointSubscriptionResponse

```
<?xml version="1.0" encoding="utf-8"?>
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"
xmlns:enc="http://www.w3.org/2003/05/soap-encoding" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:rpc="http://www.w3.org/2003/05/soap-
rpc" xmlns:xop="http://www.w3.org/2004/08/xop/include"
xmlns:wsa="http://www.w3.org/2005/08/addressing" xmlns:tt="http://www.onvif.org/ver10/schema"
xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2" xmlns:wstop="http://docs.oasis-open.org/wsn/t-1">
  <env:Header>
    <wsa:MessageID>urn:uuid:01198760-d680-1419-9d13-00804559a33b</wsa:MessageID>
    <wsa:RelatesTo>urn:uuid:cca999f8-b0e1-4e4e-ac7e-04a074d49fbf</wsa:RelatesTo>
    <wsa:To env:mustUnderstand="1">http://www.w3.org/2005/08/addressing/anonymous</wsa:To>
    <wsa:Action
env:mustUnderstand="1">http://www.onvif.org/ver10/events/wsdl/EventPortType/CreatePullPointSubscri
ptionResponse</wsa:Action>
  </env:Header>
  <env:Body>
    <CreatePullPointSubscriptionResponse xmlns="http://www.onvif.org/ver10/events/wsdl">
      <SubscriptionReference>
        <wsa:Address>http://192.168.0.10/onvif/Subscription?Idx=399</wsa:Address>
      </SubscriptionReference>
      <wsnt:CurrentTime>2011-02-03T05:38:32Z</wsnt:CurrentTime>
      <wsnt:TerminationTime>2011-02-03T05:48:32Z</wsnt:TerminationTime>
    </CreatePullPointSubscriptionResponse>
  </env:Body>
</env:Envelope>
```

3). PullMessages

```
<?xml version="1.0" encoding="utf-8"?>
<soap12:Envelope xmlns:soap12="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:tt="http://www.onvif.org/ver10/schema" xmlns:wsa="http://www.w3.org/2005/08/addressing"
xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd"
xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd">
  <soap12:Header>
    <wsa:Action
soap12:mustUnderstand="1">http://www.onvif.org/ver10/events/wsdl/PullPointSubscription/PullMessage
sRequest</wsa:Action>
    <wsa:MessageID>urn:uuid:c70fe246-0bd1-424a-abfa-6eab7bde8fd4</wsa:MessageID>
    <wsa:ReplyTo>
      <wsa:Address>http://www.w3.org/2005/08/addressing/anonymous</wsa:Address>
    </wsa:ReplyTo>
    <wsse:Security>
      <wsu:Timestamp wsu:Id="Time">
        <wsu:Created>2013-07-31T08:55:51Z</wsu:Created>
        <wsu:Expires>2013-07-31T08:56:01Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse:UsernameToken wsu:Id="User">
        <wsse:Username>admin</wsse:Username>
        <wsse:Password Type="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-
token-profile-1.0#PasswordDigest">4dG7CPI8rj+CjVCeaNTNiCX3QmM=</wsse:Password>
        <wsse:Nonce>vhcI1VHgDEWEJ/L5+TsCOg==</wsse:Nonce>
        <wsu:Created>2013-07-31T08:55:51Z</wsu:Created>
      </wsse:UsernameToken>
    </wsse:Security>
    <wsa:To soap12:mustUnderstand="1">http://192.168.0.20/onvif/Subscription?Idx=2104</wsa:To>
  </soap12:Header>
  <soap12:Body>
    <PullMessages xmlns="http://www.onvif.org/ver10/events/wsdl">
      <Timeout>PT1S</Timeout>
      <MessageLimit>1</MessageLimit>
    </PullMessages>
  </soap12:Body>
</soap12:Envelope>
```

4). PullMessagesResponse

```
<?xml version="1.0" encoding="utf-8"?>
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope"
xmlns:enc="http://www.w3.org/2003/05/soap-encoding" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:rpc="http://www.w3.org/2003/05/soap-
rpc" xmlns:xop="http://www.w3.org/2004/08/xop/include"
xmlns:wsa="http://www.w3.org/2005/08/addressing" xmlns:tt="http://www.onvif.org/ver10/schema"
xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2" xmlns:wstop="http://docs.oasis-open.org/wsn/t-1"
xmlns:tev="http://www.onvif.org/ver10/events/wsdl">
  <env:Header>
    <wsa:MessageID>urn:uuid:684fc9d2-1c38-13b2-9497-0080450da45b</wsa:MessageID>
    <wsa:RelatesTo>urn:uuid:c70fe246-0bd1-424a-abfa-6eab7bde8fd4</wsa:RelatesTo>
    <wsa:To env:mustUnderstand="1">http://www.w3.org/2005/08/addressing/anonymous</wsa:To>
    <wsa:Action
env:mustUnderstand="1">http://www.onvif.org/ver10/events/wsdl/PullPointSubscription/PullMessagesRe
sponse</wsa:Action>
  </env:Header>
  <env:Body>
    <PullMessagesResponse xmlns="http://www.onvif.org/ver10/events/wsdl">
      <CurrentTime>2013-07-31T08:56:08Z</CurrentTime>
      <TerminationTime>2013-08-01T00:00:00Z</TerminationTime>
      <wsnt:NotificationMessage>
        <wsnt:SubscriptionReference>
          <wsa:Address>http://192.168.0.20/onvif/Subscription?Idx=2104</wsa:Address>
        </wsnt:SubscriptionReference>
        <wsnt:Topic Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet"
xmlns:tns1="http://www.onvif.org/ver10/topics" xmlns:tnsipro1="http://i-
pro.com/2021/onvif/event/topics">tns1:VideoSource/MotionAlarm</wsnt:Topic>
        <wsnt:Message>
          <tt:Message UtcTime="2013-07-31T08:56:05Z">
            <tt:Source>
              <tt:SimpleItem Name="VideoSourceToken" Value="3M" />
            </tt:Source>
            <tt:Data>
              <tt:SimpleItem Name="State" Value="True" />
            </tt:Data>
          </tt:Message>
        </wsnt:Message>
      </wsnt:NotificationMessage>
    </PullMessagesResponse>
  </env:Body>
</env:Envelope>
```

II. About i-VMD

A) Analytics Service

i-VMD (WV-SAE200/WV-SAE200W) does not support Analytics Service.
Therefore, AnalyticsConfiguration cannot be added to Profile.

i. How to use

To send an AnalyticsStream using i-PRO original RTSP Stream, some preliminary preparations are required.

1) Installation of the Extension Software. in order to use the Analytics service, the Extension Software must be installed.
2) License registration. Register a license to use the extension software.
3) Time schedule registration. Register a time schedule for the enhanced software to operate according to the time period registered in the time schedule.

B) Metadata Stream

i. ONVIF RTSP Stream

MetadataStream Support Status List

See chapter 15.2.2MetadataStream distribution sequence for MetadataStream procedures.

MetadataStream	Nodes	i-VMD
Analytics Stream	BoundingBox	No
	Object Classification	No

MetadataStream	Events	i-VMD

Event Stream	Object Detection	No
	GlobalSceneChange	Yes
	AudioDetector	No

ii. i-PRO original RTSP Stream

MetadataStream Support Status List

See chapter 15.3.2MetadataStream distribution sequence for MetadataStream procedures.

MetadataStream	Nodes	i-VMD
Analytics Stream	BoundingBox	Yes
	Object Classification	No

MetadataStream	Events	i-VMD
Event Stream	Object Detection	No
	GlobalSceneChange	No
	AudioDetector	No