This firmware release note is applicable to:

- Prosilica GT, GC, GB, GE, GS, GX
- Manta
- Mako G

PvAPI

PvAPI: given only where naming varies in **PvAPI SampleViewer** versus **Vimba Viewer** and third-party software.

User sets

If new firmware contains a new feature or control, saved camera `UserSets` [**PvAPI**: `ConfigFiles`] will be invalidated and erased. Before loading new firmware, backup any used camera `UserSets` [**PvAPI**: see disk icon in SampleViewer to export current settings to file].

Firmware update instructions

For more information on updating the firmware on your GigE camera, see the camera technical manual or the *GigE Firmware Update* application note at https://www.alliedvision.com/en/support/technical-papers-knowledge-base.html

Camera feature reference

A complete listing of camera features including definitions can be found online.

- **Vimba** and third-party software users: *GigE Features Reference*
- **PvAPI** users: *GigE Camera and Driver Attributes* document

https://www.alliedvision.com/en/support/technical-documentation.html

Supported models

Listed camera models include monochrome, color, NIR, and version variants (including hardware revisions). See the firmware loader executable for full list of variants.

Prosilica GS

Prosilica GS models use Prosilica GB firmware. See table 2 for the latest Prosilica GB firmware releases.

Firmware releases at a glance (firmware loader 20464)

Camera family	Model	Firmware version	Release date
Mako	G-040, G-158	01.54.20339	2018-July-11
Prosilica GT	GT2460, GT2460C	01.54.19214	2018-May-01
Manta	G-1236B, G-1236C	01.54.20072	2018-Mar-07
Manta	G-040B, G-040C, G-158B, G-158C	01.54.19767	2018-Jan-31
Prosilica GC	GC660, GC660C, GC1290, GC1290C, GC1380H, GC1380CH, GC1600H, GC1600CH	01.54.19654	2017-Dec-15
Prosilica GC	GC2450, GC2450C	01.54.19678	2017-Dec-15
Mako	G-319B, G-319C, G-507B, G-507C	01.54.18914	2017-Aug-18
Prosilica GT	GT4090, GT4090NIR, GT4096, GT4096NIR, GT5120, GT5120NIR	01.54.19199	2017-Aug-04
Mako	G-131B, G-131C, G-192B, G-192C	01.54.18836	2017-May-02
Mako	G-234B, G-234C	01.54.18318	2017-May-02
Mako	G-030B, G-030C, G-223B, G-223B NIR, G-223C, G-419B, G-419B NIR, G-419C	01.54.18391	2017-Mar-13
Mako	G-503B, G-503C	01.54.18110	2017-Feb-10
Manta	G-223B, G-223B NIR, G-223C, G-419B, G-419B NIR, G-419C	01.54.18163	2017-Jan-27
Prosilica GT	GT2000, GT2000NIR, GT2000C, GT2050, GT2050NIR, GT2050C	01.54.18163	2017-Jan-27
Manta	G-031B, G-031C, G-032B, G-032C, G-033B, G-033C, G-046B, G-046C, G-125B, G-125C, G-145B, G-145B-30fps, G-145B NIR, G-145C, G-145C-30fps, G-146B, G-146C, G-201B, G-201B-30fps, G-201C, G-201C-30fps, G-504B, G-504C	01.44.18241	2016-Dec-16
Manta	G-046B, G-046C, G-146B, G-146C	01.44.18241	2016-Dec-02
Manta	G-895B, G-895C	01.54.18110	2016-Nov-25
Mako G	G-032B, G-032C, G-125B, G-125C	01.54.17933	2016-Oct-23
Manta	G-282B, G-282C, G-283B, G-283C, G-505B, G-505C, G-917B, G-917C	01.54.17624	2016-Aug-12
Prosilica GT	GT1290, GT1290C, GT1380, GT1380C, GT1600, GT1600C, GT1660, GT1660C, GT1910, GT1910C, GT1920, GT1920C, GT2300, GT2300C, GT2450, GT2450C, GT2750, GT2750C, GT3300, GT3300C, GT3400, GT3400C, GT4905, GT4905C, GT4907, GT4907C, GT6600, GT6600C	01.54.17562	2016-Aug-12
Prosilica	GT1930, GT1930C, GT1930L, GT1930LC	01.54.17562	2016-July-06
Manta	G-235B, G-235C, G-319B, G-319C, G-507B, G-507C	01.54.17562	2016-July-06
Mako G	G-050B, G-050C, G-095B, G-095C	01.54.11233	2014-Oct-06
Prosilica GC	GC650, GC650C, GC655, GC655C, GC660, GC660C, GC780, GC780C, GC1020, GC1020C, GC1290, GC1290C, GC1350, GC1350C, GC1380, GC1380C, GC1380H, GC1380CH, GC1600, GC1600C, GC1600H, GC1600CH, GC2450, GC2450C	01.50.01	2013-Jan-04

Table 1: Firmware releases at a glance (firmware loader 20464)

Camera family	Model	Firmware version	Release date
Manta	G-095B, G-095C	01.44.7913	2013-July-22
Prosilica GX	GX1050, GX1050C, GX1660, GX1660C, GX1910, GX1910C, GX1920, GX1920C, GX2300, GX2300C, GX2750, GX2750C, GX3300, GX3300C	01.42.05	2011-Dec-12

Table 1: Firmware releases at a glance (firmware loader 20464) (continued)

Firmware version: 01.54.20339 (release date: 2018-Jul-11)

Supported model

Camera family	Model	Firmware version
Mako	G-040B, G-040C, G-158B, G-158C	01.54.20339

New models

Initial commercial release of Mako G-040B, G-040C,G-158B, and G-158C models

Firmware loader

Released with GigeFirmwareLoader-20464.exe

Firmware version: 01.54.19214 (release date: 2018-May-01)

Supported models

Camera family	Model	Firmware version
Manta	GT2460, GT2460C	01.54.19214

New models

Initial commercial release of Prosilica GT2460, GT2460C (order code 02-xxxx and 06-xxxx)

Firmware version: 01.54.20072 (release date: 2018-Mar-07)

Supported model

Camera family	Model	Firmware version
Manta	G-1236B, G-1236C	01.54.20072

New features and enhancements

- Improved FPGA timing for improved camera reliability

- Improved burst mode frame rate.

	Firmware version 01.54.18183	Firmware version 01.54.20072
Burst mode frame rate	11.4 fps	11.8 fps

- Exposure minimum values and increments have changed since the last firmware release.

Pixel format	Firmware version 01.54.18183	Firmware version 01.54.20072
8-bit and 12-bit formats 16-bit formats 24-bit formats	71 µs to 85.89 s; 28.8 µs increments 90 µs to 85.89 s; 38.32 µs increments 129 µs to 85.89 s; 57.6 µs increments	42 µs to 85.89 s; 27.84 µs increments 51 µs to 85.89 s; 37.04 µs increments 69 µs to 85.89 s; 55.68 µs increments

- Trigger latency values have changed since the last firmware release.

Pixel format	Firmware version 01.54.18183	Firmware version 01.54.20072
8-bit and 12-bit formats 16-bit formats 24-bit formats	86.4 µs 114.95 µs 172.8 µs	83.52 µs 111.12 µs 167.04 µs

- Trigger jitter values have changed since the last firmware release.

Pixel format	Firmware version 01.54.18183	Firmware version 01.54.20072
8-bit and 12-bit formats 16-bit formats 24-bit formats	±14.4 µs ±19.16 µs ±28.8 µs	±13.92 µs ±18.52 µs ±27.84 µs

- Changes to Region of Interest frame rates.

ROI height	Firmware version 01.54.18183	Firmware version 01.54.20072
1200 pixels	24.4 fps	24.3 fps
300 pixels	96.2 fps	96 fps
240 pixels	119.7 fps	118.9 fps
120 pixels	224.0 fps	231.7 fps
60 pixels	365.5 fps	378.1 fps
32 pixels	518.2 fps	536.1 fps
12 pixels	738.8 fps	764.2 fps
4 pixels	890.3 fps	921 fps

Known issues

Gain feature should be set to zero when using ExposureAuto and GainAuto features together. Otherwise exposure value could remain constant.

Firmware version: 01.54.19767 (release date: 2018-Jan-31)

Supported models

Camera family	Model	Firmware version
Manta	G-040B, G-040C, G-158B, G-158C	01.54.19767

New models

Initial commercial release of Manta G-040B, G-040C, G-158B, G-158C (order code E00xxxx and E06xxxx)

Firmware version: 01.54.19654 (release date: 2017-Dec-15)

Supported models

Camera family	Model	Firmware version
Prosilica GC	GC660, GC660C, GC1290, GC1290C, GC1380H, GC1380CH, GC1600H, GC1600CH	01.54.19654

New models

Initial commercial release of Prosilica GC660, GC660C, GC1290, GC1290C, GC1380H, GC1380CH, GC1600H, GC1600CH (order code 06-xxxx)

New features and enhancements

Improved FPGA timing for improved camera reliability (order code 02-xxxx only)

Changes

- Exposure minimum and exposure maximum values have changed since the last firmware release (order code 02-xxxx only).

Model	Firmware version 01.54.16528	Firmware version 01.54.19654
GC660, GC660C	10 µs to 72.4 s; 1 µs increments	10 µs to 72.9 s; 1 µs increments
GC1290, GC1290C	12 µs to 72.9 s; 1 µs increments	12 µs to 72.4 s; 1 µs increments
GC1380H, GC1380CH	10 µs to 72.4 s; 1 µs increments	10 µs to 72.9 s; 1 µs increments

- Gain maximum values have changed since the last firmware release (order code 02-xxxx only).

Model	Firmware version 01.54.16528	Firmware version 01.54.19654
GC1600H, GC1600CH	0 to 32 dB; 1 dB increments	10 to 30 dB; 1 dB increments

Firmware version: 01.54.19678 (release date: 2017-Dec-15)

Supported models

Camera family	Model	Firmware version
Prosilica GC	GC2450, GC2450C	01.54.19678

New models

Initial commercial release of Prosilica GC2450 and GC2450C (order code 06-xxxx)

New features and enhancements

Improved FPGA timing for improved camera reliability (order code 02-xxxx only)

Changes

- Exposure minimum and exposure maximum values have changed since the last firmware release (order code 02-xxxx only).

Model	Firmware version 01.54.16528	Firmware version 01.54.19678
GC2450, GC2450C	49 µs to 38.0 s; 1 µs increments	10 µs to 48.0 s; 1 µs increments

- Gain maximum values have changed since the last firmware release (order code 02-xxxx only).

Model	Firmware version 01.54.16528	Firmware version 01.54.19678
GC2450, GC2450C	0 to 32 dB; 1 dB increments	10 to 24 dB; 1 dB increments

Firmware version: 01.54.18914 (release date: 2017-Aug-18)

Supported models

Camera family	Model	Firmware version
Mako	G-319B, G-319C, G-507B, G-507C	01.54.18914

New features and enhancements

Improved FPGA timing for improved camera reliability

Firmware version: 01.54.19199 (release date: 2017-Aug-04)

Supported models

Camera family	Model	Firmware version
Prosilica GT	GT4090, GT4090NIR, GT4096, GT4096NIR, GT5120, GT5120NIR	01.54.19199

New models

Initial commercial release of Prosilica GT4090, GT4090NIR, GT4096, GT4096NIR, GT5120, GT5120NIR
(order code 02-xxxx and 06-xxxx)

New features and enhancements

- Fixed Pattern Noise Correction (FPNC)
- Enhanced Defect Pixel Correction (DPC) feature with a new **Defective Pixel List Management** tool

Firmware version: 01.54.18836 (release date: 2017-May-02)

Supported models

Camera family	Model	Firmware version
Mako G	G-131B, G-131C, G-192B, G-192C	01.54.18836

Resolved issues

Mako G-131B, G-131C, G-192B, G-192C loses connection after setting the `TriggerSource` to *Line1* and then stopping acquisition.

Firmware version: 01.54.18318 (release date: 2017-May-02)

Supported models

Camera family	Model	Firmware version
Mako G	G-234B, G-234C	01.54.18318

New features and enhancements

Improved FPGA timing for improved camera reliability

Firmware version: 01.54.18391 (release date: 2017-Mar-13)

Supported models

Camera family	Model	Firmware version
Mako G	G-030B, G-030C, G-223B, G-223B NIR, G-223C, G-419B, G-419B NIR, G-419C	01.54.18391

New models

Initial commercial release of Mako G-030B, G-030C, G-223B, G-223B NIR, G-223C (order code E06xxxxx)

New features and enhancements

- Improved registry
- `DeviceUserID` is now accessible via the **Vimba** user interface
- Piecewise Linear (HDR) mode

Resolved issues

- GVCP command drop (no Ack)

- Camera no longer ignores ARP message responses sent to IP Address 0.0.0.0 if that is the camera's current IP address (which it is on power-up)

Firmware version: 01.54.18110 (release date: 2017-Feb-10)

Supported models

Camera family	Model	Firmware version
Mako G	G-131B, G-131C, G-192B, G-192C, G-503B, G-503C	01.54.18110

New features and enhancements

- Improved registry
- `DeviceUserID` is now accessible via the **Vimba** user interface

Resolved issues

- GVCP command drop (no Ack)
- Camera no longer ignores ARP message responses sent to IP Address 0.0.0.0 if that is the camera's current IP address (which it is on power-up)
- Black stripe on top of the image in Mako G-503B

Limitations

- Mako G-503B, G-503C catches two frames with one software trigger
- Mako G-131B, G-131C, G-192B, G-192C loses connection after setting the `TriggerSource` to *line1* and then stopping acquisition

Firmware version: 01.54.18163 (release date: 2017-Jan-27)

Supported models

Camera family	Model	Firmware version
Manta	G-223B, G-223B NIR, G-223C, G-419B, G-419B NIR, G-419C	01.54.18163
Prosilica GT	GT2000, GT2000NIR, GT2000C, GT2050, GT2050NIR, GT2050C	01.54.18163

New features and enhancements

- ToE Action Commands feature
- Piecewise Linear (HDR) mode
- Improved registry
- `DecimationHorizontal` and `DecimationVertical`
- `ReverseX` and `ReverseY`
- `DeviceUserID` is now accessible via the **Vimba** user interface
- IEEE 1588-2008 Precision Time Protocol enhancements
  - `PtpStatus` enumerations updated to IEEE 1588-2008 Precision Time Protocol standard: *Initializing(0), Faulty(1), Disabled(2), Listening(3), PreMaster(4), Master(5), Passive(6), Uncalibrated(7), Slave(8)*

- GevTimestampValue is no longer reset by turning off PTP
- Acquisition is no longer stopped when changing PtpMode
- PtpAcquisitionGateTime now reset to zero when PtpMode is set to *Off*
- EventPtpSyncLost now sent when PtpMode changed
- PtpMode is no longer set to *Off* when PTP synchronization is lost
- PtpMode Auto now correctly finds best master clock
- PTP synchronization drift lessened

- New event added: ExposureStart (ID 40019)

Firmware version: 01.54.18184 (release date: 2016-Dec-16)

Supported models

Camera family	Model	Firmware version
Manta	G-1236B, G-1236C	01.54.18184

New models

Initial commercial release of Manta G-1236B, G-1236C (order code E00xxxx and E06xxxxx)

Firmware version: 01.44.18241 (release date: 2016-Dec-16)

Supported models

Camera family	Model	Firmware version
Manta	G-031B, G-031C, G-032B, G-032C, G-033B, G-033C, G-046B, G-046C, G-125B, G-125C, G-145B, G-145B-30fps, G-145B NIR, G-145C, G-145C-30fps, G-146B, G-146C, G-201B, G-201B-30fps, G-201C, G-201C-30fps, G-504B, G-504C	01.44.18241

New models

Initial commercial release of Manta G-031B, G-031C, G-032B, G-032C, G-033B, G-033C, G-125B, G-125C, G-145B, G-145B-30fps, G-145B NIR, G-145C, G-145C-30fps, G-201B, G-201B-30fps, G-201C, G-201C-30fps, G-504B, G-504C (order code E06xxxxx only)

New features and enhancements

Added ReverseX to monochrome models (Manta G-031B, G-033B, G-046, G-125B, G-146B, G-201B, G-201B-30fps, G-504B). Previously only Manta G-145B, G-145B-30fps, and G-145B NIR had this feature.

Resolved issues

- BayerGR12Packed pixel format changed to BayerRG12Packed
- Chunk data displayed is from the previous frame.
- AutoExposureOnce does not work if ExposureTimeAbs is set to a value less than 100 μs before imaging.
- When BinningVertical > *8* using a packed pixel format, the camera stops responding and requires a power cycle to continue streaming (Manta G-504C).

Limitations

- Manta G-032B: `ReverseX` is not supported
- Manta G-145: Enabling `Binning` with `OffsetY` > 0 stops camera streaming
- Manta G-201-30fps: When selecting an Region of Interest, only even `OffsetX` or `OffsetY` numbers are supported.

Firmware version: 01.44.18241 (release date: 2016-Dec-02)

Supported models

Camera family	Model	Firmware version
Manta	G-046B, G-046C, G-146B, G-146C	01.44.18241

New models

Initial commercial release of Manta G-046B, G-046C, G-146B, G-146C (order code E06xxxxx only)

Firmware version: 01.44.18182 (release date: 2016-Nov-25)

Supported models

Camera family	Model	Firmware version
Manta	G-895B, G-895C	01.54.18110
Manta	G-223B, G-223B NIR, G-223C, G-419B, G-419B NIR, G-419C	01.52.18193
Prosilica GT	GT2000, GT2000NIR, GT2000C, GT2050, GT2050NIR, GT2050C	01.52.18193
Manta	G-031B, G-031C, G-033B, G-033C, G-145B, G-145C	01.44.18182

New models

- Initial commercial release of Manta G-895B, G-895C (order code E00xxxx and E06xxxxx)
- Initial commercial release of Manta G-223B, G-223B NIR, G-223C, G-419B, G-419B NIR, G-419C (order code E06xxxxx only)
- Initial commercial release of Prosilica GT2000, GT2000NIR, GT2000C, GT2050, GT2050NIR, GT2050C (order code 06-xxxx only)
- Initial commercial release of Manta G-031B, G-031C, G-033B, G-033C, G-145B, G-145C (order code E06xxxxx only)

Firmware version: 01.44.18182 (release date: 2016-Nov-17)

Supported models

Camera family	Model	Firmware version
Manta	G-032B, G-032C, G-125B, G-125C, G-201B, G-201C, G-504B, G-504C	01.44.18182

New models

Initial commercial release of Manta G-032B, G-032C, G-201B, G-201C, G-125B, G-125C, G-504B, G-504C (order code E06xxxxx only)

Firmware version: 01.54.18110 (release date: 2016-Nov-02)

Supported models

Camera family	Model	Firmware version
Mako G	G-319B, G-319C	01.54.18110

New models

Initial commercial release of Mako G-319B, G-319C (order code xxxx and xxxx-06)

Limitations

The Mako G-319C does not support `BinningY`

Firmware version: 01.54.17933 (release date: 2016-Oct-21)

Supported models

Camera family	Model	Firmware version
Mako G	G-032B, G-032C, G-125B, G-125C	01.54.17933

New models

Initial commercial release of Mako G-032B, G-032C, G-125B, G-125C (order code xxxx-06 only)

New features and enhancements

Improved registry

Firmware version: 01.54.18032 (release date: 2016-Oct-07)

Supported models

Camera family	Model	Firmware version
Mako G	G-234B, G-234C, G-507B, G-507C	01.54.18032

New models

- Initial commercial release of Mako G-507B, G-507C (order code xxxx and xxxx-06)
- Initial commercial release of Mako G-234B, G-234C (order code xxxx-06 only)

New features and enhancements

- Improved registry
- `DeviceUserID` is now accessible via the **Vimba** user interface
- Exposure related enhancements
  - When `ExposureMode` = *Timed*: Improved accuracy in exposure calculation with deviation < 1 μs, exposure calculation takes into account exposure time error (`tOFFSET`)
  - Partial Fix: When `ExposureMode` = *TriggerWidth*, you will see improved accuracy in exposure calculation with deviation ≤ one `ExposureTimeIncrement`, For a given trigger pulse width, effective exposure duration will be trigger pulse width plus exposure time error (`tOFFSET`)

   Exposure time error (`tOFFSET`) = 13.73 μs from Sony IMX249, IMX264, and IMX265 data sheets.

- Added support for sensor readout mode in Mako G-234B and G-234C models
  - This allows you to choose between 10-bit and 12-bit (default) sensor readout. 10-bit sensor readout can achieve relatively higher frame rates, especially 8-bit pixel formats and also in a small Region of Interest.

Changes

- Frame rates, exposure minimum, exposure maximum values, `ExposureTimeIncrement`, trigger jitter and trigger latency values are updated for Mako G-234B and G-234C.

Specification	Firmware version 01.54.15954 or earlier	Firmware version 01.54.18032 or later
Maximum frame rate	40 fps	41.2 fps
Exposure control	53 μs to 73 s; 19.86 μs increments	52 μs to 71 s; 19.3 μs increments
Trigger latency	69.6 μs	58.2 μs
Trigger Jitter	9.8 μs	9.6 μs

Values previously listed reflect 8-bit pixel formats (Mono8 and BayerRG8) and 10-bit sensor readout mode at full resolution.

Resolved issues

- GVCP command drop (no Ack)

- In auto gain and auto exposure, current value will stay within the range in accordance to minimum and maximum value changes
- Camera no longer ignores ARP message responses sent to IP Address 0.0.0.0 if that is the camera's current IP address (which it is on power-up).
- White flicker at minimum exposure and maximum gain no longer occurs.
- When `ReverseX` is enabled, changing the pixel format to YUV format will keep `Width` less than `WidthMax`.

Limitations

- Pixel format, binning, and decimation are changeable only when the camera is not streaming.
- The Mako G-507C does not support `BinningY`

Firmware version: 01.52.17702 (release date: 2016-Aug-12)

Supported models

Camera family	Model	Firmware version
Mako G	G-419B, G-419B NIR, G-419C	01.52.17702

New models

Initial commercial release of Mako G-419B, G-419B NIR, G-419C (order code xxxx-06 only)

Firmware version: 01.54.17624 (release date: 2016-Aug-12)

Supported models

Camera family	Model	Firmware version
Manta	G-282B, G-282C, G-283B, G-283C, G-505B, G-505C, G-917B, G-917C	01.54.17624

New models

Initial commercial release of Manta G-282B, G-282C, G-283B, G-283C, G-505B, G-505C, G-917B, G-917C standard and board level models (order code E06xxxxx only)

New features and enhancements

- Consolidated firmware update for Manta dual-tap cameras
- Improved registry
- `DeviceUserID` is now accessible via the **Vimba** user interface
- Selectable mode of sensor digitization taps (one-tap or two-tap mode), except Manta G-505B, G505C
- ToE Action Commands feature
- Binning
  - Changed the maximum `BinningX` and `BinningY` value to `4` for Manta G-505B, G-505C
- Added `ReverseX` to all color models
- Temperature readout for sensor board (see Limitations)

- IEEE 1588-2008 Precision Time Protocol enhancements
  - `PtpStatus` enumerations updated to IEEE 1588-2008 Precision Time Protocol standard: *Initializing(0), Faulty(1), Disabled(2), Listening(3), PreMaster(4), Master(5), Passive(6), Uncalibrated(7), Slave(8)*
  - `GevTimestampValue` is no longer reset by turning off PTP
  - Acquisition is no longer stopped when changing `PtpMode`
  - `PtpAcquisitionGateTime` now reset to zero when `PtpMode` is set to *Off*
  - `EventPtpSyncLost` now sent when `PtpMode` changed
  - `PtpMode` is no longer set to *Off* when PTP synchronization is lost
  - `PtpMode Auto` now correctly finds best master clock
  - PTP synchronization drift lessened
- New event added: `ExposureStart` (ID 40019)

Resolved issues

- GVCP command drop (no Ack)
- In auto gain and auto exposure, current value will stay within the range in accordance to minimum and maximum value changes
- When `ReverseX` is enabled, changing the pixel format to YUV format will keep `Width` less than `WidthMax`.

Limitations

- Pixel format, binning, and decimation are changeable only when the camera is not streaming
- IEEE 1588-2008 Precision Time Protocol related limitations
  - PTP in this firmware version has many improvements, some of which cause PTP incompatibility issues with cameras running older firmware versions.
  - When using PTP in a network with cameras running a mix of older and newer PTP firmware, `PtpMode` = *Auto* can not be used, and the master camera (camera with `PtpMode` = *Master*) must be a camera running the newer firmware version.
  - To take full advantage of the latest PTP resolved issues and improvements, it is recommended to upgrade the firmware of the listed supported models.
- The temperature readout for the sensor board does not work as expected. When selected, the temperature is the main board temperature.

Firmware version: 01.54.17562 (release date: 2016-Aug-12)

Supported models

Camera family	Model	Firmware version
Prosilica GT	GT1290, GT1290C, GT1380, GT1380C, GT1600, GT1600C, GT1660, GT1660C, GT1910, GT1910C, GT1920, GT1920C, GT2300, GT2300C, GT2450, GT2450C, GT2750, GT2750C, GT3300, GT3300C, GT3400, GT3400C, GT4905, GT4905C, GT4907, GT4907C, GT6600, GT6600C	01.54.17562

New models

Initial commercial release of Prosilica GT1290, GT1290C, GT1380, GT1380C, GT1600, GT1600C, GT1660, GT1660C, GT1910, GT1910C, GT1920, GT1920C, GT2300, GT2300C, GT2450, GT2450C, GT2750, GT2750C, GT3300, GT3300C, GT3400, GT3400C, GT4905, GT4905C, GT4907, GT4907C, GT6600, GT6600C (order code 06-xxxxx only)

New features and enhancements

- ToE Action Commands feature
- Prosilica GT2450 and GT2450C
    - Aligned features with Firmware version: 01.54.16845 (release date: 2016-May-12)

Limitations

- Black level control is not available for all Prosilica GT CCD cameras
- The following features are not implemented in Prosilica GT quad-tap CCD cameras in single-tap mode:
    - `DecimationHorizontal`
    - `DecimationVertical`
    - `ReverseX`
    - `ReverseY`
- LUTs may have different behaviors for different cameras
- No iris, exposure, gain selectable auto priority
- Dual-tap and single-tap cameras do not support column defect masking
- Tap mode switchability is not supported for Prosilica GT2450, GT2450C
- The following feature is not implemented in dual-tap CCD cameras due to sensor limitations:
    - `ReverseY` (Prosilica GT2450, GT2450C)
- The following features are not implemented in single-tap CCD cameras due to sensor limitations:
    - `ReverseX`, `ReverseY` (Prosilica GT1290, GT1290C, GT1380, GT1380C, GT1600, GT1600C)

Firmware version: 01.54.17562 (release date: 2016-Jul-06)

Supported models

Camera family	Model	Firmware version
Prosilica GT	GT1930, GT1930C, GT1930L, GT1930LC	01.54.17562
Manta	G-235B, G-235C, G-319B, G-319C, G-507B, G-507C	01.54.17562

New models

- Initial commercial release of Prosilica GT1930, GT1930C, GT1930L, GT1930LC (order code 06-xxxxx only)
- Initial commercial release of Manta G-319B, G-319C, G-507B, and G-507C standard and board level models (order code E00xxxxx and E06xxxxx)

New features and enhancements

- Improved registry
- `DeviceUserID` is now accessible via the **Vimba** user interface
- Update for Manta G-235B and G-235C standard and board level models
- BayerRG12Packed pixel format is supported for color cameras (Manta G-235C)
- ToE Action Commands feature
- IEEE 1588-2008 Precision Time Protocol enhancements
  - `PtpStatus` enumerations updated to IEEE 1588-2008 Precision Time Protocol standard: *Initializing(0), Faulty(1), Disabled(2), Listening(3), PreMaster(4), Master(5), Passive(6), Uncalibrated(7), Slave(8)*
  - `GevTimestampValue` is no longer reset by turning off PTP
  - Acquisition is no longer stopped when changing `PtpMode`
  - `PtpAcquisitionGateTime` now reset to zero when `PtpMode` is set to *Off*
  - `EventPtpSyncLost` now sent when `PtpMode` changed
  - `PtpMode` is no longer set to *Off* when PTP synchronization is lost
  - `PtpMode` 'Auto' now correctly finds best master clock
  - PTP synchronization drift lessened
- Exposure related enhancements
  - When `ExposureMode` = *Timed*: Improved accuracy in exposure calculation with deviation < 1 µs, exposure calculation takes into account exposure time error (`tOFFSET`)
  - Partial fix: When `ExposureMode` = *TriggerWidth*: Improved accuracy in exposure calculation with deviation ≤ one `ExposureTimeIncrement`. For a given trigger pulse width, effective exposure duration will be trigger pulse width plus exposure time error (`tOFFSET`).
  - `ExposureTimeIncrement` value now shows decimal values
  - Exposure minimum, exposure maximum values, `ExposureTimeIncrement`, trigger jitter, and trigger latencies are updated

> 💡 Exposure time error (`tOFFSET`) = 13.73 µs from Sony IMX174, IMX264, and IMX265 data sheets.

Resolved issues

- GVCP command drop (no Ack)
- In auto gain and auto exposure, the current value will stay within the range in accordance to minimum and maximum value changes
- Camera no longer ignores ARP message responses sent to IP Address 0.0.0.0 if that is the camera's current IP address (which it is on power-up).
- Manta G-235 board level model with 200 mm flex cable is now stable
- `ReverseX`, `ReverseY` will first flip the image and then applies the Region of Interest
- White flicker at minimum exposure and maximum gain no longer occurs.
- When `ReverseX` is enabled, changing the pixel format to YUV format will keep `Width` less than `WidthMax`.

Limitations

- Pixel format, binning, and decimation are changeable only when the camera is not streaming
- IEEE 1588-2008 Precision Time Protocol related limitations
    - PTP in this firmware version has many improvements, some of which cause PTP incompatibility issues with cameras running older firmware versions.
    - When using PTP in a network with cameras running a mix of older and newer PTP firmware, `PtpMode` = *Auto* can not be used, and the master camera (camera with `PtpMode` = *Master*) must be a camera running the newer firmware version.
    - To take full advantage of the latest PTP resolved issues and improvements, it is recommended to upgrade the firmware of the listed supported models.

Firmware version: 01.54.17455 (release date: 2016-Jul-07)

Supported models

Camera family	Model	Firmware version
Mako G	G-131B, G-131C, G-192B, G-192C, G-503B, G-503C	01.54.17455

New models

Initial commercial release of Mako G-131B, G-131C, G-192B, G-192C, G-503B, G-503C models (order code E06xxxx only)

Allied Vision

Firmware version: 01.54.16845 (release date: 2016-May-12)

Supported models

Camera family	Model	Firmware version
Prosilica GT	GT1290, GT1290C, GT1380, GT1380C, GT1600, GT1600C, GT1660, GT1660C, GT1910, GT1910C, GT1920, GT1920C, GT2300, GT2300C, GT2750, GT2750C, GT3300, GT3300C, GT3400, GT3400C, GT4905, GT4905C, GT4907, GT4907C, GT6600, GT6600C	01.54.16845

New features and enhancements

- Consolidated firmware update for Prosilica GT CCD single-tap and quad-tap cameras
- `DeviceUserID` is now accessible via the **Vimba** user interface
- Selectable mode of sensor digitization taps (one-tap or four-tap mode)
- Added `ReverseX` and `ReverseY` to all multi-tap CCD models
- Added LUTs and binning to all models
- Added `DecimationHorizontal`, `DecimationVertical` for single-tap and quad-tap models
- Temperature readout for sensor board
- Added column defect masking support for all Prosilica GT quad-tap models running in single-tap mode
- IEEE 1588-2008 Precision Time Protocol enhancements
  - `PtpStatus` enumerations updated to IEEE 1588-2008 Precision Time Protocol standard: *Initializing(0), Faulty(1), Disabled(2), Listening(3), PreMaster(4), Master(5), Passive(6), Uncalibrated(7), Slave(8)*
  - `GevTimestampValue` is no longer reset by turning off PTP
  - Acquisition is no longer stopped when changing `PtpMode`
  - `PtpAcquisitionGateTime` now reset to zero when `PtpMode` is set to *Off*
  - `EventPtpSyncLost` now sent when `PtpMode` changed
  - `PtpMode` is no longer set to *Off* when PTP synchronization is lost
  - `PtpMode` = *Auto* now correctly finds best master clock
  - PTP synchronization drift lessened

Features removed

- Cleaned up lens controls
  - Removed P-Iris and DC-Iris controls from Prosilica GT large format models
  - Removed EF controls from Prosilica GT standard format models

Resolved issues

- GVCP command drop (no Ack)
- Issue where changing the auto gain or auto exposure maximum or minimum value when the current value is within the target range does not change the current value.
- When `ReverseX` is enabled, changing the pixel format to YUV format will keep `Width` less than `WidthMax`.

Limitations

- IEEE 1588-2008 Precision Time Protocol related limitations
  - PTP in this firmware version has many improvements, some of which cause PTP incompatibility issues with models running older firmware versions.
  - When using PTP in a network with models running a mix of older and newer PTP firmware, `PtpMode` = *Auto* can not be used, and the master camera (`PtpMode` = *Master*) must be a camera running the newer firmware version.
  - To take full advantage of the latest PTP resolved issues and improvements, it is recommended to upgrade the firmware of the listed supported models.

Firmware version: 01.54.16528 (release date: 2016-June-30)

Supported models

Camera family	Model	Firmware version
Prosilica GC	GC660, GC660C, GC1290, GC1290C, GC1380H, GC1380CH, GC1600H, GC1600CH, GC2450, GC2450C	01.54.16528

This firmware is not backwards compatible with Prosilica GC hardware revision A models.

New models

Initial commercial release of Prosilica GC hardware revision D models.

New features and enhancements

- Gamma correction
- LUTs
- Hue, saturation, color transformation control (color models only)
- Device temperature readout (sensor is located on mainboard)
- New event added: `ExposureStart` (ID 40019)
- IEEE 1588-2008 Precision Time Protocol enhancements
  - `PtpStatus` enumerations updated to IEEE 1588-2008 Precision Time Protocol standard: *Initializing(0), Faulty(1), Disabled(2), Listening(3), PreMaster(4), Master(5), Passive(6), Uncalibrated(7), Slave(8)*
  - `GevTimestampValue` is no longer reset by turning off PTP
  - Acquisition is no longer stopped when changing `PtpMode`
  - `PtpAcquisitionGateTime` now reset to zero when `PtpMode` is set to *Off*
  - `EventPtpSyncLost` now sent when `PtpMode` changed
  - `PtpMode` is no longer set to *Off* when PTP synchronization is lost
  - `PtpMode` = *Auto* now correctly finds best master clock
  - PTP synchronization drift lessened

Features removed

- Black level control

- Non-functional events
- The Prosilica GC has only two inputs. Therefore the following events have been removed in the new Prosilica GC hardware revision D models:
  - `EventLine3FallingEdgeFrameID`
  - `EventLine3FallingEdgeTimestamp`
  - `EventLine3RisingEdgeFrameID`
  - `EventLine3RisingEdgeTimestamp`
  - `EventLine4FallingEdgeFrameID`
  - `EventLine4FallingEdgeTimestamp`
  - `EventLine4RisingEdgeFrameID`
  - `EventLine4RisingEdgeTimestamp`
- The corresponding events in the `EventSelector` were also removed: `Line3RisingEdge`, `Line3FallingEdge`, `Line4RisingEdge`, and `Line4FallingEdge`

Changes

- Differences in frame rates: Some of the new Prosilica GC hardware revision D models require to use different imager frequencies. Therefore it is difficult to apply the same frame rates as Prosilica GC hardware revision A models. As a side effect higher frame rates can be achieved.

Camera model	Frame rate for Prosilica GC hardware revision A models	Frame rate for Prosilica GC hardware revision D models
Prosilica GC660, GC660C	119.30 fps	121.20 fps
Prosilica GC1290, GC1290C	32.79 fps	33.31 fps
Prosilica GC1380H, GC1380CH	30.01 fps	30.49 fps

> All other Prosilica GC hardware revision D models support the same frame rates as the previous Prosilica GC models.

- Features renamed: On Prosilica GC hardware revision A models, `Gain` is called `GainRaw`; on the new Prosilica GC hardware revision D models it is referred to as `Gain`. This is just a name change to be GenICam SFNC compliant; the functionality remains the same. `GainRaw` is still available, but now it is an invisible attribute that can still be applied by programmers (**PvAPI** users for example).
- Due to the increased memory the new models have an extended `StreamHoldCapacity`. The changes are as follows:

Camera model	StreamHoldCapacity for Prosilica GC hardware revision A models	StreamHoldCapacity for Prosilica GC hardware revision D models
Prosilica GC660, GC660C	46 frames	194 frames
Prosilica GC1290, GC1290C	12 frames	52 frames
Prosilica GC1380H, GC1380CH	11 frames	46 frames
Prosilica GC1600H, GC1600CH	7 frames	33 frames
Prosilica GC2450, GC2450C	3 frames	12 frames

- Prosilica GC hardware revision A models support five user sets, the new Prosilica GC hardware revision D models support three user sets.

Limitations

- IEEE 1588-2008 Precision Time Protocol related limitations
    - PTP in this firmware version has many improvements, some of which cause PTP incompatibility issues with cameras running older firmware versions.
    - When using PTP in a network with cameras running a mix of older and newer PTP firmware, `PtpMode` = *Auto* can not be used, and the master camera (`PtpMode` = *Master*) must be a camera running the newer firmware version.
    - To take full advantage of the latest PTP resolved issues and improvements, it is recommended to upgrade the firmware of the listed supported models.

Firmware version: 01.54.16414 (release date: 2016-Mar-07)

Supported models

Camera family	Models	Firmware version
Prosilica GT	GT1930, GT1930C, GT1930L, GT1930LC	01.54.16414

New models

Initial commercial release of Prosilica GT1930 and GT1930C models

New features and enhancements

- Prosilica GT1930L and GT1930LC only
    - Added editing capability to `DeviceUserID` (users can now edit `DeviceUserID`)
    - All EF-Lens features are now disabled if no EF-Lens is attached to camera
    - Increased minimum exposure from 28 to 42

Other

- Prosilica GT1930L and GT1930LC only
    - Removed P-Iris and DC-Iris controls
    - Removed Event Control ID for `SyncIn3` and `SyncIn4`

Resolved issues

- Prosilica GT1930L and GT1930LC only
    - `ExposureTimeIncrement` value now shows decimal values

Firmware version: 01.54.15954 (release date: 2015-Nov-20)

Supported models

Camera family	Models	Firmware version
Mako G	G-234B, G-235C	01.54.15954

New models

Initial commercial release of Mako G-234B and G-235C models

New features and enhancements

- 10-bit, 12-bit switchability based on pixel format
- `ExposureValue` now rounds up or down to the nearest valid exposure value instead of always rounding down.

Firmware version: 01.54.14865 (release date: 2015-Oct-22)

Supported models

Camera family	Models	Firmware version
Manta	G-282B, G-282C, G-283B, G-283C, G-505B, G-505C, G-609B, G-609C, G-917B, G-917C	01.54.14865

New features and enhancements

- IEEE 1588-2008 Precision Time Protocol enhancements
  - `PtpStatus` enumerations updated to IEEE 1588-2008 Precision Time Protocol standard: *Initializing(0), Faulty(1), Disabled(2), Listening(3), PreMaster(4), Master(5), Passive(6), Uncalibrated(7), Slave(8)*
  - `GevTimestampValue` is no longer reset by turning off PTP
  - Acquisition is no longer stopped when changing `PtpMode`
  - `PtpAcquisitionGateTime` now reset to zero when `PtpMode` is set to *Off*
  - `EventPtpSyncLost` now sent when `PtpMode` changed
  - `PtpMode` is no longer set to *Off* when PTP synchronization is lost
  - `PtpMode` = *Auto* now correctly finds best master clock
  - PTP synchronization drift lessened

Changes

- Adjusted the following parameter(s):
  - `/Controls/Exposure; ExposureAuto; RW;  Off(1) Once(3) Continuous(2)`
  - `/Controls/Exposure; ExposureMode; RW;  Timed(0) TriggerWidth(1)`

Limitations

- IEEE 1588-2008 Precision Time Protocol related limitations
  - PTP in this firmware version has many improvements, some of which cause PTP incompatibility issues with models running older firmware versions.
  - When using PTP in a network with cameras running a mix of older and newer PTP firmware, `PtpMode` = *Auto* can not be used, and the master camera (`PtpMode` = *Master*) must be a camera running the newer firmware version.
  - To take full advantage of the latest PTP resolved issues and improvements, it is recommended to upgrade the firmware of the listed supported models.

Firmware version: 01.54.12720 (release date: 2014-Feb-20)

Supported models

Camera family	Models	Firmware version
Mako G	G-503B, G-503C	01.54.12720

New models

Initial commercial release of Mako G-503B and G-503C models

New features and enhancements

`DefectMaskEnable`
Up to 200 pixel defects may be masked

Limitations

`DefectMaskEnable` is not possible if binning and/or decimation is enabled.

Firmware version: 01.54.12239 (release date: 2014-Dec-19)

Supported models

Camera family	Models	Firmware version
Prosilica GT	GT1930L, GT1930LC	01.54.12239

New models

Initial commercial release of Prosilica GT1930L and GT1930LC models

New features and enhancements

Canon EF iris and focus lens control

Resolved issues

- As gain is reported in 1/10 dB steps and gain in chunk data is an integer, gain value is reported as ten times the actual value (gain of 23.7 is reported as 237 for example).
- Mirroring applied before the Region of Interest for `ReverseY`

Firmware version: 01.54.11712 (release date: 2014-Dec-19)

Supported models

Camera family	Models	Firmware version
Mako G	G-131B, G-131C, G-192B, G-192C	01.54.11712

New models

Initial commercial release of Mako G-131B, G-131C, G-192B, and G-192C models

New features and enhancements

`DefectMaskEnable`
Up to 200 pixel defects may be masked

Limitations

Mako G-192B and G-192C: With exposure auto and gain auto both active, the priority mechanism does not work as expected.

Firmware version: 01.54.11488 (release date: 2014-Dec-16)

Supported models

Camera family	Models	Firmware version
Mako G	G-030B, G-030C	01.54.11488

New models

Initial commercial release of Mako G-030B and G-030C models

New features and enhancements

- `DefectMaskEnable`
  Up to 200 pixel defects may be masked
- Piecewise Linear (HDR) mode

Firmware version: 01.54.11233 (release date: 2014-Oct-06)

Supported models

Camera family	Models	Firmware version
Mako G	G-050B, G-050C, G-095B, G-095C	01.54.11233

New models

Initial commercial release of Mako G-050B, G-050C, G-095B, and G-095C models

New features and enhancements

`DefectMaskEnable`
Up to 200 pixel defects may be masked

Firmware version: 01.54.11232 (release date: 2014-Oct-06)

Supported models

Camera family	Models	Firmware version
Manta	G-505B, G-505C	01.54.11232

New models

Initial commercial release of Manta G-505B and G-505C models

New features and enhancements

- IEEE 1588-2008 Precision Time Protocol enhancements:
  - `PTPStatus` enumerations updated to IEEE 1588-2008 Precision Time Protocol standard: *Disabled*, *Initializing*, *Listening*, *Master*, *Passive*, *Uncalibrated*, *Slave*.
  - `GevTimestampValue` is no longer reset by turning off PTP
  - Acquisition is no longer stopped when changing `PtpMode`
  - `PtpAcquisitionGateTime` now reset to zero when `PtpMode` is set to *OFF*
  - `EventPtpSyncLost` now sent when `PtpMode` changed
  - PTP synchronization drift lessened

Firmware version: 01.54.11026 (release date: 2014-Sep-24)

Supported models

Camera family	Models	Firmware version
Manta	G-235B, G-235C	01.54.11026

New models

Initial commercial release of Manta G-235B and G-235C models

New features and enhancements

- `ReverseX` and `ReverseY`
- `ExposureTimeIncrement`: read only, constant. Granularity of `ExposureTimeAbs`
  [**PvAPI**: `ExposureValue`]
- `ExposureTimeAbs` [**PvAPI**: `ExposureValue`]: Values written to control are rounded to nearest multiple of `ExposureIncrement`. Reading this control returns the used, rounded value.
- `Gain` [**PvAPI**: `GainValue`]: increment is 0.1, units are dB.
  [**PvAPI**: `GainValue` increment is 1, units are 0.1 dB]
- `GainAuto` [**PvAPI**: `GainMode`]: auto algorithm adjusts using 1 dB gain increments. `GainAutoMin` and `GainAutoMax` may be set to using 0.1 dB increments.
- IEEE 1588-2008 Precision Time Protocol enhancements:
  - `PTPStatus` enumerations updated to IEEE 1588-2008 Precision Time Protocol standard: *Disabled*, *Initializing*, *Listening*, *Master*, *Passive*, *Uncalibrated*, *Slave*
  - `GevTimestampValue` is no longer reset by turning off PTP
  - Acquisition is no longer stopped when changing `PtpMode`

- `PtpAcquisitionGateTime` now reset to zero when `PtpMode` is set to *OFF*
- `EventPtpSyncLost` now sent when `PtpMode` changed
- PTP synchronization drift lessened

Limitations

`ReverseY` applies any Region of Interest first, then flips image. This not the correct order. Image flip should be applied first, then the Region of Interest.

Firmware version: 01.52.11715 (release date: 2014-Dec-04)

Supported models

Camera family	Models	Firmware version
Mako G	G-032B, G-032C, G-125B, G-125C	01.52.11715

Resolved issues

Removed a possible issue that prevents saving a permanent IP address in some cases.

Firmware version: 01.52.8549 (release date: 2013-Sep-20)

Supported models

Camera family	Models	Firmware version
Prosilica GT	GT1290, GT1290C, GT1380, GT1380C	01.52.7068
Manta	G-145B, G-145B-30, G-145B-NIR, G-145C, G-145C-30	01.44.8549

New features and enhancements

- Added X-Mirror feature to Manta G-145B, G-145B-30, and G-145B-NIR
- Added LUTs to Prosilica GT1290, GT1290C, GT1380, and GT1380C

Resolved issues

- Reduced blooming effect (Manta G-145B and G-145C including 30 fps variants)
- Minimum exposure time increased from 38 µs to 43 µs (Manta G-145B and G-145C)
- Minimum exposure time increased from 37 µs to 38 µs (Manta G-145B and G-145C 30fps variants only)
- Sensor Y-size changed from 1390 to 1388 (Manta G-145B and G-145C including 30 fps variants)
- BayerGR12Packed pixel format changed to BayerRG12Packed (Manta G-145C and G-145C-30)

Firmware version: 01.52.8151 (release date: 2013-Aug-23)

Supported models

Camera family	Models	Firmware version
Prosilica GT	GT2000, GT2000NIR, GT2000C, GT2050, GT2050NIR, GT2050C	01.52.8151
Manta	G-223B, G-223C, G-419B, G-419B-NIR, G-419C	01.52.8151
Mako G	G-032B, G-032C, G-125B, G-125C, G-223B, G-223C, G-419B, G-419B NIR, G-419C	01.52.8151

New models

- Initial commercial release Mako G-032B, G-032C, G-125B, G-125C, G-223B, G-223C, G-419B, G-419B-NIR, and G-419C models
- Initial commercial release for Manta G-419B, G-419B NIR, and G-419C models

New features and enhancements

- Enhanced factory sensor calibration of the Prosilica GT2000, GT2050, and Manta G-223
- New maximum gain of 26 dB for Prosilica GT2000, GT2050, and Manta G-223

Limitations

Camera firmware shows the minimum exposure values without frame overhead time for Prosilica GT2000 and GT2050 series models, that is, 1 μs. See sensor data sheet for details on frame overhead time.

Firmware version: 01.52.7114 (release date: 2013-May-23)

Supported models

Camera family	Models	Firmware version
Manta	G-917B, G-917C	01.52.7114

Resolved issues

Optimized tap balance

Firmware version: 01.52.7068 (release date: 2013-May-21)

Supported models

Camera family	Models	Firmware version
Prosilica GT	GT2000, GT2000NIR, GT2000C, GT2050, GT2050NIR, GT2050C, GT3400, GT3400C, GT4905, GT4905C, GT4907, GT4907C, GT6600, GT6600C	01.52.7068

New models

Initial commercial release for supported models

New features and enhancements

Added three Look-up Tables

Firmware version: 01.52.00 (release date: 2013-Mar-27)

Supported models

Camera family	Models	Firmware version
Manta	G-223B, G-223C, G-282B, G-282C, G-283B, G-283C, G-609B, G-609C, G-917B, G-917C	01.52.00

New models

Initial commercial release for supported models

New Manta platform

- New hardware to support larger multi-tap sensors. Differences from previously released Manta models:
  - Larger 128 MB image buffer
  - Different LED behavior. See the *Manta Technical Manual*:
    https://www.alliedvision.com/en/support/technical-documentation/manta-documentation.html
  - IEEE 1588-2008 Precision Time Protocol
  - `DeviceTemperatureSelector` = *Sensor*
  - Gamma correction enhanced to support values [0.25 to 4]
  - Reduced the number of `UserSets` to 3

Limitations

- Look-up Tables on Manta G-223B and G-223C are currently limited to 10-bit. Future maintenance release will bring this to 12-bit.
- `EdgeFilter` is not currently supported
- Manta G-223B and G-223C do not support binning (this is not a sensor feature).

Firmware version: 01.50.02 (release date: 2013-Jan-28)

Supported models

Camera family	Models	Firmware version
Prosilica GT	GT1660, GT1660C, GT1910, GT1910C, GT2300, GT2300C, GT3300, GT3300C	01.50.02

Resolved issues

Prosilica GT cameras with ON Semiconductor CCD sensors dropping packets on multiple camera systems.

Firmware version: 01.50.01 (release date: 2013-Jan-04)

Supported models

Camera family	Models	Firmware version
Prosilica GC	GC650, GC650C, GC655, GC655C, GC660, GC660C, GC780, GC780C, GC1020, GC1020C, GC1290, GC1290C, GC1350, GC1350C, GC1380, GC1380C, GC1380H, GC1380CH, GC1600, GC1600C, GC1600H, GC1600CH, GC2450, GC2450C	01.50.01
Prosilica GT	GT1290, GT1290C, GT1380, GT1380C, GT1600, GT1600C, GT1660, GT1660C, GT1910, GT1910C, GT1920, GT1920C, GT2300, GT2300C, GT2450, GT2450C, GT2750, GT2750C, GT3300, GT3300C	01.50.01

New features and enhancements

- `FrameTriggerReady` event
- `DeviceTemperatureSelector` = *Sensor* [**PvAPI**: `DeviceTemperatureSensor`] added for Prosilica GT series, except Prosilica GT2450 and GT2450C.

Resolved issues

- Camera maximum `ExposureTimeAbs` [**PvAPI**: `ExposureValue`] are now accurate. Previously, all cameras were listed as 60 seconds, but all cameras did not achieve this. See the camera Technical Manual for new maximum values.
- `FrameTrigger` signal removed from `SyncOutSource` [**PvAPI**: `SyncOutMode`]. Signal was too short to be seen on camera outputs
- `DSPSubregionBottom`, `DSPSubregionTop` upper limit changed from 4294967295 to sensor maximum height
- `DSPSubregionLeft`, `DSPSubregionRight` upper limit changed from 4294967295 to sensor maximum width
- Gamma correction is now properly saved or loaded in `SavedUserSets` [**PvAPI**: `ConfigFile`]

Limitations

- `EdgeFilter` does not work, feature removed
- RGB48 `PixelFormat` does not work, feature removed

Firmware version: 01.50.00 (release date: 2012-Jun-01)

Supported models

Camera family	Models	Firmware version
Prosilica GC	GC650, GC650C, GC655, GC655C, GC660, GC660C, GC780, GC780C, GC1020, GC1020C, GC1290, GC1290C, GC1350, GC1350C, GC1380, GC1380C, GC1380H, GC1380CH, GC1600, GC1600C, GC1600H, GC1600CH, GC2450, GC2450C	01.50.00
Prosilica GT	GT1290, GT1290C, GT1380, GT1380C, GT1600, GT1600C, GT1660, GT1660C, GT1910, GT1910C, GT1920, GT1920C, GT2300, GT2300C, GT2450, GT2450C, GT2750, GT2750C, GT3300, GT3300C	01.50.00

New models

Initial commercial release of Prosilica GT1660 and GT1660C models

New features and enhancements

IEEE 1588-2008 Precision Time Protocol synchronization added to Prosilica GC models

Firmware version: 01.48.02 (release date: 2012-Apr-04)

Supported models

Camera family	Models	Firmware version
Prosilica GT	GT1290, GT1290C, GT1380, GT1380C, GT1600, GT1600C, GT1910, GT1910C, GT1920, GT1920C, GT2300, GT2300C, GT2450, GT2450C, GT2750, GT2750C, GT3300, GT3300C	01.48.02

Resolved issues

`LensDCIris` was not driving some DC-lenses properly

Firmware version: 01.48.01 (release date: 2012-Feb-20)

Supported models

Camera family	Models	Firmware version
Prosilica GT	GT1290, GT1290C, GT1380, GT1380C, GT1600, GT1600C, GT1910, GT1910C, GT1920, GT1920C, GT2300, GT2300C, GT2450, GT2450C, GT2750, GT2750C, GT3300, GT3300C	01.48.01

New models

Initial commercial release of Prosilica GT series

New features and enhancements

- IEEE 1588-2008 Precision Time Protocol synchronization

- `LensDCIris` control
- `LensPIris` control
- `DeviceTemperature` [**PvAPI**: `DeviceTemperatureMainboard`] monitoring

Firmware version: 01.44.7913 (release date: 2013-Jul-22)

Supported models

Camera family	Models	Firmware version
Manta	G-095B, G-095C	01.44.7913

Resolved issues

Imaging artifact on Manta G-095B and G-095C observed at-20 °Celsius to +5 °Celsius ambient.

Firmware end of life

This is the last official firmware release for the Manta G-095B and G-095C models.

Firmware version: 01.44.09 (release date: 2013-Jan-18)

Supported models

Camera family	Models	Firmware version
Manta	G-031B, G-031C, G-032B, G-032C, G-033B, G-033C, G-046B, G-046C, G-095C, G-125B, G-125C, G-145B, G-145B-30, G-145B NIR, G-145C, G-145C-30, G-146B, G-146C, G-201B, G-201B-30, G-201C, G-201C-30, G-504B, G-504C	01.44.09

Resolved issues

- `StreamBytesPerSecond` calculation issues for all Manta models
- `LUTControl` parameters (`LUTEnable`, `LUTMode` for example) are not saved in `ConfigFile` for all Manta models
- `Gain` or `Offset` affecting maximum gray level on Manta G-032B and G-032C

Firmware version: 01.44.08 (release date: 2012-Oct-26)

Supported models

Camera family	Models	Firmware version
Manta	G-032B, G-032C, G-095C	01.44.08

Resolved issues

Improved production yield for Manta G-032B, G-032C, and G-095C

Firmware version: 01.44.04 (release date: 2012-Feb-13)

Supported models

Camera family	Models	Firmware version
Manta	G-031B, G-031C, G-032B, G-032C, G-033B, G-033C, G-046B, G-046C, G-095C, G-125B, G-125C, G-145B, G-145B-30, G-145B NIR, G-145C, G-145C-30, G-146B, G-146C, G-201B, G-201B-30, G-201C, G-201C-30, G-504B, G-504C	01.44.04

Resolved issues

- `TimestampValue` between first and second frame was not correct
- Delay between first and second image in external triggered acquisition
- Influence of `ExposureValue` in `ExposureMode` = *External*

Other

- Feature renamed: `BlackLevelValue` to `BlackLevel` according to GenICam SFNC version 1.5
- Feature renamed: `GainRaw` to `Gain` according to GenICam SFNC version 1.5

Firmware version: 01.44.00 (release date: 2011-Jul-11)

Supported models

Camera family	Models	Firmware version
Manta	G-031B, G-031C, G-032B, G-032C, G-033B, G-033C, G-046B, G-046C, G-095C, G-125B, G-125C, G-145B, G-145B-30, G-145B NIR, G-145C, G-145C-30, G-146B, G-146C, G-201B, G-201B-30, G-201C, G-201C-30, G-504B, G-504C	01.44.00

New models

Initial commercial release of Manta G-145B, G-145C, G-201B, and G-201C (including 30 fps variants)

New features and enhancements

- Added three 12-bit LUTs
- Gamma correction default values: 0.45, 0.5, and 0.7
- `DecimationHorizontal` and `DecimationVertical` (sub-sampling) excluding Manta G-032B and G-032C
- Mono12Packed and Bayer12Packed
- `ChunkData`
- Event channel
- `SyncInGlitchFilter`
- Auto Iris (Video Type) support

Resolved issues

- Baud rate of serial port now configurable

- Manta G-032B, G-032C, G-125B, and G-125C first image defective
- Manta G-201B and G-201C picture optimization
- Manta G-032B and G-032C trigger error in external level trigger mode
- Varying image brightness in level and edge mode
- Exposure signal jitter in external trigger mode
- Manta G-145B and G-145C stops grabbing in free-run at exposure time 320 µs

Firmware releases at a glance (firmware loader 01.42.05)

Camera family	Model	Firmware version	Release date
Prosilica GB	GB650, GB650-P, GB650-PV, GB650-V, GB650C, GB650C-P, GB650C-PV, GB650C-V, GB660, GB660-V, GB660C, GB660C-V, GB1380, GB1380-P, GB1380-PV, GB1380-V, GB1380C, GB1380C-P, GB1380C-PV, GB1380C-V, GB2450, GB2450-V, GB2450C, GB2450C-V	01.42.04	2011-Jun-01
Prosilica GC	GC650, GC650C, GC655, GC655C, GC660, GC660C, GC780, GC780C, GC1020, GC1020C, GC1290, GC1290C, GC1350, GC1350C, GC1350H, GC1350CH, GC1380, GC1380C, GC1380H, GC1380CH, GC1600, GC1600C, GC1600H, GC1600CH, GC2450, GC2450C	01.42.04	2011-Jun-01
Prosilica GE	GE650, GE650C, GE655, GE655C, GE680, GE680C, GE1050, GE1050C, GE1350, GE1350C, GE1380, GE1380C, GE1600, GE1600C, GE1650, GE1650C, GE1660, GE1660C, GE1900, GE1900C, GE1910, GE1910C, GE2040, GE2040C, GE4000, GE4000C, GE4900, GE4900C	01.42.04	2011-Jun-01
Prosilica GX	GX1050, GX1050C, GX1660, GX1660C, GX1910, GX1910C, GX2300, GX2300C, GX3300, GX3300C	01.42.02	2011-Jan-17
Prosilica GX	GX1920, GX1920C, GX2750, GX2750C	01.42.05	2011-Dec-12
Prosilica GC	GC640, GC640C, GC1280	01.36.00	2009-Mar-13
Prosilica GE	GE640, GE640C	01.36.00	2009-Mar-13
Prosilica GC	GC750, GC750C	01.30.00	2007-Dec-17
Note: Prosilica GS models use the Prosilica GB firmware version			

Table 2: Firmware releases at a glance (firmware loader 01.42.05)

Firmware version: 01.42.05 (release date: 2011-Dec-12)

Supported models

Camera family	Models	Firmware version
Prosilica GX	GX1920, GX1920C, GX2750, GX2750C	01.42.05

New models

Initial commercial release of Prosilica GX2750 models

Resolved issues

Prosilica GX1920 connection issue with National Instruments LabView

Firmware version: 01.42.04 (release date: 2011-Jun-01)

Supported models

Camera family	Models	Firmware version
Prosilica GB	GB650, GB660, GB1380, GB2450	01.42.04
Prosilica GC	GC650, GC655,GC660, GC780, GC1020, GC1290, GC1350, GC1380, GC1380H, GC1600, GC1600H, GC2450	01.42.04
Prosilica GE	GE650, GE655, GE680, GE1050, GE1350, GE1380, GE1600, GE1650, GE1660, GE1900, GE1910, GE2040, GE4000, GE4900	01.42.04

Firmware version: 01.42.03 (release date: 2011-Apr-19)

Supported models

Camera family	Models	Firmware version
Prosilica GB	GB650, GB660, GB1380, GB2450	01.42.03
Prosilica GC	GC650, GC655, GC660, GC780, GC1020, GC1290, GC1350, GC1380, GC1380H, GC1600, GC1600H, GC2450	01.42.03
Prosilica GE	GE650, GE655, GE680, GE1050, GE1350, GE1380, GE1600, GE1650, GE1660, GE1900, GE1910, GE2040, GE4000, GE4900	01.42.03
Prosilica GX	GX1050, GX1660, GX1910, GX1920, GX2300, GX3300	01.42.03

New models

Initial commercial release of Prosilica GX1920 model

Firmware version: 01.42.02 (release date: 2011-Jan-17)

Supported models

Camera family	Models	Firmware version
Prosilica GB	GB650, GB660, GB1380, GB2450	01.42.01
Prosilica GC	GC650, GC655, GC660, GC780, GC1020, GC1290, GC1350, GC1380, GC1380H, GC1600, GC1600H, GC2450	01.42.01
Prosilica GE	GE650, GE655, GE680, GE1050, GE1350, GE1380, GE1600, GE1650, GE1660, GE1900, GE1910, GE2040, GE4000, GE4900	01.42.01
Prosilica GX	GX1050, GX1660, GX1910, GX1920, GX2300, GX3300	01.42.01

Resolved issues

- `ChunkModeActive` added to Prosilica GB models
- Issue where firmware update from version 01.36 to 01.42.00 or 01.42.01 corrupts `SavedUserSets` if `UserSetDefaultSelector` = *Default* [**PvAPI**: `ConfigFilePowerUp` = *Factory*].
- `SyncIn1GlitchFilter` now defaults to 2000 on startup

Firmware version: 01.42.01 (release date: 2011-Jan-06)

Supported models

Camera family	Models	Firmware version
Prosilica GE	GE650, GE655, GE680, GE1050, GE1350, GE1380, GE1600, GE1650, GE1660, GE1900, GE1910, GE2040, GE4000, GE4900	01.42.01

Resolved issues

Issue on Prosilica GE models where `BinningVertical` [**PvAPI**: `BinningY`] > 1 caused tap imbalance.

Firmware version: 01.42.00 (release date: 2010-Nov-10)

Supported models

Camera family	Models	Firmware version
Manta	G-031B, G-031C, G-032B, G-032C, G-033B, G-033C, G-046B, G-046C, G-095C, G-125B, G-125C, G-145B, G-145B NIR, G-145C, G-146B, G-146C, G-201B, G-201C, G-504B, G-504C	01.42.00

Resolved issues

- Intermittent gaps within histogram
- Corrected minimum `ExposureValues`
- `SyncOut1` delay issue at short exposure times. Applicable to Manta G-032B and G-032C only

Firmware version: 01.42.00 (release date: 2010-Nov-02)

Supported models

Camera family	Models	Firmware version
Prosilica GB	GB650, GB660, GB1380, GB2450	01.42.00
Prosilica GC	GC650, GC655, GC660, GC780, GC1020, GC1290, GC1350, GC1380, GC1380H, GC1600, GC1600H, GC2450	01.42.00
Prosilica GE	GE650, GE655, GE680, GE1050, GE1350, GE1380, GE1600, GE1650, GE1660, GE1900, GE1910, GE2040, GE4000, GE4900	01.42.00
Prosilica GX	GX1050, GX1660, GX1910, GX2300, GX3300	01.42.00

New features and enhancements

- `ChunkModeActive` added to Prosilica GC and GE models
- `EventControls` added to all camera models
- `StreamFrameRateConstrain`
- `TriggerOverlap`
  [**PvAPI**: `FrameStartTriggerOverlap`]
- `SyncInGlitchFilter`

- If using `ExposureMode` = *Auto*, and `GainMode` = *Auto* simultaneously, priority is given to changes in exposure until `ExposureAutoMax` is reached, at which point priority is given to changes in gain.
- RGB and YUV color modes added to Prosilica GC2450C, GB2450C, and GC1600CH

Firmware version: 01.40.00 (release date: 2010-Jun-15)

Supported models

Camera family	Models	Firmware version
Manta	G-031B, G-031C, G-032B, G-032C, G-033B, G-033C, G-046B, G-046C, G-095C, G-125B, G-125C, G-145B, G-145B NIR, G-145C, G-146B, G-146C, G-201B, G-201C, G-504B, G-504C	01.40.00

Change log

Update of pre-series models from firmware version 01.38 to version 01.40

Firmware version: 01.40.00 (release date: 2010-Feb-23)

Supported models

Camera family	Models	Firmware version
Prosilica GX	GX1050, GX1660, GX1910, GX2300, GX3300	01.40.00

New features and enhancements

- `LensDrive` controls for 1,2,3 axis (iris, focus, zoom) lenses
- `DefectMaskColumnEnable`
- `ChunkModeActive`

Firmware version: 01.38.00 (release date: 2010-Feb-10)

Supported models

Camera family	Models	Firmware version
Prosilica GX	GX1050, GX1660, GX1910, GX2300, GX3300	01.38.00

New models

Initial commercial release of Prosilica GX series

New features and enhancements

`EventControls`

Firmware version: 01.36.00 (release date: 2009-Mar-13)

Supported models

Camera family	Models	Firmware version
Prosilica GB	GB650, GB660, GB1380, GB2450	01.36.00
Prosilica GC	GC640, GC650, GC655, GC660, GC780, GC1020, GC1280, GC1290, GC1350, GC1380, GC1380H, GC1600, GC1600H, GC2450	01.36.00
Prosilica GE	GE640, GE650, GE655, GE680, GE1050, GE1350, GE1380, GE1600, GE1650, GE1660, GE1900, GE1910, GE2040, GE4000, GE4900	01.36.00

New models

Initial commercial release of Prosilica GC780 model

Resolved issues

- XML register `RegMemoryFileCmdExecute` changed from Read Only to Read/Write for Cognex compatibility.
- Issue where Prosilica GC1290 first exposure after `AcquisitionStart` was slightly darker than rest.

Firmware end of life

This is the last official firmware release for the Prosilica GC640, GC1280, and GE640 models.

Firmware version: 01.34.00 (release date: 2009-Jan-12)

Supported models

Camera family	Models	Firmware version
Prosilica GB	GB650, GB660, GB1380, GB2450	01.34.00
Prosilica GC	GC640, GC650, GC655, GC660, GC1020, GC1280, GC1290, GC1350, GC1380, GC1380H, GC1600, GC1600H, GC2450	01.34.00
Prosilica GE	GE650, GE655, GE680, GE1050, GE1350, GE1380, GE1600, GE1650, GE1660, GE1900, GE1910, GE2040, GE4000, GE4900	01.34.00

New models

- Initial commercial release of Prosilica GB series
- Initial commercial release of Prosilica GE1660 and GE1910 models

Resolved issues

- DHCP now works when multiple DHCP servers are active
- `AcquisitonStart` now allowed while `AcquisitionStop` is in progress
- RGBA32, BGRA32 works on all cameras

Firmware version: 01.32.00 (release date: 2008-Mar-28)

Supported models

Camera family	Models	Firmware version
Prosilica GE	GE680, GE1650, GE1900, GE2040	01.32.00

Resolved issues

Mono16 and Bayer16 image pixel format issue

Firmware version: 01.30.00 (release date: 2007-Dec-17)

Supported models

Camera family	Models	Firmware version
Prosilica GC	GC640, GC650, GC655, GC660, GC750, GC1020, GC1280, GC1290, GC1350, GC1380, GC1380H, GC1600, GC1600H, GC2450	01.30.00
Prosilica GE	GE650, GE655, GE680, GE1350, GE1380, GE1600, GE1650, GE1900, GE2040, GE4000, GE4900	01.30.00

Resolved issues

Firmware version 01.28.00 flash erase issue

Firmware end of life

This is the last official firmware release for the Prosilica GC750 model.

Firmware version: 01.28.00 (release date: 2007-Dec-04)

Supported models

Camera family	Models	Firmware version
Prosilica GC	GC640, GC650, GC655, GC660, GC750, GC1020, GC1280, GC1290, GC1350, GC1380, GC1380H, GC1600, GC1600H, GC2450	01.28.00
Prosilica GE	GE650, GE655, GE680, GE1350, GE1380, GE1600, GE1650, GE1900, GE2040, GE4000, GE4900	01.28.00

New models

Initial commercial release of Prosilica GC660, GC1290, GC1600H, GC2450, and GC1280 models

New features and enhancements

- `SavedUserSets`
  [**PvAPI**: `ConfileFiles`]
- User Read/Write non-volatile `CameraName` (**PvAPI** only)

Resolved issues

- `StreamBytesPerSecond` now works at very low values
- `StreamHoldCapacity` correctly calculated

Firmware version: 01.26.00 (release date: 2007-May-30)

Supported models

Camera family	Models	Firmware version
Prosilica GC	GC640, GC650, GC655, GC750, GC1020, GC1350, GC1380, GC1380H, GC1600	01.26.00
Prosilica GE	GE640, GE650, GE655, GE680, GE1350, GE1380, GE1600, GE1650, GE1900, GE2040, GE4000, GE4900	01.26.00

New models

Initial commercial release of Prosilica GC750, GC1380H, GE4000, and GE4900 models

New features and enhancements

- Prosilica GC Iris controls added (auto iris for video-type iris lenses)
- `AcquisitionMode` = *SingleFrame*, *Multiframe*, *Recorder*
- `StreamBytesPerSecond BandwidthCtrlMode` added. Allows limiting camera bandwidth
- `StreamHoldCapacity`

Firmware end of life

This is the last official firmware release for the Prosilica GE640 model.

Firmware version: 01.24.00 (release date: 2006-Nov-30)

Supported models

Camera family	Models	Firmware version
Prosilica GC	GC640, GC650, GC655, GC1020, GC1350, GC1380, GC1600	01.24.00
Prosilica GE	GE640, GE650, GE655, GE680, GE1350, GE1380, GE1600, GE1650, GE1900, GE2040	01.24.00

New models

Initial commercial release of Prosilica GC655, GC1020, and GE655 models

Firmware version: 01.22.00 (release date: 2006-Sep-08)

Supported models

Camera family	Models	Firmware version
Prosilica GC	GC640, GC650, GC655, GC1020, GC1350, GC1380, GC1600	01.22.00
Prosilica GE	GE640, GE650, GE655, GE680, GE1350, GE1380, GE1600, GE1650, GE1900, GE2040	01.22.00

New models

Initial commercial release of Prosilica GC series

New features and enhancements

- `StreamHold`
- `SyncOutSource` = *GPO* with `SyncOutLevels`
  [**PvAPI**: `SyncOutGPOLevels`]

Firmware version: 01.20.00

Boot code update only

Firmware version: 01.18.00 (release date: 2006-Aug-02)

Supported models

Camera family	Models	Firmware version
Prosilica GE	GE640, GE650, GE655, GE680, GE1350, GE1380, GE1600, GE1650, GE1900, GE2040	01.18.00

New features and enhancements

- `DHCP`, `Auto-IP`, `Persistent-IP` addressing modes
- `PixelFormat` = *YUV411Packed*, *YUV422Packed*, *YUV444Packed*
  [**PvAPI**: *YUV411*, *YUV422*, *YUV444*]

Firmware version: 01.16.00 (release date: 2006-Jun-28)

Supported models

Camera family	Models	Firmware version
Prosilica GE	GE640, GE650, GE655, GE680, GE1350, GE1380, GE1600, GE1650, GE1900, GE2040	01.16.00

New models

Initial commercial release of Prosilica GE640 model

Firmware version: 01.14.00 (release date: 2006-Apr-12)

Supported models

Camera family	Models	Firmware version
Prosilica GE	GE650, GE655, GE680, GE1350, GE1380, GE1600, GE1650, GE1900, GE2040	01.14.00

New models

Initial commercial release of Prosilica GE655, GE680, GE1650, GE1900, and GE2040 models

New features and enhancements

- `ExposureAuto` = *Once*, *Continuous*
  [**PvAPI**: `ExposureMode` = *Auto*, *AutoOnce*]
- `BalanceWhiteAuto` = *Once*, *Continuous*
  [**PvAPI**: `WhitebalMode` = *Auto*, *AutoOnce*]

Firmware version: 01.08.00 to 01.12.00

Boot code update only

Firmware version: 01.06.00 (release date: 2006-Mar-08)

Supported models

Camera family	Models	Firmware version
Prosilica GE	GE650C, GE1350C, GE1380C, GE1600C	01.06.00

New models

Initial commercial release of Prosilica GE650C, GE1350C, GE1380C, and GE1600C color models

New features and enhancements

`PixelFormat` = *BayerRG8*, *BayerRG12*, *RGB8Packed*, *BGR8Packed*
[**PvAPI**: *Bayer8*, *Bayer16*, *RGB24*, *BGR24*]

Firmware version: 01.04.00 (release date: 2006-Feb-24)

Supported models

Camera family	Models	Firmware version
Prosilica GE	GE650, GE1350, GE1380, GE1600	01.04.00

New models

Initial commercial release of Prosilica GE1350 and GE1600 monochrome models

Firmware version: 01.02.00 (release date: 2006-Feb-13)

Supported models

Camera family	Models	Firmware version
Prosilica GE	GE650, GE1380	01.02.00

New features and enhancements

Serial RS232 communication

Firmware version: 01.00.00 (release date: 2006-Feb-03)

Supported models

Camera family	Models	Firmware version
Prosilica GE	GE650, GE1380	01.00.00

New models

Initial commercial release of Prosilica GE650 and GE1380 monochrome models

Acronyms and abbreviations

The following table provides a list of abbreviations used in this document.

Acronym or abbreviation	Description
CCD	Charge-coupled device
dB	Decibel
DHCP	Dynamic Host Control Protocol
FPGA	Field-programmable gate array
fps	Frames per second
GVCP	GigE Vision Control Protocol
HDR	High-dynamic range
LUT	Look-up table
MB	Megabyte
NIR	Near-Infrared
PTP	Precision Time Protocol
s	Second
SFNC	Standard Feature Naming Convention
ToE	Trigger over Ethernet
µs	Microsecond

Additional References

Technical manuals and *GigE Features Reference*
https://www.alliedvision.com/en/support/technical-documentation

For technical support, please contact support@alliedvision.com.
For comments or suggestions regarding this document, please contact info@alliedvision.com

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