

# User Manual

Gobi-640-17 $\mu$ m GigE/CL/CXP Camera and  
Gobi-384-25 $\mu$ m GigE/CL Camera

ENG-2012-UMN007-R003

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## Revision History

Issue	Issue date	Changes	Modified by
001	21/03/2012	First issue	CDU
001.01	04/04/2012	Table 2.1 updated	CDU
001.02	18/04/2012	Additional review	CDU
001.03	30/10/2012	New sections added and other sections updated according to input and review	CDU
001.04	31/10/2012	Figs updated: are without IO expander	CDU
001.05	29/11/2012	Camera feature and functions updated	JDS
001.06	30/11/2012	Power cable diagram added	CDU
001.07	11/02/2013	Link to table corrected	CDU
001.08	11/02/2013	New AutoGain algorithm Gobi-640-CL info added	JDS
	22/02/2013	Camera functionality for GigE and CL moved to separate ICD. Title chap. 2.2 added, chap. 1.2, 6.4 and chap. 7 small updates, table 2.1: weight added GigE camera	CDU
001.09	19/04/2013	Chap. 1.2, 1.3, 4.2, 5.1, 6.3, 7 updated	CDU
001.10	05/06/2013	Firmware update Gobi-640-GigE (version 2013/05/31) & Gobi-640-CL (version 2.1.1043) New mechanical drawings	JDS
001.11	25/09/2013	New revisions of mechanical drawings in Appendix B, new revision of Appendix D: Bolometer Control & Operation	CDU
001.12	02/10/2013	Gobi-384 added / new revision of Appendix D: Bolometer Control & Operation	JDS
	09/10/2013	Appendix D: Bolometer Control & Operation: new revision added, info about Gobi-384-25µm added	CDU
001.13	13/11/2013	Review manual	JDS
002	25/11/2013	New issue Appendix Bolometer Control & Operation, CL interface: note about timing diagram added, Appendix F: frame rate calculator added, Second released issue	CDU
002.01	06/01/2014	Trigger warning added	CDU
002.02	19/01/2014	Updated mechanical drawing (rev D)	JDH
002.03	20/01/2014	Updated Ref 7 Xeneth Installation Manual	CDU
002.04	31/01/2014	Trigger-in delay and trigger-in jitter added	CDU
002.05	26/02/2014	New issue Appendix F: Frame rate calculator	CDU
002.06	28/03/2014	Gobi-640-CXP added	JDS
002.07	31/03/2014	Appendix mechanical drawing updated (EASM file removed)	CDU
002.08	25/04/2014	Table 1.1 updated	JDS
002.09	02/05/2014	Onboard algorithms updated XEN-numbers updated Lens table updated	JDS
002.10	13/05/2014	New revision of Appendix Bolometer Control & Operation	CDU
003	13/06/2014	3 <sup>rd</sup> release	JDS

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## Change Details

This table lists all changes of this issue compared to the previous released one.

Chapter/Section	Changes	Modified by
Table 4.1	Trigger comment added	CDU
4.3	Trigger warning added	CDU
7.2	Appendix B: New mechanical drawing	JDH
1.3	Reference document Xeneth Installation Manual updated for Xeneth 2.5	CDU
Table 2.2	Trigger, trigger-in delay and trigger-in jitter added	CDU
Table 2.4	Trigger, trigger-in delay and trigger-in jitter added	CDU
Table 1.1, Table 2.2, Table 4.1	CXP added	JDS
Table 1.1	Updated (updated camera description)	JDS
Section 2.5	Onboard functionality updated	JDS
Table 3.1	Lens table updated	JDS

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## List of Abbreviations

a-Si	Amorphous Silicon
ASY	Assembly
ath	Athermalized
CC	Camera Control
CE	Conformité Européenne
CL	Camera Link protocol
CXP	CoaXpress
DFOV	Dual Field Of View
GigE	Gigabit Ethernet
GND	Ground
ICD	Interface Control Document
LWIR	Long-Wave Infrared
mnt	mount
NETD	Noise Equivalent Temperature Difference
PoE	Power over Ethernet
RJ	Registered Jack
RoHS	Restriction of Hazardous Substances
SDK	Software Development Kit
SDR	Shrunk Delta Ribbon connector
SMA	Sub-Miniature version A connector
SW	Software
UMN	User manual
XEN	Xenics Part Number
XSP	Xenics Serial Protocol
XTM	Xenics Thermal Module

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# 1. Introduction

## 1.1. Scope

This User Manual describes the technical specifications, dimensions, image processing, basic and advanced parameters and related subjects for the following cameras:

Gobi-640-17µm Camera	Part Number
Gobi-640-50mK-GigE Scientific	XEN-000065
Gobi-640-50mK-GigE Industrial	XEN-000088
Gobi-640-50mK-CL Industrial	XEN-000066
Gobi-640-50mK-CXP Industrial	XEN-000324
Gobi-640-75mK-GigE Industrial	XEN-000401
Gobi-640-75mK-9Hz-GigE Industrial	XEN-000402
Gobi-640-75mK-CL Industrial	XEN-000403
Gobi-640-75mK-9Hz-CL Industrial	XEN-000404
Gobi-640-75mK-CXP Industrial	XEN-000405
Gobi-640-75mK-9Hz-CXP Industrial	XEN-000406
Gobi-640-75mK-CL-Shutterless Industrial (planned)	XEN-000326
Gobi-640-75mK-9Hz-CL-Shutterless Industrial (planned)	XEN-000327

Table 1-1 Camera overview - Gobi-640-17µm-GigE&CL

Gobi-384-25µm Camera	Part Number
Gobi-384-80mK-GigE Scientific	XEN-000385
Gobi-384-80mK-GigE Industrial	XEN-000386
Gobi-384-80mK-9Hz-GigE Industrial	XEN-000387
Gobi-384-80mK-CL Industrial	XEN-000373
Gobi-384-80mK-9Hz-CL Industrial	XEN-000374
Gobi-384-80mK-CL-Shutterless Industrial (planned)	XEN-000359
Gobi-384-80mK-9Hz-CL-Shutterless Industrial (planned)	XEN-000361

Table 1-2 Camera overview - Gobi-384-25µm-GigE&CL

Target group: This technical manual is written for professional users.



Please read this manual thoroughly before operating the camera!

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## 1.2. Manual Overview

This section provides a chapter overview:

- Chapter 1 gives an overview of the conventions used in this manual (styles and symbols), the safety warnings, conformity information about Xenics cameras and the contact information.
- Chapter 2 gives a mechanical (2D drawings) and electrical overview
- Chapter 3 describes the optical interfaces
- Chapter 4 describes the electrical interfaces
- Chapter 5 provides the installation of the Xeneth and SDK software
- Chapter 6 lists the steps to get started using the camera
- Chapter 7 lists the appendices.

## 1.3. Reference Documents

(Ref. 1)	Xenics Serial Protocol	ENG-2011-ICD003
(Ref. 2)	Mechanical Drawing Gobi-640-GigE Mechanical Drawing Gobi-640-CL	
(Ref. 3)	Auto Gain Control	ENG-2013-UMN006
(Ref. 4)	Histogram Equalization	ENG-2014-UMN002
(Ref. 5)	Bolometer Control & Operation	ENG-2013-ICD004
(Ref. 6)	Network connection set-up for GigE	ENG-2013-ICD003
(Ref. 7)	Frame rate calculator	ENG-2013-ICD012
(Ref. 8)	Xeneth Installation Manual (see Xeneth SW directory)	ENG-2013-UMN024

## 1.4. Conventions Used in This Manual

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

The styles used in this manual are:

- **Bold**: used for programs, inputs (commands or parameters) or highlighting important things
- `Courier New`: used for code listings and output.
- *Italics*: used for modes and fields.

The symbols used in this manual:



Note: This symbol highlights important information.

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Warning: This symbol highlights important instructions. These instructions must be followed to avoid malfunctions!

## 1.5. Safety Warnings

The following safety warnings must be followed:



**Supply voltage polarity:** Use the correct polarity of the 12 V supply voltage.



**Warranty:** The warranty becomes void in case of unauthorized tampering or any manipulations not approved by the manufacturer.



**Electrostatic discharge:** The camera contains sensitive electronic components which can be destroyed by means of electrostatic discharge. Use sufficient grounding to minimize the risk of damage.



**Environmental conditions:** Operate the camera in dry and dust free environment.

Regarding the signal quality of the camera it is an advantage to operate the camera under constant ambient air temperature (~20°C).

Beneath or above ambient temperature a sufficient heating or cooling may be necessary.



**Warm-up Period:** Depending on the prevailing environmental conditions, some time might pass after the camera start, until the image quality reaches its optimum.

## 1.6. Conformity

Xenics declares under its sole responsibility that all standard cameras of the Gobi 640 family to which this declaration relates to, are conform with the following standard(s) or other normative document(s):

- CE, following the provisions of 2004/108/EG directive
- RoHS (2002/95/EC).

CE:

We declare, under our sole responsibility, that the previously described Gobi cameras conform to the CE directives.

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- **Distributors worldwide**  
Xenics is a European based provider of infrared imaging products and has representatives and distributor locations around the world to service our many customers.

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## 2. Mechanical & Electrical Specifications

The mechanical drawings of Gobi-640/Gobi-384-GigE and CL can be found in [Appendix B](#).

### 2.1. Gobi-640-17 $\mu$ m Detector Specifications

The detector specifications are summarized in [Table 2-1](#).

Parameter	Specification
Array Type	a-Si micro-bolometer
# pixels	640 (W) x 480 (H)
Pixel pitch	17 $\mu$ m
Spectral Band	8-14 $\mu$ m
NETD	(1) 50 mK @ 30°C with F/1 lens (typical value) (2) <75 mK @ 30°C with F/1 lens
Detector Operating Mode	Rolling Shutter Mode
Window of interest	Yes
Exposure time range	1 – 80 $\mu$ s
Pixel Operability	>99%

Table 2-1 Gobi-640-17 $\mu$ m detector specifications

### 2.2. Gobi-640-17 $\mu$ m GigE, CL & CXP Camera Specifications

The camera specifications are listed in [Table 2-2](#).

Feature	GigE	CL	CXP
Frame rate (full frame)	50 Hz		
Shutter	Yes		
Cooling	No		
A/D conversion resolution	16 bit		
Input Voltage	12V $\pm$ 10%		Power over CoaXPress (PoCXP)
Ambient operating temperature	-40 to 60°C		
Storage Temperature	-45 to 85°C		
Vibration	5g (20 to 2000 Hz), according to MIL-STD883J		
Shock	40g, 11ms, according to MIL-STD810G		
Electrical interface	GigE Vision (image acquisition and camera control)	Camera Link (image acquisition and camera control)	CoaXPress (image acquisition and camera control)
Trigger	In or out via SMA	In or out via SMA or CL-CC1	In or out via SMA

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Trigger-in delay	2.2 μs rising edge (SMA trigger) <sup>(2)</sup> 2.4 μs falling edge (SMA trigger) <sup>(2)</sup>	0.4 μs rising and falling edge (CC1 trigger) 2.2 μs rising edge (SMA trigger) <sup>(2)</sup> 2.4 μs falling edge (SMA trigger) <sup>(2)</sup>	2.2 μs rising edge (SMA trigger) <sup>(2)</sup> 2.4 μs falling edge (SMA trigger) <sup>(2)</sup>
Trigger-in jitter	0.03 μs		
Power consumption	< 4.5W	< 2W	< 3.5W
Dimensions (W x H x L) <sup>(1)</sup>	49.0 x 49.0 x 79.0 mm <sup>3</sup>	49.0 x 49.0 x 61.4 mm <sup>3</sup>	49.0 x 49.0 x 69.4 mm <sup>3</sup>
Camera weight <sup>(1)</sup>	263 g	208 g	231g

Table 2-2 Gobi-640-GigE/CL/CXP camera specifications

<sup>(1)</sup> Without Lens

<sup>(2)</sup> With trigger-in voltage = 5V



The design and specifications for the products described above may change without notice.

## 2.3. Gobi-384-25μm Detector Specifications

The detector specifications are summarized in [Table 2-3](#).

Parameter	Specification
Array Type	a-Si micro-bolometer
# pixels	384 (W) x 288 (H)
Pixel pitch	25μm
Spectral Band	8-14 μm
NETD	(1) <60 mK @ 30°C with F/1 lens (2) <80mK @ 30°C with F/1 lens
Detector Operating Mode	Rolling Shutter Mode
Window of interest	Yes – Higher frame rates possible for smaller windows
Exposure time range	1 – 70 μs
Pixel Operability	>99%

Table 2-3 Gobi-384 detector specifications

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## 2.4. Gobi-384-25µm GigE & CL Camera Specifications

The Gobi-384 specifications are listed in [Table 2-4](#).

Feature	GigE	CL
Frame rate (full frame)	84 Hz	
Shutter	Yes	
Cooling	No	
A/D conversion resolution	16 bit	
Input Voltage	12V±10%	
Ambient operating temperature	-40°C to 60°C	
Storage Temperature	-45 to 85°C	
Vibration	5g (20 to 2000 Hz), according to MIL-STD883J	
Shock	40g, 11ms, according to MIL-STD810G	
Electrical interface	GigE Vision (image acquisition and camera control)	Camera Link (image acquisition and camera control)
Trigger	In or out via SMA	In or out via SMA or CL-CC1
Trigger-in delay	2.5 µs rising edge (SMA trigger) <sup>(2)</sup> 2.7 µs falling edge (SMA trigger) <sup>(2)</sup>	0.7 µs rising and falling edge (CC1 trigger) 2.5 µs rising edge (SMA trigger) <sup>(2)</sup> 2.7 µs falling edge (SMA trigger) <sup>(2)</sup>
Trigger-in jitter	0.05 µs	
Power consumption	< 4.5W	< 2W
Dimensions (W x H x L) <sup>(1)</sup>	49.0 x 49.0 x 79.0 mm <sup>3</sup>	49.0 x 49.0 x 61.4 mm <sup>3</sup>
Camera weight <sup>(1)</sup>	263 g	208 g

Table 2-4 Gobi-384-GigE&CL camera specifications

<sup>(1)</sup> Without Lens

<sup>(2)</sup> With trigger-in voltage = 5V



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## 2.5. On-board Algorithms and Functionality

The on-board algorithms, properties and functionality for the different cameras are summarized in [Table 2-5](#) and [Table 2-6](#).

On Board Image Processing Algorithms	Gobi-640-GigE	Gobi-640-CL	Gobi-640-CXP	Gobi-384-GigE	Gobi-384-CL
NUC (non-uniformity correction)	X	X	X	X	X
Auto-Offset and Auto-Gain	X			X	X
Auto-Offset and Auto-Gain with selectable region of interest		X	X		
Histogram equalization		X	X		

Table 2-5 On board image processing features

Properties and onboard functionality	Gobi-640-GigE	Gobi-640CL	Gobi-640CXP	Gobi-384-GigE	Gobi-384-CL
Self-starting	X	X	X	X	X
Trigger possibilities	X	X	X	X	X
BIST (Build-In Self-Test)		X			
Lifetime and power-on counter		X	X		
Test-pattern		X	X		X

Table 2-6 Properties and onboard functionality

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### 3. Optical Interface

The optical interface of the camera consists of three parts: the front panel, a lens insert and the lens itself.

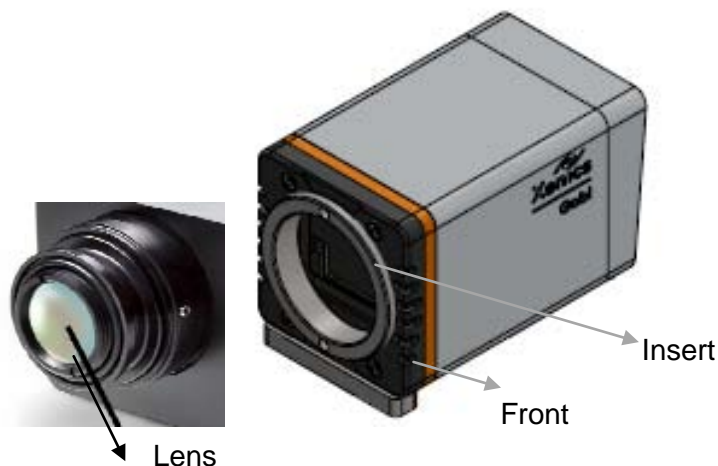


Figure 3-1 Optical components: lens - insert - front

A list of all possible lenses for Gobi-384 and Gobi-640 is shown in [Table 3-1](#).

Lens configuration	
LWIR microscopic lens for 640 (17) + mnt	ASY-000575
LWIR lens 10mm f/1 for 640 (17μm) + mnt	ASY-000415
LWIR lens 10mm f/1 for 640 (17μm) + mnt + ND1F	ASY-000604
LWIR lens 15mm f/1 for 640 (17μm) + mnt	ASY-000869
LWIR lens 18mm f/1 for 640 (17μm) + mnt	ASY-000407
LWIR lens 18mm f/1 for 640 (17μm) + mnt + ND1F	ASY-000606
LWIR lens 25mm f/1 for 640 (17μm) + mnt	ASY-000408
LWIR lens 40mm f/1 for 640 (17μm) + mnt	ASY-000409
LWIR lens 50mm f/1 for 640 (17μm) + mnt	ASY-000410
LWIR lens 60mm f/1 for 640 (17μm) + mnt	ASY-000411
LWIR lens 75mm f/1 for 640 (17μm) + mnt	ASY-000412
LWIR lens 100mm f/1 for 640 (17μm) + mnt(XTM)	ASY-000386
LWIR lens 150mm f/1 for 640 (17μm) + mnt(XTM)	ASY-000383
LWIR lens 200mm f/1.4 for 640 (17μm) + mnt(XTM)	ASY-000364
LWIR lens 210mm f/1.4 for 640 (17μm) (M) + mnt(XTM)	ASY-000683
LWIR DFOV lens 33/99mm f/1.25 640(17) +mnt (XTM)	ASY-000351
LWIR DFOV lens 45/135mm f/1.1 for 640/17 +mnt(XTM)	ASY-000733
LWIR zoom lens 15-100mm f/1.4 640/17 (M) +mnt(XTM)	ASY-000388
LWIR zoom lens 25-225mm f/1.5 640(17)(M) +mnt(XTM)	ASY-000750

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LWIR zoom lens (man.) 30-100mm f/1.6 640(17) + mnt	ASY-000863
LWIR ath lens 5.8mm f/1.0 for 640 (17um) + mnt	ASY-000787
LWIR ath lens 9.6mm f/1 for 640 (17um) + mnt	ASY-000792
LWIR ath lens 14.25mm f/1 for 640 (17um) + mnt	ASY-000786
LWIR ath lens 15mm f/1.0 for 640 (17um) + mnt	ASY-000814
LWIR ath lens 18mm f/1.0 for 640 (17um) + mnt	ASY-000760
LWIR ath lens 25mm f/1.0 for 640 (17um) + mnt	ASY-000817
LWIR ath lens 50mm f/1.2 for 640 (17um) + mnt	ASY-000818
LWIR ath lens 75mm f/1 for 640 (17um) + mnt	ASY-000669
LWIR ath lens 100mm f/1.6 for 640 (17um) + mnt	ASY-000568

Table 3-1 Lens configuration

It is possible to use the following different solvents to clean a lens:

- Ethanol: removal of fingerprints and other contaminants
- Alcohol: final cleaning before use.



Perform the following steps to clean a lens:

1. Immerse lens tissue in Alcohol / Propanol or Ethanol (reagent grade).
2. Wipe the lens in "S" motion in such way that each lens area will not be wiped more than once!
3. Repeat stage 2 until the lens is clean. Use a new lens tissue each time!

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## 4. Electrical Interface

### 4.1. General Overview Connectors and Specifications

Connect all cables to the connectors at the camera back (see also [\(Ref. 2\)](#)). [Table 4-1](#) lists the connector and interface specifications overview of the Gobi-640-17μm and of the Gobi-384-25μm.

Interface	Connector	Specification	Camera Protocol
Gobi-640-GigE and Gobi-384-GigE			
Input power (12V DC)	Hirose HR10-7R-4SA(73)	12V ±10%	
Trigger (either Trigger-in or Trigger-out!)	SMA	Trigger in: V <sub>IN,L</sub> = 0.8V Max. V <sub>IN,H</sub> = 2V Min. V <sub>IN,MAX</sub> = 30V Internal Pull-down: R = 10kΩ	
		Trigger out: V <sub>HIGH</sub> = 3.3V ±10% V <sub>LOW</sub> = 0V	
Ethernet	RJ45 connector	GigE standard	GigE Vision
Gobi-640-CL and Gobi-384-CL			
Input power (12V DC)	Hirose HR10-7R-4SA(73)	12V ±10%	
Trigger (either Trigger-in or Trigger-out!)	SMA	Trigger in: V <sub>IN,L</sub> = 0.8V Max. V <sub>IN,H</sub> = 2V Min. V <sub>IN,MAX</sub> = 30V Internal Pull-down: R = 10kΩ	
		Trigger out: V <sub>HIGH</sub> = 3.3V ±10% V <sub>LOW</sub> = 0V	
Mini-camera link	CONN SDR 26POS VERT RECEPT	Serial control: 115200 baud, 8n1 Levels: RS-644	XSP Protocol (see (Ref. 1))
		Image acquisition: CL	CL Base protocol/ 1 TAP for image acquisition
Gobi-640-CXP			
CoaXPress	BNC connector	CXP-1 (or CXP-2)	CXP
Trigger (either Trigger-in or Trigger-out!)	SMA	Trigger in: V <sub>IN,L</sub> = 0.8V Max. V <sub>IN,H</sub> = 2V Min. V <sub>IN,MAX</sub> = 30V Internal Pull-down: R = 10kΩ	
		Trigger out: V <sub>HIGH</sub> = 3.3V ±10% V <sub>LOW</sub> = 0V	

Table 4-1 Electrical interface specs for Gobi-640/Gobi-384-GigE, CL, CXP interface

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## 4.2. Power Interface

The power cable (ASY-001268) must be connected to the backside of the camera (see [\(Ref. 2\)](#) for its location). For a Gobi-GigE, the power cable does not need to be connected to the camera in case Power over Ethernet (PoE) is foreseen.

[Figure 4-1](#) shows schematically the pin location of the power connector on the camera (Hirose HR10-7R-4SA(73)). [Table 4-2](#) lists the connector pins overview.

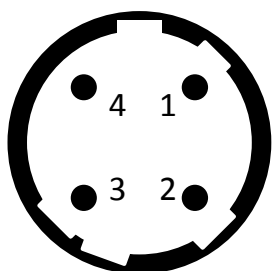


Figure 4-1 Camera power connector

Pin	Signal
1	+ 12V
2	+ 12V
3	Gnd
4	Gnd

Table 4-2 Camera power connector 12V<sub>DC</sub>

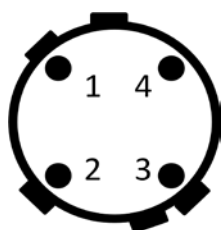


Figure 4-2 Cable connector

Pin	Signal
1	+ 12V
2	+ 12V
3	Gnd
4	Gnd

Table 4-3 Cable connector 12V<sub>DC</sub>

For the power cable (ASY-001268) the connector pins overview is shown in [Table 4-3](#). [Figure 4-2](#) shows schematically the pin location of the cable connector (Hirose HR10-7P-4P(73)).

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### 4.3. Trigger Interface



Do not apply voltages to the trigger connector when it is configured in Trigger-OUT mode, because this will damage the camera!

For the trigger interface, a SMA connector is foreseen.

The trigger interface can be configured either as **Trigger-IN** or **Trigger-OUT**. The following settings can be customized:

- Trigger OUT
  - Polarity:
    - High
    - Low.
  - Width
  - Delay.
- Trigger-IN
  - Sensitivity
    - Level
    - Edge.
  - Polarity:
    - Low level / falling edge
    - High level / rising edge.
  - Delay
  - Trigger skip-count.

More information on the trigger configuration can be found in [\(Ref. 4\)](#).

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## 4.4. Gobi-640/Gobi-384-GigE Interface

GigE Vision® is a camera interface standard that uses the Gigabit Ethernet (GigE) communication protocol. It provides a framework for transmitting high-speed video and related control data over Ethernet networks.

To realize the GigE communication the Gobi-GigE cameras are equipped with a 1000Base-T Ethernet interface (RJ-45 connector). The data connection between camera and PC can be established via a standard CAT5e cable.

The GigE Vision standard defines how compliant products interact to deliver video and control information over Ethernet networks. It has the following four main elements:

- **Device discovery:** defines the sequence of events required for compliant devices to obtain valid Internet Protocol addresses, and for control applications to discover compliant devices.
- **GigE Vision control protocol (GVCP):** defines how to specify video stream channels and control and configure compliant devices.
- **GigE Vision stream protocol (GVSP):** defines how images are packetized and provides mechanisms for cameras or other types of video transmission systems to send image data and other information to compliant receivers.
- **An extensible mark-up language (XML) description file:** provides the equivalent of a computer-readable data sheet of features in compliant devices. This file must be based on standard defined by the European Machine Vision Association's GenICam™.

## 4.5. Gobi-640 CXP Interface

CoaXPress (CXP) is an asymmetric high speed serial communication standard over coaxial cable. The Gobi-CXP camera can be interfaced to a CoaXPress frame grabber by a single coaxial cable (characteristic impedance of 75Ω) without an external power supply or extra cables for uplink communication to the camera.

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## 4.6. Gobi-640/Gobi-384-CL Interface

Camera Link is an interface for the transfer of digital video data. The standard defines data transfer on a physical base and determines connectors, cables and components for transmission and reception. Different configurations are available, distinguishing between the numbers of parallel transferred data bits.

For the Gobi-CL camera, the **BASE configuration with 1 TAP** is used. The pin assignment and pin lay-out of the Camera Link connector on the Gobi-CL camera are shown in [Figure 4-3](#) and [Table 4-4](#).

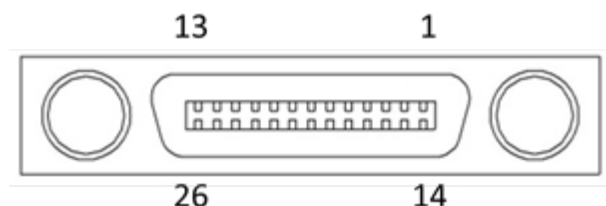


Figure 4-3 Pin out of Camera Link connector on the Gobi-640-CL camera

Pin	Signal	Pin	Signal
1	GND	14	GND
2	X0	15	X0+
3	X1	16	X1+
4	X2	17	X2+
5	XCLK	18	XCLK+
6	X3	19	X3+
7	SerTC+	20	SerTC-
8	SerTFG-	21	SerTFG+ P
9	CC1	22	CC1+
10	CC2+	23	CC2
11	CC3	24	CC3+
12	CC4+	25	CC4
13	GND	26	GND

Table 4-4 Camera Link connector (base) pin assignment

CC1 can be configured as trigger input.

CC2 to CC4 in [Table 4-4](#) are not supported by the camera. The clock rate is 16 MHz with one tap & 16 bit/pixel.



Information about the timing diagram can be found in [\(Ref. 4\)](#).

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## 5. Software Installation

Before being able to start the camera, the Xeneth imaging suite (at least version 2.4) and its graphical user interface must be installed, so that the data coming from a wide variety of Xenics detectors and cameras can be easily operated on and analyzed.

### 5.1. Xeneth Installation



It is a good practice to first uninstall a previous Xeneth version when installing a new one.

Refer to the Xeneth Installation Manual ([Ref. 6](#)) that is delivered on the CD together with the camera to install Xeneth.



When using camera link cameras, it is also necessary to pre-install the frame grabber before installing Xeneth! Refer to the frame grabber manual for installation instructions.

### 5.2. SDK Installation

The optional SDK installation file is delivered on the CD together with the camera. Install the SDK software using this file.

After the SDK installation, the SDK manual, together with the samples and header files can be found in the C:\Program Files\Xeneth\SDK directory.

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## 6. Getting Started

### 6.1. Install the Software

First perform the Xeneth installation and when necessary the SDK installation as well (see chap. 5 [Software Installation](#).)

### 6.2. Connect the Cables

The cable information and interfaces is described in chap. 4 [Electrical Interface](#).

### 6.3. Connect the Camera via Xeneth

When connecting the GigE interface: see ([Ref. 6](#)) otherwise do the following:

Click the Xeneth shortcut on the desktop to start up Xeneth (see [Figure 6-1](#)). The connection dialog will become visible (see [Figure 6-2](#)). When the camera is not shown, click the refresh button on the dialog. Select the camera, together with the calibration data suited for it. For more details, consult the Xeneth User Manual, section Connection setup - Settings.



Figure 6-1 Xeneth shortcut

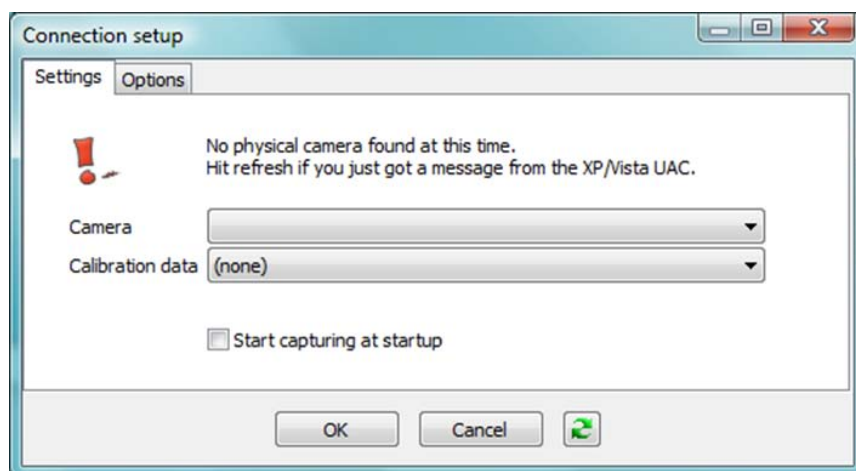


Figure 6-2 Connection dialog - settings

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## 6.4. Camera Properties

Within Xeneth an html description of the camera properties is available. To select the camera property documentation, right click on the camera icon and select 'Show property documentation' (see [Figure 6-3](#)).



Figure 6-3 Camera properties settings tab

For the Gobi-640/Gobi-384: the user is able to modify the following properties and functionality:

- Image acquisition
  - o Windowing
  - o Trigger operation
- Image processing
  - o Pixel correction
  - o Gain control
  - o Offset control
- Non-volatile memory
  - o User settings
  - o Calibrations
- Detector Operation
  - o ROIC settings
  - o Bias Voltages
- Firmware Upgrade

More information on the camera functionality and operation for GigE and CL can be found in ([Ref. 4](#)).

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## 7. Appendices

### 7.1. Appendix A

A detailed description of the Xenics Serial Protocol can be found in [\(Ref. 1\)](#).

### 7.2. Appendix B

The complete mechanical drawings of the Gobi-640/Gobi-384-GigE and CL can be found in [\(Ref. 2\)](#).

### 7.3. Appendix C

More detailed information on the Auto Gain Control functionality is provided in [\(Ref. 3\)](#).

### 7.4. Appendix D

More detailed information on the Histogram Equalization functionality is provided in [\(Ref. 4\)](#)

### 7.5. Appendix E

The control and operation of bolometer cameras and cores lists the registers which are described in [\(Ref. 5\)](#).

### 7.6. Appendix F

The network connection set-up and the camera functions and features for Gobi-640/Gobi-384-GigE are described in more detail in [\(Ref. 6\)](#).

### 7.7. Appendix G

The achievable frame rate and the minimal required frame time can be calculated using the Frame rate calculator in [\(Ref. 7\)](#).

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