Allied Vision

Vimba

Vimba USB TL Features Manual

1.0.2

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2 Document history and conventions

This chapter includes:

2.1 Document history

Version	Date	Changes
1.0.1	2015-11-09	Inital release version
1.0.2	2016-Feb-29	New document layout

2.2 Conventions used in this manual

To give this manual an easily understood layout and to emphasize important information, the following typographical styles and symbols are used:

2.2.1 Styles

Style	Function	Example
Emphasis	Programs, or highlighting important things	**Emphasis**
Publication title	Publication titles	Title
Web reference	Links to web pages	Link
Document reference	Links to other documents	Document
Output	Outputs from software GUI	**Output**
Input	Input commands, modes	Input
Feature	Feature names	`Feature`

2.2.2 Symbols

Practical Tip

Safety-related instructions to avoid malfunctions
Instructions to avoid malfunctions

Further information available online

3 VimbaUSBTL - Overview

The VimbaUSBTL (Vimba USB Transport Layer) transports the data from the USB interface card to an application. It complies with GenICam and thus can serve as a GenTL (GenICam transport layer) producer for applications providing a GenTL consumer interface. The VimbaUSBTL is included in the Vimba installation since version 1.4 and supports USB cameras from Allied Vision.

Under Windows, the USB device driver is mandatory and has to be installed separately. See Vimba Manual, chapter Vimba Driver Installer. If you install the device driver manually, install it on the USB3 Vision device. Do not install it on the composite device.

Under Linux, run the Install.sh script located in the USB TL folder. See Vimba Manual, chapter Installing Vimba.

The VimbaUSBTL consists of several parts: the functional interface, the feature maps and a configuration file.

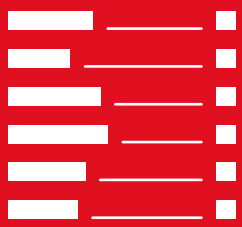
The **functional interface** is needed for dynamically controlling USB cameras. It covers the functionality described in GenTL specification 1.3. There is extra functionality, which is described in chapter Vimba functional extensions to GenTL.

The **features** exposed by XML files are GenAPI-conforming features described in the following locations:

- Features of the GenTL **System module** in chapter VimbaUSBTL System Features. The System is a module for handling multiple GenTL Interfaces in one transport layer. The VimbaUSBTL only provides one Interface.
- Features of the GenTL **Interface module** in chapter VimbaUSBTL Interface Features. The Interface is a module for handling multiple GenTL Devices. In this case, all the devices are attached to the same Interface.
- Features of the GenTL **Device module** in chapter VimbaUSBTL Device Features. The Device module is a host-side representation of the Camera also known as **Remote Device**.
- Features of the GenTL **Data Stream module** in chapter VimbaUSBTL DataStream Features. The Data Stream module allows handling all streaming-related operations.
- Camera (**Remote Device**) features in USB_Features_Reference.pdf.

The **configuration file**, which is named VimbaUSBTL.xml (according to the name of the VimbaUSBTL.cti), must be in the same directory as the Transport Layer file. The configuration options are described in the comments of the file itself.

4 VimbaUSBTL System Features



This chapter includes:

This chapter lists features that are potentially available in this module. Some features are only available under certain circumstances.

The following categories can be found below the Root category:

- SystemInformation
- InterfaceEnumeration

4.1 SystemInformation

Category that contains all System Information features of the System module.

See GenTL specification 1.3 chapter 7 for more details.

4.1.1 TLVendorName

Name	TL Vendor Name
Interface	IString
Access	Read
Visibility	Beginner

Name of the GenTL Producer vendor.
Corresponds to the TL_INFO_VENDOR command of TLGetInfo function.

See GenTL specification 1.3 chapter 7 for more details.

4.1.2 TLModelName

Name	TL Model Name
Interface	IString
Access	Read
Visibility	Beginner

Name of the GenTL Producer to distinguish different kinds of GenTL Producer implementations from one vendor.
Corresponds to the TL_INFO_MODEL command of TLGetInfo function.

See GenTL specification 1.3 chapter 7 for more details.

4.1.3 TLID

Name	TL ID
Interface	IString
Access	Read
Visibility	Expert

Unique identifier of the GenTL Producer like a GUID.
Corresponds to the TL_INFO_ID command of TLGetInfo function.

See GenTL specification 1.3 chapter 7 for more details.

4.1.4 TLDisplayName

Name	TL Display Name
Interface	IString
Access	Read
Visibility	Expert

User readable name of the GenTL Producer.
Corresponds to the TL_INFO_DISPLAYNAME command of TLGetInfo function.

See GenTL specification 1.3 chapter 7 for more details.

4.1.5 TLVersion

Name	TL Version
Interface	IString
Access	Read
Visibility	Beginner

Vendor specific version string.
Corresponds to the TL_INFO_VERSION command of TLGetInfo function.
See GenTL specification 1.3 chapter 7 for more details.

4.1.6 TLPath

Name	TL Path
Interface	IString
Access	Read
Visibility	Expert

Full path to the GenTL Producer driver including name and extension.
Corresponds to the TL_INFO_PATHNAME command of TLGetInfo function.
See GenTL specification 1.3 chapter 7 for more details.

4.1.7 TLType

Name	TL Type
Interface	IEnumeration
Access	Read
Visibility	Expert
Values	USB3

Transport layer type of the GenTL Producer implementation.
Corresponds to the TL_INFO_TLTYPE command of TLGetInfo function.
See GenTL specification 1.3 chapter 7 for more details.

4.1.8 GenTLVersionMajor

Name	GenTL Version Major
Interface	IInteger
Access	Read
Visibility	Expert

Major version number of the GenTL specification the GenTL Producer implementation complies with.
See GenTL specification 1.3 chapter 7 for more details.

4.1.9 GenTLVersionMinor

Name	GenTL Version Minor
Interface	IInteger
Access	Read
Visibility	Expert

Minor version number of the GenTL specification the GenTL Producer implementation complies with.
See GenTL specification 1.3 chapter 7 for more details.

4.1.10 GenTLSFNCVersionMajor

Name	GenTL SFNC Version Major
Interface	IInteger
Access	Read
Visibility	Expert

Major version number of the GenTL Standard Features Naming Convention that was used to create the GenTL Producer's XML.

See GenTL specification 1.3 chapter 7 for more details.

4.1.11 GenTLSFNCVersionMinor

Name	GenTL SFNC Version Minor
Interface	IInteger
Access	Read
Visibility	Expert

Minor version number of the GenTL Standard Features Naming Convention that was used to create the GenTL Producer's XML.

See GenTL specification 1.3 chapter 7 for more details.

4.1.12 GenTLSFNCVersionSubMinor

Name	GenTL SFNC Version Sub Minor
Interface	IInteger
Access	Read
Visibility	Expert

Sub minor version number of the GenTL Standard Features Naming Convention that was used to create the GenTL Producer's XML.

See GenTL specification 1.3 chapter 7 for more details.

4.2 InterfaceEnumeration

Category that contains all Interface Enumeration features of the System module.

See GenTL specification 1.3 chapter 7 for more details.

4.2.1 InterfaceUpdateList

Name	Interface Update List
Interface	ICommand
Access	Read/Write
Visibility	Expert

Update the interface list on this GenTL Producer.

See GenTL specification 1.3 chapter 7 for more details.

4.2.2 InterfaceCount [Allied Vision]

Name	Interface Count
Interface	IInteger
Access	Read
Visibility	Expert

Number of interfaces on this GenTL Producer.

4.2.3 InterfaceSelector

Name	Interface Selector
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	0..

Selector for the different GenTL Producer interfaces.
See GenTL specification 1.3 chapter 7 for more details.

4.2.4 InterfaceID

Name	Interface ID
Interface	IString
Access	Read
Visibility	Expert

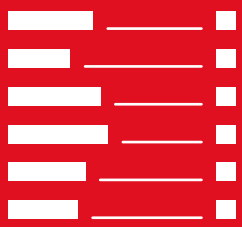
GenTL Producer wide unique identifier of the selected interface.
See GenTL specification 1.3 chapter 7 for more details.

4.2.5 InterfaceDisplayName [Allied Vision]

Name	Interface Display Name
Interface	IString
Access	Read
Visibility	Expert

User readable name of the selected interface.

5 VimbaUSBTL Interface Features



This chapter includes:

This chapter lists features that are potentially available in this module. Some features are only available under certain circumstances.

The following categories can be found below the Root category:

- InterfaceInformation
- DeviceEnumeration

5.1 InterfaceInformation

Category that contains all Interface Information features of the Interface module.

See GenTL specification 1.3 chapter 7 for more details.

5.1.1 InterfaceID

Name	Interface ID
Interface	IString
Access	Read
Visibility	Expert

GenTL Producer wide unique identifier of the selected interface.
Corresponds to the INTERFACE_INFO_ID command of IFGetInfo function.

See GenTL specification 1.3 chapter 7 for more details.

5.1.2 InterfaceType

Name	Interface Type
Interface	IEnumeration
Access	Read
Visibility	Expert
Values	USB3

Transport layer type of the interface.
Corresponds to the INTERFACE_INFO_TLTYPE command of IFGetInfo function.
See GenTL specification 1.3 chapter 7 for more details.

5.1.3 InterfaceDisplayName

Name	Interface Display Name
Interface	IString
Access	Read
Visibility	Expert

User readable name of the selected interface.
Corresponds to the INTERFACE_INFO_DISPLAYNAME command of IFGetInfo function.
See GenTL specification 1.3 chapter 7 for more details.

5.2 DeviceEnumeration

Category that contains all Device Enumeration features of the Interface module.
See GenTL specification 1.3 chapter 7 for more details.

5.2.1 DeviceUpdateList

Name	Device Update List
Interface	ICommand
Access	Read/Write
Visibility	Expert

Updates the internal device list.
See GenTL specification 1.3 chapter 7 for more details.

5.2.2 DeviceCount [Allied Vision]

Name	Device Count
Interface	IInteger
Access	Read
Visibility	Expert

Number of found devices.

5.2.3 DeviceSelector

Name	Device Selector
Interface	IInteger
Access	Read/Write
Visibility	Expert
Values	0..

Selector for the different devices on this interface.
See GenTL specification 1.3 chapter 7 for more details.

5.2.4 DeviceID

Name	Device ID
Interface	IString
Access	Read
Visibility	Expert

Interface wide unique identifier of the selected device.
See GenTL specification 1.3 chapter 7 for more details.

5.2.5 DeviceDisplayName [Allied Vision]

Name	Device Display Name
Interface	IString
Access	Read
Visibility	Expert

User readable name of the selected device.

5.2.6 DeviceVendorName

Name	Device Vendor Name
Interface	IString
Access	Read
Visibility	Expert

Name of the device vendor.
Corresponds to the ”DeviceVendorName” feature of the remote device.
See GenTL specification 1.3 chapter 7 for more details.

5.2.7 DeviceModelName

Name	Device Model Name
Interface	IString
Access	Read
Visibility	Expert

Name of the device model.
Corresponds to the ”DeviceModelName” feature of the remote device.
See GenTL specification 1.3 chapter 7 for more details.

5.2.8 DeviceType [Allied Vision]

Name	Device Type
Interface	IEnumeration
Access	Read
Visibility	Expert
Values	USB3

Identifies the transport layer technology of the device.
Possible values:

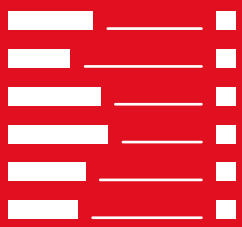
- USB3: USB3 Vision

5.2.9 DeviceAccessStatus

Name	Device Access Status
Interface	IEnumeration
Access	Read
Visibility	Expert
Values	ReadWrite, ReadOnly, NoAccess

Gives the device's access status at the moment of the last execution of "DeviceUpdateList".
See GenTL specification 1.3 chapter 7 for more details.

6 VimbaUSBTL Device Features



This chapter includes:

This chapter lists features that are potentially available in this module. Some features are only available under certain circumstances.

The following categories can be found below the Root category:

- DeviceInformation
- StreamEnumeration

6.1 DeviceInformation

Category that contains all Device Information features of the Device module.

See GenTL specification 1.3 chapter 7 for more details.

6.1.1 DeviceID

Name	Device ID
Interface	IString
Access	Read
Visibility	Expert

Interface-wide unique identifier of this device.
Corresponds to the DEVICE_INFO_ID command of DevGetInfo function.

See GenTL specification 1.3 chapter 7 for more details.

6.1.2 DeviceVendorName

Name	Device Vendor Name
Interface	IString
Access	Read
Visibility	Beginner

Name of the device vendor.
Corresponds to the DEVICE_INFO_VENDOR command of DevGetInfo function.
See GenTL specification 1.3 chapter 7 for more details.

6.1.3 DeviceModelName

Name	Device Model Name
Interface	IString
Access	Read
Visibility	Beginner

Name of the device model.
Corresponds to the DEVICE_INFO_MODEL command of DevGetInfo function.
See GenTL specification 1.3 chapter 7 for more details.

6.1.4 DeviceType

Name	Device Type
Interface	IEnumeration
Access	Read
Visibility	Expert
Values	USB3

Transport layer type of the device.
See GenTL specification 1.3 chapter 7 for more details.

6.1.5 DeviceDisplayName

Name	Device Display Name
Interface	IString
Access	Read
Visibility	Expert

User readable name of the device.
Corresponds to the DEVICE_INFO_DISPLAYNAME command of DevGetInfo function.
See GenTL specification 1.3 chapter 7 for more details.

6.1.6 DriverPath

Name	Driver Path
Interface	IString
Access	Read
Visibility	Beginner

System driver path that can also be used for opening the device.
See GenTL specification 1.3 chapter 7 for more details.

6.1.7 DeviceLocation

Name	Device Location
Interface	IString
Access	Read
Visibility	Beginner

Location path of device in USB tree that can also be used for opening the device.
See GenTL specification 1.3 chapter 7 for more details.

6.2 StreamEnumeration

Category that contains all Stream Enumeration features of the Device module.

See GenTL specification 1.3 chapter 7 for more details.

6.2.1 StreamCount [Allied Vision]

Name	Stream Count
Interface	IInteger
Access	Read
Visibility	Beginner

Number of available streams.

6.2.2 StreamSelector

Name	Stream Selector
Interface	IInteger
Access	Read/Write
Visibility	Beginner
Values	0..

Selector for the different stream channels.

See GenTL specification 1.3 chapter 7 for more details.

6.2.3 StreamID

Name	Stream ID
Interface	IString
Access	Read
Visibility	Beginner

Device unique ID for the stream, for instance a GUID.

See GenTL specification 1.3 chapter 7 for more details.

7 VimbaUSBTL DataStream Features

This chapter includes:

This chapter lists features that are potentially available in this module. Some features are only available under certain circumstances.

The following categories can be found below the Root category:

- StreamInformation
- BufferHandlingControl

7.1 StreamInformation

Category that contains all Stream Information features of the Data Stream module.

See GenTL specification 1.3 chapter 7 for more details.

7.1.1 StreamID

Name	Stream ID
Interface	IString
Access	Read
Visibility	Expert

Device unique ID for the data stream, for instance a GUID.
Corresponds to the STREAM_INFO_ID command of DSGetInfo function.

See GenTL specification 1.3 chapter 7 for more details.

7.1.2 StreamType

Name	Stream Type
Interface	IEnumeration
Access	Read
Visibility	Expert
Values	USB3

Transport layer type of the Data Stream.

See GenTL specification 1.3 chapter 7 for more details.

7.1.3 StreamIsGrabbing [Allied Vision]

Name	Stream Is Grabbing
Interface	IBoolean
Access	Read/Write
Visibility	Beginner

Flag indicating whether the acquisition engine is started or not.

7.2 BufferHandlingControl

Contains all features of the Data Stream module that control the used buffers.

See GenTL specification 1.3 chapter 7 for more details.

7.2.1 StreamAnnouncedBufferCount

Name	Stream Announced Buffer Count
Interface	IInteger
Access	Read
Visibility	Expert

Number of announced (known) buffers on this stream.
Corresponds to the STREAM_INFO_NUM_ANNOUNCED command of DSGetInfo function.

See GenTL specification 1.3 chapter 7 for more details.

7.2.2 StreamBufferHandlingMode

Name	Stream Buffer Handling Mode
Interface	IEnumeration
Access	Read
Visibility	Beginner
Values	Default

Available acquisition modes of this stream.
See GenTL specification 1.3 chapter 7 for more details.

7.2.3 StreamAnnounceBufferMinimum

Name	Stream Announce Buffer Minimum
Interface	IInteger
Access	Read
Visibility	Expert

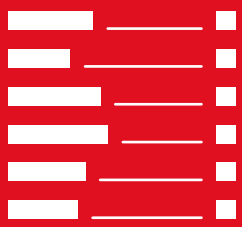
Minimal number of buffers to announce to enable selected buffer handling mode.
Corresponds to the STREAM_INFO_BUF_ANNOUNCE_MIN command of DSGetInfo function.
See GenTL specification 1.3 chapter 7 for more details.

7.2.4 MaxDriverBuffersCount [Allied Vision]

Name	Max Driver Buffers Count
Interface	IInteger
Access	Read/Write
Visibility	Guru
Values	1..4096

Maximum number of driver buffers used by the acquisition engine.

8 Vimba functional extensions to GenTL



This chapter includes:

Vimba transport layers provide additional functionality to the general GenTL interface. The provided extensions to Transport Layer Events allow monitoring system changes. Other extensions allow comfortable access to additional URL information.

8.1 Custom Transport Layer events

Custom additions to the following Enumerations are available:

- EVENT_TYPE_LIST (used in GCRegisterEvent and GCUnregisterEvent)
- EVENT_DATA_INFO_CMD_LIST (used in EventGetDataInfo)

Additionally, an enumeration for determining the type of a change is provided: IFCHANGE_WHAT_LIST

These extensions allow the users of Vimba transport layers to get informed about changes to either the interface list or the camera list.

8.1.1 Additions to EVENT_TYPE_LIST

Listing 1: Event types

```
enum EVENT_TYPE_LIST_VIMBA
{
    EVENT_SYSTEM_CHANGE        = 1000, // System detected some change
    EVENT_INTERFACE_CHANGE     = 1001  // Interface detected some change
}
```

8.1.2 Additions to EVENT_DATA_INFO_CMD_LIST

Listing 2: Change Events

```
enum EVENT_DATA_INFO_CMD_LIST_VIMBA
{
    // for event type EVENT_SYSTEM_CHANGE
    EVENT_DATA_SYSTEM_IFCOUNT  = 1000, // UINT32   Number of detected interfaces

    // for event type EVENT_INTERFACE_CHANGE
    EVENT_DATA_IFCHANGE_DUID   = 1001, // STRING   Device UID
    EVENT_DATA_IFCHANGE_WHAT   = 1002, // UINT32   Bitfield of what has changed
                                       //  (IFCHANGE_WHAT_LIST)
    EVENT_DATA_IFCHANGE_DATA   = 1003  // UINT32   Bitfield of current state of
                                       //  the device (IFCHANGE_WHAT_LIST)
};
```

8.1.3 Additional enumeration IFCHANGE_WHAT_LIST

Listing 3: Change Event options

```
enum IFCHANGE_WHAT_LIST
{
    IFCHANGE_WHAT_VISIBILITY   = 1,    // Device visibility has changed
    IFCHANGE_WHAT_REACHABILITY = 2     // Device reachability has changed
};
```

8.2 Additional URL information

For the following Enumeration, extensions are available:

- URL_INFO_CMD_LIST (used inGCGetPortURLInfo)

The extensions allow the user of the Vimba transport layers to access URL information without having to parse the URL string.

8.2.1 Additions to URL_INFO_CMD_LIST

Listing 4: URL information

```
enum URL_INFO_CMD_LIST_VIMBA
{
    URL_INFO_FILENAME          = 1000,  // STRING   Filename of the port XML file
    URL_INFO_ADDRESS           = 1001,  // UINT64   Start address of the XML file
    URL_INFO_LENGTH            = 1002,  // SIZET    XML file length (in bytes)
    URL_INFO_ZIPPED            = 1003   // BOOL8    Is the XML file zipped
};
```