# ONVIF®

# Imaging Client Test Specification

Version 19.06

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# REVISION HISTORY

| Vers. | Date | Description |
|---|---|---|
| 19.06 | Jun 14, 2019 | The following was done according to #309:<br><br>'Validated Feature' section for each feature updated to be synchronized with feature ID used in feature list.<br><br>'Feature Under Test' section for each test case updated to be synchronized with sub-feature ID used in feature list.<br><br>'Validated Feature List' test case section removed. |
| 18.06 | Jun 21, 2018 | Reformatting document using new template |
| 18.06 | May 22, 2018 | Tampering feature updated according to #246 |
| 18.06 | Apr 28, 2018 | Tampering feature updated according to #246 |
| 18.06 | Apr 05, 2018 | 'Required Number of Devices Summary' Annex added according to #241 |
| 18.06 | Feb 14, 2018 | The following were updated in the scope of #241:<br><br>Feature Level Requirement (updated with new rules)<br><br>Each Feature Level Requirement (updated with Check Condition based on Device Features and Required Number of Devices) |
| 17.12 | Aug 15, 2017 | Requirement level of Profile T of the following features was changed from Mandatory to Cconditional according to #220:<br><br>Focus Move Capabilities<br><br>Focus Control |
| 17.06 | Jun 15, 2017 | Links in Normative references section were updated. |
| 17.06 | May 22, 2017 | Motion Alarm Test Cases added. |
| 17.06 | Mar 22, 2017 | Tampering Test Cases added.<br><br>Introduction section updated. |
| 17.06 | Mar 17, 2017 | Profile T Normative Reference were added for the following features:<br><br>Get Imaging Setting, Imaging Settings Configuration, Focus Move Capabilities |
| 16.07 | Mar 14, 2016 | www.onvif.org was removed from Copyright section. |
| 16.07 | Mar 09, 2016 | The following step was removed from SETIMAGINGSETTINGS-2 test case: [S4] It invoked for the same Device as for the Client SetImagingSettings request<br><br>Steps with checking that settings from the SetImagingSettings request correspond options from GetOptionsResponse were removed from SETIMAGINGSETTINGS-2 test case |
| 16.01 | Dec 21, 2016 | Focus Control Test Cases was splitted on two parts (Focus Move Capabilities Test Cases and Focus Control Test Cases) to handle Device capabilities issue. |

| | | |
|---|---|---|
| 16.01 | Dec 18, 2016 | Get Imaging Capabilities Test Cases feature definition was updated |
| 15.10 | Oct 20, 2016 | Initial version:<br>General parts added<br>Get Imaging Capabilities Test Cases added<br>Video Sources List Test Cases added<br>Get Imaging Settings Test Cases added<br>Imaging Settings Configuration Test Cases added<br>Focus Control Test Cases added |

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# 1 Introduction

The goal of the ONVIF Test Specification set is to make it possible to realize fully interoperable IP physical security implementations from different vendors. This specification also acts as an input document to the development of a test tool which will be used to test the ONVIF Client implementation conformance towards ONVIF standard. This Client Test Tool analyzes network communications between ONVIF Devices and Clients being tested and determines whether a specific Client is ONVIF conformant (see ONVIF Conformance Process Specification).

This particular document defines test cases required for testing Imaging Service features of a Client application e.g. Get Imaging Capabilities, Video Sources List, Get Imaging Settings, Imaging Settings Configuration, Focus Control. It also describes the test framework, test setup, prerequisites, test policies needed for the execution of the described test cases.

## 1.1 Scope

This ONVIF Imaging Client Test Specification defines and regulates the conformance testing procedure for the ONVIF conformant Clients in the scope of Imaging Service features. Conformance testing is meant to be black-box network traces analysis and verification. The objective of this specification is to provide the test cases to test individual requirements of ONVIF Clients in the scope of Imaging Service features according to ONVIF Imaging Service Specification.

The principal intended purposes are:

- Provide self-assessment tool for implementations.
- Provide comprehensive test suite coverage for Imaging Service features.

This specification **does not** address the following:

- 3rd parties Client use cases
- Non-functional (performance and regression) testing and analysis.
- SOAP Implementation Interoperability test i.e. Web Services Interoperability Basic Profile version 2.0 (WS-I BP2.0).
- Network protocol implementation Conformance test for HTTPS and HTTP protocols.

The following sections cover test cases needed for the verification of relevant features as mentioned in the ONVIF Profile Specifications.

## 1.2 Get Imaging Capabilities

Get Imaging Capabilities section specifies Client ability to request imaging capabilities from Device.

## 1.3 Get Imaging Settings

Get Imaging Settings section specifies Client ability to request imaging settings from Device.

## 1.4 Imaging Settings Configuration

Imaging Settings Configuration section specifies Client ability to change imaging settings on Device.

## 1.5 Focus Move Capabilities

Focus Move Capabilities section specifies Client ability to retrieve focus move capabilities from Device.

## 1.6 Focus Control

Focus Control section specifies Client ability to control focus on Device.

## 1.7 Tampering

Tampering section specifies Client ability to receive notifications of Tampering events.

## 1.8 Motion Alarm

Motion Alarm section specifies Client ability to receive notifications of motion alarm event.

# 2 Normative references

- ONVIF Conformance Process Specification:

  https://www.onvif.org/profiles/conformance/

- ONVIF Profile Policy:

  https://www.onvif.org/profiles/

- ONVIF Core Specifications:

  https://www.onvif.org/profiles/specifications/

- ONVIF Core Client Test Specification:

  https://www.onvif.org/profiles/conformance/client-test/

- ONVIF Imaging Specification:

  https://www.onvif.org/profiles/specifications/

- ISO/IEC Directives, Part 2, Annex H:

  http://www.iso.org/directives

- ISO 16484-5:2014-09 Annex P:

  https://www.iso.org/obp/ui/#!iso:std:63753:en

- W3C SOAP 1.2, Part 1, Messaging Framework:

  http://www.w3.org/TR/soap12-part1/

- W3C XML Schema Part 1: Structures Second Edition:

  http://www.w3.org/TR/xmlschema-1/

- W3C XML Schema Part 2: Datatypes Second Edition:

  http://www.w3.org/TR/xmlschema-2/

# 3 Terms and Definitions

## 3.1 Conventions

The key words "shall", "shall not", "should", "should not", "may", "need not", "can", "cannot" in this specification are to be interpreted as described in [ISO/IEC Directives Part 2].

## 3.2 Definitions

This section describes terms and definitions used in this document.

| | |
|---|---|
| **Profile** | See ONVIF Profile Policy. |
| **ONVIF Device** | Computer appliance or software program that exposes one or multiple ONVIF Web Services. |
| **ONVIF Client** | Computer appliance or software program that uses ONVIF Web Services. |
| **Conversation** | A Conversation is all exchanges between two MAC addresses that contains SOAP request and response. |
| **Network** | A network is an interconnected group of devices communicating using the Internet protocol. |
| **Network Trace Capture file** | Data file created by a network protocol analyzer software (such as Wireshark). Contains network packets data recorded during a live network communications. |
| **SOAP** | SOAP is a lightweight protocol intended for exchanging structured information in a decentralized, distributed environment. It uses XML technologies to define an extensible messaging framework providing a message construct that can be exchanged over a variety of underlying protocols. |
| **Client Test Tool** | ONVIF Client Test Tool that tests ONVIF Client implementation towards the ONVIF Test Specification set. |
| **Imaging Service** | Services for exposure time, gain and white balance parameters among others. |
| **Image Stabilization** | Functionality used to avoid blurring of images due to movement of the device or its objects. |
| **Tone Compensation** | Functionality used to make the image with dark or bright areas to be more visible. |
| **Defogging** | Functionality used to make the image more detailed in presence of fog. |
| **Valid Device Response** | Device has responded to specific request with code HTTP or RTSP 200 OK and SOAP fault message has not appeared. |

## 3.3 Abbreviations

This section describes abbreviations used in this document.

**HTTP** Hyper Text Transport Protocol.

**HTTPS** Hyper Text Transport Protocol over Secure Socket Layer.

**URI** Uniform Resource Identifier.

**WSDL** Web Services Description Language.

**XML** eXtensible Markup Language.

## 3.4 Namespaces

Prefix and namespaces used in this test specification are listed in Table 1. These prefixes are not part of the standard and an implementation can use any prefix.

### Table 3.1. Defined namespaces in this specification

| Prefix | Namespace URI | Description |
|---|---|---|
| soapenv | http://www.w3.org/2003/05/soap-envelope | Envelope namespace as defined by SOAP 1.2 [SOAP 1.2, Part 1] |
| xs | http://www.w3.org/2001/XMLSchema | Instance namespace as defined by XS [XML-Schema, Part1] and [XMLSchema,Part 2] |
| xsi | http://www.w3.org/2001/XMLSchema-instance | XML schema instance namespace |
| tns1 | http://www.onvif.org/ver10/topics | The namespace for the ONVIF topic namespace |
| tt | http://www.onvif.org/ver10/schema | ONVIF XML schema descriptions |
| tds | http://www.onvif.org/ver10/device/wsdl | The namespace for the WSDL device service |
| trt | http://www.onvif.org/ver10/media/wsdl | The namespace for the WSDL media service |
| timg | http://www.onvif.org/ver20/imaging/wsd | The namespace for the WSDL imaging service |

# 4 Test Overview

This section provides information for the test setup procedure and required prerequisites that should be followed during test case execution.

An ONVIF client with Imaging features support can provide image settings configuration and focus control.

An ONVIF Profile is described by a fixed set of functionalities through a number of services that are provided by the ONVIF standard. A number of services and functionalities are mandatory for each type of ONVIF Profile. An ONVIF Device and ONVIF Client may support any combination of Profiles and other optional services and functionalities.

## 4.1 General

Test Cases are grouped depending on features. Each Test Cases group provides description of feature requirement level for Profiles, expected scenario under test and related test cases:

- Feature Level Normative Reference
- Expected Scenarios Under Test
- List of Test Cases

### 4.1.1 Feature Level Requirement

Feature Level Requirement item contains a feature ID, check condition based on Device features, required number of Devices and feature requirement level for the Profiles, which will be used for Profiles conformance.

To claim this Feature as supported Client shall pass Expected Scenario Under Test:

- for each Device, which supports Device Features defined in Check Condition Based on Device Features
- for at least with number of Devices specified in Required Number of Devices

If Feature Level Requirement is defined as Mandatory for some Profile, Client shall support this Feature to claim this Profile Conformance.

### 4.1.2 Expected Scenarios Under Test

Expected Scenarios Under Test item contains expected scenario under test, conditions when the feature will be defined as supported and as not supported.

### 4.1.3 Test Cases

Test Case items contain list of test cases which are related to feature. Test cases provide exact procedure of testing feature support conditions.

Each Test Case contains the following parts:

- Test Label - Unique label for each test
- Test Case ID - Unique ID for each test
- Profile Normative References - Normative Reference level for the feature under test is defined in Profile Specification. This reference is informative and will not be used in conformance procedure.
- Feature Under Test - Feature which is under current test. Typically a particular command or an event.
- Test Purpose - The purpose of current test case.
- Pre-Requisite - The pre-requisite defines when the test should be performed. In case if pre-reqiusite does not match, the test result will be NOT DETECTED.
- Test Procedure - scenario expected to be reflected in network trace file.
- Test Result - Passed and failed criteria of the test case. Depending on these criteria test result will be defined as PASSED or FAILED.

## 4.2 Test Setup

Collect Network Traces files required by the test cases.

Collect Feature List XML files for Devices detected in the Network Trace files.

Client shall support all mandatory and conditional features listed in the Device Feature List XML file supplied for the Profiles supported by the Client.

For ONVIF compatibility, the ONVIF Client shall follow the requirements of the conformance process. For details please see the latest ONVIF Conformance Process Specification.

## 4.3 Prerequisites

The pre-requisites for executing the test cases described in this Test Specification include:

The Device shall be configured with an IPv4 address.

The Device shall be able to be discovered by the Client.

# 5 Get Imaging Capabilities Test Cases

## 5.1 Feature Level Requirement:

**Validated Feature:** Get Imaging Capabilities (GetImagingCapabilities)

**Check Condition based on Device Features:** Imaging Service is supported by Device.

**Required Number of Devices:** 1

## 5.2 Expected Scenarios Under Test:

1. Client connects to Device to retrieve a imaging capabilities.
2. Client is considered as supporting Get Imaging Capabilities if the following conditions are met:
   - Client is able to retrieve a imaging capabilities using **GetCapabilities** operation OR **GetServiceCapabilities** operation (Imaging Service) OR supports get_services_capabilities.get_services feature.
3. Client is considered as NOT supporting Get Imaging Capabilities if ANY of the following is TRUE:
   - No valid responses for **GetCapabilities** request if detected AND Device supportes GetCapabilities feature OR
   - No valid responses for **GetServiceCapabilities** request (Imaging Service) if detected AND Device supportes GetServices feature
   - No valid responses for **GetCapabilities** request AND no valid responses for **GetServiceCapabilities** request (Imaging Service) AND get_services_capabilities.get_services feature is not supported by Client.

## 5.3 GET CAPABILITIES

**Test Label:** Get Imaging Capabilities - Get Capabilities

**Test Case ID:** GETIMAGINGCAPABILITIES-1

**Feature Under Test:** Get Imaging Capabilities using Get Capabilities (GetImagingCapabilities_GetImgCapabilities)

**Test Purpose:** To verify that imaging capabilities provided by Device is received by Client using the **GetCapabilities** operation.

**Pre-Requisite:**

- The Network Trace Capture files contains at least one Conversation between Client and Device with **GetCapabilities** operation with **tds:Category** element equal to "All" OR "Imaging" OR without any **tds:Category** element present.
- Device supports Imaging Service.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes **GetCapabilities** request message with **tds:Category** element equal to "All" OR "Imaging" OR without any **tds:Category** element to retrieve imaging capabilities from the Device.
2. Device responds with code HTTP 200 OK and **GetCapabilitiesResponse** message.

**Test Result:**

**PASS -**

- Client **GetCapabilities** request messages are valid according to XML Schemas listed in Namespaces AND
- Client **GetCapabilities** request in Test Procedure fulfills the following requirements:
  - [S1] **soapenv:Body** element has child element **tds:GetCapabilities** AND
  - [S2] IF it contains any **tds:Category** element THEN it contains **tds:Category** element equal to "All" OR "Imaging" AND
- Device response on the **GetCapabilities** request fulfills the following requirements:
  - [S3] It has HTTP 200 response code AND
  - [S4] **soapenv:Body** element has child element **tds:GetCapabilitiesResponse**.

**FAIL -**

- The Client failed PASS criteria.

## 5.4 GET SERVICE CAPABILITIES

**Test Label:** Get Imaging Capabilities - Get Service Capabilities

**Test Case ID:** GETIMAGINGCAPABILITIES-2

**Feature Under Test:** Get Imaging Capabilities using Get Service Capabilities (GetImagingCapabilities_GetImgServiceCapabilities)

**Test Purpose:** To verify that imaging capabilities provided by Device is received by Client using the **GetServiceCapabilities** operation.

**Pre-Requisite:**

- The Network Trace Capture files contains at least one Conversation between Client and Device with **GetServiceCapabilities** operation for Imaging Service present.
- Device supports Imaging Service.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes **GetServiceCapabilities** request message to retrieve imaging capabilities from the Device.
2. Device responds with code HTTP 200 OK and **GetServiceCapabilitiesResponse** message.

**Test Result:**

**PASS -**

- Client **GetServiceCapabilities** request messages are valid according to XML Schemas listed in Namespaces AND
- Client **GetServiceCapabilities** request in Test Procedure fulfills the following requirements:
  - [S1] **soapenv:Body** element has child element **timg:GetServiceCapabilities** AND
- Device response on the **GetServiceCapabilities** request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND
  - [S3] **soapenv:Body** element has child element **timg:GetServiceCapabilitiesResponse**.

**FAIL -**

- The Client failed PASS criteria.

# 6 Get Imaging Settings Test Cases

## 6.1 Feature Level Requirement:

**Validated Feature:** Get Imaging Settings (GetImagingSettings)

**Check Condition based on Device Features:** Imaging Service is supported by Device.

**Required Number of Devices:** 3

**Profile T Requirement:** Mandatory

## 6.2 Expected Scenarios Under Test:

1. Client connects to Device to retrieve a current imaging settings.
2. Client is considered as supporting Get Imaging Settings if the following conditions are met:
   - Client is able to retrieve a current imaging settings using **GetImagingSettings** operation.
3. Client is considered as NOT supporting Get Imaging Settings if ANY of the following is TRUE:
   - No valid responses for **GetImagingSettings** request.

## 6.3 GET IMAGING SETTINGS

**Test Label:** Get Imaging Settings - Get Imaging Settings

**Test Case ID:** GETIMAGINGSETTINGS-1

**Feature Under Test:** Get Imaging Settings (GetImagingSettings_GetImgSettings)

**Profile T Normative Reference:** Mandatory

**Test Purpose:** To verify that imaging settings for Device is received by Client using the **GetImagingSettings** operation.

**Pre-Requisite:**

- The Network Trace Capture files contains at least one Conversation between Client and Device with **GetImagingSettings** operation present.
- Device supports Imaging Service.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes **GetImagingSettings** request message to retrieve imaging settings for specified video source from the Device.
2. Device responds with code HTTP 200 OK and **GetImagingSettingsResponse** message.

**Test Result:**

**PASS -**

- Client **GetImagingSettings** request messages are valid according to XML Schemas listed in Namespaces AND
- Client **GetImagingSettings** request in Test Procedure fulfills the following requirements:
  - [S1] **soapenv:Body** element has child element **timg:GetImagingSettings** AND
- Device response on the **GetImagingSettings** request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND
  - [S3] **soapenv:Body** element has child element **timg:GetImagingSettingsResponse**.

**FAIL -**

- The Client failed PASS criteria.

# 7 Imaging Settings Configuration Test Cases

## 7.1 Feature Level Requirement:

**Validated Feature:** Imaging Settings Configuration (SetImagingSettings)

**Check Condition based on Device Features:** Imaging Service is supported by Device.

**Required Number of Devices:** 3

**Profile T Requirement:** Mandatory

## 7.2 Expected Scenarios Under Test:

1. Client connects to Device to change imaging settings.
2. Client is considered as supporting Imaging Settings Configuration if the following conditions are met:
   - Client is able to retrieve a imaging options using **GetOptions** operation AND
   - Client is able to change a imaging settings using **SetImagingSettings** operation.
3. Client is considered as NOT supporting Imaging Settings Configuration if ANY of the following is TRUE:
   - No valid responses for **GetOptions** request OR
   - No valid responses for **SetImagingSettings** request OR
   - There is no **GetOptions** request for the same video source token as used in **SetImagingSettings** request.

## 7.3 GET OPTIONS

**Test Label:** Get Imaging Settings - Get Options

**Test Case ID:** SETIMAGINGSETTINGS-1

**Feature Under Test:** Get Options (SetImagingSettings_GetOptions)

**Profile T Normative Reference:** Mandatory

**Test Purpose:** To verify that imaging options for Device is received by Client using the **GetOptions** operation.

**Pre-Requisite:**

- The Network Trace Capture files contains at least one Conversation between Client and Device with **GetOptions** operation present.
- Device supports Imaging Service.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes **GetOptions** request message to retrieve imaging options for specified video source from the Device.
2. Device responds with code HTTP 200 OK and **GetOptionsResponse** message.

**Test Result:**

**PASS -**

- Client **GetOptions** request messages are valid according to XML Schemas listed in Namespaces AND
- Client **GetOptions** request in Test Procedure fulfills the following requirements:
  - [S1] **soapenv:Body** element has child element **timg:GetOptions** AND
- Device response on the **GetOptions** request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND
  - [S3] **soapenv:Body** element has child element **timg:GetOptionsResponse**.

**FAIL -**

- The Client failed PASS criteria.

## 7.4 SET IMAGING SETTINGS

**Test Label:** Set Imaging Settings - Set Imaging Settings

**Test Case ID:** SETIMAGINGSETTINGS-2

**Feature Under Test:** Set Imaging Settings (SetImagingSettings_SetImagingSettingsRequest)

**Profile T Normative Reference:** Mandatory

**Test Purpose:** To verify that Client is able to change imaging settings on Device using the **SetImagingSettings** operation.

**Pre-Requisite:**

- The Network Trace Capture files contains at least one Conversation between Client and Device with **SetImagingSettings** operation present.
- Device supports Imaging Service.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes **GetOptions** request message to retrieve imaging options for specified video source from the Device.
2. Device responds with code HTTP 200 OK and **GetOptionsResponse** message.
3. Client invokes **SetImagingSettings** request message to change imaging settings for specified video source which correspond to the retrieved options on the Device.
4. Device responds with code HTTP 200 OK and **SetImagingSettingsResponse** message.

**Test Result:**

**PASS -**

- Client **SetImagingSettings** request messages are valid according to XML Schemas listed in Namespaces AND
- Client **SetImagingSettings** request in Test Procedure fulfills the following requirements:
  - [S1] **soapenv:Body** element has child element **timg:SetImagingSettings** AND
- Device response on the **SetImagingSettings** request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND
  - [S3] **soapenv:Body** element has child element **timg:SetImagingSettingsResponse** AND
- There is a Client **GetOptions** request in Test Procedure that fulfills the following requirements:
  - [S4] **timg:VideoSourceToken** element value is equal to **timg:VideoSourceToken** element from the **SetImagingSettings** request AND
  - [S5] It is invoked before the Client **SetImagingSettings** request AND
- Device response on the **GetOptions** request fulfills the following requirements:
  - [S6] It has HTTP 200 response code AND
  - [S7] **soapenv:Body** element has child element **timg:GetOptionsResponse**.

**FAIL -**

- The Client failed PASS criteria.

# 8 Focus Move Capabilities Test Cases

## 8.1 Feature Level Requirement:

**Validated Feature:** Focus Move Capabilities (GetMoveOptions)

**Check Condition based on Device Features:** Imaging Service is supported by Device.

**Required Number of Devices:** 1

**Profile T Requirement:** Conditional

## 8.2 Expected Scenarios Under Test:

1. Client connects to Device to get focus move capabilities.
2. Client is considered as supporting Focus Move Capabilities if the following conditions are met:
   - Client is able to retrieve a focus move options using **GetMoveOptions** operation AND
3. Client is considered as NOT supporting Focus Move Capabilities if ANY of the following is TRUE:
   - No valid responses for **GetMoveOptions** request OR

## 8.3 GET FOCUS MOVE OPTIONS

**Test Label:** Get Move Options

**Test Case ID:** GETMOVEOPTIONS-1

**Feature Under Test:** Get Move Options (GetMoveOptions_GetFocusMoveOptions)

**Profile T Normative Reference:** Conditional

**Test Purpose:** To verify that Client is able retrive focus move capabilities from Device using the **GetMoveOptions** operation.

**Pre-Requisite:**

- The Network Trace Capture files contains at least one Conversation between Client and Device with **GetMoveOptions** operation present.
- Device supports Imaging Service.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes **GetMoveOptions** request message to retrieve focus move options for specified video source from the Device.
2. Device responds with code HTTP 200 OK and **GetMoveOptionsResponse** message.

**Test Result:**

**PASS -**

- Client **GetMoveOptions** request messages are valid according to XML Schemas listed in Namespaces AND
- Client **GetMoveOptions** request in Test Procedure fulfills the following requirements:
  - [S1] **soapenv:Body** element has child element **timg:GetMoveOptions** AND
- Device response on the **GetMoveOptions** request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND
  - [S3] **soapenv:Body** element has child element **timg:GetMoveOptionsResponse**.

**FAIL -**

- The Client failed PASS criteria.

# 9 Focus Control Test Cases

## 9.1 Feature Level Requirement:

**Validated Feature:** Focus Control (FocusControl)

**Check Condition based on Device Features:** Focus Control is supported by Device.

**Required Number of Devices:** 1

**Profile T Requirement:** Conditional

## 9.2 Expected Scenarios Under Test:

1. Client connects to Device to control focus.
2. Client is considered as supporting Focus Control if the following conditions are met:
   - Client supports get_move_options feature AND
   - Client is able to invoke Absolute OR Relative OR Continuous focus move using **Move** operation AND
   - If Client is able to invoke Continuous focus move Client is able to invoke stop focus move using **Stop** operation.
3. Client is considered as NOT supporting Focus Control if ANY of the following is TRUE:
   - Client does not support get_move_options feature OR
   - No valid responses for **Move** request OR
   - **Move** request contains settings which does not correspong to **GetMoveOptions** message for the same video source token OR
   - No valid responses for **Stop** request if **Stop** request is supported by the Client OR
   - **Stop** request is not supported, in the case Continuous focus move is supported by the Client.

## 9.3 ABSOLUTE FOCUS MOVE

**Test Label:** Focus Control - Absolute Focus Move

**Test Case ID:** FOCUSCONTROL-1

**Feature Under Test:** Absolute Focus Move (FocusControl_AbsoluteFocusMove)

**Profile T Normative Reference:** Conditional

**Test Purpose:** To verify that Client is able retrive absolute focus move on Device using the **Move** operation.

**Pre-Requisite:**

- The Network Trace Capture files contains at least one Conversation between Client and Device with **Move** operation with **tt:Absolute** element present.
- Device supports Imaging Service.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes **GetMoveOptions** request message to retrieve focus move options for specified video source from the Device.
2. Device responds with code HTTP 200 OK and **GetMoveOptionsResponse** message.
3. If **GetMoveOptionsResponse** message contains **tt:Absolute** element Client invokes **Move** request message for specified video source with **tt:Absolute** element with parameters which are correspond to the resieved focus move options to start absolute focus movement on the Device.
4. Device responds with code HTTP 200 OK and **MoveResponse** message.

**Test Result:**

**PASS -**

- Client **Move** request messages are valid according to XML Schemas listed in Namespaces AND
- Client **Move** request in Test Procedure fulfills the following requirements:
  - [S1] **soapenv:Body** element has child element **timg:Move** AND
  - [S2] It contains **timg:Focus/tt:Absolute** element AND
- Device response on the **Move** request fulfills the following requirements:
  - [S3] It has HTTP 200 response code AND
  - [S4] **soapenv:Body** element has child element **timg:MoveResponse** AND
- There is a Client **GetMoveOptions** request in Test Procedure fulfills the following requirements:
  - [S5] It invoked for the same Device as for the Client **Move** request AND

- [S6] It invoked before the Client **Move** request AND
- [S7] **timg:VideoSourceToken** element value is equal to **timg:VideoSourceToken** element from the **Move** request AND

- Device response on the **GetMoveOptions** request fulfills the following requirements:
  - [S8] It has HTTP 200 response code AND
  - [S9] **soapenv:Body** element has child element **timg:GetMoveOptionsResponse** AND
  - [S10] It contains **timg:MoveOptions\tt:Absolute** element AND

- Settings from the **Move** request corresponds options recieved in the **GetMoveOptionsResponse** message:
  - [S11] **timg:Focus/tt:Absolute/tt:Position** element value from the **Move** request is less or equal to **timg:MoveOptions/tt:Absolute/tt:Position/tt:Max** from the the **GetMoveOptionsResponse** message AND
  - [S12] **timg:Focus/tt:Absolute/tt:Position** element value from the **Move** request is greater or equal to **timg:MoveOptions/tt:Absolute/tt:Position/tt:Min** from the the **GetMoveOptionsResponse** message AND
  - [S13] IF the **Move** request contains **timg:Focus/tt:Absolute/tt:Speed** element THEN:
    - The **GetMoveOptionsResponse** message contains **timg:MoveOptions/tt:Absolute/tt:Speed** element AND
    - **timg:Focus/tt:Absolute/tt:Speed** element value from the **Move** request is less or equal to **timg:MoveOptions/tt:Absolute/tt:Speed/tt:Max** from the the **GetMoveOptionsResponse** message AND
    - **timg:Focus/tt:Absolute/tt:Speed** element value from the **Move** request is greater or equal to **timg:MoveOptions/tt:Absolute/tt:Speed/tt:Min** from the the **GetMoveOptionsResponse** message.

**FAIL -**

- The Client failed PASS criteria.

## 9.4 RELATIVE FOCUS MOVE

**Test Label:** Focus Control - Relative Focus Move

**Test Case ID:** FOCUSCONTROL-2

**Feature Under Test:** Relative Focus Move (FocusControl_RelativeFocusMove)

**Profile T Normative Reference:** Conditional

**Test Purpose:** To verify that Client is able retrive relative focus move on Device using the **Move** operation.

**Pre-Requisite:**

- The Network Trace Capture files contains at least one Conversation between Client and Device with **Move** operation with **tt:Relative** element present.
- Device supports Imaging Service.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes **GetMoveOptions** request message to retrieve focus move options for specified video source from the Device.
2. Device responds with code HTTP 200 OK and **GetMoveOptionsResponse** message.
3. If **GetMoveOptionsResponse** message contains **tt:Relative** element Client invokes **Move** request message for specified video source with **tt:Relative** element with parameters which are correspond to the resieved focus move options to start relative focus movement on the Device.
4. Device responds with code HTTP 200 OK and **MoveResponse** message.

**Test Result:**

**PASS -**

- Client **Move** request messages are valid according to XML Schemas listed in Namespaces AND
- Client **Move** request in Test Procedure fulfills the following requirements:
  - [S1] **soapenv:Body** element has child element **timg:Move** AND
  - [S2] It contains **timg:Focus/tt:Relative** element AND
- Device response on the **Move** request fulfills the following requirements:
  - [S3] It has HTTP 200 response code AND
  - [S4] **soapenv:Body** element has child element **timg:MoveResponse** AND
- There is a Client **GetMoveOptions** request in Test Procedure fulfills the following requirements:
  - [S5] It invoked for the same Device as for the Client **Move** request AND
  - [S6] It invoked before the Client **Move** request AND
  - [S7] **timg:VideoSourceToken** element value is equal to **timg:VideoSourceToken** element from the **Move** request AND
- Device response on the **GetMoveOptions** request fulfills the following requirements:
  - [S8] It has HTTP 200 response code AND
  - [S9] **soapenv:Body** element has child element **timg:GetMoveOptionsResponse** AND

- [S10] It contains **timg:MoveOptions\tt:Relative** element AND

- Settings from the **Move** request corresponds options recieved in the **GetMoveOptionsResponse** message:
  - [S11] **timg:Focus/tt:Relative/tt:Distance** element value from the **Move** request is less or equal to **timg:MoveOptions/tt:Relative/tt:Distance/tt:Max** from the the **GetMoveOptionsResponse** message AND
  - [S12] **timg:Focus/tt:Relative/tt:Distance** element value from the **Move** request is greater or equal to **timg:MoveOptions/tt:Relative/tt:Distance/tt:Min** from the the **GetMoveOptionsResponse** message AND
  - [S13] IF the **Move** request contains **timg:Focus/tt:Relative/tt:Speed** element THEN:
    - The **GetMoveOptionsResponse** message contains **timg:MoveOptions/tt:Relative/tt:Speed** element AND
    - **timg:Focus/tt:Relative/tt:Speed** element value from the **Move** request is less or equal to **timg:MoveOptions/tt:Relative/tt:Speed/tt:Max** from the the **GetMoveOptionsResponse** message AND
    - **timg:Focus/tt:Relative/tt:Speed** element value from the **Move** request is greater or equal to **timg:MoveOptions/tt:Relative/tt:Speed/tt:Min** from the the **GetMoveOptionsResponse** message.

**FAIL -**

- The Client failed PASS criteria.

## 9.5 CONTINUOUS FOCUS MOVE

**Test Label:** Focus Control - Continuous Focus Move

**Test Case ID:** FOCUSCONTROL-3

**Feature Under Test:** Continuous Focus Move (FocusControl_ContinuousFocusMove)

**Profile T Normative Reference:** Conditional

**Test Purpose:** To verify that Client is able retrive continuous focus move on Device using the **Move** operation.

**Pre-Requisite:**

- The Network Trace Capture files contains at least one Conversation between Client and Device with **Move** operation with **tt:Continuous** element present.

- Device supports Imaging Service.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes **GetMoveOptions** request message to retrieve focus move options for specified video source from the Device.
2. Device responds with code HTTP 200 OK and **GetMoveOptionsResponse** message.
3. If **GetMoveOptionsResponse** message contains **tt:Continuous** element Client invokes **Move** request message for specified video source with **tt:Relative** element with parameters which are correspond to the resieved focus move options to start continuous focus movement on the Device.
4. Device responds with code HTTP 200 OK and **MoveResponse** message.

**Test Result:**

**PASS -**

- Client **Move** request messages are valid according to XML Schemas listed in Namespaces AND
- Client **Move** request in Test Procedure fulfills the following requirements:
  - [S1] **soapenv:Body** element has child element **timg:Move** AND
  - [S2] It contains **timg:Focus/tt:Continuous** element AND
- Device response on the **Move** request fulfills the following requirements:
  - [S3] It has HTTP 200 response code AND
  - [S4] **soapenv:Body** element has child element **timg:MoveResponse** AND
- There is a Client **GetMoveOptions** request in Test Procedure fulfills the following requirements:
  - [S5] It invoked for the same Device as for the Client **Move** request AND
  - [S6] It invoked before the Client **Move** request AND
  - [S7] **timg:VideoSourceToken** element value is equal to **timg:VideoSourceToken** element from the **Move** request AND
- Device response on the **GetMoveOptions** request fulfills the following requirements:
  - [S8] It has HTTP 200 response code AND
  - [S9] **soapenv:Body** element has child element **timg:GetMoveOptionsResponse** AND
  - [S10] It contains **timg:MoveOptions\tt:Continuous** element AND
- Settings from the **Move** request corresponds options recieved in the **GetMoveOptionsResponse** message:
  - [S11] **timg:Focus/tt:Continuous/tt:Speed** element value from the **Move** request is less or equal to **timg:MoveOptions/tt:Continuous/tt:Speed/tt:Max** from the the **GetMoveOptionsResponse** message AND

- [S12] **timg:Focus/tt:Continuous/tt:Speed** element value from the **Move** request is greater or equal to **timg:MoveOptions/tt:Continuous/tt:Speed/tt:Min** from the the **GetMoveOptionsResponse** message.

**FAIL -**

- The Client failed PASS criteria.

## 9.6 STOP

**Test Label:** Focus Control - Stop

**Test Case ID:** FOCUSCONTROL-4

**Feature Under Test:** Stop (FocusControl_FocusStop)

**Profile T Normative Reference:** Conditional

**Test Purpose:** To verify that Client is able retrivefocus move options fromon Device using the **Stop** operation.

**Pre-Requisite:**

- The Network Trace Capture files contains at least one Conversation between Client and Device with **Stop** operation present.
- Device supports Imaging Service.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes **Stop** request message to stop focus move for specified video source for the Device.
2. Device responds with code HTTP 200 OK and **StopResponse** message.

**Test Result:**

**PASS -**

- Client **Stop** request messages are valid according to XML Schemas listed in Namespaces AND
- Client **Stop** request in Test Procedure fulfills the following requirements:
  - [S1] **soapenv:Body** element has child element **timg:Stop** AND
- Device response on the **Stop** request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND

- [S3] **soapenv:Body** element has child element **timg:StopResponse**.

**FAIL -**

- The Client failed PASS criteria.

# 10 Tampering Test Cases

## 10.1 Feature Level Normative Reference:

**Validated Feature:** Tampering Events (Tampering)

**Check Condition based on Device Features:** None (ONVIF Profile T Simulator is used as device).

**Required Number of Devices:** 1

**Profile T Requirement:** Conditional

## 10.2 Expected Scenarios Under Test:

1. Client subscribes to ONVIF Profile T Simulator using **CreatePullPointSubscription** operation to get tampering notifications.
2. Client uses Pull Point event mechanism to retrieve the following notification events from ONVIF Profile T Simulator:
   - tns1:VideoSource/ImageTooBlurry/AnalyticsService
   - tns1:VideoSource/ImageTooBlurry/ImagingService
   - tns1:VideoSource/ImageTooDark/AnalyticsService
   - tns1:VideoSource/ImageTooDark/ImagingService
   - tns1:VideoSource/ImageTooBright/AnalyticsService
   - tns1:VideoSource/ImageTooBright/ImagingService
   - tns1:VideoSource/GlobalSceneChange/AnalyticsService
   - tns1:VideoSource/GlobalSceneChange/ImagingService
3. Client is considered as supporting Tampering if the following conditions are met:
   - ONVIF Profile T Simulator detects **Tampering** feature as supported.
4. Client is considered as NOT supporting Tampering if ANY of the following is TRUE:
   - ONVIF Profile T Simulator detects **Tampering** feature as not supported.

# 11 Motion Alarm Test Cases

## 11.1 Feature Level Normative Reference:

**Validated Feature:** Motion Alarm Event (MotionAlarm)

**Check Condition based on Device Features:** Motion Alarm is supported by Device.

**Required Number of Devices:** 3

**Profile T Requirement:** Mandatory

## 11.2 Expected Scenarios Under Test:

1. Client subscribes to device messages using **CreatePullPointSubscription** operation to get motion alarm notifications.
2. Client uses Pull Point event mechanism to retrieve notification events from Device.
3. Client is considered as supporting Motion Alarm if the following conditions are met:
   - Client supports EventHandling_Pullpoint feature AND
   - Client is able to retrieve tns1:VideoSource/MotionAlarm notifications if Device supports Motion Alarm feature.
4. Client is considered as NOT supporting Motion Alarm if ANY of the following is TRUE:
   - Client does not support EventHandling_Pullpoint feature OR
   - Client is not able to retrieve tns1:VideoSource/MotionAlarm.

# Annex A Test for Appendix A

## A.1 Required Number of Devices Summary

Required number of devices and Device feature dependency used in this test specification are listed in the Table.

### Table A.1. Required Number of Devices Summary

| Feature ID | Feature Name | Required Number of Devices | Check Condition based on Device Features | Check Condition based on Device Features ID |
|---|---|---|---|---|
| tc.GetImagingCapabilities | Get Imaging Capabilities | 1 | Imaging Service is supported by Device. | ImagingService |
| tc.GetImagingSettings | Get Imaging Settings | 3 | Imaging Service is supported by Device. | ImagingService |
| tc.SetImagingSettings | Imaging Settings Configuration | 3 | Imaging Service is supported by Device. | ImagingService |
| tc.GetMoveOptions | Focus Move Capabilities | 1 | Imaging Service is supported by Device. | ImagingService |
| tc.FocusControl | Focus Control | 1 | Focus Control is supported by Device. | FocusControl |
| tc.Tampering | Tampering | 1 | None (ONVIF Profile T Simulator is used as device). | None (ONVIF Profile T Simulator is used as device) |
| tc.MotionAlarm | Motion Alarm | 3 | Motion Alarm is supported by Device. | MotionAlarm |