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Interface Protocol
GenICam
weCat3D Sensoren



GEN<i>CAM

EN

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1 Use for Intended Purpose

According to the GenICam standard, all device features are defined in GenTL as APIs and organized into five layered modules: System, Interface, Local Device, Remote Device, and DataStream. Each module provides a GenAPI-compliant XML file detailing its features.

This document describes the GenTL features for weCat3D under different modules and categories. These features are either standard and applicable to wecat3d_gentl, or customfeatures specific to wecat3d_gentl. For more information on standard feature naming conventions, feature meanings, and related topics, please refer to the GenICam SFNC (Standard Features Naming Convention) documentation.

2 System Module

2.1 SystemInformation

Feature Name	TLID
Access Mode	Read only
Interface Type	IString
Visibility	Expert
Description	Unique identifier of the GenTL Producer like a GUID.

Feature Name	TLVendorName
Access Mode	Read only
Interface Type	IString
Visibility	Expert
Description	Name of the GenTL Producer vendor.

Feature Name	TLModelName
Access Mode	Read only
Interface Type	IString
Visibility	Beginner
Description	Name of the GenTL Producer to distinguishdifferent kinds of GenTL Producerimplementations from one vendor. It returns“weCat3D”.

Feature Name	TLVersion
Access Mode	Read only
Interface Type	IString
Visibility	Beginner
Description	Vendor specific version string of the GenTL Producer.

Feature Name	TLFileName
Access Mode	Read only
Interface Type	IString
Visibility	Expert
Description	File name including extension of the GenTL Producer. It returns “wecat3d_gentl.cti”.

Feature Name	TLPath
Access Mode	Read only
Interface Type	IString
Visibility	Expert
Description	Full path to the GenTL Producer including filename and extension. For Windows: *C:\ProgramFiles\wenglor\weCat3DGenICam\bin\we-cat3d_gentl.cti* For Linux: */opt/wenglor/wecat3d-genicam/lib/wecat3d_gentl.cti*

Feature Name	TLType
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Expert
Description	Transport layer type of the GenTL Producer implementation.

Feature Name	GenTLVersionMajor
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Value	>0
Description	Major version number of the GenTL specification the GenTL Producer implementation complies with.

Feature Name	GenTLVersionMinor
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Value	≥0
Description	Minor version number of the GenTL specification the GenTL Producer implementation complies with.

Feature Name	GenTLSFNCVersionMajor
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Value	>0
Description	Major version number of the GenTL StandardFeatures Naming Convention that was used tocreate the GenTL Producer's XML.

Feature Name	GenTLSFNCVersionMinor
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert

Value	≥0
Description	Minor version number of the GenTL Standard Features Naming Convention that was used to create the GenTL Producer's XML.

2.2 InterfaceEnumeration

Feature Name	InterfaceUpdateList
Access Mode	(Read) Write
Interface Type	ICommand
Visibility	Beginner
Description	Updates the internal list of the interfaces. This feature should be readable if the execution cannot be 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.

Feature Name	InterfaceUpdateTimeout
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Expert
Value	>0
Description	Specifies timeout for the InterfaceUpdateList command.

Feature Name	InterfaceSelector
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Beginner
Value	≥0
Description	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.

Feature Name	InterfaceID[InterfaceSelector]
Access Mode	Read only
Interface Type	IString
Visibility	Beginner
Description	GenTL Producer wide unique identifier of the selected interface.

3 Interface Module

3.1 InterfaceInformation

Feature Name	InterfaceID
Access Mode	Read only
Interface Type	IString
Visibility	Expert
Description	GenTL Producer wide unique identifier of the selected interface. Returns same value as the InterfaceID (Beginner level) in System module.

Feature Name	InterfaceType
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	GenTL
Description	Transport layer type of the interface.

3.2 DeviceEnumeration

Feature Name	DeviceSelector
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Expert
Value	≥0
Description	Selects among the different devices available on this interface. The value is updated when “DeviceUpdateList” is executed. Only devices of TYPE “profile-generator” (excluding GigE and smart sensor devices) are included as candidates in this list. The selector is zero-based to match the indexing used in the C interface.

Feature Name	DeviceID[DeviceSelector]
Access Mode	Read only
Interface Type	IString
Visibility	Expert
Description	Interface wide unique identifier of the selected device, which is also a unique identifier for each wenglor device. It consists of DeviceModelName and DeviceSerialNumber joined by an underscore “_”, for example, “MLSL131_000042”. This value only changes on execution of the DeviceUpdateList command.

Feature Name	DeviceVendorName[DeviceSelector]
Access Mode	Read only
Interface Type	IString
Visibility	Expert

Description	Name of the device vendor.

Feature Name	DeviceAccessStatus[DeviceSelector]
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Unknown / ReadWrite / ReadOnly / NoAccess / Busy / OpenReadWrite
Description	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. • NoAccess: Not available to connect due to wrong IP configuration. • Busy: The device is already opened by another host. • OpenReadWrite: Open in Read/Write mode by this GenTL host. **ATTENTION!** This feature DeviceAccessStatus changes value only via the DeviceUpdateList command. That is, when a device is selected and being connected, this feature value will not be updated to OpenReadWrite/OpenReadOnly unless the DeviceUpdateList command is executed.

Feature Name	DeviceSerialNumber[DeviceSelector]
Access Mode	Read only
Interface Type	IString
Visibility	Expert
Description	Serial number of the selected remote device. This value only changes on execution of the DeviceUpdateList command.

Feature Name	DeviceUserID[DeviceSelector]
Access Mode	Read only
Interface Type	IString
Visibility	Expert
Description	User defined identifier of the device. • If FW version <1.3.6 or <2.4.1, DeviceUserID has no value. • If FW version ≥1.3.6 or ≥2.4.1, the DeviceUserID value is retrieved from the device. The value of DeviceUserID (RO) is updated when “DeviceUpdateList” is executed. If the device is being connected, this value will be updated from the Device module's DeviceUserID (RW) when “DeviceUpdateList” is executed.

Feature Name	DeviceIPAddress[DeviceSelector]
Access Mode	Read only

Interface Type	IInteger
Visibility	Expert
Description	IPv4 address of the selected remote device. In case the DeviceForceIP command is executed, the value will be updated from DeviceForceIPAddress. DeviceIPAddress can be used to compose an alternative device ID for establishing a connection. The syntax of such an ID is “#ip#<DeviceIPAddress>”, for example: “#ip#10.10.38.60”.

Feature Name	DeviceSubnetMask[DeviceSelector]
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Description	Subnet mask of the selected remote device. In case the DeviceForceIP command is executed, the value will be updated from DeviceForceSubnetMask.

Feature Name	DeviceGateway[DeviceSelector]
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Description	Gateway IP address of the selected remote device. In case the DeviceForceIP command is executed, the value will be updated from DeviceForceGateway.

Feature Name	DeviceMACAddress[DeviceSelector]
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Description	MAC address of the selected remote device.

Feature Name	DeviceForceIP[DeviceSelector]
Access Mode	Write only
Interface Type	ICommand
Visibility	Expert
Description	Apply the force IP settings (DeviceForceIPAddress, DeviceForceSubnetMask and DeviceForceGateway) in the selected device using the ForceIP command. This command will reboot the device automatically to apply the changes. This command is only accepted by a device showing ReadWrite DeviceAccessStatus.

Feature Name	DeviceForceIPAddress[DeviceSelector]
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Expert

Description	Static IPv4 address (for the ICommand DeviceForceIP) to set. The value is a 32-bit unsigned integer in network byte order. Each byte represents one octet of the IP address.

Feature Name	DeviceForceSubnetMask[DeviceSelector]
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Expert
Description	Static subnet mask (for the ICommand DeviceForceIP) to set. The value is a 32-bit unsigned integer in network byte order. Each byte represents one octet of the device subnet mask.

Feature Name	DeviceForceGateway[DeviceSelector]
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Expert
Description	Static gateway (for the ICommand DeviceForceIP) to set. The value is a 32-bit unsigned integer in network byte order. Each byte represents one octet of the gateway.

4 Device Module

This module, as well as the features inside it, is only available when a physical device is selected and being connected.

4.1 DeviceInformation

Feature Name	DeviceAccessStatus[DeviceSelector]
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Unknown / ReadWrite / NoAccess / Busy / OpenReadWrite
Description	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. • NoAccess: Not available to connect due to wrong IP configuration. • Busy: The device is already opened by another host. • OpenReadWrite: Open in Read/Write mode by this GenTL host. **ATTENTION!** Since this feature DeviceAccessStatus is in the Device module, it is only available when the device is being connected. Therefore the value is always OpenReadWrite. Any real-time status such as connection lost can be read in feature DeviceConnectionStatus.

Feature Name	DeviceConnectionStatus[DeviceSelector]
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Inactive / Active
Description	Connection status of local host to the selected physical (remote) device. This value can be updated either by ICommand UpdateConnectionStatus or EventDeviceLost. Feature DeviceAccessStatus changes value only via DeviceUpdateList command and will not be aware of the real-time connection status. This feature DeviceConnectionStatus is designed to fulfill this purpose.

Feature Name	UpdateConnectionStatus[DeviceSelector]
Access Mode	Write only
Interface Type	ICommand
Visibility	Expert
Description	Actively updates the connection status of the selected remote device (rather than passively via event notification).

5 Remote Device Module

This module, as well as all features inside it, are only available when a physical device is selected and being connected. Most of the features in this module display information about the connected sensor and are therefore hardware dependent.

5.1 DeviceControl

Feature Name	DeviceType
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Guru
Enum Entry	Custom
Description	Returns Custom: Data stream transmitter device.

Feature Name	DeviceScanType
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Linescan3D
Description	Scan type of the device.

Feature Name	DeviceModelName
Access Mode	Read only
Interface Type	IString
Visibility	Beginner
Description	Model of the weCat3D device.

Feature Name	DeviceUserID
Access Mode	Read/Write
Interface Type	IString
Visibility	Beginner
Description	User ID of the device. This feature value is stored on the device and can be modified by the client. The corresponding DeviceUserID (read-only) in the Interface module is updated from this value when “DeviceUpdateList” is executed.

Feature Name	DeviceVendorName
Access Mode	Read only
Interface Type	IString
Visibility	Beginner
Description	Name of the device vendor.

Feature Name	DeviceVersion
Access Mode	Read only
Interface Type	IString
Visibility	Beginner

Description	General version info about the device.

Feature Name	DeviceFirmwareVersion
Access Mode	Read only
Interface Type	IString
Visibility	Beginner
Description	Firmware version info about the device.

Feature Name	DeviceSerialNumber
Access Mode	Read only
Interface Type	IString
Visibility	Expert
Description	Serial number of the device.

Feature Name	DeviceTLType
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Beginner
Enum Entry	Custom
Description	General info about the transport layer type of the device.

Feature Name	DeviceTemperatureSelector
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	CPU
Description	Selects the location of the device where the temperature is measured.

Feature Name	DeviceTemperature[DeviceTemperatureSelector]
Access Mode	Read only
Interface Type	IFloat
Visibility	Expert
Unit	°C
Description	Device temperature at the selected location in degrees Celsius (°C).

Feature Name	DeviceReset
Access Mode	Write only
Interface Type	ICommand
Visibility	Guru
Description	Reset of the device to its power-up state, after which GenTL is disconnected from the device.

Feature Name	DeviceFeaturePersistenceStart

Access Mode	Write only
Interface Type	ICommand
Visibility	Guru
Description	Indicate to the device and GenICam XML to get ready for persisting of all streamable features.

Feature Name	DeviceFeaturePersistenceEnd
Access Mode	Write only
Interface Type	ICommand
Visibility	Guru
Description	Indicate to the device the end of feature persistence.

Feature Name	DeviceRegisterStreamingStart
Access Mode	Write only
Interface Type	ICommand
Visibility	Guru
Description	Prepare the device for register streaming without checking for consistency.

Feature Name	DeviceRegisterStreamingEnd
Access Mode	Write only
Interface Type	ICommand
Visibility	Guru
Description	Announce the end of register streaming. This will perform a register set validation for consistency and activate it.

5.2 ImageFormatControl

This section contains the features related to the format of the transmitted image.

Feature Name	RegionSelector
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Beginner
Enum Entry	Scan3dExtraction0 / Region0
Default	Region0
Description	Selects the Region of interest to control. • If Region0 is selected, the features Width, Height, OffsetX and OffsetY define the size of the ROI on the camera chip in pixels. In this region, only Intensity is available; component Range is not supported. • If Scan3dExtraction0 is selected, it takes feature Width to define the number of points per scan, and uses Height to define the number of profiles included in each image. Each row of the image represents a unique profile acquired from the profile sensor. Both components Range and Intensity are available in this region.

Feature Name	RegionMode[RegionSelector]
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Beginner
Enum Entry	Off / On
Default	• Off when ReginSelector=Region0 • On when RegionSelector=Scan3dExtraction0
Description	This feature acts as a switch between profile mode and camera mode of the remote physical device. In Profile mode, sensor profiles are acquired from the sensor. In Camera mode, the camera image of the sensor is read out from the currently defined ROI. The combination of this value and the selected region determines which mode to set: • If RegionMode[Region0]=Off or RegionMode[Scan3dExtraction0]=On → device is set to Profile Mode. • If RegionMode[Region0]=On or RegionMode[Scan3dExtraction0]=Off → device is set to Camera Mode. The remote device supports only either profile mode or camera mode. Setting RegionMode[Region0]=Off results in RegionMode[Scan3dExtraction0]=On and vice versa. The remote device supports a camera mode acquisition frequency of 1 Hz. Setting RegionMode[Region0]=On will result in updating the feature AcquisitionFrameRate to be Read Only with a value of 1 Hz.

Feature Name	ComponentSelector[RegionSelector]
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Beginner
Enum Entry	Intensity / Range (Range is only available when RegionSelector=Scan3dExtraction0)
Default	Intensity
Description	Selects the component of the selected Region to be transmitted in the output frame. The selected component is enabled/disabled using the feature ComponentEnable. • If Intensity is selected: – When RegionSelector=Scan3dExtraction0 (profile mode), the interface sends intensity values of the scanned profile in Mono10 pixel format. – When RegionSelector=Region0 (camera mode), the intensity values represent the camera image in Mono8 pixel format. • If Range is selected (only available when RegionSelector=Scan3dExtraction0): the interface sends the point cloud in the selected pixel format. The point cloud is composed of points, each defined by three coordinate values: Coor-

	dinateA (X), CoordinateB (Y), CoordinateC (Z). CoordinateA and CoordinateC are derived directly from the scanned profile, either in native point cloud format or scaled to 16-bit integers (see feature PixelFormat for details). Some pixel values are invalid, e.g. out of measuring range; refer to Scan3dInvalidDataFlag and Scan3dInvalidDataValue for filtering of invalid data. CoordinateB is not obtained from the scanned data but is derived from timestamp, encoder value, or Frame ID. Details on CoordinateB and Scan3dCoordinateSource are explained in the Scan3dControl category.

Feature Name	ComponentEnable[RegionSelector][ComponentSelector]
Access Mode	Read/Write*
Interface Type	IBoolean
Visibility	Beginner
Value	0 / 1
Default	1
Description	Enables (1) / disables (0) sending the selected component in the output frame. *When RegionSelector=Region0, the ComponentEnable[Intensity] is Read Only and has value 1.

Feature Name	PixelFormat[RegionSelector][ComponentSelector]
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Beginner
Enum Entry	Mono8 / Mono10 / Coord3D_ABC32f / Coord3D_ABC16 / Mono16
Default	• Mono8 when RegionSelector=Region0, CompoentSelector=Intensity • Mono10 when RegionSelector=Scan3dExtraction0, CompoentSelector=Intensity
Description	Specifies the image format sent to the client. When Region0 is selected: Mono8 is the PixelFormat for the Intensity component. When Scan3dExtraction0 is selected: Mono10 is the PixelFormat for the Intensity component. For the Range component, PixelFormat can be set to Coord3D_ABC32f, Coord3D_ABC16 or Mono16. • Mono8: Grayscale camera image; each pixel is an 8-bit integer. • Mono10: Intensity values of the scanned profile; each pixel is a 10-bit integer. • Coord3D_ABC32f: Native point cloud format; A (X), B (Y), C (Z) each as a 32-bit float. • Coord3D_ABC16: 16-bit integer values for A, B, C. Less precision than Coord3D_ABC32f but smaller data size. Coordinate values in mm: – *X(i) [mm] = PixelValue[i].x × Scan3dCoordinateScale[CoordinateA] + Scan3dCoordinateOffset[CoordinateA]*

	– *Y(i) [mm] = PixelValue[i].y × Scan3dCoordinateScale[CoordinateB] + Scan3dCoordinateOffset[CoordinateB]* – *Z(i) [mm] = PixelValue[i].z × Scan3dCoordinateScale[CoordinateC] + Scan3dCoordinateOffset[CoordinateC]* where “i” is the pixel index (column) for each row, and each row represents a unique profile. • Mono16 Single-channel (Z only) grayscale image; each pixel is a 16-bit unsigned integer. Smallest data size. Z-coordinate in mm: – *Z(i) [mm] = PixelValue(i) × Scan3dCoordinateScale[CoordinateC] + Scan3dCoordinateOffset[CoordinateC]* The X-position for each pixel is not stored explicitly but can be calculated from its pixel index: • *X(i) [mm] = i × Scan3dCoordinateScale[CoordinateA] + Scan3dCoordinateOffset[CoordinateA]* • *Y(i) [mm] = j × Scan3dCoordinateScale[CoordinateB] + Scan3dCoordinateOffset[CoordinateB]* where “j” is the row index. For more details, refer to the Scan3dControl category.

Feature Name	ComponentIDValue[RegionSelector][ComponentSelector]
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Description	Returns a unique identifier value that corresponds to the type of the component selected by ComponentSelector. • If ComponentSelector = Intensity → ID = 1 • If ComponentSelector = Range → ID = 4

Feature Name	Width[RegionSelector]
Access Mode	Read/Write*
Interface Type	IInteger
Visibility	Beginner
Enum Entry	Min: 32 pixels, Max: WidthMax**
Default	MLSL: 1280 MLWL: 2048
Description	• If RegionSelector=Region0: defines the width of the selected ROI in pixels. • If RegionSelector=Scan3dExtraction0: defines the number of points per scan. By default Width[Scan3dExtraction0] = Width[Region0], unless SignalEnable = First_and_Second, where Width[Scan3dExtraction0] = 2 × Width[Region0]. DecimationHorizontal affects Width as well. For example, setting DecimationHorizontal to 2 will reduce Width by half.

	*Width[Scan3dExtraction0] is Read Only; Width[Region0] is Read/Write. **WidthMax is not a fixed value. It varies depending on DecimationHorizontal and OffsetX. Default WidthMax: 1280 (MLSL), 2048 (MLWL). WidthMax[Region0] is updated automatically when OffsetX or DecimationHorizontal changes: *WidthMax[Region0] = SensorWidthMax / DecimationHorizontal − OffsetX*

Feature Name	Height[RegionSelector]
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Beginner
Value	Depends on the Region selected in RegionSelector (see Description)
Default	• 1280 (MLSL) | 2048(MLWL) , if RegionSelector=Region0 • 1, if RegionSelector=Scan3dExtraction
Description	• If RegionSelector=Region0: defines the height of the selected ROI in pixels. The ROI size affects the sensor's maximum measurement rate. Value — MLSL/MLWL: Min: 32, Max: HeightMax* DecimationVertical affects Height[Region0]. Setting DecimationVertical to 2 will reduce Height[Region0] by half. • If RegionSelector=Scan3dExtraction0: defines the number of profiles included in each frame. Each row represents a unique profile. Value — MLSL/MLWL: 1...10000 (default = 1) *HeightMax[Region0] is not a fixed value. It varies depending on DecimationVertical and OffsetY. *HeightMax[Region0] = SensorHeightMax / DecimationVertical − OffsetY* The interface sends a frame only when the number of received profiles reaches Height[Scan3dExtraction0], or when a timeout is triggered. In case of timeout, the frame is sent as-is with only the received profiles; remaining rows are set to 0.

Feature Name	OffsetX[RegionSelector]
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Beginner
Value	Min: 0, Max: OffsetXMax*
Default	0
Description	• If RegionSelector=Region0: defines the X offset of the ROI in pixels. • If RegionSelector=Scan3dExtraction0: Read Only (not used). *OffsetXMax is not a fixed value. Default: MLSL = 1279 pixels, MLWL = 2047 pixels.

	OffsetXMax = SensorWidthMax / DecimationHorizontal − Width[Region0]

Feature Name	OffsetY[RegionSelector]
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Beginner
Value	Min: 0, Max: OffsetYMax*
Default	0
Description	• If RegionSelector=Region0: defines the Y offset of the ROI in pixels. • If RegionSelector=Scan3dExtraction0: Read Only (not used). Setting OffsetY will update HeightMax automatically. *OffsetYMax is a Read Only invisible feature. Default: MLSL = 1023 pixels, MLWL = 2047 pixels. *OffsetYMax = SensorHeightMax / DecimationVertical − Height[Region0]*

The features Height[Region0], Width[Region0], OffsetX[Region0] and OffsetY[Region0] define the size of the ROI in pixels for the internal camera. The minimum and maximum values depend on hardware. Adjusting the ROI influences the maximum measurement rate.

Width[Region0] sets the number of points in X direction. Reducing Width[Region0] decreases the capture area in X direction and the number of pixels read out from the sensor, allowing the measuring rate to increase and reducing network load.

Height[Region0] sets the capture area in Z (Y in camera coordinate system) direction. Reducing Height[Region0] decreases the working range of the sensor but increases the maximum measurement rate.

OffsetX[Region0] and OffsetY[Region0] define the start position of the capture area in X and Z (i.e. Y in camera coordinate system) direction respectively.

[Image: MLSL — relationship between number of lines and the measurement rate. Number of rows in Width_X are set to 1280.]

For the weCat3D MLSL Profile Sensor, both Width[Region0] and Height[Region0] influence the measuring rate. Reducing the ROI in Width and Height increases the maximum measuring rate. The approximate achievable measuring rate can be calculated as:

Measuring rate [Hz] = 1 × 1000000 / ((0.003458273 × Width_X + 0.073443424) × Height_Z + 56)

NOTICE

The formula gives an approximation valid for Width[Region0] in the range 345...1280. The measuring rate also depends on exposure time and network performance.

[Image: MLWL — relationship between number of lines in Z and the measurement rate.]

For the weCat3D MLWL Profile Sensor, the measuring rate depends on Height[Region0]:

Measuring rate [Hz] = 149359.496817005 × $Height_Z^{-0.8678007147}$

NOTICE

The formula gives an approximation valid for Height[Region0] in the range 64...1024. The measuring rate also depends on the exposure time and network performance. See feature ExposureTime for further details.

NOTICE

The maximum value range of feature AcquisitionLineRate will be updated dynamically based on the given ROI size.

Feature Name	SensorWidth
Access Mode	Read only
Interface Type	IInteger
Visibility	Beginner
Description	Delivers the effective width of the integrated camera in pixels. MLSL: 1024 pixels; MLWL: 2048 pixels

Feature Name	SensorHeight
Access Mode	Read only
Interface Type	IInteger
Visibility	Beginner
Description	Delivers the effective height of the integrated camera in pixels. MLSL: 1280 pixels; MLWL: 2048 pixels

Feature Name	DecimationHorizontal
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Expert
Value	MLSL: 1...1280 MLWL: 1 / 2
Default	1
Description	Horizontal sub-sampling of the image. Reduces the horizontal resolution (width) by the specified decimation factor. A value of 1 indicates no horizontal decimation. • For MLSL: if subsampling is applied to reduce the number of pixels in the CMOS line (X-direction), for example by half, the effective range in X remains unchanged (only the resolution is reduced), and the measuring rate can be doubled. • For MLWL: setting to 2 decreases only the amount of transmitted data; it has no impact on the measuring rate.

Feature Name	DecimationVertical
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Expert
Value	1 / 2
Default	1
Description	Vertical sub-sampling of the image. Reduces the vertical resolution (height) by the specified decimation factor. A value of 1 indicates no vertical decimation. If set to 2, every second line of the camera chip is read out, doubling the measuring rate. This may reduce resolution.

5.3 TransportLayerControl

Feature Name	PayloadSize
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Unit	B (bytes)
Description	Provides the number of bytes transferred for each frame on the stream channel. This includes any end-of-line, end-of-frame statistics or other stamp data. This is the total size of data payload for a data block.

Feature Name	GenDCStreamingMode
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Guru
Enum Entry	On
Description	Controls the device's streaming by GenDC format.

Feature Name	GenDCStreamingStatus
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Guru
Enum Entry	On
Description	Returns the device's streaming mode.

Feature Name	GenDCFlowMappingTable
Access Mode	Read only
Interface Type	IRegister
Visibility	Guru
Description	Returns the GenDC Container data flow mapping table that will be used to transport the GenDC Container.

Feature Name	GenDCDescriptor
Access Mode	Read only
Interface Type	IRegister
Visibility	Guru
Description	Returns a prefetched GenDC Descriptor that can be used as reference for the data to be streamed out by the device in its current configuration. This information can be used to set up the receiver in advance to be ready for incoming data containers.

5.4 AcquisitionControl

This section contains the features related to image acquisition, including trigger and exposure control.

Feature Name	AcquisitionMode
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Beginner
Enum Entry	Continuous / SingleFrame
Default	Continuous
Description	Defines the acquisition mode of the interface. • In Continuous mode, once the interface receives the StartAcquisition command from the client, it keeps sending images until the client sends a StopAcquisition command. • In SingleFrame mode, the interface sends only one image per StartAcquisition command and the client does not need to send a StopAcquisition command.

Feature Name	AcquisitionLineRate
Access Mode	Read/Write*
Interface Type	IFloat
Visibility	Beginner
Value	• MLSL: 10...4000 Hz (from FW v1.0.10: 1...4000 Hz) • MLWL: 10...6000 Hz (from FW v1.0.10: 1...6000 Hz) Max: MaxFps**
Unit	Hz
Default	MLSL: 205 MLWL: 178
Description	Defines the measurement rate of the sensor in Hz (number of measured profiles per second). AcquisitionLineRate is only considered if the LineStart trigger mode is Off (internal trigger mode). In other trigger modes, the measurement rate depends on input signals and the value of TriggerDivider. *In camera mode, AcquisitionLineRate has value 1.0 and is Read Only. **The maximum value is determined by the hidden feature MaxFps, which is hardware dependent and influenced by ExposureTime and the active ROI size. **NOTE:** If AcquisitionLineRate is set to a large value without considering the ROI size, the sensor may fail to send reliable profiles.

Feature Name	ExposureTime
Access Mode	Read/Write
Interface Type	IFloat
Visibility	Beginner
Value	0...100000

Unit	µs
Default	150
Description	Sets the exposure time of the integrated camera in µs. For further information see the weCat3D MLSL/ MLWL Profile Sensors Operating Instructions.

The allowed values for AcquisitionLineRate and ExposureTime are interdependent and must satisfy:

1000000 × (1 / AcquisitionLineRate) ≥ ExposureTime + 40 (µs)

Feature Name	TriggerSelector
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Beginner
Enum Entry	LineStart / FrameStart / AcquisitionActive
Default	LineStart
Description	Selects the trigger function to configure. • LineStart: Defines the trigger settings to generate a single profile. • FrameStart: Defines the trigger settings to generate a frame (an image where each row represents a scanned profile). The number of profiles in a frame is defined in Height[Scan3dExtraction0]. • AcquisitionActive: Acts as a global trigger enable/disable. For more information refer to features TriggerSource and TriggerMode.



⚠ CAUTION

It is not possible to select the same line trigger source in “LineStart” and “FrameStart”, and it is not possible to activate both “FrameStart” and “AcquisitionActive” simultaneously since both modes share the same sensor resources.

For further information, refer to the “Profile enable” pin function in chapter “I/O Settings” in the weCat3D MLSL/MLWL Profile Sensors Operating Instructions.

The following examples illustrate the relationship between “LineStart” and “FrameStart”.

Example 1:

Height[Scan3dExtraction0] = 5

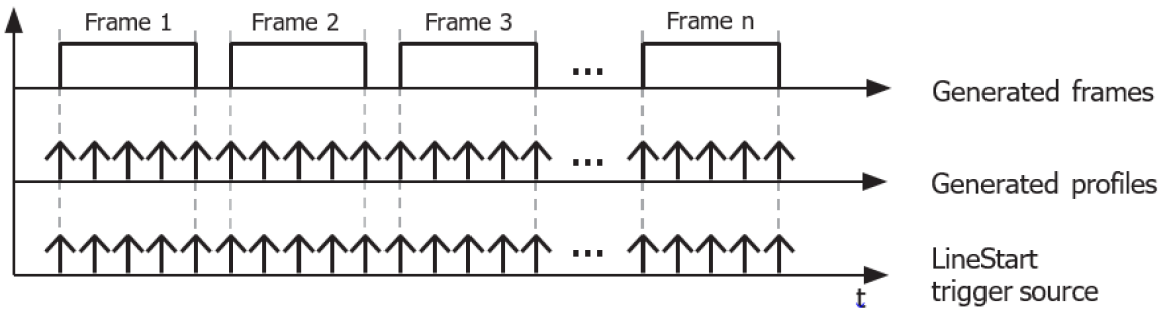
TriggerSelector = LineStart

TriggerMode[LineStart] = On and TriggerSource[LineStart] = any Line, Encoder or Software

OR TriggerMode[LineStart] = Off (Internal triggering)

TriggerSelector = FrameStart; TriggerMode[FrameStart] = Off

TriggerSelector = AcquisitionActive; TriggerMode[AcquisitionActive] = Off



Example 2:

Height[Scan3dExtraction0] = 5

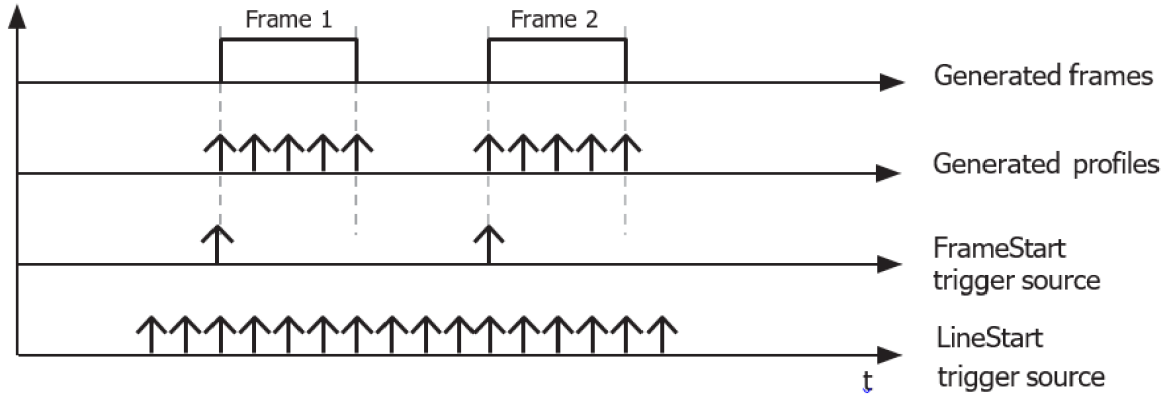
TriggerSelector = LineStart

TriggerMode[LineStart] = On and TriggerSource[LineStart] = any Line (except Line1), Encoder or Software

OR TriggerMode[LineStart] = Off (Internal triggering)

TriggerSelector = FrameStart; TriggerMode[FrameStart] = On; TriggerSource[FrameStart] = Line1

TriggerSelector = AcquisitionActive; TriggerMode[AcquisitionActive] = Off



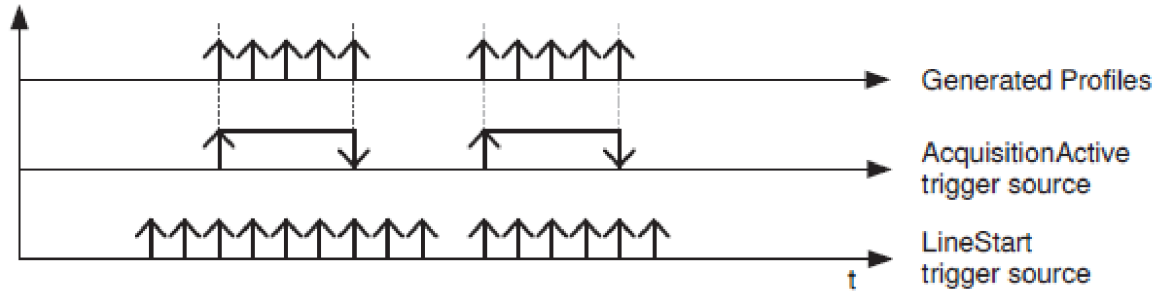
Example 3:

Height[Scan3dExtraction0] = 1

TriggerSelector = LineStart; TriggerMode[LineStart] = Off

TriggerSelector = FrameStart; TriggerMode[FrameStart] = Off

TriggerSelector = AcquisitionActive; TriggerMode[AcquisitionActive] = On; TriggerSource[AcquisitionActive] = Line3



Feature Name	TriggerMode[TriggerSelector]
Access Mode	Read/Write*
Interface Type	IEnumeration
Visibility	Beginner
Enum Entry	On / Off
Default	Off
Description	Switches the selected trigger function on or off. • If LineStart is selected: – Off: Sensor is in internal trigger mode; generates profiles according to AcquisitionLineRate.

	– On: Sensor generates profiles from the source defined in TriggerSource. • If FrameStart is selected: – Off: Frames are sent continuously without waiting for a frame trigger signal. – On: Sensor starts one frame only when a new trigger signal defined in TriggerSource is received. • If AcquisitionActive is selected: – On: Global enable is activated. – Off: Global disable is activated. *If TriggerMode[AcquisitionActive] is On, then TriggerMode[FrameStart] is Read Only, and vice versa.



⚠ CAUTION

It is not possible to switch On both FrameStart and AcquisitionActive at the same time, because both trigger functions share some of the sensor's resources.

Feature Name	TriggerSource[TriggerSelector]
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Beginner
Enum Entry	Line1 / Line2 / Line3 / Line4 / Encoder1 / Encoder2 / Software
Default	Software
Description	Line1...Line4: Depending on the selected trigger function: • LineStart: sensor generates a profile when the selected line is activated (SyncIn mode). • FrameStart: sensor sends one frame each time the selected line is activated (fixed mode). • AcquisitionActive: sensor generates profiles as long as the selected line is active (ProfileEnable mode). The availability of selectable lines depends on Line Exclusivity and LineMode Constraint (see below). • Encoder1: Only available in LineStart function. The sensor generates a profile with each HTL encoder step. • Encoder2: Only available in LineStart function. The sensor generates a profile with each TTL encoder step. • Software: Available in LineStart and FrameStart functions. The sensor generates a profile or sends a frame each time a software trigger command is received. See feature TriggerSoftware for details.

When selecting a line as trigger source, the following rules must be observed:

- Line Exclusivity: A line cannot be assigned simultaneously to more than one of: TriggerSource[LineStart], TriggerSource[FrameStart], TriggerSource[AcquisitionActive], EncoderSourceA, EncoderSourceB, EncoderResetSource.
- LineMode Constraint must also be satisfied. Refer to feature LineMode for details.

Feature Name	TriggerActivation[TriggerSelector]
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Beginner
Enum Entry	RisingEdge / LevelHigh
Default	RisingEdge
Description	Defines the activation signal. Only available if the selected TriggerSource is Line1...Line4. • If TriggerSelector = LineStart or FrameStart → TriggerActivation = LevelHigh • If TriggerSelector = AcquisitionActive → TriggerActivation = RisingEdge

Feature Name	TriggerDelay[TriggerSelector]
Access Mode	Read/Write
Interface Type	IFloat
Visibility	Expert
Value	0...100000
Unit	µs
Default	0
Description	Sets a constant delay for profile acquisition in µs. The allowed value depends on AcquisitionLineRate and ExposureTime. This feature is not available when TriggerSource=Software.

Feature Name	TriggerDivider[TriggerSelector]
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Expert
Value	0...65535
Default	1
Description	Sets the division factor for the external trigger source. For example, if TriggerDivider is set to 150, the sensor triggers on encoder values 150, 300, 450, and so on. This feature is unavailable when TriggerSource=Software.

Feature Name	TriggerSoftware[TriggerSelector]
Access Mode	Write only
Interface Type	ICommand
Visibility	Beginner

Description	Sends a software trigger command for the selected trigger function (LineStart/FrameStart) to the we-Cat3D Profile Sensor. Only available when TriggerSource=Software.

Feature Name	AcquisitionStart
Access Mode	Write only
Interface Type	ICommand
Visibility	Beginner
Description	Starts the acquisition of profiles (images) from the weCat3D Profile Sensor.

Feature Name	AcquisitionStop
Access Mode	Write only
Interface Type	ICommand
Visibility	Beginner
Description	Stops the acquisition of profiles (images) from the weCat3D Profile Sensor.

5.5 DigitalIOControl

This section contains the features related to the control of the input and output pins of the device.

Feature Name	LineSelector
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Line1 / Line2 / Line3 / Line4
Default	Line1
Description	Selects the user I/O to be configured.

Feature Name	LineMode[LineSelector]
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Input / Output
Description	Defines the selected line as input or output.

LineMode Constraint:

- If a line source is selected for Trigger or Encoder, then it operates as input LineMode. In this case, LineMode = Output is not allowed.
- If a line is already configured as Output, it should not be available for other source selection.

Feature Name	LineInverter[LineSelector]
Access Mode	Read/Write
Interface Type	IBoolean
Visibility	Expert
Value	0 / 1
Description	Controls the signal inversion of the selected line. Only available if the selected line is configured as “Input”.

Feature Name	LineStatus[LineSelector]
Access Mode	Read only
Interface Type	IBoolean
Visibility	Expert
Value	0 / 1
Description	Displays the current status of the selected line. 1 = signal level is High 0 = signal level is Low.

Feature Name	LineSource[LineSelector]
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	UserOutput / Timer1Active
Description	Defines the control of the output signal for the selected line. Only available if the LineMode of the selected line is “Output”. • UserOutput: allows the user to activate the output signal manually. • Timer1Active: the output signal is activated by Timer1. See category CounterAndTimerControl for details.

Feature Name	UserOutputValue[LineSelector]
Access Mode	Read/Write
Interface Type	IBoolean
Visibility	Expert
Value	0 / 1
Description	Activates the signal of the selected line. • 0 = normally open • 1 = normally closed. Only available when the selected line is LineMode=Output and LineSource=UserOutput.

Feature Name	OutputFunction[LineSelector]
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	PushPull / PNP / NPN
Description	Controls the electrical format of the selected line. Only available when the selected line is “Output”. Refer to the weCat3D MLSL/MLWL Profile Sensors Operating Instructions for details.

Feature Name	InputLoad[LineSelector]
Access Mode	Read/Write
Interface Type	IBoolean

Visibility	Expert
Value	0 / 1
Description	Controls the electrical configuration of the selected user line. Enables/disables the extra load on the I/O input to get a defined 0 level (helpful for some PLC hardware). Only available when the selected line is “Input”. Refer to the weCat3D MLSL/MLWL Profile Sensors Operating Instructions for details.

Feature Name	LineStatusAll
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Description	Returns the current status of all available Line signals at the time of polling in a single bitfield. • bit 0: Line1 • bit 1: Line2 • bit 2: Line3 • bit 3: Line4

5.6 CounterAndTimerControl

Feature Name	TimerSelector
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Timer1
Description	Selects the timer to be configured. See the example at the end of this section.

Feature Name	TimerTriggerSource[TimerSelector]
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	LineTrigger
Description	Selects the trigger source for starting the timer.

Feature Name	TimerDuration[TimerSelector]
Access Mode	Read/Write
Interface Type	IFloat
Visibility	Expert
Value	0...100000
Unit	µs
Default	1000
Description	Defines the active signal duration (in µs) of the timer. **NOTE!** The sum of TimerDuration and TimerDelay must be smaller than AcquisitionLineTime.

Feature Name	TimerDelay[TimerSelector]
Access Mode	Read/Write
Interface Type	IFloat
Visibility	Expert
Value	0...100000
Unit	µs
Default	0
Description	Defines the delay (in µs) between triggering and activating the timer.

Example:

Configure E/A4 to output a signal controlled by Timer1 (TimerDuration = 1000 µs, TimerDelay = 5000 µs):

Setting in DigitalIOControl:

LineSelector = Line4 | LineMode = Output | LineSource = Timer1Active

Setting in CounterAndTimerControl:

TimerSelector = Timer1 | TimerTriggerSource = LineTrigger | TimerDuration = 1000 µs | TimerDelay = 5000 µs

5.7 EncoderControl

It is possible to connect two types of encoders to the profile sensor: HTL encoder through E/A1 and E/A2, and TTL encoder through the specific input pins. Only one encoder can trigger the sensor in the “LineStart” function. Refer to the weCat3D MLSL/MLWL Profile Sensors Operating Instructions for connection and activation details.

Feature Name	EncoderSelector
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Encoder1 / Encoder2
Default	Encoder1
Description	Selects the encoder to be configured. Encoder1 refers to the HTL encoder; Encoder2 refers to the TTL encoder.

Feature Name	EncoderSourceA[EncoderSelector]
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Line1 / Off
Default	Line1
Description	Selects the input line for encoder A signal. Only available for Encoder1 (HTL). The Line1 selection must follow the line exclusivity and line mode constraint. Refer to feature TriggerSource for details.

Feature Name	EncoderSourceB[EncoderSelector]
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Line2 / Off

Default	Line2
Description	Selects the input line for encoder B signal. Only available for Encoder1 (HTL). The Line2 selection must follow the line exclusivity and line mode constraint. Refer to feature TriggerSource for details.



NOTICE

If EncoderSourceA or EncoderSourceB are switched off, the HTL encoder is deactivated and the sensor can be triggered through the TTL encoder.

Feature Name	EncoderOutputMode
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	PositionUp / PositionDown / DirectionUp / DirectionDown / Motion
Default	Motion
Description	• PositionUp: Triggers the sensor only in one direction (counting up) and only if the new encoder value is higher than the last highest value. • PositionDown: Same as PositionUp, but in the opposite direction. • DirectionUp: Triggers in one direction without considering the last position. • DirectionDown: Same as DirectionUp, but in the opposite direction. • Motion: Triggers in each direction (counting up or down).

Feature Name	EncoderResetSource
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Line1 / Line2 / Line3 / Line4 / Off
Default	Off
Description	Selects the signal to reset both encoders. The line selection must follow the line exclusivity and line mode constraint. Refer to feature TriggerSource for details.

Feature Name	EncoderResetActivation
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	AnyEdge / RisingEdge / FallingEdge
Default	AnyEdge
Description	Selects the activation mode of the EncoderResetSource signal.

Feature Name	EncoderReset
Access Mode	Write only
Interface Type	ICommand
Visibility	Expert
Description	Software command to reset both encoders.

Feature Name	EncoderValue[EncoderSelector]
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Default	0
Description	Displays the current encoder value of the selected encoder.

5.8 ProfileControl

Feature Name	SignalEnable
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	First / Second / FirstAndSecond
Default	First
Description	The sensor acquires internally two peaks. Based on this feature value, the sensor provides the corresponding profile. The selection of SignalEnable determines the number of points per profile. • If SignalEnable = First or Second: the sensor outputs the first or second profile respectively. • *Width[Scan3dExtraction0] = Width[Region0]* • If SignalEnable = FirstAndSecond: the sensor outputs both profiles, containing twice the number of points. • *Width[Scan3dExtraction0] = 2 × Width[Region0]* For further information see the weCat3D MLSL/MLWL Profile Sensors Operating Instructions.

Feature Name	SignalSelection
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Top / Strength / SignalWidth / Bottom
Default	Strength
Description	Sorts the signals received by the internal camera according to one of the listed criteria (top, strength, width, bottom) to assign them to Signal1 and Signal2. For further information see the weCat3D MLSL/MLWL Profile Sensors Operating Instructions.

Feature Name	SignalWidthMin
Access Mode	Read/Write

Interface Type	IInteger
Visibility	Expert
Value	0...63 pixels
Default	0
Description	Filter that defines the minimum peak width for evaluation in pixels.

Feature Name	SignalWidthMax
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Expert
Value	0...63 pixels
Default	63
Description	Filter that defines the maximum peak width for evaluation in pixels.

Feature Name	SignalStrengthMin
Access Mode	Read/Write
Interface Type	IInteger
Visibility	Expert
Value	0...1023
Default	20
Description	Defines the minimum signal strength to evaluate the signal.

SignalWidthMax and SignalWidthMin define the maximum and minimum peak width in pixels for evaluation. SignalStrengthMin defines the minimum signal strength threshold.

5.9 ChunkDataControl

The Chunk Data Control defines a number of selectors to access a particular item of a received Chunk. Use ChunkData instead of ExtraData to retrieve data (such as encoder value or state of the E/A pins) related to each scan line (row) in the received image. ChunkData is implemented according to the latest GenICam standard.

Feature Name	ChunkModeActive
Access Mode	Read/Write
Interface Type	IBoolean
Visibility	Expert
Value	0 / 1
Default	1
Description	Activates (1) / deactivates (0) the inclusion of Chunk data in the payload of the image.

Feature Name	ChunkSelector
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	CounterValue / EncoderValue / LineStatusAll
Default	CounterValue

Description	Selects the chunk feature (ChunkCounterValue, ChunkEncoderValue or ChunkLineStatusAll) to enable or control.

Feature Name	ChunkEnable[ChunkSelector]
Access Mode	Read/Write
Interface Type	IBoolean
Visibility	Expert
Value	0 / 1
Default	1
Description	Enables (1) / disables (0) the selected chunk feature to be transmitted with the data stream. Each chunk can be enabled or disabled using ChunkSelector and ChunkEnable.

Feature Name	ChunkComponentSelector
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Intensity / Range
Default	Intensity
Description	Selects the component from which to retrieve data. Using this selector it is possible to read and map chunk data to the individual components.

Feature Name	ChunkComponentIDValue[ChunkComponentSelector]
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Description	Returns a unique identifier value that corresponds to the type of component selected by ChunkComponentSelector.

Feature Name	ChunkCounterValue
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Description	Returns the value of the picture counter of the selected line (row) in the received data.

Feature Name	ChunkLineStatusAll
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Description	Returns the value of LineStatusAll in the received data. Encodes the state of all lines E/A1...E/A4 at the time of generating the profile:

	• bit 0: E/A1 status • bit 1: E/A2 status • bit 2: E/A3 status • bit 3: E/A4 status

Feature Name	ChunkEncoderValue
Access Mode	Read only
Interface Type	IInteger
Visibility	Expert
Default	0
Description	Returns the value of the activated encoder.

Feature Name	ChunkScan3dCoordinateSelector
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	CoordinateA / CoordinateB / CoordinateC
Default	CoordinateB
Description	Selects an individual chunk coordinate in the 3D information/transformation.

Feature Name	ChunkScan3dCoordinateScale[ChunkScan3dCoordinateSelector]
Access Mode	Read only
Interface Type	IFloat
Visibility	Expert
Description	Returns the value of the ChunkScan3dCoordinateScale for the selected coordinate.

Feature Name	ChunkScan3dCoordinateOffset[ChunkScan3dCoordinateSelector]
Access Mode	Read only
Interface Type	IFloat
Visibility	Expert
Description	Returns the value of the ChunkScan3dCoordinateOffset for the selected coordinate.

Feature Name	ChunkScan3dOutputMode
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	CalibratedABC_Grid
Description	Returns the calibration mode of the payload image.

5.10 Scan3DControl

This section contains the features related to the control of the 3D scan features.

Feature Name	Scan3dDistanceUnit
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Millimeter
Description	Specifies the unit used when delivering calibrated distance data.

Feature Name	Scan3dCoordinateSystem
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Cartesian
Description	Specifies the coordinate system to use for the device.

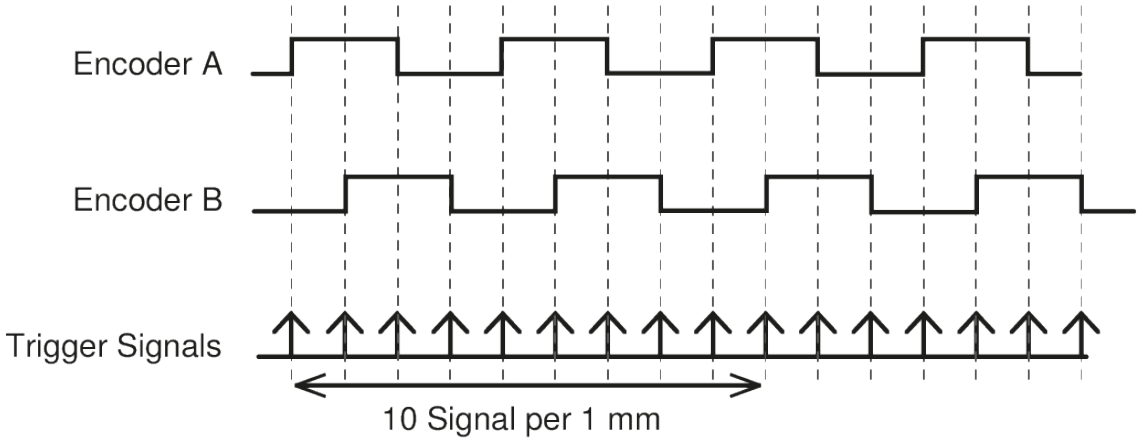
Feature Name	Scan3dOutputMode
Access Mode	Read only
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	CalibratedABC_Grid
Description	Controls the calibration and data organization of the device and the coordinates transmitted.

Feature Name	Scan3dCoordinateSelector
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	CoordinateA / CoordinateB / CoordinateC
Default	CoordinateB
Description	Selects the individual axis for 3D information/transformation. • CoordinateA = X axis • CoordinateB = Encoder/Timestamp/FrameID (Y) axis • CoordinateC = Z axis

Feature Name	Scan3dCoordinateScale[Scan3dCoordinateSelector]
Access Mode	Read/Write (see conditions below)
Interface Type	IFloat
Visibility	Expert
Default	If PixelFormat=Corord3D_ABC32f: • CoordinateA: 1.0 • CoordinateB: 0.01 • CoordinateC: 1.0

Description	Scale factor used to transform a pixel value (CoordinateA and CoordinateC) and Encoder/Timestamp/FrameID value (CoordinateB) into mm coordinates. Values vary based on selected PixelFormat and Scan3dCoordinateSelector: • Coord3D_ABC32f: – CoordinateA: 1 (RO) – CoordinateB: 0.01 (R/W) – CoordinateC: 1 (RO) • Coord3D_ABC16: – CoordinateA: (axisMax[A] – axisMin[A]) / 65535.0 (RO) – CoordinateB: 0.01 (R/W) – CoordinateC: (axisMax[C] – axisMin[C]) / 65535.0 (RO) • Mono16: – CoordinateA: axisMax[A] × 2 / SensorWidth (RO) – CoordinateB: 0.01 (R/W) – CoordinateC: (axisMax[C] – axisMin[C]) / 65535.0 (RO)

There are three ways to compute the Y coordinate (CoordinateB): using Encoder, Timestamp or FrameID. Scan3dCoordinateScale[CoordinateB] is independent of the selected pixel format.



Example:

If Scan3dCoordinateSource = Encoder and encoder trigger is 10 signals per 1 mm:

Scan3dCoordinateScale = 1/10 = 0.1

If Scan3dCoordinateSource = Timestamp, AcquisitionLineRate = 100 Hz and conveyor belt speed = 10 mm/s:

Scan3dCoordinateScale = (10 [mm/s] / 100 [Hz]) × 10−6 [µs → s] = 0.001

Feature Name	Scan3dCoordinateOffset[Scan3dCoordinateSelector]
Access Mode	Read/Write (see conditions below)
Interface Type	IFloat
Visibility	Expert
Default	If PixelFormat=Corord3D_ABC32f: 0

Description	Offset factor used to transform a pixel value (CoordinateA and CoordinateC) and Encoder/Timestamp/FrameID value (CoordinateB) into mm coordinates. Values vary based on selected PixelFormat and Scan3dCoordinateSelector: • Coord3D_ABC32f: – CoordinateA: 0 (RO) – CoordinateB: 0 (R/W) – CoordinateC: 0 (RO) • Coord3D_ABC16 or Mono16: – CoordinateA: axisMin[A] (RO) – CoordinateB: 0 (R/W) – CoordinateC: axisMin[C] (RO)

Feature Name	Scan3dCoordinateSource[Scan3dCoordinateSelector]
Access Mode	Read/Write
Interface Type	IEnumeration
Visibility	Expert
Enum Entry	Encoder / Timestamp / FrameID
Default	Timestamp
Description	Defines the source used to compute the Y coordinate for the Range component. Only available when CoordinateB is selected in Scan3dCoordinateSelector. • Encoder: Y-coordinate is calculated from the encoder value relative to the first profile in the frame. • Timestamp: Y-coordinate is derived from the timestamp relative to the first profile in the frame. • FrameID: Y-coordinate is derived from the picture counter relative to the first profile in the frame. The Y coordinate can be calculated as: *Y(i) [mm] = Scan3dCoordinateOffset[CoordinateB] + Scan3dCoordinateScale[CoordinateB] × Scan3dCoordinateSource*

Feature Name	Scan3dInvalidDataFlag[Scan3dCoordinateSelector]
Access Mode	Read only
Interface Type	IBoolean
Visibility	Expert
Default	1
Description	Enables (1) / disables (0) the identification of invalid points in the received data. Some pixel values are invalid, e.g. CoordinateA and CoordinateC are both 0, or pixels are outside the working range.

	• Value 0 (False): No specific value is used to indicate missing or invalid points. • Value 1 (True): Scan3dInvalidDataValue defines a special value in CoordinateA, CoordinateB and CoordinateC to mark invalid points.

Feature Name	Scan3dInvalidDataValue[Scan3dCoordinateSelector]
Access Mode	Read only
Interface Type	IFloat
Visibility	Expert
Default	0
Description	This feature has value 0.0. It can be used to identify invalid pixels/points [0, 0, 0] when Scan3dInvalidDataFlag is enabled.

Feature Name	Scan3dAxisMin[Scan3dCoordinateSelector]
Access Mode	Read only
Interface Type	IFloat
Visibility	Expert
Description	The minimum valid transmitted coordinate value of the selected axis. Not available if CoordinateB is selected.

Feature Name	Scan3dAxisMax[Scan3dCoordinateSelector]
Access Mode	Read only
Interface Type	IFloat
Visibility	Expert
Description	The maximum valid transmitted coordinate value of the selected axis. Not available if CoordinateB is selected.

Feature Name	Scan3dAxisMinStart[Scan3dCoordinateSelector]
Access Mode	Read only*
Interface Type	IFloat
Visibility	Expert
Description	The minimum valid transmitted coordinate start value of the selected axis. *Only available when CoordinateA is selected.

Feature Name	Scan3dAxisMaxStart[Scan3dCoordinateSelector]
Access Mode	Read only*
Interface Type	IFloat
Visibility	Expert
Description	The maximum valid transmitted coordinate start value of the selected axis. *Only available when CoordinateA is selected.

6 Migrating from weCat3D GigE into weCat3D GenICam

	weCat3D GigE Interface	weCat3D GenICam
Installation and starting the interface	The user installs the 3rd party application and start it explicitly. If the user wants to connect several weCat3Ds in the client, he needs to start several instances from the application.	The user has to install a driver provided as an EXE (as any other GenTL producer). The GenICam compliant clients will load it automatically without extra action from the user. The user can use the client to connect to several weCat3Ds (if the client supports it) without extra action from the user
ComponentSelector dependency	ComponentSelector is independent from RegionSelector. Does not comply with the GenICam SFNC	depends on the selected region in RegionSelector. It complies with the GenICam SFNC. Example (1), see below
RegionSelector Scan3dExtraction0	It is written as Scan3DExtraction. The name is not complaint with the GenICam SFNC	Scan3dExtraction (this change is needed to be GenICam SFNC complaint)
Line1..4 as TriggerSource	Selecting TriggerSource LineX will setup the LineX internally to be TriggerSource, even if the LineX had another functionality (e.g. EncoderSourceA/B or even an Ouput)	LineX will be visible in TriggerSource only if the following conditions are met: LineX is input LineX is not used for another input function like EncoderSourceA/B or EncoderReset Per default, Line1, Line2 are set as EncoderSourceA/B. Line3 is set as an output. Example (2), see below
Index of Intensity component in Halcon	The index of intensity image in Halcon is 4	The index of intensity image in Halcon is 1. avoid hardcoding the intensity index by using the following Haclon script example (3), see below

(1) The user wants to change the Height of the region Scan3dExtraction0 to be 100

set_framegrabber_param (AcqHandle, 'RegionSelector', 'Scan3dExtraction0')

set_framegrabber_param (AcqHandle, 'Height', 100)

(2) The user wants to use Line1 as TriggerSource

set_framegrabber_param (AcqHandle, 'EncoderSelector', 'Encoder1')

set_framegrabber_param (AcqHandle, 'EncoderSourceA', 'Off')

set_framegrabber_param (AcqHandle, 'EncoderSourceB', 'Off')

set_framegrabber_param (AcqHandle, 'LineSelector', 'Line1')

set_framegrabber_param (AcqHandle, 'LineMode', 'Input')

set_framegrabber_param (AcqHandle, 'LineInverter', 1)

set_framegrabber_param (AcqHandle, 'InputLoad', 1)

set_framegrabber_param (AcqHandle, 'TriggerSelector', 'LineStart')

set_framegrabber_param (AcqHandle, 'TriggerMode', 'On')

set_framegrabber_param (AcqHandle, 'TriggerSource', 'Line1')
Then the user should be able to see the Line1 as an option in TriggerSource

(3)
index := find(ImageContents,'image') + 1
select_obj (Image, Intensity, index)