GenICam GenTL

Standard Features Naming Convention

Version 1.2.0

GENICAM

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History

Version	Date	Changed by	Change
0.1	04.10.2010	Christoph Zierl, MVTec	First draft version based on Chapter 7 of the GenICam GenTL standard v1.2 and the feature collection at the GenICam Wiki.
0.2	29.09.2011	Christoph Zierl, MVTec	- Adapted to changes in GenTL v1.3 RC2 - Added additional features corresponding to INFO_CMD enumerations - Added first round of CXP features
0.3	05.09.2012	Christoph Zierl, MVTec Jan Becvar, Groget	- General review - Introduced feature categories - Reviewed feature visibility - Adapted CXP features to new proposal from CoaXPress group for SFNC 2.0 - Added all missing features corresponding to STREAM_INFO_CMD and BUFFER_INFO_CMD enumerations
RC1	05.12.2012	Christoph Zierl, MVTec	- Fixed erroneous name of `IFUpdateDeviceList` function - Updated value list for TL/Interface/Device/Stream/BufferType features according to new value list defined in SFNC 2.0 - Updated interface type and value list for BufferPixelFormat feature according to new value list defined in SFNC 2.0 / PFNC 1.0 - Added features DeviceFamilyName, DeviceVersion, DeviceFirmwareVersion corresponding to SFNC 2.0 and GenCP 1.0 - Added features U3vVersionMajor and U3vVersionMinor - Renamed ‘GenICam Access’ categories to ’GenICam Control’ - Updated text regarding buffer handling modes - Updated introduction text in Chapter 1
RC2	29.01.2013	Christoph Zierl, MVTec	- Removed CxpVersionMajor/Minor and U3vVersionMajor/Minor features in accordance to SFNC 2.0 - Corrected entries in standard units table - Improved description of DeviceChunkDataFormat feature - Fixed typo in DeviceEventDataFormat - Updated acknowledgements table

Version	Date	Changed by	Change
RC3	11.03.2013	Christoph Zierl, MVTec Jan Becvar, Groget	- Removed erroneous '[DeviceSelector]' from DeviceSerialNumber and DeviceUserID features in section 3.3.1 'DeviceInformation' - Moved double occurrence of GevDeviceMACAddress feature from section 3.3.1 'Device Information' to section 3.2.2 'Device Enumeration' - Renamed CxpPoCxpAuto feature into CxpPoCxpSetAuto and CxpPoCxpOff feature into CxpPoCxpTurnOff following the input from CoaXPress liaison group - Revised description and fixed typos regarding CoaXPress features - Renamed 'Recommended Visibility' into 'Visibility' in all feature tables - Improved overall formatting, in particular to enable the automatic generation of the reference XML files - Updated acknowledgements table
RC4	25.03.2013	Christoph Zierl, MVTec	- Fixed inconsistent naming of feature TLFileName - Removed all CXP features since it is not yet decided whether it actually makes sense to copy these feature definitions from the regular SFNC document to the GenTL SFNC document. Note that this does not affect the binding character of these features for the CoaXPress standard itself!
1.0	06.05.2013	GenICam Committee	Final Release v1.0

Version	Date	Changed by	Change
1.1	2007-02-03	Mattias Johannesson, SICK	For GenTL 1.5. Collected from Discussion Topic #50. - Standards Definitions from SFNC 2.3 section 1.4 included. Acronyms not in document removed. - Timeout added for Interface/DeviceUpdateList commands. - Added GigE Vision IP & Control setup features - Added NewestOnly buffer mode - Added Generic TL version features, deprecated GigEs. - Added Action Command support - DeviceAccessStatus enum aligned with GenTL for device and interface - GigE specific parts moved to be in same position as generic for ease of use reading the document. - Added features for Multipart buffers introduced in GenTL 1.5 and proposed for GigE Vision 2.1. - InterfaceDisplayName Added - Interface Enumeration Category and some features changed to Beginner level. - TLType enum contents that were deprecated in 1.0 are kept to not break compatibility backwards. - Features for LinkCommand timeout and retries added. - Adjusted visibility levels for consistency to have category at same level as lowest visible feature. - Added DeviceTimestampFrequency to complete mapping of DEVICE_INFO_XX features, and references all of them correctly. - EventControl added as per ticket #1305. - Deprecated abbreviated TLTypes from 1.0 removed in this versionare kept to not break compatibility backwards.EventControl added as per ticket #1305.a to not break compatibility backwards
1.1.1	2017-02-08	Mattias Johannesson, SICK	- Fixing a few category typos and updating the Macros so that reference TXT/XML generation is working. - Untracked changes : typo fixes and missed references.

1.2.0	2020-06-17	Mattias Johannesson, SICK	- GenTL 1.6 Partdatatype list extension, Region/ComponentID not tentative - Ticket #1305: Event control clarifications – made via more referencing to other standards documents and additional text. - Ticket #1942: Packet size renegotiation - Ticket #1985: Feature Persistence, added some text. - Added “Newest Only” buffer mode picture. - Fixing misaligned tables 2-19 and forward from 1.1.1. - Stream Information category Mandatory since it has mandatory features. - Added Optional “TLType” row for features, column for feature summary, allowing features to be Mandatory for specified TLs.

1 Introduction

The GenICam standards (see http://www.emva.org/standards-technology/genicam) define a generic standard software interface for industrial cameras. The GenICam standards are hosted by the EMVA. Part of the GenICam standards is GenTL, a generic Transport Layer interface on the host system, e.g. a PC. This document defines the Standard Features Naming Convention (SFNC) for the GenTL interface.

The GenICam GenTL standard provides a generic way to enumerate devices known to a system, communicate with one or more devices and, if possible, stream data from the device to the host independent from the underlying transport technology. This allows a third party software to use different technologies to control cameras and to acquire data in a transport layer agnostic way.

Besides the definition of a C interface with a defined behavior, the GenICam GenTL standard also defines a set of feature names and their meanings. To access these features the GenICam GenApi module is used.

The goal of the GenICam GenTL "Standard Features Naming Convention (GenTL SFNC)" is to standardize the features used in different GenTL Producer implementations. Thus, the GenICam GenTL standard should be decoupled as far as possible from the definition of specific feature names and their meaning. Note that the GenTL SFNC does not substitute or hide the features defined in the regular GenICam SFNC that defines the features for remote devices, but complement it by covering explicitly only the features of the GenTL Producer itself.

The GenTL Standard Features Naming Convention of GenICam is targeting maximum usability by existing and future transport layer technologies. It provides the definitions of a **standard behavioral model** and of **standard features**. The goal is to cover and to standardize the naming convention used in all the basic use cases where the implementation by different vendors would be very similar anyway.

1.1 GenICam Reference documents

It is recommended to study the GenICam Standard, the device-oriented GenICam Standard Feature Naming Convention (SFNC) and the GenICam GenTL Standard to understand this document.

The revisions relevant for this release are

Standard	Version	Date
GenICam Standard	2.1.1	2016-01-18
GenICam GenTL Standard	1.6	2019-11-04
GenICam Standard Feature Naming Convention (SFNC)	2.5	2019-05-07

1.2 TL specific features

All Transport Layer Specific features have a prefix. Currently only GigE Vision features are in this document and they all have the prefix "Gev". The GigE Vision standard is hosted by AIA.

1.3 Standard Definitions

This section defines the terms used in this document. See Transport layer specific standards, as well as GenICam and SFNC for detailed information.

Entity	An *Entity* is an end point located at either side (*Host* or *Device*) of a *Communication*.
Host System	The *Host System* is the *Entity* that takes control over a *Device*. A *Host System* can be the sink or the source for the data being streamed. Under GenICam the *Host System* must read and use the GenICam compliant XML file of the *Device* to control it.
Device	The *Device* is an *Entity* that is controlled by a *Host System*. A *Device* can be the source or the sink for streaming data. It can be remote (outside the *Host System*) or local (in the *Host System*). Under GenICam the *Device* must provide a GenICam compliant XML file and a register-based control access.
Link	A *Link* is the virtual binding between a *Host System* and a *Device* to establish a *Communication*. A *Link* is logical and may use one or more physical *Connections*.
Connection	A *Connection* is the physical binding between a *Host System* and a *Device*.
Interface	A: A virtual endpoint of the *Link* between a *Device* and a *Host System.* B: A GenICam programming interface class, e.g. Uint or Command.
Consumer	A library or application using an implementation of a GenTL Transport Layer Interface.
Producer	GenTL Transport Layer Interface implementation.
Adapter	A physical entity located in the Host System that has one or many *Interfaces.*
Communication	A *Communication* is an exchange of information between two *Entities* using a *Link.*
Channel	A logical point-to-point *Communication* over a *Link*. There may be multiple *Channels* on a single *Link.*
Transport Layer	The layer of *Communication* responsible to transport information between *Entities*.
Transmitter	An *Entity* that acts as the source for streaming data. This may apply to a *Host System* or a *Device*.
Receiver	An *Entity* that acts as the sink for streaming data. This may apply to a *Host System* or a *Device*.
Transceiver	An *Entity* that can receive and transmit streaming data. This may apply to a *Host System* or a *Device*.
Peripheral	An *Entity* that neither acts as a source nor as a sink for streaming data but can be controlled.
Stream	A flow of data that comes from a source and goes to a sink. A data *Stream* can be composed of images or chunk of data.
Stream Channel	A *Communication Channel* used to transmit a data *Stream* from a *Transmitter* (or *Transceiver*) to a *Receiver* (or *Transceiver*).
Event Channel	A *Communication Channel* used by the *Device* to notify the *Host System* asynchronously of *Events*. The *Host System* could also use an *Event Channel* to

	communicate events to the *Device*.
Control Channel	A *Communication Channel* used to configure and control a *Device*. For a *Control Channel* the *Device* acts as a server that provides the initial point of *Communication* for the *Host System* that acts as a Client. The *Communication* on a *Control Channel* is bidirectional and initiated by the *Host System.*
Event	An asynchronous notification of the occurrence of a fact. *Events* are transmitted on an *Event Channel*.

1.3.1 Events in GenTL

Events in GenICam are used for asynchronous signaling between entities, such as the device signaling to the host application. This is described and exemplified in the GenICam and SFNC documents.

In GenTL each module in the producer has the ability to implement events to the application (consumer). Therefore the feature lists in this document includes description of the event mechanism for each module, even if for some modules no predefined events are included.

Typical events from producer to consumer in GenTL give information about the device(s), e.g. new devices are available or a connected device becomes unavailable, or data stream information such as the arrival of a new buffer.

1.3.2 Feature Persistence in GenTL

GenICam Feature Persistence is handled outside of the module whos features to persist. In devices this use the defined standard feature **DeviceFeaturePersistenceStart** to announce that featues are to be read from the device, and the feature **DeviceFeaturePersistenceEnd** to announce that reading of features for persistence has ended. Between these, the persistence algorithm should read all streamable features.

Likewise, **DeviceRegistersStreamingStart** is used to announce writing of streamed features without validation, and **DeviceRegistersStreamingEnd** to end this mode, validate the current feature set and update **DeviceRegistersValid**. The current persistence algorithm in the GenAPI reference implementation uses these standard features.

These features can be used inside GenTL modules to facilitate persistence even though the GenTL modules are not devices.. The persistence features are not included in the features listed in this specification.

1.4 Conventions

Feature Name and Interface

According to the GenICam standard, all the public features of a GenTL Producer must be included in the corresponding GenICam XML files following the GenTL module hierarchy and must use the SFNC Name and Interface type for those features if they exist. Other vendor specific or specialized features not mapping to existing SNFC features can be included but must be located in a vendor specific namespace in the GenICam XML and may use a vendor specific name.

This document lists for each feature the Name and Interface type that must be used.

Feature Category

With the GenICam standard, each feature should be included in a "Category". The Category element defines in which group of features the feature will be located.

The Category does not affect the functionality of the features but is used by the GUIs to group the features when displaying them. The purpose is mainly to insure that the GUI can present features in a more organized way.

This document lists for each feature, a recommended Category that should be used.

Feature Level

In this document, features are tagged according to the following requirement levels:

- **M: Mandatory** - Must be implemented to achieve compliance with the GenICam GenTL standard.
- **R: Recommended** - This feature adds important aspects to the use case and must respect the naming convention if used.
- **O: Optional** - This feature is less critical. Nevertheless, it is considered and must respect the naming convention if used.

For additional details about the mandatory general features, please refer to the GenICam GenTL standard. For additional details about the mandatory features to certain transport layers, please refer to the text of those standards.

Feature Visibility

According to the GenICam standard, each feature can be assigned a "Visibility". The Visibility defines the type of user that should get access to the feature. Possible values are Beginner, Expert, Guru and Invisible. The latter is required to make features accessible from the API, but invisible in the GUI.

The visibility does not affect the functionality of the features but is used by the GUI to decide which features to display based on the current user level. The purpose is mainly to insure that the GUI is not cluttered with information that is not intended at the current user level.

The following criteria have been used for the assignment of the recommended visibility:

- **B: Beginner** – Features that should be visible for ***all*** users via the GUI and API. This is the default visibility in the GenICam XML files and will be used if the Visibility element is omitted for a feature. The number of features with "Beginner" visibility should be limited to all **basic** features of the GenTL Producer so the GUI display is well-organized and is easy to use.
- **E: Expert** – Features that require a more in-depth knowledge of the device functionality. This is the preferred visibility level for all advanced features in the devices.
- **G: Guru** – Advanced features that might bring the devices into a state where it will not work properly anymore if it is set incorrectly for the devices current mode of operation.
- **I: Invisible** – Features that should be kept hidden for the GUI users but still be available via the API.

This document lists for each feature, a recommended Visibility that should be used.

Selector

A selector is used to index which instance of the feature is accessed in situations where multiple instances of a feature exist.

A selector is a separate feature that is typically an IEnumeration or an IInteger. Selectors must be used only to select the target features for subsequent changes. It is not allowed to change the behavior of a GenTL Producer in response to a change of a selector value.

If a selector has only one possible value, the selector relation can be omitted but it is recommended to leave the selector feature as read only for information purpose.

In this document, the features which potentially dependent on a selector are expressed using the C language convention for arrays: a pair of brackets follows the feature name, like in SelectedFeature[Selector]. When the Selector is not present, one must deduce the feature is not an array.

1.5 Standard Units

The following abbreviations are used as standard units for features described in this document. Note that all units are using plain ASCII characters.

ns	nanoseconds
us	microseconds
ms	milliseconds
s	seconds
B	Bytes
Bps	Bytes per second
MBps	Mega Bytes per second
Mbps	Mega bits per second
Fps	Frames per second
dB	Decibels
C	Celsius
Hz	Hertz
%	Percent

1.6 Acronyms

AIA	Automated Imaging Association. See http://www.visiononline.org
DHCP	Dynamic Host Configuration Protocol
EMVA	European Machine Vision Association. See http://www.emva.org
ID	Identifier
IP	Internet Protocol
LLA	Link-Local Address
MAC	Media Access Control
R	Read (or Recommended, depends on the context)
R/W	Read and Write, if one of the letters is in brackets either read or write is optional, for example R(/W) means read and optionally write
W	Write
XML	eXtensible Markup Language

2 Features Summary

This section provides a comprehensive list of the standard features covered by this document. The following sections provide more detailed explanation of each feature.

2.1 System Module

2.1.1 System Information

Contains the features related to general information about the GenTL Producer.

Table 2-1: System Information Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
SystemInformation	R	All	ICategory	R	-	B	Category that contains all System Information features of the System module.
TLID	M	All	IString	R	-	E	Unique identifier of the GenTL Producer like a GUID.
TLVendorName	M	All	IString	R	-	B	Name of the GenTL Producer vendor.
TLModelName	M	All	IString	R	-	B	Name of the GenTL Producer to distinguish different kinds of GenTL Producer implementations from one vendor.
TLVersion	M	All	IString	R	-	B	Vendor specific version string of the GenTL Producer.
TLFileName	R	All	IString	R	-	E	Filename including extension of the GenTL Producer.
TLDisplayName	R	All	IString	R/(W)	-	B	User readable name of the GenTL Producer.
TLPath	M	All	IString	R	-	E	Full path to the GenTL Producer including filename and extension.
TLType	M	All	IEnumeration	R	-	E	Transport layer type of the GenTL Producer implementation.

GenTLVersionMajor	M	All	IInteger	R	-	E	Major version number of the GenTL specification the GenTL Producer implementation complies with.
GenTLVersionMinor	M	All	IInteger	R	-	E	Minor version number of the GenTL specification the GenTL Producer implementation complies with.
GenTLSFNCVersionMajor	R	All	IInteger	R	-	E	Major version number of the GenTL Standard Features Naming Convention that was used to create the GenTL Producer`s XML.
GenTLSFNCVersionMinor	R	All	IInteger	R	-	E	Minor version number of the GenTL Standard Features Naming Convention that was used to create the GenTL Producer`s XML.
GevVersionMajor	O	GEV	IInteger	R	-	E	This feature is deprecated (See InterfaceTLVersionMajor).
GevVersionMinor	O	GEV	IInteger	R	-	E	This feature is deprecated (See InterfaceTLVersionMinor).

2.1.2 Interface Enumeration

Contains the features related to the enumeration of available Interface modules within the System module of a GenTL Producer.

Table 2-2: Interface Enumeration Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
InterfaceEnumeration	R	All	ICategory	R	-	B	Category that contains all Interface Enumeration features of the System module.
InterfaceUpdateList	M	All	ICommand	(R)/W	-	B	Updates the internal list of the interfaces.
InterfaceUpdateTimeout	R	All	IInteger	R/W	ms	E	Specifies timeout for the InterfaceUpdateList Command.
InterfaceSelector	M	All	IInteger	R/W	-	B	Selector for the different GenTL Producer interfaces.
InterfaceID[InterfaceSelector]	M	All	IString	R	-	B	GenTL Producer wide unique identifier of the selected interface.

InterfaceDisplayName[InterfaceSelector]	R	All	IString	R	-	B	A user-friendly name of the Interface.
GevInterfaceMACAddress[InterfaceSelector]	M	GEV	IInteger	R	-	E	48-bit MAC address of the selected interface.
GevInterfaceDefaultIPAddress[InterfaceSelector]	M	GEV	IInteger	R	-	E	IP address of the first subnet of the selected interface.
GevInterfaceDefaultSubnetMask[InterfaceSelector]	M	GEV	IInteger	R	-	E	Subnet mask of the first subnet of the selected interface.
GevInterfaceDefaultGateway[InterfaceSelector]	R	GEV	IInteger	R	-	E	Gateway of the selected interface.

2.1.3 GenICam Control

Contains the features related to GenICam control and access of the System module.

Table 2-3: GenICam Control Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
Root	M	All	ICategory	R	-	B	Provides the Root of the GenICam features tree.
TLPort	M	All	IPort	R/W	-	I	The GenICam port through which the System module is accessed.

2.1.4 Event Control

Category that contains Event Control features.

Table 2-4: Event Control Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
EventControl	R	All	ICategory	R	-	E	Category that contains Event control features.
EventSelector	R	All	IEnumeration	R/W	-	E	Selects which Event to signal to the host application.
EventNotification[EventSelector]	R	All	IEnumeration	R/W	-	E	Activate or deactivate the notification to the host application of the occurrence of the selected Event.

2.2 Interface Module

2.2.1 Interface Information

Contains the features related to general information about a specific Interface module.

Table 2-5: Interface Information Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
InterfaceInformation	R	All	ICategory	R	-	E	Category that contains all Interface Information features of the Interface module.
InterfaceID	M	All	IString	R	-	E	GenTL Producer wide unique identifier of the selected interface.
InterfaceDisplayName	R	All	IString	R	-	E	A user-friendly name of the Interface.
InterfaceType	M	All	IEnumeration	R	-	E	Transport layer type of the interface.
InterfaceTLVersionMajor	M	All	IInteger	R	-	E	Major version number of the transport layer specification the GenTL Producer interface complies with.
InterfaceTLVersionMinor	M	All	IInteger	R	-	E	Minor version number of the transport layer specification the GenTL Producer interface complies with.
GevInterfaceGatewaySelector	M	GEV	IInteger	R/W	-	E	Selector for the different gateway entries for this interface.
GevInterfaceGateway[GevInterfaceGatewaySelector]	M	GEV	IInteger	R	-	E	IP address of the selected gateway entry of this interface.
GevInterfaceMACAddress	M	GEV	IInteger	R	-	E	48-bit MAC address of this interface.
GevInterfaceSubnetSelector	M	GEV	IInteger	R/W	-	E	Selector for the subnet of this interface.
GevInterfaceSubnetIPAddress[GevInterfaceSubnetSelector]	M	GEV	IInteger	R	-	E	IP address of the selected subnet of this interface.
GevInterfaceSubnetMask[GevInterfaceS	M	GEV	IInteger	R	-	E	Subnet mask of the selected subnet of this interface.

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2.2.2 Device Enumeration

Contains the features related to the enumeration of available Device modules within a specific Interface module.

Table 2-6: Device Enumeration Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
DeviceEnumeration	R	All	ICategory	R	-	E	Category that contains all Device Enumeration features of the Interface module.
DeviceUpdateList	M	All	ICommand	(R)/W	-	E	Updates the internal device list.
DeviceUpdateTimeout	R	All	IInteger	R/W	ms	E	Specifies timeout for the DeviceUpdateList Command.
DeviceSelector	M	All	IInteger	R/W	-	E	Selector for the different devices on this interface.
DeviceID[DeviceSelector]	M	All	IString	R	-	E	Interface wide unique identifier of the selected device.
DeviceVendorName[DeviceSelector]	M	All	IString	R	-	E	Name of the device vendor.
DeviceModelName[DeviceSelector]	M	All	IString	R	-	E	Name of the device model.
DeviceAccessStatus[DeviceSelector]	M	All	IEnumeration	R	-	E	Gives the device's access status at the moment of the last execution of the DeviceUpdateList command.
DeviceSerialNumber[DeviceSelector]	R	All	IString	R	-	E	Serial number of the remote device.
DeviceUserID[DeviceSelector]	O	All	IString	R	-	E	User-programmable device identifier of the remote device.
DeviceTLVersionMajor[DeviceSelector]	M	All	IInteger	R	-	E	Major version number of the transport layer specification the remote device complies with.
DeviceTLVersionMinor[DeviceSelector]	M	All	IInteger	R	-	E	Minor version number of the transport layer specification the remote device complies with.
GevDeviceIPAddress[DeviceSelector]	M	GEV	IInteger	R	-	E	Current IP address of the GVCP interface of the selected

							remote device.
GevDeviceSubnetMask[DeviceSelector]	M	GEV	IInteger	R	-	E	Current subnet mask of the GVCP interface of the selected remote device.
GevDeviceGateway[DeviceSelector]	R	GEV	IInteger	R	-	E	Current gateway IP address of the GVCP interface of the selected remote device.
GevDeviceIPConfigurationStatus[DeviceSelector]	R	GEV	IEnum	R/W	-	E	Device IP configuration of the GVCP interface of the selected remote device.
GevDeviceMACAddress[DeviceSelector]	M	GEV	IInteger	R	-	E	48-bit MAC address of the GVCP interface of the selected remote device.
GevDeviceCurrentControlMode[DeviceSelector]	O	GEV	IEnum	R/W	-	E	The current control mode of the device.
GevApplicationSwitchoverKey[DeviceSelector]	O	GEV	IInteger	W	-	E	Application switchover key to use when requesting ControlAccess switchover.
GevDeviceForceIP[DeviceSelector]	R	GEV	ICommand	(R)/W	-	E	Apply the force IP settings (GevDeviceForceIPAddress, GevDeviceForceSubnetMask and GevDeviceForceGateway) in the Device using ForceIP command.
GevDeviceForceIPAddress[DeviceSelector]	R	GEV	IInteger	R/W	-	E	Static IP address to set for the GVCP interface of the remote device.
GevDeviceForceSubnetMask[DeviceSelector]	R	GEV	IInteger	R/W	-	E	Static subnet mask to set for GVCP interface of the remote device.
GevDeviceForceGateway[DeviceSelector]	R	GEV	IInteger	R/W	-	E	Static gateway IP address to set for the GVCP interface of the remote device.

2.2.3 Action Control

Category that contains Action Control features.

Table 2-7: Action Control Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
ActionControl	R	GEV	ICategory	R	-	E	Category that contains all Action Control features of the Interface module.
ActionCommand	R	GEV	ICommand	(R)/W	-	E	Send ActionCommand to device(s).
ActionDeviceKey	R	GEV	IInteger	R/W	-	E	The Action Command Device Key to use in the Action Command.
ActionGroupKey	R	GEV	IInteger	R/W	-	E	The Action Command Group Key to use in the Action Command.
ActionGroupMask	R	GEV	IInteger	R/W	-	E	The Action Command Group Mask to use in the Action Command.
ActionScheduledTimeEnable	R	GEV	IBoolean	R/W	-	E	Specifies if a time enabled Action Command should be given.
ActionScheduledTime	R	GEV	IInteger	R/W	-	E	Specifies the time a time enabled Action Command is scheduled.
GevActionDestinationIPAddress	R	GEV	IInteger	R/W	-	E	Specifies destination the IP address for the Action Command.

2.2.4 GenICam Control

Contains the features related to GenICam control and access of a specific Interface module.

Table 2-8: GenICam Control Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
Root	M	All	ICategory	R	-	B	Provides the Root of the GenICam features tree.
InterfacePort	M	All	IPort	R/W	-	I	The GenICam port through which the Interface module is accessed.

2.2.5 Event Control

Category that contains Event Control features.

Table 2-9: Event Control Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
EventControl	R	All	ICategory	R	-	E	Category that contains Event control features.
EventSelector	R	All	IEnumeration	R/W	-	E	Selects which Event to signal to the host application.
EventNotification[EventSelector]	R	All	IEnumeration	R/W	-	E	Activate or deactivate the notification to the host application of the occurrence of the selected Event.

2.3 Device Module

2.3.1 Device Information

Contains the features related to general information about a specific Device module.

Table 2-10: Device Information Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description

DeviceInformation	R	All	ICategory	R	-	B	Category that contains all Device Information features of the Device module.
DeviceID	M	All	IString	R	-	E	Interface-wide unique identifier of this device.
DeviceSerialNumber	R	All	IString	R	-	E	Serial number of the remote device.
DeviceUserID	O	All	IString	R/W	-	E	User-programmable device identifier of the remote device.
DeviceVendorName	M	All	IString	R	-	B	Name of the remote device vendor.
DeviceModelName	M	All	IString	R	-	B	Name of the remote device model.
DeviceFamilyName	R	All	IString	R	-	B	Name of the product family of the remote device model.
DeviceVersion	R	All	IString	R	-	B	The version of the remote device model.
DeviceManufacturerInfo	R	All	IString	R	-	B	Manufacturer information about the remote device.
DeviceType	M	All	IEnumeration	R	-	E	Transport layer type of the device.
DeviceDisplayName	R	All	IString	R	-	E	User readable name of the device.
DeviceTimestampFrequency	R	All	IInteger	R	-	B	The tick-frequency of the time stamp clock.
DeviceAccessStatus	M	All	IEnumeration	R	-	E	Gives the device's access status at the moment of the last execution of the DeviceUpdateList command.
DeviceChunkDataFormat	R	All	IEnumeration	R	-	E	Chunk data format used by the device.
DeviceEventDataFormat	R	All	IEnumeration	R	-	E	Enumeration, informing about the event data format used by the device (meaning the "device events", see event type EVENT_REMOTE_DEVICE (named EVENT_FEATURE_DEVEVENT in GenTL up to version 1.
GevDeviceMACAddress	M	GEV	IInteger	R	-	E	48-bit MAC address of the GVCP interface of the remote device.
GevDeviceIPAddress	M	GEV	IInteger	R	-	E	Current IP address of the GVCP interface of the remote device.

GevDeviceSubnetMask	M	GEV	IInteger	R	-	E	Current subnet mask of the GVCP interface of the remote device.
GevDeviceGateway	M	GEV	IInteger	R	-	E	Current gateway IP address of the GVCP interface of the remote device.

2.3.2 Device Control

Contains the features related to configure a specific Device module.

Table 2-11: Device Control Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
DeviceControl	R	All	ICategory	R	-	E	Category that contains all Device Control features of the Device module.
DeviceEndianessMechanism	M	GEV	IEnumeration	R/W	-	E	Identifies the endianess handling mode.
LinkCommandTimeout	R	All	IFloat	R/W	us	G	Specifies application timeout for the control channel communication.
LinkCommandRetryCount	R	All	IInteger	R/W	-	G	Specifies maximum number of tries before failing the control channel commands.

2.3.3 Stream Enumeration

Contains the features related to the enumeration of available Data Stream modules within a specific Device module.

Table 2-12: Stream Enumeration Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
StreamEnumeration	R	All	ICategory	R	-	B	Category that contains all Stream Enumeration features of the Device module.
StreamSelector	M	All	IInteger	R/W	-	B	Selector for the different stream channels.
StreamID[StreamSelector]	M	All	IString	R	-	B	Device unique ID for the stream.

2.3.4 GenICam Control

Contains the features related to GenICam control and access of a specific Device module.

Table 2-13: GenICam Control Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
Root	M	All	ICategory	R	-	B	Provides the Root of the GenICam features tree.
DevicePort	M	All	IPort	R/W	-	I	The GenICam port through which the Device module is accessed.

2.3.5 Event Control

Category that contains Event Control features.

Table 2-14: Event Control Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
EventControl	R	All	ICategory	R	-	E	Category that contains Event control features.
EventSelector	R	All	IEnumeration	R/W	-	E	Selects which Event to signal to the host application.
EventNotification[EventSelector]	R	All	IEnumeration	R/W	-	E	Activate or deactivate the notification to the host application of the occurrence of the selected Event.

2.4 Data Stream Module

2.4.1 Stream Information

Contains the features related to general information about a specific Data Stream module.

Table 2-15: Stream Information Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
StreamInformation	M	All	ICategory	R	-	E	Category that contains all Stream Information features of the Data Stream module.
StreamID	M	All	IString	R	-	E	Device unique ID for the data stream.
StreamType	M	All	IEnumeration	R	-	E	Transport layer type of the Data Stream.

2.4.2 Device Stream Channel Control

Contains the features related to control the buffers within the acquisition engine of a specific Data Stream module.

Table 2-16: Buffer Handling Control Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
DeviceStreamChannelControl	R	GEV	ICategory	R	-	E	Category containing features to control the stream channel shared between the remote device and the GenTL Producer's data stream module.
DeviceStreamChannelPacketSize	R	GEV	IInteger	R/(W)	B	E	Specifies the stream packet size, in bytes, to send on the selected channel for a transmitter or specifies the maximum packet size supported by a receiver.
DeviceStreamChannelPacketSizeMin	O	GEV	IInteger	R/(W)	B	G	Controls desired minimum of the packet size feature to be

							used for the stream channel.
DeviceStreamChannelPacketSizeMax	O	GEV	IInteger	R/(W)	B	G	Controls desired maximum of the packet size feature to be used for the stream channel.
DeviceStreamChannelPacketSizeInc	O	GEV	IInteger	R/(W)	B	G	Controls desired increment of the packet size feature to be used for the stream channel.
DeviceStreamChannelNegotiatePacketSize	O	GEV	ICommand	(R)/W	-	E	Starts negotiation for the optimal packet size considering the remote device, host and their connection path.

2.4.3 Buffer Handling Control

Contains the features related to GenICam control and access of a specific Data Stream module.

Table 2-17: GenICam Control Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
BufferHandlingControl	R	All	ICategory	R	-	B	Contains all features of the Data Stream module that control the used buffers.
StreamAnnouncedBufferCount	M	All	IInteger	R	-	E	Number of announced (known) buffers on this stream.
StreamBufferHandlingMode	M	All	IEnumeration	R(/W)	-	B	Available buffer handling modes of this Data Stream.
StreamAnnounceBufferMinimum	M	All	IInteger	R	-	E	Minimal number of buffers to announce to enable selected buffer handling mode.
StreamDeliveredFrameCount	R	All	IInteger	R	-	E	Number of delivered frames since last acquisition start.
StreamLostFrameCount	R	All	IInteger	R	-	E	Number of lost frames due to queue underrun.
StreamInputBufferCount	O	All	IInteger	R	-	E	Number of buffers in the input buffer pool plus the buffers(s) currently being filled.
StreamOutputBufferCount	R	All	IInteger	R	-	E	Number of buffers in the output buffer queue.

StreamStartedFrameCount	R	All	IInteger	R	-	E	Number of frames started in the acquisition engine.
PayloadSize	R	All	IInteger	R	Byte	E	Size of the expected data in bytes.
StreamIsGrabbing	R	All	IBoolean	R		E	Flag indicating whether the acquisition engine is started or not.
StreamChunkCountMaximum	R	All	IInteger	R		E	Maximum number of chunks to be expected in a buffer (can be used to allocate the array for the DSGetBufferChunkData function).
StreamBufferAlignment	R	All	IInteger	R	Byte	E	Alignment size in bytes of the buffers passed to DSAnnounceBuffer.

2.4.4 GenICam Control

Category that contains Event Control features.

Table 2-18: Event Control Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
Root	M	All	ICategory	R	-	B	Provides the Root of the GenICam features tree.
StreamPort	M	All	IPort	R/W	-	I	The GenICam port through which the Data Stream module is accessed.

2.4.5 Event Control

Contains the features related to the Event Buffers Discarded.

Table 2-19: Buffer Discarded Event Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
EventControl	R	All	ICategory	R	-	E	Category that contains Event control features.
EventSelector	R	All	IEnumeration	R/W	-	E	Selects which Event to signal to the host application.
EventNotification[EventSelector]	R	All	IEnumeration	R/W	-	E	Activate or deactivate the notification to the host application of the occurrence of the selected Event.

2.5 Buffer Module

2.5.1 Buffer Information

Contains the features related to general information about a specific Buffer module.

Table 2-20: Buffer Information Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
BufferInformation	O	All	ICategory	R	-	E	Category that contains all Buffer Information features of the Buffer module.
BufferUserData	O	All	IInteger	R	-	E	Pointer to user data casted to an integer number referencing GenTL Consumer specific data.
BufferType	O	All	IEnumeration	R	-	E	Transport layer type of the buffer.
BufferSize	O	All	IInteger	R	Byte	E	Size of the buffer in bytes.

2.5.2 Buffer Data Information

Contains the features related to the currently filled data of a specific Buffer module.

Table 2-21: Buffer Data Information Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
BufferDataInformation	O	All	ICategory	R	-	E	Contains all Buffer Data Information features of the Buffer module.

BufferData	O	All	IRegister	R/(W)	-	E	Entire buffer data.
BufferTimeStamp	O	All	IInteger	R	-	E	Timestamp the buffer was acquired.
BufferNewData	O	All	IBoolean	R	-	E	Flag to indicate that the buffer contains new data since the last delivery.
BufferIsQueued	O	All	IBoolean	R	-	E	Flag to indicate if the buffer is in the input pool or output buffer queue.
BufferIsAcquiring	O	All	IBoolean	R	-	E	Flag to indicate that the buffer is currently being filled with data.
BufferIsIncomplete	O	All	IBoolean	R	-	E	Flag to indicate that a buffer was filled but an error occurred during that process.
BufferPayloadType	O	All	IEnumeration	R	-	E	Payload type of the data.
BufferNumberOfParts	O	All	IInteger	R	-	E	The number of parts in the current buffer as delivered by the transport mechanism.
BufferPartSelector	O	All	IInteger	R	-	E	The buffer part to extract information from.
BufferSizeFilled	O	All	IInteger	R	Byte	E	Number of bytes written into the buffer last time it was filled.
BufferPartDataType[BufferPartSelector]	O	All	IEnumeration	R	-	E	The data type of the part.
BufferPartSourceIDValue[BufferPartSelector]	O	All	IInteger	R	-	E	The Source ID type of the part.
BufferPartRegionIDValue[BufferPartSelector]	O	All	IInteger	R	-	E	The Region ID type of the part.
BufferPartComponentIDValue[BufferPartSelector]	O	All	IInteger	R	-	E	The Component ID type of the part.
BufferWidth[BufferPartSelector]	O	All	IInteger	R	-	E	Width of the data in the buffer in number of pixels.
BufferHeight[BufferPartSelector]	O	All	IInteger	R	-	E	Height of the data in the buffer in number of pixels as configured.

BufferXOffset[BufferPartSelector]	O	All	IInteger	R	-	E	XOffset of the data in the buffer in number of pixels from the image origin to handle areas of interest.
BufferYOffset[BufferPartSelector]	O	All	IInteger	R	-	E	YOffset of the data in the buffer in number of lines from the image origin to handle areas of interest.
BufferXPadding[BufferPartSelector]	O	All	IInteger	R	Byte	E	XPadding of the data in the buffer in number of bytes.
BufferYPadding	O	All	IInteger	R	Byte	E	YPadding of the data in the buffer in number of bytes.
BufferFrameID	R	All	IInteger	R	-	E	A sequentially incremented number of the frame.
BufferImagePresent	O	All	IBoolean	R	-	E	Flag to indicate if the current data in the buffer contains image data.
BufferImageOffset	O	All	IInteger	R	Byte	E	Offset of the image data from the beginning of the delivered buffer in bytes.
BufferPixelFormat[BufferPartSelector]	O	All	IEnumeration	R	-	E	Format of the pixels provided by the buffer.
BufferDeliveredImageHeight[BufferPartSelector]	O	All	IInteger	R	-	E	The number of lines in the current buffer part as delivered by the transport mechanism.
BufferDeliveredChunkPayloadSize	O	All	IInteger	R	-	E	Size of the valid chunk payload data delivered in the buffer.
BufferChunkLayoutID	O	All	IInteger	R	-	E	ID of the chunk data layout delivered in the buffer.
BufferFileName	O	All	IString	R	-	E	Filename for the file payload data delivered in the buffer.

2.5.3 GenICam Control

Contains the features related to GenICam control and access of a specific Buffer module.

Table 2-22: GenICam Control Summary

Name	Level	TLType	Interface	Access	Unit	Visibility	Description
Root	O	All	ICategory	R	-	B	Provides the Root of the GenICam features tree.

BufferPort	O	All	IPort	R/W	-	I	The GenICam port through which the Buffer module is accessed.

3 General Features

Contains all features that are independent from the underlying transport technology, in particular including all mandatory features for all GenTL Producer implementations.

3.1 System Module

Contains all features of the System module that are independent from the underlying transport technology.

3.1.1 System Information

Features in this section provide basic information about the System Module and its identity. Note that all features in this section are defined as read-only.

3.1.1.1 SystemInformation

Name	SystemInformation
Category	Root
Level	Recommended
Interface	ICategory
Access	Read
Unit	-
Visibility	Beginner
Values	-

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

3.1.1.2 TLID

Name	TLID
Category	SystemInformation
Level	Mandatory
Interface	IString
Access	Read
Unit	-

Visibility	Expert
Values	Any NULL-terminated string

Unique identifier of the GenTL Producer like a GUID.

Corresponds to the `TL_INFO_ID` command of `TLGetInfo` function.

3.1.1.3 TLVendorName

Name	TLVendorName
Category	SystemInformation
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Beginner
Values	Any NULL-terminated string

Name of the GenTL Producer vendor.

Corresponds to the `TL_INFO_VENDOR` command of `TLGetInfo` function.

3.1.1.4 TLModelName

Name	TLModelName
Category	SystemInformation
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Beginner
Values	Any NULL-terminated string

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.

3.1.1.5 TLVersion

Name	TLVersion
Category	SystemInformation
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Beginner
Values	Any NULL-terminated string

Vendor specific version string of the GenTL Producer.

Corresponds to the `TL_INFO_VERSION` command of `TLGetInfo` function.

3.1.1.6 TLFileName

Name	TLFileName
Category	SystemInformation
Level	Recommended
Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

Filename including extension of the GenTL Producer.

Corresponds to the `TL_INFO_NAME` command of `TLGetInfo` function.

3.1.1.7 TLDisplayName

Name	TLDisplayName
Category	SystemInformation

Level	Recommended
Interface	IString
Access	Read/(Write)
Unit	-
Visibility	Beginner
Values	Any NULL-terminated string

User readable name of the GenTL Producer.

Corresponds to the `TL_INFO_DISPLAYNAME` command of `TLGetInfo` function.

3.1.1.8 TLPath

Name	TLPath
Category	SystemInformation
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

Full path to the GenTL Producer including filename and extension.

Corresponds to the `TL_INFO_PATHNAME` command of `TLGetInfo` function.

3.1.1.9 TLType

Name	TLType
Category	SystemInformation
Level	Mandatory
Interface	IEnumeration
Access	Read
Unit	-
Visibility	Expert

Values	GigEVision CameraLink CameraLinkHS CoaXPress USB3Vision Mixed Custom CL (Deprecated) CLHS (Deprecated) CXP (Deprecated) Ethernet (Deprecated) IIDC (Deprecated) PCI (Deprecated) USB3 (Deprecated) UVC (Deprecated)

Transport layer type of the GenTL Producer implementation.

Note that these values already follow the updated value list of the "DeviceTLType" feature from GenICam SFNC 2.3. Depending on this value, the transport layer specific features for the chosen transport layer standard have to be considered.

- **CameraLink**: Camera Link
- **CameraLinkHS**: Camera Link High Speed
- **CoaXPress**: CoaXPress
- **GigEVision**: GigE Vision
- **USB3Vision**: USB3 Vision
- **Mixed**: Different Interface modules of the GenTL Producer are of different types
- **Custom**: Custom transport layer
- **CL (Deprecated):** Camera Link
- **CLHS (Deprecated):** Camera Link HS
- **CXP (Deprecated):** CoaXPress
- **Ethernet (Deprecated):** Generic Ethernet
- **GEV (Deprecated):** GigE Vision
- **IIDC (Deprecated)**: IIDC 1394

- **PCI (Deprecated)**: PCI / PCIe
- **USB3 (Deprecated)**: USB3 Vision
- **UVC (Deprecated)**: USB video class

Corresponds to the `TL_INFO_TLTYPE` command of `TLGetInfo` function.

3.1.1.10 GenTLVersionMajor

Name	GenTLVersionMajor
Category	SystemInformation
Level	Mandatory
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	>0

Major version number of the GenTL specification the GenTL Producer implementation complies with.

3.1.1.11 GenTLVersionMinor

Name	GenTLVersionMinor
Category	SystemInformation
Level	Mandatory
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Minor version number of the GenTL specification the GenTL Producer implementation complies with.

3.1.1.12 GenTLSFNCVersionMajor

Name	GenTLSFNCVersionMajor
Category	SystemInformation
Level	Recommended
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	>0

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

3.1.1.13 GenTLSFNCVersionMinor

Name	GenTLSFNCVersionMinor
Category	SystemInformation
Level	Recommended
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

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

3.1.1.14 GevVersionMajor (Deprecated)

Name	GevVersionMajor
Category	SystemInformation
Level	Optional
TLType	GigEVision

Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	>0

This feature is deprecated (See InterfaceTLVersionMajor).

Major version number of the GigE Vision specification the GenTL Producer implementation complies with.

If the value of the feature TLType is "Mixed" but supports GigE Vision interfaces this feature must be present.

3.1.1.15 GevVersionMinor (Deprecated)

Name	GevVersionMinor
Category	SystemInformation
Level	Optional
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

This feature is deprecated (See InterfaceTLVersionMinor).

Minor version number of the GigE Vision specification the GenTL Producer implementation complies with.

If the value of the feature TLType is "Mixed" but supports GigE Vision interfaces this feature must be present.

3.1.2 Interface Enumeration

The Interface Enumeration section describes all features related to discovery and enumeration of interfaces belonging to the System module.

3.1.2.1 InterfaceEnumeration

Name	InterfaceEnumeration
Category	Root
Level	Recommended
Interface	ICategory
Access	Read
Unit	-
Visibility	Beginner
Values	-

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

3.1.2.2 InterfaceUpdateList

Name	InterfaceUpdateList
Category	InterfaceEnumeration
Level	Mandatory
Interface	ICommand
Access	(Read)/Write
Unit	-
Visibility	Beginner
Values	-

Updates the internal list of the interfaces. This feature should be readable if the execution cannot performed immediately. The command then returns and the status can be polled. This function interacts with the `TLUpdateInterfaceList` function of the GenTL Producer. It is up to the GenTL Consumer to handle access in case both methods are used.

3.1.2.3 InterfaceUpdateTimeout

Name	InterfaceUpdateTimeout
Category	InterfaceEnumeration
Level	Recommended
Interface	IInteger

Access	Read/Write
Unit	ms
Visibility	Expert
Values	>0

Specifies timeout for the InterfaceUpdateList Command.

3.1.2.4 InterfaceSelector

Name	InterfaceSelector
Category	InterfaceEnumeration
Level	Mandatory
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Beginner
Values	≥0

Selector for the different GenTL Producer interfaces. This interface list only changes on execution of "InterfaceUpdateList". The selector is 0-based in order to match the index of the C interface.

3.1.2.5 InterfaceID

Name	InterfaceID[InterfaceSelector]
Category	InterfaceEnumeration
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Beginner
Values	Any NULL-terminated string

GenTL Producer wide unique identifier of the selected interface.

3.1.2.6 InterfaceDisplayName

Name	InterfaceDisplayName[InterfaceSelector]
Category	InterfaceEnumeration
Level	Recommended
Interface	IString
Access	Read
Unit	-
Visibility	Beginner
Values	Any NULL-terminated string

A user-friendly name of the Interface.

Corresponds to the `TLGetInterfaceID` function with the index corresponding to "InterfaceSelector".

3.1.2.7 GevInterfaceMACAddress

Name	GevInterfaceMACAddress[InterfaceSelector]
Category	InterfaceEnumeration
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

48-bit MAC address of the selected interface. Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory, and that the Representation element should be used in the XML to facilitate understanding the data.

3.1.2.8 GevInterfaceDefaultIPAddress

Name	GevInterfaceDefaultIPAddress[InterfaceSelector]
Category	InterfaceEnumeration

Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

IP address of the first subnet of the selected interface. Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory.

3.1.2.9 GevInterfaceDefaultSubnetMask

Name	GevInterfaceDefaultSubnetMask[InterfaceSelector]
Category	InterfaceEnumeration
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

Subnet mask of the first subnet of the selected interface. Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory.

3.1.2.10 GevInterfaceDefaultGateway

Name	GevInterfaceDefaultGateway[InterfaceSelector]
Category	InterfaceEnumeration
Level	Recommended
TLType	GigEVision
Interface	IInteger

Access	Read
Unit	-
Visibility	Export
Values	

Gateway of the selected interface.

3.1.3 GenICam Control

This section provides the necessary features to use the GenICam feature tree of the System module.

Note: In case of discrepancy between the features described in this section and the "GenICam Standard text" the GenTL SFNC document prevails.

3.1.3.1 Root

Name	Root
Category	None
Level	Mandatory
Interface	ICategory
Access	Read
Unit	-
Visibility	Beginner
Values	-

Provides the Root of the GenICam features tree.

3.1.3.2 TLPort

Name	TLPort
Category	None
Level	Mandatory
Interface	IPort
Access	Read/Write
Unit	-

Visibility	Invisible
Values	-

The GenICam port through which the System module is accessed.

Note that TLPort is a port node (not a feature node) and is generally not accessed by the end user directly.

3.1.4 Event Control

Controls the generation of events for an instance of the interface module. An Event is a message that is sent to the host application to notify it of the occurrence of an internal event.

See GenICam SFNC for more details on event control.

EventSelector selects which particular Event to control.

3.1.4.1 EventControl

Name	EventControl
Category	Root
Level	Recommended
Interface	ICategory
Access	Read
Unit	-
Visibility	Expert
Values	-

Category that contains Event control features.

3.1.4.2 EventSelector

Name	EventSelector
Category	EventControl
Level	Recommended
Interface	IEnumeration
Access	Read/Write
Unit	-

Visibility	Expert
Values	InterfaceListChanged

Selects which Event to signal to the host application.

Possible values are:

- **InterfaceListChanged:** the list of interfaces is updated.

3.1.4.3 EventNotification

Name	EventNotification[EventSelector]
Category	EventControl
Level	Recommended
Interface	IEnumeration
Access	Read/Write
Unit	-
Visibility	Expert
Values	Off On Once

Activate or deactivate the notification to the host application of the occurrence of the selected Event.

Possible values are:

- **Off**: The selected Event notification is disabled.
- **On**: The selected Event notification is enabled.
- **Once**: The selected Event notification is enabled for one event then return to the Off state.

3.2 Interface Module

Contains all features of the Interface module that are independent from the underlying transport technology.

3.2.1 Interface Information

Features in this section provide basic information about the Interface Module and its identity. Note that all features in this section are defined read-only.

3.2.1.1 InterfaceInformation

Name	InterfaceInformation
Category	Root
Level	Recommended
Interface	ICategory
Access	Read
Unit	-
Visibility	Expert
Values	-

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

3.2.1.2 InterfaceID

Name	InterfaceID
Category	InterfaceInformation
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

GenTL Producer wide unique identifier of the selected interface.

Corresponds to the `INTERFACE_INFO_ID` command of `IFGetInfo` function.

3.2.1.3 InterfaceDisplayName

Name	InterfaceDisplayName
Category	InterfaceInformation
Level	Recommended

Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

A user-friendly name of the Interface.

Corresponds to the `INTERFACE_INFO_DISPLAYNAME` command of `IFGetInfo` function.

3.2.1.4 InterfaceType

Name	InterfaceType
Category	InterfaceInformation
Level	Mandatory
Interface	IEnumeration
Access	Read
Unit	-
Visibility	Expert
Values	GigEVision CameraLink CameraLinkHS CoaXPress USB3Vision Custom

Transport layer type of the interface.

Note that these values already follow the updated value list of the "DeviceTLType" feature from GenICam SFNC 2.3. Depending on this value, the transport layer specific features for the chosen transport layer standard have to be considered.

- **CameraLink**: Camera Link
- **CameraLinkHS**: Camera Link High Speed
- **CoaXPress**: CoaXPress

- **GigEVision**: GigE Vision
- **USB3Vision**: USB3 Vision
- **Custom**: Custom transport layer

Corresponds to the `INTERFACE_INFO_TLTYPE` command of `IFGetInfo` function.

3.2.1.5 InterfaceTLVersionMajor

Name	InterfaceTLVersionMajor
Category	InterfaceInformation
Level	Mandatory
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	>0

Major version number of the transport layer specification the GenTL Producer interface complies with. The TL version of the Interface can be compared with the TL version of the device to assure compatibility.

3.2.1.6 InterfaceTLVersionMinor

Name	InterfaceTLVersionMinor
Category	InterfaceInformation
Level	Mandatory
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Minor version number of the transport layer specification the GenTL Producer interface complies with. The TL version of the Interface can be compared with the TL version of the device to assure compatibility.

3.2.1.7 GevInterfaceGatewaySelector

Name	GevInterfaceGatewaySelector
Category	InterfaceInformation
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Expert
Values	≥0

Selector for the different gateway entries for this interface. The selector is 0-based. Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory.

3.2.1.8 GevInterfaceGateway

Name	GevInterfaceGateway[GevInterfaceGatewaySelector]
Category	InterfaceInformation
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

IP address of the selected gateway entry of this interface. Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory.

3.2.1.9 GevInterfaceMACAddress

Name	GevInterfaceMACAddress

Category	InterfaceInformation
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

48-bit MAC address of this interface. Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory, and that the Representation element should be used in the XML to facilitate understanding the data.

3.2.1.10 GevInterfaceSubnetSelector

Name	GevInterfaceSubnetSelector
Category	InterfaceInformation
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Expert
Values	≥0

Selector for the subnet of this interface. Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory.

3.2.1.11 GevInterfaceSubnetIPAddress

Name	GevInterfaceSubnetIPAddress[GevInterfaceSubnetSelector]
Category	InterfaceInformation
Level	Mandatory
TLType	GigEVision

Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

IP address of the selected subnet of this interface. Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory.

3.2.1.12 GevInterfaceSubnetMask

Name	GevInterfaceSubnetMask[GevInterfaceSubnetSelector]
Category	InterfaceInformation
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

Subnet mask of the selected subnet of this interface. Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory.

3.2.2 Device Enumeration

The Device Enumeration section describes all features related to discovery and enumeration of devices belonging to the Interface module.

3.2.2.1 DeviceEnumeration

Name	DeviceEnumeration
Category	Root
Level	Recommended
Interface	ICategory

Access	Read
Unit	-
Visibility	Expert
Values	-

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

3.2.2.2 DeviceUpdateList

Name	DeviceUpdateList
Category	DeviceEnumeration
Level	Mandatory
Interface	ICommand
Access	(Read)/Write
Unit	-
Visibility	Expert
Values	-

Updates the internal device list. This feature should be readable if the execution cannot be performed immediately. The command then returns and the status can be polled. This feature interacts with the `IFUpdateDeviceList` function of the GenTL Producer. It is up to the GenTL Consumer to handle access in case both methods are used.

3.2.2.3 DeviceUpdateTimeout

Name	DeviceUpdateTimeout
Category	DeviceEnumeration
Level	Recommented
Interface	IInteger
Access	Read/Write
Unit	ms
Visibility	Expert
Values	>0

Specifies timeout for the DeviceUpdateList Command.

3.2.2.4 DeviceSelector

Name	DeviceSelector
Category	DeviceEnumeration
Level	Mandatory
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Expert
Values	≥0

Selector for the different devices on this interface. This value only changes on execution of "DeviceUpdateList". The selector is 0-based in order to match the index of the C interface.

3.2.2.5 DeviceID

Name	DeviceID[DeviceSelector]
Category	DeviceEnumeration
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

Interface wide unique identifier of the selected device. This value only changes on execution of the DeviceUpdateList command.

Corresponds to the `IFGetDeviceID` function with the index corresponding to "DeviceSelector".

3.2.2.6 DeviceVendorName

Name	DeviceVendorName[DeviceSelector]

Category	DeviceEnumeration
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

Name of the device vendor. This value only changes on execution of the DeviceUpdateList command.

Corresponds to the "DeviceVendorName" feature of the remote device and is retrieved during device discovery.

3.2.2.7 DeviceModelName

Name	DeviceModelName[DeviceSelector]
Category	DeviceEnumeration
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

Name of the device model. This value only changes on execution of the DeviceUpdateList command.

Corresponds to the "DeviceModelName" feature of the remote device and is retrieved during device discovery.

3.2.2.8 DeviceAccessStatus

Name	DeviceAccessStatus[DeviceSelector]
Category	DeviceEnumeration
Level	Mandatory

Interface	IEnumeration
Access	Read
Unit	-
Visibility	Expert
Values	Unknown ReadWrite ReadOnly NoAccess Busy OpenReadWrite OpenReadOnly

Gives the device's access status at the moment of the last execution of the DeviceUpdateList command. This value only changes on execution of the DeviceUpdateList command.

- **Unknown** : Not known to producer.
- **ReadWrite**: Full access
- **ReadOnly**: Read-only access
- **NoAccess**: Not available to connect.
- **Busy**: The device is already opened by another entity.
- **OpenReadWrite** : Open in Read/Write mode by this GenTL host
- **OpenReadOnly** : Open in Read only mode by this GenTL host

3.2.2.9 DeviceSerialNumber

Name	DeviceSerialNumber[DeviceSelector]
Category	DeviceEnumeration
Level	Recommended
Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

Serial number of the remote device. This value only changes on execution of the DeviceUpdateList command.

Corresponds to the "DeviceSerialNumber" feature of the remote device and is retrieved during device discovery. Note that this feature was added in GenICam SFNC 2.0 and later, thus, for remote devices following an older GenICam SFNC version it corresponds to the "DeviceID" feature of the remote device.

3.2.2.10 DeviceUserID

Name	DeviceUserID[DeviceSelector]
Category	DeviceEnumeration
Level	Optional
Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

User-programmable device identifier of the remote device. This value only changes on execution of the DeviceUpdateList command.

Corresponds to the "DeviceUserID" feature of the remote device and it is ususally retrieved during device discovery.

3.2.2.11 DeviceTLVersionMajor

Name	DeviceTLVersionMajor[DeviceSelector]
Category	DeviceEnumeration
Level	Mandatory
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	>0

Major version number of the transport layer specification the remote device complies with.

3.2.2.12 DeviceTLVersionMinor

Name	DeviceTLVersionMinor[DeviceSelector]
Category	DeviceEnumeration
Level	Mandatory
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Minor version number of the transport layer specification the remote device complies with.

3.2.2.13 GevDeviceIPAddress

Name	GevDeviceIPAddress[DeviceSelector]
Category	DeviceEnumeration
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

Current IP address of the GVCP interface of the selected remote device. This value only changes on execution of the DeviceUpdateList command.

Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory.

3.2.2.14 GevDeviceSubnetMask

Name	GevDeviceSubnetMask[DeviceSelector]

Category	DeviceEnumeration
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

Current subnet mask of the GVCP interface of the selected remote device. This value only changes on execution of the DeviceUpdateList command.

Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory.

3.2.2.15 GevDeviceGateway

Name	GevDeviceGateway[DeviceSelector]
Category	DeviceEnumeration
Level	Recommended
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

Current gateway IP address of the GVCP interface of the selected remote device. This value only changes on execution of the DeviceUpdateList command.

3.2.2.16 GevDeviceIPConfigurationStatus

Name	GevDeviceIPConfigurationStatus[DeviceSelector]
Category	DeviceEnumeration
Level	Recommended

TLType	GigEVision
Interface	IEnum
Access	Read/Write
Unit	-
Visibility	Expert
Values	DHCP PersistentIP LinkLocal

Device IP configuration of the GVCP interface of the selected remote device. This value only changes on execution of the DeviceUpdateList command.

3.2.2.17 GevDeviceMACAddress

Name	GevDeviceMACAddress[DeviceSelector]
Category	DeviceEnumeration
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

48-bit MAC address of the GVCP interface of the selected remote device.

Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory, and that the Representation element should be used in the XML to facilitate understanding the data.

3.2.2.18 GevDeviceCurrentControlMode

Name	GevDeviceCurrentControlMode[DeviceSelector]
Category	DeviceEnumeration
Level	Optional

TLType	GigEVision
Interface	IEnum
Access	Read/Write
Unit	-
Visibility	Expert
Values	Open ControlAccess ExclusiveAccess NoAccess

The current control mode of the device. This value only changes on execution of the DeviceUpdateList command. See also DeviceAccessStatus, which gives a similar TL independent status. The values are.

- **Open** : The device is open for control or exclusive access.
- **ControlAccess**: The device is controlled by another host, but switchover or readonly access is possible.
- **ExclusiveAccess**: The device is under exclusive access by a host and cannot be accessed by another.
- **NoAccess**: The device cannot be accessed, for instance it may be a GigE Vision device on a subnet different from the interface.

3.2.2.19 GevApplicationSwitchoverKey

Name	GevApplicationSwitchoverKey[DeviceSelector]
Category	DeviceEnumeration
Level	Optional
TLType	GigEVision
Interface	IInteger
Access	Write
Unit	-
Visibility	Expert
Values	

Application switchover key to use when requesting ControlAccess switchover. Setup of the key for switchover is done via device features in the device by a host connected in ExclusiveAccess mode.

3.2.2.20 GevDeviceForceIP

Name	GevDeviceForceIP[DeviceSelector]
Category	DeviceEnumeration
Level	Recommended
TLType	GigEVision
Interface	ICommand
Access	(Read)/Write
Unit	-
Visibility	Expert
Values	

Apply the force IP settings (GevDeviceForceIPAddress, GevDeviceForceSubnetMask and GevDeviceForceGateway) in the Device using ForceIP command.

This command is only accepted by a device showing ReadWrite DeviceAccessStatus.The IP change is not persistent in the device.

3.2.2.21 GevDeviceForceIPAddress

Name	GevDeviceForceIPAddress[DeviceSelector]
Category	DeviceEnumeration
Level	Recommended
TLType	GigEVision
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Expert
Values	

Static IP address to set for the GVCP interface of the remote device.

3.2.2.22 GevDeviceForceSubnetMask

Name	GevDeviceForceSubnetMask[DeviceSelector]
Category	DeviceEnumeration
Level	Recommended
TLType	GigEVision
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Expert
Values	

Static subnet mask to set for GVCP interface of the remote device.

3.2.2.23 GevDeviceForceGateway

Name	GevDeviceForceGateway[DeviceSelector]
Category	DeviceEnumeration
Level	Recommended
TLType	GigEVision
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Expert
Values	

Static gateway IP address to set for the GVCP interface of the remote device.

3.2.3 Action Control

Features in this section provide give access to the Action Control features within the Interface Module.

3.2.3.1 ActionControl

Name	ActionControl
Category	Root
Level	Recommended
TLType	GigEVision
Interface	ICategory
Access	Read
Unit	-
Visibility	Expert
Values	-

Category that contains all Action Control features of the Interface module.

3.2.3.2 ActionCommand

Name	ActionCommand
Category	ActionControl
Level	Recommended
TLType	GigEVision
Interface	ICommand
Access	(Read)/Write
Unit	-
Visibility	Expert
Values	

Send ActionCommand to device(s).

3.2.3.3 ActionDeviceKey

Name	ActionDeviceKey
Category	ActionControl
Level	Recommended
TLType	GigEVision

Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Expert
Values	

The Action Command Device Key to use in the Action Command.

3.2.3.4 ActionGroupKey

Name	ActionGroupKey
Category	ActionControl
Level	Recommended
TLType	GigEVision
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Expert
Values	

The Action Command Group Key to use in the Action Command.

3.2.3.5 ActionGroupMask

Name	ActionGroupMask
Category	ActionControl
Level	Recommended
TLType	GigEVision
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Expert
Values	

The Action Command Group Mask to use in the Action Command.

3.2.3.6 ActionScheduledTimeEnable

Name	ActionScheduledTimeEnable
Category	ActionControl
Level	Recommended
TLType	GigEVision
Interface	IBoolean
Access	Read/Write
Unit	-
Visibility	Expert
Values	

Specifies if a time enabled Action Command should be given.

3.2.3.7 ActionScheduledTime

Name	ActionScheduledTime
Category	ActionControl
Level	Recommended
TLType	GigEVision
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Expert
Values	

Specifies the time a time enabled Action Command is scheduled.

3.2.3.8 GevActionDestinationIPAddress

Name	GevActionDestinationIPAddress

Category	ActionControl
Level	Recommended
TLType	GigEVision
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Expert
Values	

Specifies destination the IP address for the Action Command. This can be any valid destination address (thus including broadcast addresses for this interface).

3.2.4 GenICam Control

This chapter provides the necessary features to use the GenICam feature tree of the Interface module.

Note: In case of discrepancy between the features described in this chapter and the "GenICam Standard text" the GenTL SFNC document prevails.

3.2.4.1 Root

Name	Root
Category	None
Level	Mandatory
Interface	ICategory
Access	Read
Unit	-
Visibility	Beginner
Values	-

Provides the Root of the GenICam features tree.

3.2.4.2 InterfacePort

Name	InterfacePort

Category	None
Level	Mandatory
Interface	IPort
Access	Read/Write
Unit	-
Visibility	Invisible
Values	-

The GenICam port through which the Interface module is accessed.

Note that InterfacePort is a port node (not a feature node) and is generally not accessed by the end user directly.

3.2.5 Event Control

Controls the generation of events for an instance of the interface module.An Event is a message that is sent to the host application to notify it of the occurrence of an internal event.

See GenICam SFNC for more details on event control.

EventSelector selects which particular Event to control.

3.2.5.1 EventControl

Name	EventControl
Category	Root
Level	Recommended
Interface	ICategory
Access	Read
Unit	-
Visibility	Expert
Values	-

Category that contains Event control features.

3.2.5.2 EventSelector

Name	EventSelector

Category	EventControl
Level	Recommended
Interface	IEnumeration
Access	Read/Write
Unit	-
Visibility	Expert
Values	InterfaceLost DeviceListChanged

Selects which Event to signal to the host application.

Possible values are:

- **InterfaceLost:** Raised when the interface connection is lost.
- **DeviceListChanged:** The list of devices is updated.

3.2.5.3 EventNotification

Name	EventNotification[EventSelector]
Category	EventControl
Level	Recommended
Interface	IEnumeration
Access	Read/Write
Unit	-
Visibility	Expert
Values	Off On Once

Activate or deactivate the notification to the host application of the occurrence of the selected Event.

Possible values are:

- **Off**: The selected Event notification is disabled.
- **On**: The selected Event notification is enabled.

- **Once**: The selected Event notification is enabled for one event then return to Off state

3.3 Device Module

Contains all features of the Device module that are independent from the underlying transport technology. Do not mistake the features of the Device module with the features of the remote device.

3.3.1 Device Information

Features in this section provide basic information about the Device module and its identity. Note that all features in this section are defined read-only.

3.3.1.1 Device Information

Name	DeviceInformation
Category	Root
Level	Recommended
Interface	ICategory
Access	Read
Unit	-
Visibility	Beginner
Values	-

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

3.3.1.2 DeviceID

Name	DeviceID
Category	DeviceInformation
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Expert

Values	Any NULL-terminated string

Interface-wide unique identifier of this device.

Corresponds to the `DEVICE_INFO_ID` command of `DevGetInfo` function.

3.3.1.3 DeviceSerialNumber

Name	DeviceSerialNumber
Category	DeviceInformation
Level	Recommended
Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

Serial number of the remote device.

Corresponds to the "DeviceSerialNumber" feature of the remote device and usually is retrieved via the bootstrap register of the remote device. Note that this feature has been added in GenICam SFNC 2.0, thus, for remote devices following an older GenICam SFNC version it corresponds to the “DeviceID” feature of the remote device.

Corresponds to the `DEVICE_INFO_SERIAL_NUMBER` command of `DevGetInfo` function.

3.3.1.4 DeviceUserID

Name	DeviceUserID
Category	DeviceInformation
Level	Optional
Interface	IString
Access	Read/Write
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

User-programmable device identifier of the remote device.

Corresponds to the “DeviceUserID” feature of the remote device and usually it is retrieved via the bootstrap register of the remote device.

Corresponds to the `DEVICE_INFO_USER_DEFINED_NAME` command of `DevGetInfo` function.

3.3.1.5 DeviceVendorName

Name	DeviceVendorName
Category	DeviceInformation
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Beginner
Values	Any NULL-terminated string

Name of the remote device vendor.

Corresponds to the `DEVICE_INFO_VENDOR` command of `DevGetInfo` function.

3.3.1.6 DeviceModelName

Name	DeviceModelName
Category	DeviceInformation
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Beginner
Values	Any NULL-terminated string

Name of the remote device model.

Corresponds to the `DEVICE_INFO_MODEL` command of `DevGetInfo` function.

3.3.1.7 DeviceFamilyName

Name	DeviceFamilyName
Category	DeviceInformation
Level	Recommended
Interface	IString
Access	Read
Unit	-
Visibility	Beginner
Values	Any NULL-terminated string

Name of the product family of the remote device model.

Corresponds to the "DeviceFamilyName" feature of the remote device and is usuallyretrieved via the bootstrap register of the remote device.

3.3.1.8 DeviceVersion

Name	DeviceVersion
Category	DeviceInformation
Level	Recommended
Interface	IString
Access	Read
Unit	-
Visibility	Beginner
Values	Any NULL-terminated string

The version of the remote device model.

Corresponds to the "DeviceVersion" feature of the remote device and is usuallyretrieved via the bootstrap register of the remote device.

Corresponds to the `DEVICE_INFO_VERSION` command of `DevGetInfo` function.

3.3.1.9 DeviceManufacturerInfo

Name	DeviceManufacturerInfo
Category	DeviceInformation
Level	Recommended
Interface	IString
Access	Read
Unit	-
Visibility	Beginner
Values	Any NULL-terminated string

Manufacturer information about the remote device.

Corresponds to the "DeviceManufacturerInfo" feature of the remote device and is usuallyretrieved via the bootstrap register of the remote device.

3.3.1.10 DeviceType

Name	DeviceType
Category	DeviceInformation
Level	Mandatory
Interface	IEnumeration
Access	Read
Unit	-
Visibility	Expert
Values	GigEVision CameraLink CameraLinkHS CoaXPress USB3Vision Custom

Transport layer type of the device.

Note that these values already follow the updated value list of the "DeviceTLType" feature from GenICam SFNC 2.3. Depending on this value, the transport layer specific features for the chosen transport layer standard have to be considered.

- **CameraLink**: Camera Link
- **CameraLinkHS**: Camera Link High Speed
- **CoaXPress**: CoaXPress
- **GigEVision**: GigE Vision
- **USB3Vision**: USB3 Vision
- **Custom**: Custom transport layer

Corresponds to the `DEVICE_INFO_TLTYPE` command of `DevGetInfo` function.

3.3.1.11 DeviceDisplayName

Name	DeviceDisplayName
Category	DeviceInformation
Level	Recommended
Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

User readable name of the device. If this is not defined in the device this should be "VENDOR MODEL (ID)".

Corresponds to the `DEVICE_INFO_DISPLAYNAME` command of `DevGetInfo` function.

3.3.1.12 DeviceTimestampFrequency

Name	DeviceTimestampFrequency
Category	DeviceInformation
Level	Recommended
Interface	IInteger
Access	Read

Unit	-
Visibility	Beginner
Values	>0

The tick-frequency of the time stamp clock.

Corresponds to the `DEVICE_INFO_TIMESTAMP_FREQUENCY` command of `DevGetInfo` function.

3.3.1.13 DeviceAccessStatus

Name	DeviceAccessStatus
Category	DeviceInformation
Level	Mandatory
Interface	IEnumeration
Access	Read
Unit	-
Visibility	Expert
Values	Unknown ReadWrite ReadOnly NoAccess Busy OpenReadWrite OpenReadOnly

Gives the device's access status at the moment of the last execution of the DeviceUpdateList command. This value only changes on execution of the DeviceUpdateList command.

- **Unknown**: Not known to producer.
- **ReadWrite**: Full access
- **ReadOnly**: Read-only access
- **NoAccess**: Not available to connect.
- **Busy**: The device is already opened by another entity.

- **OpenReadWrite**: Open in Read/Write mode by this GenTL host
- **OpenReadOnly**: Open in Read access mode by this GenTL host

Corresponds to the `DEVICE_INFO_ACCESS_STATUS` command of `DevGetInfo` function.

3.3.1.14 DeviceChunkDataFormat

Name	DeviceChunkDataFormat
Category	DeviceInformation
Level	Recommended
Interface	IEnumeration
Access	Read
Unit	-
Visibility	Expert
Values	None GigEVision Custom

Chunk data format used by the device. This information allows devices based on other technologies or protocols than "standard" ones such as GigE Vision to inform the GenTL Consumer about the chunk data layout they use.

In contrast, one can assume that any generic GenTL Consumer will understand the GigE Vision chunk format because the GigE Vision chunk adapter is readily available.

Note that GenTL Consumers having access to a generic chunk adapter can use this adapter without caring about the actual data layout, provided that the GenTL Producer implements the `DSGetBufferChunkData` function. However, using the native chunk adapter might typically lead to slightly better performance.

- **None**: The device does not use chunk data at all.
- **GigEVision**: The device formats the chunk data using the chunk data format defined by GigE Vision specification version 1.x. The chunk data decoding algorithm (chunk adapter) common for the GigE Vision devices can be used.
- **Custom**: The device formats the chunk data using a custom, non-standard format. Without a-priori additional knowledge about the device and its implementation, the GenTL Consumer should always use the generic chunk adapter to decode the chunk data, not making any assumptions about the internal chunk data layout.

3.3.1.15 DeviceEventDataFormat

Name	DeviceEventDataFormat
Category	DeviceInformation
Level	Recommended
Interface	IEnumeration
Access	Read
Unit	-
Visibility	Expert
Values	None GigEVision GigEVisionExtendedId Custom

Enumeration, informing about the event data format used by the device (meaning the "device events", see event type `EVENT_REMOTE_DEVICE` (named `EVENT_FEATURE_DEVEVENT` in GenTL up to version 1.4). This allows devices based on other technologies or protocols than "standard" ones such as GigE Vision to inform the GenTL Consumer about the event data layout they use.

In contrast, one can assume that any generic GenTL Consumer will understand the GigE Vision event format because the GigE Vision event adapter is readily available

Note that GenTL Consumers having access to a generic event adapter can use this adapter without caring about the actual data layout.

- **None**: The device does not use event data at all.
- **GigEVision**: The device formats the event data using the event data format defined by GigE Vision specification version 1.x. The event data decoding algorithm (event adapter) common for the GigE Vision devices can be used.
- **GigEVisionExtendedId**: The device formats the event data using the event data format defined by GigE Vision specification version 2.x. The event data decoding algorithm (event adapter) common for the GigE Vision devices can be used.
- **Custom**: The device formats the event data using a custom, non-standard format. Without a-priori additional knowledge about the device and its implementation, the GenTL Consumer should always use the generic event adapter to decode the event data, not making any assumptions about the internal event data layout.

3.3.1.16 GevDeviceMACAddress

Name	GevDeviceMACAddress
Category	DeviceInformation
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

48-bit MAC address of the GVCP interface of the remote device.

Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory, and that the Representation element should be used in the XML to facilitate understanding the data.

3.3.1.17 GevDeviceIPAddress

Name	GevDeviceIPAddress
Category	DeviceInformation
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

Current IP address of the GVCP interface of the remote device.

Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory.

3.3.1.18 GevDeviceSubnetMask

Name	GevDeviceSubnetMask
Category	DeviceInformation
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

Current subnet mask of the GVCP interface of the remote device.

Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory.

3.3.1.19 GevDeviceGateway

Name	GevDeviceGateway
Category	DeviceInformation
Level	Mandatory
TLType	GigEVision
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

Current gateway IP address of the GVCP interface of the remote device.

Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory.

3.3.2 Device Control

The Device Control section contains all features related to control specific properties of the Device module.

3.3.2.1 DeviceControl

Name	DeviceControl
Category	Root
Level	Recommended
Interface	ICategory
Access	Read
Unit	-
Visibility	Expert
Values	-

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

3.3.2.2 DeviceEndianessMechanism

Name	DeviceEndianessMechanism
Category	DeviceControl
Level	Mandatory
TLType	GigEVision
Interface	IEnumeration
Access	Read/Write
Unit	-
Visibility	Expert
Values	Legacy Standard

Identifies the endianess handling mode.

- **Legacy**: Handling the device endianess according to GenICam Schema 1.0
- **Standard**: Handling the device endianess according to GenICam Schema 1.1 and later

Default value is “Legacy”.

Note that for a GenTL Producer implementation supporting GigE Vision this feature is mandatory, otherwise recommended.

3.3.2.3 LinkCommandTimeout

Name	LinkCommandTimeout
Category	DeviceControl
Level	Recommented
Interface	IFloat
Access	Read/Write
Unit	us
Visibility	Guru
Values	>0

Specifies application timeout for the control channel communication. This feature defines the application timeout, and it is related to the device feature DeviceLinkCommandTimeout specifying the maximum time for handling a command in the device. Up to DeviceLinkCommandRetryCount attempts with this timeout are made before a command fails with a timout error.

3.3.2.4 LinkCommandRetryCount

Name	LinkCommandRetryCount
Category	DeviceControl
Level	Recommended
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Guru
Values	>=0

Specifies maximum number of tries before failing the control channel commands.

3.3.3 Stream Enumeration

The Stream Enumeration section describes all features related to the enumeration of data streams belonging to the Device module.

3.3.3.1 StreamEnumeration

Name	StreamEnumeration
Category	Root
Level	Recommended
Interface	ICategory
Access	Read
Unit	-
Visibility	Beginner
Values	-

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

3.3.3.2 StreamSelector

Name	StreamSelector
Category	StreamEnumeration
Level	Mandatory
Interface	IInteger
Access	Read/Write
Unit	-
Visibility	Beginner
Values	≥0

Selector for the different stream channels.The selector is 0-based in order to match the index of the C interface.

3.3.3.3 StreamID

Name	StreamID[StreamSelector]
Category	StreamEnumeration

Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Beginner
Values	Any NULL-terminated string

Device unique ID for the stream. Not Mandator for non-streaming DeviceCorresponds to the `DevGetDataStreamID` function with the index corresponding to “StreamSelector”.

3.3.4 GenICam Control

This chapter provides the necessary features to use the GenICam feature tree of the Device module.

Note: In case of discrepancy between the features described in this chapter and the “GenICam Standard text” the GenTL SFNC document prevails.

3.3.4.1 Root

Name	Root
Category	None
Level	Mandatory
Interface	ICategory
Access	Read
Unit	-
Visibility	Beginner
Values	-

Provides the Root of the GenICam features tree.

3.3.4.2 DevicePort

Name	DevicePort
Category	None
Level	Mandatory

Interface	IPort
Access	Read/Write
Unit	-
Visibility	Invisible
Values	-

The GenICam port through which the Device module is accessed. Note that DevicePort is a port node (not a feature node) and is generally not accessed by the end user directly.

3.3.5 Event Control

Controls the generation of events for an instance of the Device module. An Event is a message that is sent to the host application to notify it of the occurrence of an internal event.

See GenICam SFNC for more details on event control.

EventSelector selects which particular Event to control.

3.3.5.1 EventControl

Name	EventControl
Category	Root
Level	Recommended
Interface	ICategory
Access	Read
Unit	-
Visibility	Expert
Values	-

Category that contains Event control features.

3.3.5.2 EventSelector

Name	EventSelector
Category	EventControl
Level	Recommended

Interface	IEnumeration
Access	Read/Write
Unit	-
Visibility	Expert
Values	DeviceLost

Selects which Event to signal to the host application.

Possible values are:

- **DeviceLost:** Raised when the local host looses connection to the physical (remote) device.

3.3.5.3 EventNotification

Name	EventNotification[EventSelector]
Category	EventControl
Level	Recommended
Interface	IEnumeration
Access	Read/Write
Unit	-
Visibility	Expert
Values	Off On Once

Activate or deactivate the notification to the host application of the occurrence of the selected Event.

Possible values are:

- **Off**: The selected Event notification is disabled.
- **On**: The selected Event notification is enabled.
- **Once**: The selected Event notification is enabled for one event then return to Off state.

3.4 Data Stream Module

Contains all features of the Data Stream module that are independent from the underlying transport technology.

3.4.1 Stream Information

Features in this section provide basic information about the Data Stream module and its identity.

3.4.1.1 Stream Information

Name	StreamInformation
Category	Root
Level	Mandatory
Interface	ICategory
Access	Read
Unit	-
Visibility	Expert
Values	-

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

3.4.1.2 StreamID

Name	StreamID
Category	StreamInformation
Level	Mandatory
Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

Device unique ID for the data stream.

Corresponds to the `STREAM_INFO_ID` command of `DSGetInfo` function.

3.4.1.3 StreamType

Name	StreamType
Category	StreamInformation
Level	Mandatory
Interface	IEnumeration
Access	Read
Unit	-
Visibility	Expert
Values	GigEVision CameraLink CameraLinkHS CoaXPress USB3Vision Custom

Transport layer type of the Data Stream.

Note that these values already follow the updated value list of the "DeviceTLType" feature from GenICam SFNC 2.3. Depending on this value, the transport layer specific features for the chosen transport layer standard have to be considered.

- **CameraLink**: Camera Link
- **CameraLinkHS**: Camera Link High Speed
- **CoaXPress**: CoaXPress
- **GigEVision**: GigE Vision
- **USB3Vision**: USB3 Vision
- **Custom**: Custom transport layer

Corresponds to the `STREAM_INFO_TLTYPE` command of `DSGetInfo` function.

3.4.2 Device Stream Channel Control

3.4.2.1 DeviceStreamChannelControl

Name	DeviceStreamChannelControl
Category	Root
Level	Recommended
TLType	GigEVision
Interface	ICategory
Access	Read
Unit	-
Visibility	Expert
Values	-

Category containing features to control the stream channel shared between the remote device and the GenTL Producer's data stream module. Applicable for GigE Vision stream channels, and operating on the boot strap registers of the device since the nodemap for the device is not accessible to the GenTL producer.

3.4.2.2 DeviceStreamChannelPacketSize

Name	DeviceStreamChannelPacketSize
Category	DeviceStreamChannelControl
Level	Recommended
TLType	GigEVision
Interface	IInteger
Access	Read/(Write)
Unit	B
Visibility	Expert
Values	>0

Specifies the stream packet size, in bytes, to send on the selected channel for a transmitter or specifies the maximum packet size supported by a receiver. Controls the packet size configuration of the remote device and if needed the GenTL Producer.

3.4.2.3 DeviceStreamChannelPacketSizeMin

Name	DeviceStreamChannelPacketSizeMin
Category	DeviceStreamChannelControl
Level	Optional
TLType	GigEVision
Interface	IInteger
Access	Read/(Write)
Unit	B
Visibility	Guru
Values	>0

Controls desired minimum of the packet size feature to be used for the stream channel. Affects both the direct control of the packet size as well as the negotiation algorithm. The GenTL Consumer can set the value in accordance with the known limits of the remote device or apply further restrictions e.g. based on additional knowledge of the system.

3.4.2.4 DeviceStreamChannelPacketSizeMax

Name	DeviceStreamChannelPacketSizeMax
Category	DeviceStreamChannelControl
Level	Optional
TLType	GigEVision
Interface	IInteger
Access	Read/(Write)
Unit	B
Visibility	Guru
Values	>0

Controls desired maximum of the packet size feature to be used for the stream channel. Affects both the direct control of the packet size as well as the negotiation algorithm. The GenTL Consumer can set the value in accordance with the known limits of the remote device or apply further restrictions e.g. based on additional knowledge of the system.

3.4.2.5 DeviceStreamChannelPacketSizeInc

Name	DeviceStreamChannelPacketSizeInc
Category	DeviceStreamChannelControl
Level	Optional
TLType	GigEVision
Interface	IInteger
Access	Read/(Write)
Unit	B
Visibility	Guru
Values	>0

Controls desired increment of the packet size feature to be used for the stream channel. Affects both the direct control of the packet size as well as the negotiation algorithm. The GenTL Consumer can set the value in accordance with the known limits of the remote device or apply further restrictions e.g. based on additional knowledge of the system.

3.4.2.6 DeviceStreamChannelNegotiatePacketSize

Name	DeviceStreamChannelNegotiatePacketSize
Category	DeviceStreamChannelControl
Level	Optional
TLType	GigEVision
Interface	ICommand
Access	(Read)/Write
Unit	-
Visibility	Expert
Values	-

Starts negotiation for the optimal packet size considering the remote device, host and their connection path. The negotiation result is applied on the device and reflected in DeviceStreamChannelPacketSize. If the negotiation fails, the algorithm attempts to revert the configuration to the initial packet size value.

3.4.3 Buffer Handling Control

Features in this section provide control over the buffers within the acquisition engine of a data stream.

3.4.3.1 BufferHandlingControl

Name	BufferHandlingControl
Category	Root
Level	Recommended
Interface	ICategory
Access	Read
Unit	-
Visibility	Beginner
Values	-

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

3.4.3.2 StreamAnnouncedBufferCount

Name	StreamAnnouncedBufferCount
Category	BufferHandlingControl
Level	Mandatory
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Number of announced (known) buffers on this stream. This value is volatile. It may change if additional buffers are announced and/or buffers are revoked by the GenTL Consumer.

Corresponds to the `STREAM_INFO_NUM_ANNOUNCED` command of `DSGetInfo` function.

3.4.3.3 StreamBufferHandlingMode

Name	StreamBufferHandlingMode

Category	BufferHandlingControl
Level	Mandatory
Interface	IEnumeration
Access	Read(/Write)
Unit	-
Visibility	Beginner
Values	OldestFirst (Mandatory) OldestFirstOverwrite NewestOnly Default (Deprecated)

Available buffer handling modes of this Data Stream.

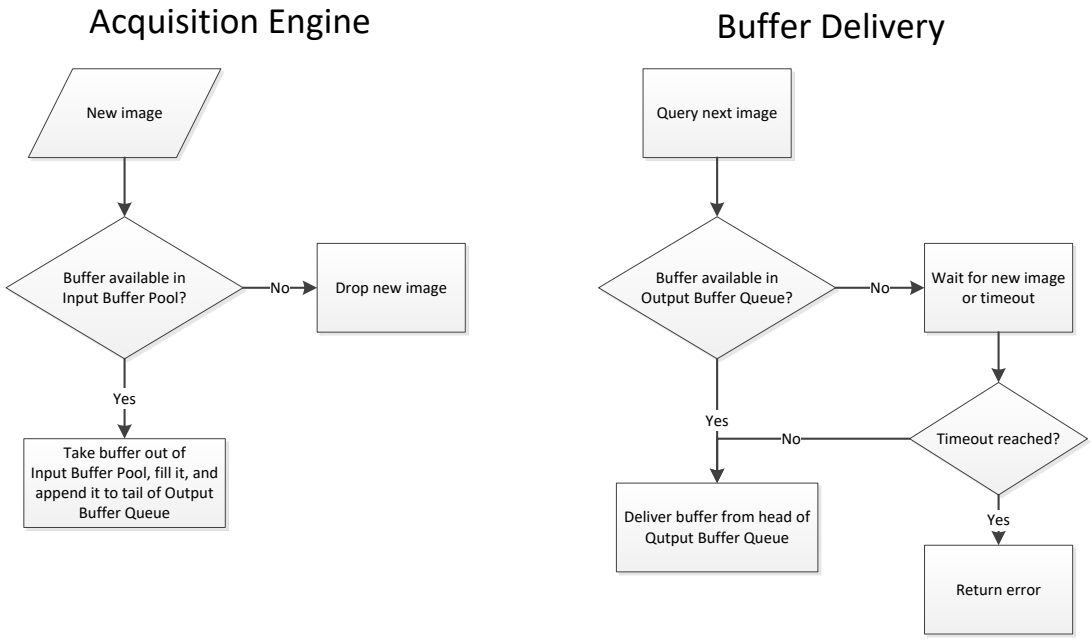

Figure 3-3.1: Buffer handling mode "OldestFirst"

- **OldestFirst (Mandatory)**: The application always gets the buffer from the head of the Output Buffer Queue (thus, the oldest available one). If the Output Buffer Queue is empty, the application waits for a newly acquired buffer until the timeout expires.

  When data for a new buffer is available, the acquisition engine looks for any available buffer in the Input Buffer Pool, fills it, and appends it to the tail of the Output Buffer Queue. If the Input Buffer Pool is empty, the new data is dropped.

This buffer handling mode is typically used if every image frame is to be acquired and the mean processing time is lower than acquisition time. No buffer is discarded or overwritten in the Output Buffer Queue and all filled buffers are delivered in the order they were acquired.

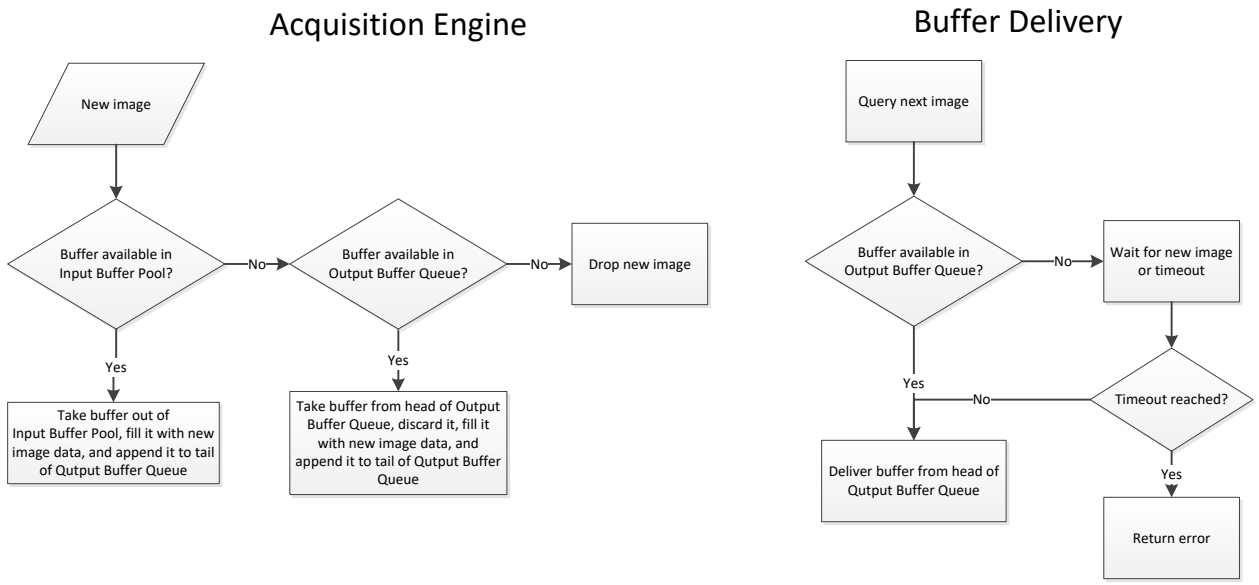

Figure 3-3.2: Buffer handling mode “OldestFirstOverwrite”

- **OldestFirstOverwrite (Recommended)**: The application always gets the buffer from the head of the Output Buffer Queue (thus, the oldest available one). If the Output Buffer Queue is empty, the application waits for a newly acquired buffer until the timeout expires.

  When data for a new buffer is available, the acquisition engine looks for any available buffer in the Input Buffer Pool, fills it, and appends it to the tail of the Output Buffer Queue. If the Input Buffer Pool is empty and the Ouput Buffer Queue is not empty, it discards the head of the Output Buffer Queue (i.e., the oldest buffer), overwrites it with the new data, and appends it to the tail of the Output Buffer Queue. If the Input Buffer Pool and the Output Buffer Queue are empty, the new data is dropped.

  This buffer handling mode is typically used if not every image frame is to be acquired and the application may not fall behind.

- **NewestOnly (Recommended):** The application always gets the latest completed buffer (the newest one). If the Output Buffer Queue is empty, the application waits for a newly acquired buffer until the timeout expires.

This buffer handling mode is typically used in a live display GUI where it is important that there is no lag between camera and display.

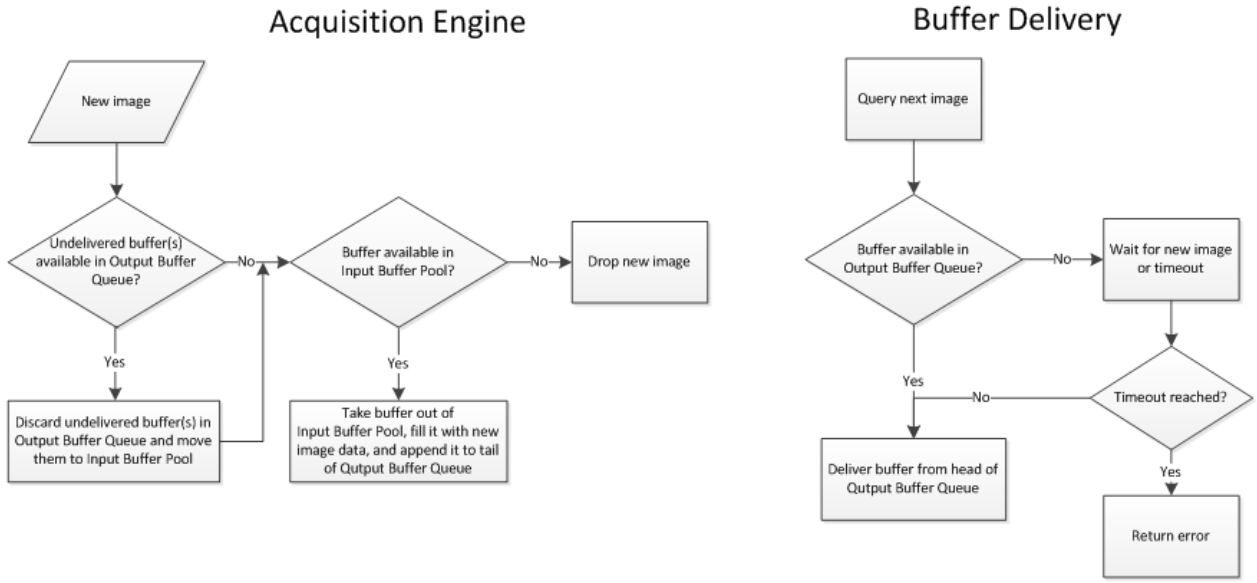

Figure 3-3.3 . Buffer Handling Mode “Newest Only”.

- **Default (Deprecated):** Same behavior as "OldestFirst".

Note that depending on the actual payload not only pure images, but any kind of data can be acquired.

3.4.3.4 StreamAnnounceBufferMinimum

Name	StreamAnnounceBufferMinimum
Category	BufferHandlingControl
Level	Mandatory
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Minimal number of buffers to announce to enable selected buffer handling mode.

Corresponds to the `STREAM_INFO_BUF_ANNOUNCE_MIN` command of `DSGetInfo` function.

3.4.3.5 StreamDeliveredFrameCount

Name	StreamDeliveredFrameCount
Category	BufferHandlingControl
Level	Recommended
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Number of delivered frames since last acquisition start. It is not reset until the stream is closed.

Corresponds to the `STREAM_INFO_NUM_DELIVERED` command of `DSGetInfo` function.

3.4.3.6 StreamLostFrameCount

Name	StreamLostFrameCount
Category	BufferHandlingControl
Level	Recommended
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Number of lost frames due to queue underrun. This number is initialized with zero at the time the stream is opened and incremented every time the data could not be acquired because there was no buffer in the input buffer pool. It is not reset until the stream is closed.

Corresponds to the `STREAM_INFO_NUM_UNDERRUN` command of `DSGetInfo` function.

3.4.3.7 StreamInputBufferCount

Name	StreamInputBufferCount
Category	BufferHandlingControl

Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Number of buffers in the input buffer pool plus the buffers(s) currently being filled.

Corresponds to the `STREAM_INFO_NUM_QUEUED` command of `DSGetInfo` function.

3.4.3.8 StreamOutputBufferCount

Name	StreamOutputBufferCount
Category	BufferHandlingControl
Level	Recommended
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Number of buffers in the output buffer queue.

Corresponds to the `STREAM_INFO_NUM_AWAIT_DELIVERY` command of `DSGetInfo` function.

3.4.3.9 StreamStartedFrameCount

Name	StreamStartedFrameCount
Category	BufferHandlingControl
Level	Recommended
Interface	IInteger
Access	Read
Unit	-

Visibility	Expert
Values	≥0

Number of frames started in the acquisition engine. This number is incremented every time in case of a new buffer is started and then to be filled (data written to) regardless even if the buffer is later delivered to the user or discarded for any reason. This number is initialized with 0 at the time the stream is opened. It is not reset until the stream is closed.

Corresponds to the `STREAM_INFO_NUM_STARTED` command of `DSGetInfo` function.

3.4.3.10 PayloadSize

Name	PayloadSize
Category	BufferHandlingControl
Level	Recommended
Interface	IInteger
Access	Read
Unit	Byte
Visibility	Expert
Values	>0

Size of the expected data in bytes. Note that this feature "overwrites" the PayloadSize of the remote device, see also sections "Data Payload Delivery" and "Allocate Memory" of the GenICam GenTL standard.

Corresponds to the `STREAM_INFO_PAYLOAD_SIZE` command of `DSGetInfo` function.

3.4.3.11 StreamIsGrabbing

Name	StreamIsGrabbing
Category	BufferHandlingControl
Level	Recommended
Interface	IBoolean
Access	Read
Unit	
Visibility	Expert

Values	True False

Flag indicating whether the acquisition engine is started or not. This is independent from the acquisition status of the remote device.

Corresponds to the `STREAM_INFO_IS_GRABBING` command of `DSGetInfo` function.

3.4.3.12 StreamChunkCountMaximum

Name	StreamChunkCountMaximum
Category	BufferHandlingControl
Level	Recommended
Interface	IInteger
Access	Read
Unit	
Visibility	Expert
Values	≥0

Maximum number of chunks to be expected in a buffer (can be used to allocate the array for the `DSGetBufferChunkData` function).

Corresponds to the `STREAM_INFO_NUM_CHUNKS_MAX` command of `DSGetInfo` function.

3.4.3.13 StreamBufferAlignment

Name	StreamBufferAlignment
Category	BufferHandlingControl
Level	Recommended
Interface	IInteger
Access	Read
Unit	Byte
Visibility	Expert
Values	≥0

Alignment size in bytes of the buffers passed to DSAnnounceBuffer.

If a buffer is passed to `DSAnnounceBuffer` which is not aligned according to the alignment size it is up to the Producer to either reject the buffer and return a `GC_ERR_INVALID_BUFFER` error code or to cope with a potential overhead and use the unaligned buffer as is.

Corresponds to the `STREAM_INFO_BUF_ALIGNMENT` command of `DSGetInfo` function.

3.4.4 GenICam Control

This chapter provides the necessary features to use the GenICam feature tree of the Device module.

Note: In case of discrepancy between the features described in this chapter and the "GenICam Standard text" the GenTL SFNC document prevails.

3.4.4.1 Root

Name	Root
Category	None
Level	Mandatory
Interface	ICategory
Access	Read
Unit	-
Visibility	Beginner
Values	-

Provides the Root of the GenICam features tree.

3.4.4.2 StreamPort

Name	StreamPort
Category	None
Level	Mandatory
Interface	IPort
Access	Read/Write
Unit	-
Visibility	Invisible
Values	-

The GenICam port through which the Data Stream module is accessed.

Note that StreamPort is a port node (not a feature node) and is generally not accessed by the end user directly.

3.4.5 Event Control

Controls the generation of events for an instance of the buffer module.An Event is a message that is sent to the host application to notify it of the occurrence of an internal event.

See GenICam SFNC for more details on event control.

EventSelector selects which particular Event to control

3.4.5.1 EventControl

Name	EventControl
Category	Root
Level	Recommended
Interface	ICategory
Access	Read
Unit	-
Visibility	Expert
Values	-

Category that contains Event control features.

3.4.5.2 EventSelector

Name	EventSelector
Category	EventControl
Level	Recommended
Interface	IEnumeration
Access	Read/Write
Unit	-
Visibility	Expert
Values	NewBufferData

	TransferEnd BufferTooSmall BuffersDiscarded

Selects which Event to signal to the host application.

Possible values are:

- **NewBufferData:** A new buffer is available.
- **TransferEnd:** The transfer of a data for new buffer finished; this is not directly related with delivering the buffer, the data might be appended to end of Output Buffer Queue, dropped, etc., depending on the buffer handling mode and acquisition engine status.
- **BufferTooSmall:** The buffer was too small to receive the expected amount of data.
- **BuffersDiscarded:** Buffers discared by GenTL or device. This event could optionally carry two numeric child data fields EventBuffersDiscardedDeviceCount and EventBuffersDiscardedProducerCount.
  EventBuffersDiscardedDeviceCount: Number of buffers discarded by the device since last fired instance of this event (the producer would get to know about this for example by observing a gap in the block_id sequence)
  EventBuffersDiscardedProducerCount: Number of buffers discarded by the producer since last fired instance of this event (this would happen e.g. if there are no free buffers available or if given buffer handling mode requires discarding old buffers etc.)

3.4.5.3 EventNotification

Name	EventNotification[EventSelector]
Category	EventControl
Level	Recommended
Interface	IEnumeration
Access	Read/Write

Unit	-
Visibility	Expert
Values	Off On Once

Activate or deactivate the notification to the host application of the occurrence of the selected Event.

Possible values are:

- **Off**: The selected Event notification is disabled.
- **On**: The selected Event notification is enabled.
- **Once**: The selected Event notification is enabled for one event then return to Off state.

3.5 Buffer Module

Contains all features of the Buffer module that are independent from the underlying transport technology. Since for the Buffer module the GenTL Port is optional, all features listed in this chapter are optional.

3.5.1 Buffer Information

Features in this section provide basic information about the Buffer module.

3.5.1.1 BufferInformation

Name	BufferInformation
Category	Root
Level	Optional
Interface	ICategory
Access	Read
Unit	-
Visibility	Expert
Values	-

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

Note that this category depends whether a Port access is provided through the "BufferPort"feature.

3.5.1.2 BufferUserData

Name	BufferUserData
Category	BufferInformation
Level	Optional (but mandatory if Port access provided)
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

Pointer to user data casted to an integer number referencing GenTL Consumer specific data. It is reflecting the pointer provided by the user data pointer at buffer announcement.This allows the GenTL Consumer to attach information to a buffer.

Note that according to the GenICam GenTL standard, this feature is mandatory if a Port access is provided through the “BufferPort” feature.

Corresponds to the `BUFFER_INFO_USER_PTR` command of `DSGetBufferInfo` function.

3.5.1.3 BufferType

Name	BufferType
Category	BufferInformation
Level	Optional
Interface	IEnumeration
Access	Read
Unit	-
Visibility	Expert
Values	GigEVision CameraLink CameraLinkHS CoaXPress USB3Vision

	Custom

Transport layer type of the buffer.

Note that these values already follow the updated value list of the "DeviceTLType" feature from GenICam SFNC 2.3. Depending on this value, the transport layer specific features for the chosen transport layer standard have to be considered.

- **CameraLink**: Camera Link
- **CameraLinkHS**: Camera Link High Speed
- **CoaXPress**: CoaXPress
- **GigEVision**: GigE Vision
- **USB3Vision**: USB3 Vision
- **Custom**: Custom transport layer

Corresponds to the `BUF_INFO_TLTYPE` command of `DSGetBufferInfo` function.

3.5.1.4 BufferSize

Name	BufferSize
Category	BufferInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	Byte
Visibility	Expert
Values	≥0

Size of the buffer in bytes.

Corresponds to the `BUF_INFO_SIZE` command of `DSGetBufferInfo` function.

3.5.2 Buffer Data Information

Features in this section provide information about the currently filled data in the buffers. Note that for multipart buffers the BufferPartSelector is used to extract information for each part of the buffer.

3.5.2.1 BufferDataInformation

Name	BufferDataInformation
Category	Root
Level	Optional
Interface	ICategory
Access	Read
Unit	-
Visibility	Expert
Values	-

Contains all Buffer Data Information features of the Buffer module.

Note that this category depends whether a Port access is provided through the "BufferPort"feature.

3.5.2.2 BufferData

Name	BufferData
Category	BufferDataInformation
Level	Optional (but mandatory if Port access provided)
Interface	IRegister
Access	Read/(Write)
Unit	-
Visibility	Expert
Values	

Entire buffer data.

Note that according to the GenICam GenTL standard, this feature is mandatory if a Port access is provided through the "BufferPort" feature.

Corresponds to the `BUFFER_INFO_BASE` command of `DSGetBufferInfo` function.

3.5.2.3 BufferTimeStamp

Name	BufferTimeStamp

Category	BufferInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Timestamp the buffer was acquired. The unit is device/implementation dependent. In case the technology and/or the device does not support this for example under Windows a QueryPerformanceCounter can be used.

Corresponds to the `BUF_INFO_TIMESTAMP` command of `DSGetBufferInfo` function.

3.5.2.4 BufferNewData

Name	BufferNewData
Category	BufferDataInformation
Level	Optional
Interface	IBoolean
Access	Read
Unit	-
Visibility	Expert
Values	True False

Flag to indicate that the buffer contains new data since the last delivery.

Corresponds to the `BUFFER_INFO_NEW_DATA` command of `DSGetBufferInfo` function.

3.5.2.5 BufferIsQueued

Name	BufferIsQueued
Category	BufferDataInformation
Level	Optional
Interface	IBoolean

Access	Read
Unit	-
Visibility	Expert
Values	True False

Flag to indicate if the buffer is in the input pool or output buffer queue.

Corresponds to the `BUFFER_INFO_IS_QUEUED` command of `DSGetBufferInfo` function.

3.5.2.6 BufferIsAcquiring

Name	BufferIsAcquiring
Category	BufferDataInformation
Level	Optional
Interface	IBoolean
Access	Read
Unit	-
Visibility	Expert
Values	True False

Flag to indicate that the buffer is currently being filled with data.

Corresponds to the `BUFFER_INFO_IS_ACQUIRING` command of `DSGetBufferInfo` function.

3.5.2.7 BufferIsIncomplete

Name	BufferIsIncomplete
Category	BufferDataInformation
Level	Optional
Interface	IBoolean
Access	Read
Unit	-
Visibility	Expert

Values	True False

Flag to indicate that a buffer was filled but an error occurred during that process.

Corresponds to the `BUFFER_INFO_IS_INCOMPLETE` command of `DSGetBufferInfo` function.

3.5.2.8 BufferPayloadType

Name	BufferPayloadType
Category	BufferDataInformation
Level	Optional
Interface	IEnumeration
Access	Read
Unit	-
Visibility	Expert
Values	Unknown Image RawData File ChunkData JPEG JPEG2000 H264 ChunkOnly MultiPart GenDC

Payload type of the data.

- **Unknown**: The GenTL Producer is not aware of the payload type of the data in the provided buffer. For the GenTL Consumer perspective this can be handled as raw data.
- **Image**: The buffer payload contains pure image data. In particular, no chunk data isattached to the image.
- **RawData**: The buffer payload contains raw, unspecified data. For instance, this can be used to send acquisition statistics.

- **File**: The buffer payload contains data of a file. It is used to transfer files, such as JPEG compressed images, which can be stored by the GenTL Producer directly to a hard disk. The user might get a hint how to interpret the buffer by the filename by the "BufferFileName" feature.
- **ChunkData**: The buffer payload contains chunk data which can be parsed. The chunk data type might be reported through SFNC or deduced from the technology the device is based on. Note that the chunk data can also contain an image. The GenTL Producer should report the presence, position (offset in the buffer) and properties of the image through corresponding `BUFFER_INFO_CMD` commands.
- **JPEG**: The buffer payload is a Jpeg formatted image.
- **JPEG2000**: The buffer payload is a JPEG2000 formatted image.
- **H264**: The buffer payload is H.264 formatted image data.
- **ChunkOnly**: The buffer only contains chunk data.
- **MultiPart**: The buffer payload has multiple parts.
- **GenDC**: The buffer payload contains a GenDC container.

Corresponds to the `BUFFER_INFO_PAYLOADTYPE` command of `DSGetBufferInfo` function.

3.5.2.9 BufferNumberOfParts

Name	BufferNumberOfParts
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

The number of parts in the current buffer as delivered by the transport mechanism. For non-multipart this is 0, giving that it is not a multipart buffer.

3.5.2.10 BufferPartSelector

Name	BufferPartSelector
Category	BufferDataInformation

Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

The buffer part to extract information from. For non-multipart the value is 0. The maximum value should be dynamic and reflect the number of parts possible to index.

3.5.2.11 BufferSizeFilled

Name	BufferSizeFilled
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	Byte
Visibility	Expert
Values	≥0

Number of bytes written into the buffer last time it was filled. This value is reset to 0 when the buffer is placed into the Input Buffer Pool.

Corresponds to the `BUFFER_INFO_SIZE_FILLED` command of `DSGetBufferInfo` function.

3.5.2.12 BufferPartDataType

Name	BufferPartDataType[BufferPartSelector]
Category	BufferDataInformation
Level	Optional
Interface	IEnumeration
Access	Read
Unit	-

Visibility	Expert
Values	Image2D BiplanarImagePlane2D TriplanarImagePlane2D QuadPlanarImagePlane2D Image3D BiplanarImagePlane3D TriplanarImagePlane3D QuadPlanarImagePlane3D ConfidenceMap Chunk Jpeg Jpeg2000 Custom

The data type of the part.

3.5.2.13 BufferPartSourceIDValue

Name	BufferPartSourceIDValue[BufferPartSelector]
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

The Source ID type of the part.

3.5.2.14 BufferPartRegionIDValue

Name	BufferPartRegionIDValue[BufferPartSelector]
Category	BufferDataInformation
Level	Optional
Interface	IInteger

Access	Read
Unit	-
Visibility	Expert
Values	

The Region ID type of the part.

3.5.2.15 BufferPartComponentIDValue

Name	BufferPartComponentIDValue[BufferPartSelector]
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	

The Component ID type of the part.

3.5.2.16 BufferWidth

Name	BufferWidth[BufferPartSelector]
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Width of the data in the buffer in number of pixels.

This information refers for example to the width entry in the GigE Vision image stream data leader. For other technologies, this is to be implemented accordingly.

Corresponds to the `BUFFER_INFO_WIDTH` command of `DSGetBufferInfo` function.

3.5.2.17 BufferHeight

Name	BufferHeight[BufferPartSelector]
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Height of the data in the buffer in number of pixels as configured. For variable size images this is the max Height of the buffer.

For example this information refers to the height entry in the GigE Vision image stream data leader. For other technologies this is to be implemented accordingly.

Corresponds to the `BUFFER_INFO_HEIGHT` command of `DSGetBufferInfo` function.

3.5.2.18 BufferXOffset

Name	BufferXOffset[BufferPartSelector]
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

XOffset of the data in the buffer in number of pixels from the image origin to handle areas of interest.

This information refers for example to the information provided in the GigE Vision image stream data leader. For other technologies this is to be implemented accordingly.

Corresponds to the `BUFFER_INFO_XOFFSET` command of `DSGetBufferInfo` function.

3.5.2.19 BufferYOffset

Name	BufferYOffset[BufferPartSelector]
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

YOffset of the data in the buffer in number of lines from the image origin to handle areas of interest.

This information refers for example to the information provided in the GigE Vision image stream data leader. For other technologies, this is to be implemented accordingly.

Corresponds to the `BUFFER_INFO_YOFFSET` command of `DSGetBufferInfo` function.

3.5.2.20 BufferXPadding

Name	BufferXPadding[BufferPartSelector]
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	Byte
Visibility	Expert
Values	≥0

XPadding of the data in the buffer in number of bytes.

This information refers for example to the information provided in the GigE Vision image stream data leader. For other technologies, this is to be implemented accordingly.

Corresponds to the `BUFFER_INFO_XPADDING` command of `DSGetBufferInfo` function.

3.5.2.21 BufferYPadding

Name	BufferYPadding
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	Byte
Visibility	Expert
Values	≥0

YPadding of the data in the buffer in number of bytes.

This information refers for example to the information provided in the GigE Vision image stream data leader. For other thechnologies, this is to be implemented accordingly.

Corresponds to the `BUFFER_INFO_YPADDING` command of `DSGetBufferInfo` function.

3.5.2.22 BufferFrameID

Name	BufferFrameID
Category	BufferDataInformation
Level	Recommended
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

A sequentially incremented number of the frame.

This information refers for example to the information provided in the GigE Vision image stream block id. For other technologies, this is to be implemented accordingly. The wrap around of this number is transportation technology dependent

Corresponds to the `BUFFER_INFO_FRAMEID` command of `DSGetBufferInfo` function.

3.5.2.23 BufferImagePresent

Name	BufferImagePresent
Category	BufferDataInformation
Level	Optional
Interface	IBoolean
Access	Read
Unit	-
Visibility	Expert
Values	True False

Flag to indicate if the current data in the buffer contains image data.

This information refers for example to the information provided in the GigE Vision image stream data leader. For other technologies, this is to be implemented accordingly.

Corresponds to the `BUFFER_INFO_IMAGEPRESET` command of `DSGetBufferInfo` function.

3.5.2.24 BufferImageOffset

Name	BufferImageOffset
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	Byte
Visibility	Expert
Values	≥0

Offset of the image data from the beginning of the delivered buffer in bytes. Applies for example when delivering the image as part of chunk data or on technologies requiring specific buffer alignment.

Corresponds to the `BUFFER_INFO_IMAGEOFFSET` command of `DSGetBufferInfo` function.

3.5.2.25 BufferPixelFormat

Name	BufferPixelFormat[BufferPartSelector]
Category	BufferDataInformation
Level	Optional
Interface	IEnumeration
Access	Read
Unit	-
Visibility	Expert
Values	Mono1p Mono2p Mono4p Mono8 Mono8s Mono10 Mono10c3a64 Mono10c3p32 Mono10g12 Mono10msb Mono10p Mono10pmsb Mono10s Mono12 Mono12g Mono12msb Mono14 Mono16 R8 G8 B8 RGB8 RGB8_Planar

	RGB8a32 RGBa8 RGB10 RGB10_Planar RGB10g32 RGB10g32msb RGB10p32 RGB10p32msb RGB12 RGB12_Planar RGB16 RGB16_Planar RGB565p BGR10 BGR12 BGR16 BGR565p BGR8 BGRa8 YUV411_8 YUV422_8 YUV8 YCbCr411_8 YCbCr422_8 YCbCr601_411_8 YCbCr601_422_8 YCbCr601_8 YCbCr709_411_8 YCbCr709_422_8 YCbCr709_8 YCbCr8 BayerBG8 BayerGB8 BayerGR8 BayerRG8 BayerBG10 BayerBG10g12 BayerGB10 BayerGB10g12 BayerGR10 BayerGR10g12

	BayerRG10 BayerRG10g12 BayerBG12 BayerBG12g BayerGB12 BayerGB12g BayerGR12 BayerGR12g BayerRG12 BayerRG12g BayerBG16 BayerGB16 BayerGR16 BayerRG16 Raw16 Raw8 Device-specific - GigE Vision Specific: Mono12Packed BayerGR10Packed BayerRG10Packed BayerGB10Packed BayerBG10Packed BayerGR12Packed BayerRG12Packed BayerGB12Packed BayerBG12Packed RGB10V1Packed BGR10V1Packed RGB12V1Packed

Format of the pixels provided by the buffer.

Note that the value list already follows the updated value list of the "PixelFormat" feature from GenICam SFNC 2.0, i.e., this feature does not exactly correspond to the `BUFFER_INFO_PIXELFORMAT` command of `DSGetBufferInfo` function in the GenICam GenTL 1.3 standard. For multipart buffers this corresponds to `BUFFER_PART_INFO_DATA_FORMAT` for PFNC formatted parts.

Note that only a subset of the possible pixel formats is listed here. The complete list of possible standard pixel formats and their detailed layout can be found in the "Pixel Format Naming

Convention (PFNC)" specification hosted by the AIA organisation. Refer to the most recent version of that convention for additional information about the construction of a pixel format name.

3.5.2.26 BufferDeliveredImageHeight

Name	BufferDeliveredImageHeight[BufferPartSelector]
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

The number of lines in the current buffer part as delivered by the transport mechanism. For area scan type images, this is usually the number of lines configured in the device. For variable size linescan images, this number may be lower than the configured image height.

This information refers for example to the information provided in the GigE Vision image stream data trailer. For other technologies, this is to be implemented accordingly.

Corresponds to the `BUFFER_INFO_DELIVERED_IMAGEHEIGHT` command of `DSGetBufferInfo` function and `BUFFER_PART_INFO_DELIVEREDIMAGEHEIGHT` in a `DSGetPartInfo` function

3.5.2.27 BufferDeliveredChunkPayloadSize

Name	BufferDeliveredChunkPayloadSize
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

Size of the valid chunk payload data delivered in the buffer.

This information refers for example to the information provided in the GigE Vision image stream data trailer. For other technologies, this is to be implemented accordingly.

Corresponds to the BUFFER_INFO_DELIVERED_CHUNKPAYLOADSIZE command of DSGetBufferInfo function.

3.5.2.28 BufferChunkLayoutID

Name	BufferChunkLayoutID
Category	BufferDataInformation
Level	Optional
Interface	IInteger
Access	Read
Unit	-
Visibility	Expert
Values	≥0

ID of the chunk data layout delivered in the buffer. Can be used to track changes of the layout data among individual buffers.

This information refers for example to the information provided in the GigE Vision image stream data leader. The chunk layout id serves as an indicator that the chunk layout has changed and the application should re-parse the chunk layout in the buffer. When a chunk layout (availability or position of individual chunks) changes since the last buffer delivered by the device through the same stream, the device MUST change the chunk layout id. As long as the chunk layout remains stable, the camera MUST keep the chunk layout id intact. When switching back to a layout, which was already used before, the camera can use the same id again or use a new id. A chunk layout id value of 0 is invalid. It is reserved for use by cameras not supporting the layout id functionality. The algorithm used to compute the chunk layout id is left as quality of implementation. For other technologies this is to be implemented accordingly.

Corresponds to the `BUFFER_INFO_CHUNKLAYOUTID` command of `DSGetBufferInfo` function.

3.5.2.29 BufferFileName

Name	BufferFileName
Category	BufferDataInformation
Level	Optional

Interface	IString
Access	Read
Unit	-
Visibility	Expert
Values	Any NULL-terminated string

Filename for the file payload data delivered in the buffer.

This information refers for example to the information provided in the GigE Vision image stream data leader. For other technologies, this is to be implemented accordingly. Since this is GigE Vision related information and the filename in GigE Vision is UTF8 coded, this filename is also UTF8 coded.

Corresponds to the `BUFFER_INFO_FILENAME` command of `DSGetBufferInfo` function.

3.5.3 GenICam Control

This chapter provides the necessary features to use the GenICam feature tree of the Buffer module.

Note: In case of discrepancy between the features described in this chapter and the "GenICam Standard text" the GenTL SFNC document prevails.

3.5.3.1 Root

Name	Root
Category	None
Level	Optional
Interface	ICategory
Access	Read
Unit	-
Visibility	Beginner
Values	-

Provides the Root of the GenICam features tree.

3.5.3.2 BufferPort

Name	BufferPort

Category	None
Level	Optional
Interface	IPort
Access	Read/Write
Unit	-
Visibility	Invisible
Values	-

The GenICam port through which the Buffer module is accessed.

Note that BufferPort is a port node (not a feature node) and is generally not accessed by the end user directly.

Note that according to the GenICam GenTL standard, this feature is not mandatory. However, if this feature is provided, also the features “BufferData” and “BufferUserData” are mandatory.

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