



## **Gobi-640-GigE/CL/CXP**

## **Gob-384-GigE/CL**

### Datasheet Document

ENG-2012-DSD005-R006

---

Company confidential.

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

Xenics nv  
Ambachtenlaan 44  
BE-3001 Leuven • Belgium

T +32 16 38 99 00  
F +32 16 38 99 01  
[www.xenics.com](http://www.xenics.com)

Doc Ref: ENG-2012-DSD005  
Issue: R006  
Date: 26/10/2015  
XF-104\_02/20-01-2012

#### **Disclaimer**

All products manufactured by Xenics NV are warranted as laid down in the sales conditions.

Xenics NV has no other obligation or liability for defects than those set forth therein.

No other warranty is expressed or implied. Xenics NV specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

This warranty will no longer be valid if the instructions contained herein are not followed.

Xenics NV shall not be liable for any direct, indirect, special, incidental or consequential loss of damage, whether based on contract, tort, product liability or any other legal theory.

#### **Copyright/Intellectual Property Rights**

© Xenics NV 2015.

All rights reserved worldwide.

This document must not, in whole or part, be copied, photocopied, reproduced, translated or transmitted to any electronic medium or machine readable form without written permission from Xenics NV.

Names and marks appearing on the products herein are either registered trademarks or trademarks of Xenics NV. All other trademarks, trade names or company names referenced in this document are used for identification only and are the property of their respective owners.

#### **Quality Assurance**

The Quality Management System under which these products are developed and manufactured has been certified in accordance with the ISO 9001 standard.

Xenics NV is committed to a policy of continuous development for which we reserve the right to make changes and improvements on any of the products described in this manual without prior notice.

---

#### **Company confidential.**

**This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.**

Xenics nv  
Ambachtenlaan 44  
BE-3001 Leuven • Belgium

T +32 16 38 99 00  
F +32 16 38 99 01  
www.xenics.com

Doc Ref: ENG-2012-DSD005  
Issue: R006  
Date: 26/10/2015  
XF-104\_02/20-01-2012

## Revision History

Issue	Issue date	Reason for changes	Modified by	Approved by
001	22/08/2012	Released Version	JDS	PMN
001.01	03/12/2012	Update Industrial Components	JDS	CDU
001.02	01/07/2013	Document name changed from DS to DSD	CDU	JDS
001.03	15/10/2013	Update with Gobi-384	JDS	CDU
002	15/11/2013	Second released issue	CDU	JDS
002.01	03/02/2014	Trigger specs updated	CDU	JDS
002.02	30/04/2014	Xen numbers added - 384: 60mK NETD - 640: CXP Histogram Equalization, Counters and BIST added. Lens list updated	JDS	CDU
003	13/06/2014	3 <sup>rd</sup> released issue	JDS	CDU
003.01	03/09/2014	Add information shutterless	JDS	CDU
003.02	03/10/2014	Upgrade Gobi-384 Addition info on thermography	JDS	CDU
004	14/10/2014	4 <sup>th</sup> official released issue	JDS	CDU
004.01	13/02/2015	Remove XEN-000469 and XEN-000385	KNB	JDS
004.02	08/10/2015	Vibration spec. updated (MIL-STD810G)	JDS	
005	09/10/2015	5 <sup>th</sup> released issue	KNB	JDS
005.01	26/10/2015	XIE filter added	KNB	
006	26/10/2015	6 <sup>th</sup> released issue	KNB	JDS

## Change Details

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

Chapter/Section	Changes	Modified by

Company confidential.

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

## Table of Contents

Revision History .....	3
Change Details .....	3
List of Abbreviations.....	5
List of Figures .....	6
List of Tables.....	7
1. Configurations, General Description and Applications.....	8
2. Detector Specifications .....	11
3. Camera Specifications .....	12

---

Company confidential.

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

Xenics nv  
Ambachtenlaan 44  
BE-3001 Leuven • Belgium

T +32 16 38 99 00  
F +32 16 38 99 01  
www.xenics.com

Doc Ref: ENG-2012-DSD005  
Issue: R006  
Date: 26/10/2015  
XF-104\_02/20-01-2012

## List of Abbreviations

a-Si	Amorphous Silicon
CL	Camera Link
CXP	CoaXpress
GigE	Gigabit Ethernet
IO	Input Output
LWIR	Long-Wave Infrared
NETD	Noise Equivalent Temperature Difference
SDK	Software Development Kit
SMA	Sub-Miniature version A connector
WOI	Window of Interest
XEN	Xenics Part Number

---

Company confidential.

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

Xenics nv  
Ambachtenlaan 44  
BE-3001 Leuven • Belgium

T +32 16 38 99 00  
F +32 16 38 99 01  
[www.xenics.com](http://www.xenics.com)

Doc Ref: ENG-2012-DSD005  
Issue: R006  
Date: 26/10/2015  
XF-104\_02/20-01-2012

## List of Figures

Figure 1-1 Picture of the Gobi .....	8
Figure 1-2 Connector overview: GigE, CL and CXP .....	8

---

Company confidential.

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

Xenics nv  
Ambachtenlaan 44  
BE-3001 Leuven • Belgium

T +32 16 38 99 00  
F +32 16 38 99 01  
[www.xenics.com](http://www.xenics.com)

Doc Ref: ENG-2012-DSD005  
Issue: R006  
Date: 26/10/2015  
XF-104\_02/20-01-2012

## List of Tables

Table 1-1 Gobi-640 camera configurations and general description.....	9
Table 1-2 Gobi-384 camera configurations and general description.....	9
Table 1-3 Applications.....	10
Table 2-1 Gobi-640 detector specifications .....	11
Table 2-2 Gobi-384 detector specifications .....	11
Table 3-1 Camera imaging specifications Gobi-640 .....	12
Table 3-2 Camera imaging specifications Gobi-384 .....	12
Table 3-3 On board image processing features.....	12
Table 3-4 Camera specifications Gobi-640 and Gobi-384 .....	14
Table 3-5 Thermal Calibration Packs .....	14
Table 3-6 Lens configuration .....	15
Table 3-7 Software.....	15
Table 3-8 Accessories.....	15

---

Company confidential.

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

Xenics nv  
Ambachtenlaan 44  
BE-3001 Leuven • Belgium

T +32 16 38 99 00  
F +32 16 38 99 01  
www.xenics.com

Doc Ref: ENG-2012-DSD005  
Issue: R006  
Date: 26/10/2015  
XF-104\_02/20-01-2012

# 1. Configurations, General Description and Applications



Figure 1-1 Picture of the Gobi

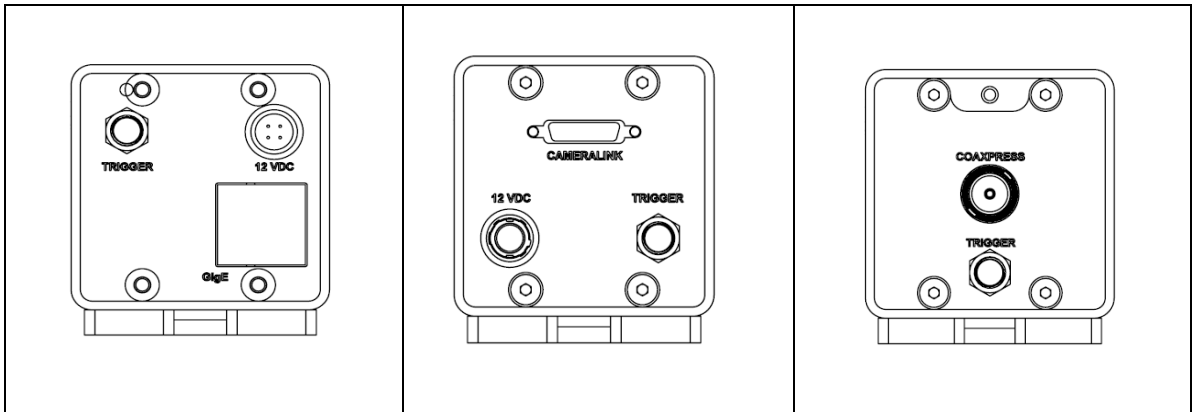


Figure 1-2 Connector overview: GigE, CL and CXP

Company confidential.

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

Xenics nv  
Ambachtenlaan 44  
BE-3001 Leuven • Belgium

T +32 16 38 99 00  
F +32 16 38 99 01  
www.xenics.com

Doc Ref: ENG-2012-DSD005  
Issue: R006  
Date: 26/10/2015  
XF-104\_02/20-01-2012



Camera	Product Number	General Description
Gobi-640-50mK-GigE Scientific	XEN-000065	LWIR uncooled Thermal Imaging Camera with 640 Premium bolometer sensor (NETD = 50mK(*))
Gobi-640-50mK-GigE Industrial	XEN-000088	
Gobi-640-50mK-CL Industrial	XEN-000066	
Gobi-640-50mK-CXP Industrial	XEN-000324	
Gobi-640-50mK-9Hz-GigE Industrial	XEN-000600	
Gobi-640-50mK-9Hz-CL Industrial	XEN-000601	
Gobi-640-75mK-GigE Industrial	XEN-000401	LWIR uncooled Thermal Imaging Camera with 640 Base bolometer sensor (NETD <75mK)
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	XEN-000326	LWIR Uncooled Shutterless Thermal Imaging Camera with 640 Base bolometer sensor (NETD <75mK)
Gobi-640-75mK-CL-9Hz Shutterless Industrial	XEN-000327	

Table 1-1 Gobi-640 camera configurations and general description

(\*): Typical value

Camera	Product Number	General Description
Gobi-384-60mK-GigE Industrial	XEN-000470	LWIR uncooled Thermal Imaging Camera with 384 bolometer sensor (NETD <60mK)
Gobi-384-60mK-GigE-9Hz Industrial	XEN-000471	
Gobi-384-60mK-CL Industrial	XEN-000472	
Gobi-384-60mK-9Hz-CL Industrial	XEN-000473	
Gobi-384-80mK-GigE Industrial	XEN-000386	LWIR uncooled Thermal Imaging Camera with 384 bolometer sensor (NETD <80mK)
Gobi-384-80mK-GigE-9Hz Industrial	XEN-000387	
Gobi-384-80mK-CL Industrial	XEN-000373	
Gobi-384-80mK-9Hz-CL Industrial	XEN-000374	

Table 1-2 Gobi-384 camera configurations and general description

**Company confidential.**

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

Xenics nv  
Ambachtenlaan 44  
BE-3001 Leuven • Belgium

T +32 16 38 99 00  
F +32 16 38 99 01  
www.xenics.com

Doc Ref: ENG-2012-DSD005  
Issue: R006  
Date: 26/10/2015  
XF-104\_02/20-01-2012

Applications
<p>The Gobi is a high resolution uncooled thermal camera designed for use in a scientific or an industrial environment. It is developed for use in a wide variety of applications:</p> <ul style="list-style-type: none"><li>- Temperature measurement</li><li>- Medical imaging</li><li>- Process control and monitoring</li><li>- Quality control and quality assurance.</li></ul>

Table 1-3 Applications

---

Company confidential.

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

Xenics nv  
Ambachtenlaan 44  
BE-3001 Leuven • Belgium

T +32 16 38 99 00  
F +32 16 38 99 01  
www.xenics.com

Doc Ref: ENG-2012-DSD005  
Issue: R006  
Date: 26/10/2015  
XF-104\_02/20-01-2012

## 2. Detector Specifications

Parameter	Specification
Array Type	a-Si micro-bolometer
# pixels	640 (W) x 480 (H)
Pixel pitch	17 $\mu\text{m}$
Spectral Band	8-14 $\mu\text{m}$
NETD	(1) $\approx 50$ mK (*) @ 30°C with F/1 lens (2) $< 75$ mK @ 30°C with F/1 lens
Detector Operating Mode	Rolling Shutter Mode
Window of interest	Yes (not for shutterless) – Higher frame rates possible for smaller windows
Exposure time range	1 – 80 $\mu\text{s}$
Pixel Operability	$> 99\%$

Table 2-1 Gobi-640 detector specifications

(\*): typical value

Parameter	Specification
Array Type	a-Si micro-bolometer
# pixels	384 (W) x 288 (H)
Pixel pitch	25 $\mu\text{m}$
Spectral Band	8-14 $\mu\text{m}$
NETD	(1) $< 60$ mK @ 30°C with F/1 lens (2) $< 80$ mK @ 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 $\mu\text{s}$
Pixel Operability	$> 99\%$

Table 2-2 Gobi-384 detector specifications

Company confidential.

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

Xenics nv  
Ambachtenlaan 44  
BE-3001 Leuven • Belgium

T +32 16 38 99 00  
F +32 16 38 99 01  
www.xenics.com

Doc Ref: ENG-2012-DSD005  
Issue: R006  
Date: 26/10/2015  
XF-104\_02/20-01-2012

### 3. Camera Specifications

Imaging specifications Gobi-640	
Frame rate (full frame)	50 Hz
Window of interest	Yes (not for shutterless)
Smallest window of interest	160 x 120
WOI granularity	4 x 1
Max. frame rate in smallest window	744 Hz (exposure time < 10µs)
Exposure time range	1 – 80 µs
A/D conversion resolution	16 bit

Table 3-1 Camera imaging specifications Gobi-640

Imaging specifications Gobi-384	
Frame rate (full frame)	84 Hz
Window of interest	Yes
Smallest window of interest	160 x 80
WOI granularity	4 x 1
Max. frame rate in smallest window	620 Hz (exposure time < 16µs)
Exposure time range	1 – 70 µs
A/D conversion resolution	16 bit

Table 3-2 Camera imaging specifications Gobi-384

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

Table 3-3 On board image processing features

Company confidential.

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

Camera Specifications		Gobi-640-GigE	Gobi-640-CL	Gobi-640-CL-Shutterless	Gobi-640-CXP	Gobi-384-GigE	Gobi-384-CL
<b>Camera properties &amp; onboard functionality</b>							
Self-starting		x	x	x	x	x	x
Trigger possibilities		x	x	x	x	x	x
BIST (Build-In Self-Test)			x	x			x
Lifetime and power-on counter			x	x	x		x
Test-pattern			x	x	x		x
<b>Interfaces</b>							
Camera control	GigE	x				x	
	CL		x	x			x
	CXP				x		
Image Acquisition	GigE	x				x	
	CL		x	x			x
	CXP				x		
Trigger	Trigger In / Out (configurable) via SMA	x			x	x	
	Trigger In / Out (configurable) via SMA or CL-CC1		x	x			x
<b>Trigger Characteristics</b>							
Trigger-in delay (for 640)	0.4 $\mu$ s rising and falling edge (CC1 trigger)		x	x			
	2.2 $\mu$ s rising edge (SMA trigger) <sup>(1)</sup>	x	x	x	x		
	2.4 $\mu$ s falling edge (SMA trigger) <sup>(1)</sup>						
Trigger-in delay (for 384)	0.7 $\mu$ s rising and falling edge (CC1 trigger)						x
	2.5 $\mu$ s rising edge (SMA trigger) <sup>(1)</sup>					x	x
	2.7 $\mu$ s falling edge (SMA trigger) <sup>(1)</sup>						
Trigger-in jitter (for 640)	0.03 $\mu$ s	x	x	x	x		
Trigger-in jitter (for 384)	0.05 $\mu$ s					x	x
<b>Power Requirements</b>							
Average power consumption (without shutter)	<4.5 W	x				x	
	<2 W		x	x			x
	<3.5 W				x		
Input Voltage	12 V	x	x	x		x	x
	Power over CXP				x		
Start-up time	< 10 s	x	x	x	x	x	x

Company confidential.

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

Physical characteristics							
Dimensions	49 mm x 49 mm x 79 mm	x				x	
	49 mm x 49 mm x 61.35 mm		x	x			x
	49 mm x 49 mm x 69.4 mm				x		
Weight camera head	263 g (without lens)	x				x	
	208 g (without lens)		x				x
	205 g (without lens)			x			
	231 g (without lens)				x		
Environmental specifications							
Shock	40G, 11ms, according to MIL-STD810G	x	x	x	x	x	x
Vibration	5G (20 to 2000 Hz), according to MIL-STD810G	x	x	x	x	x	x
Ambient operating temperature	-40 to 60°C	x	x	x	x	x	x
Ambient operating temperature for thermography	10°C – 35°C	x	x	/	x	x	x
Storage temperature	-45 to 85°C	x	x	x	x	x	x

Table 3-4 Camera specifications Gobi-640 and Gobi-384

(1) With trigger-in voltage = 5V

Thermal Calibration Packs (in Software)		Gobi-640-GigE-Scientific	Gobi-640-GigE-Industrial	Gobi-640-CL	Gobi-640-CL-Shutterless	Gobi-640-CXP	Gobi-384-GigE-Scientific	Gobi-384-GigE-Industrial	Gobi-384-CL
-20 to 120°C	Standard	x					x		
	Optional		x	x		x		x	x
50 to 400°C	Optional	x	x	x		x	x	x	x
300 to 1200°C	Optional	x	x	x		x	x	x	x
1000 to 2000°C	Optional	x	x	x		x	x	x	x

Table 3-5 Thermal Calibration Packs

**Company confidential.**

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.

Xenics nv  
Ambachtenlaan 44  
BE-3001 Leuven • Belgium

T +32 16 38 99 00  
F +32 16 38 99 01  
www.xenics.com

Doc Ref: ENG-2012-DSD005  
Issue: R006  
Date: 26/10/2015  
XF-104\_02/20-01-2012

Lens configuration Gobi-640 & Gobi-320	
Other Lenses	VIS or SWIR lenses available For more information, see <a href="http://www.xenics.com/LSG">http://www.xenics.com/LSG</a>

Table 3-6 Lens configuration

Software		Gobi-Scientific	Gobi-Industrial
Xeneth SDK	Standard	x	
	Optional		x
Xeneth Advanced	Standard		x
	Optional	x	
Xeneth Radiometric	Standard	x	
	Optional		x

Table 3-7 Software

Accessories			Gobi-GigE Scientific	Gobi-GigE Industrial	Gobi-CL	Gobi-CXP
Ethernet Cable 5m	ELC-001330	Standard	x			
		Optional		x		
Frame grabber NI 1433	ELC-001337	Optional			x	
Euresys GRABLINK full	ELC-002139	Optional			x	
Camera-Link Cable	ELC-001281	Optional			x	
Trigger cable	ELC-001760	Standard	x			
		Optional		x	x	x
Power supply	ASY-001268	Standard	x	x	x	
	ELC-001288	Optional (EUR)	x	x	x	
	ELC-001500	Optional (USA)	x	x	x	
Power cord	ELC-001501	Optional (UK)	x	x	x	
	ASY-000057	Standard	x	x	x	x

Table 3-8 Accessories

**Company confidential.**

This document is the property of Xenics. It may not be reproduced – completely or partially – or passed to a third party without written permission from Xenics.