

NCLT-50C.I


10-Gigabit-Ethernet-Flächenkamera NCLT-50C.I
Farbe, IP-Schutz /

10-Gigabit Ethernet area scan camera NCLT-50C.I
color, IP protection



Technische Beschreibung / Specification

Sensor Daten / Sensor data

Chip / Sensor	Sony IMX250
Typ / Type	2/3" progressive scan CMOS
Shutter / Shutter	Global shutter
Auflösung / Resolution	2448 x 2048 Px
Größe / Scan area	8.44 x 7.06 mm ²
Pixelgröße / Pixel size	3.45 µm x 3.45 µm
Farbe / Color	

Optische Daten und Objektivanschluss / Optical data and lens mount

Optischer Filter / Optical filter	IR Sperrfilter / IR cut filter
Objektivanschluss / Lens mount	C-Mount

Bildaufnahme­daten / Image acquisition data

Belichtungszeit / Exposure time	1 µs...60 s
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Analoge Steuerung / Analog settings

Verstärkungsfaktor / Gain	0...48 dB
Offset / Offset	0...255 LSB 12 Bit

Farbmodelle / Color models	Mono, Raw Bayer, RGB, BGR
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Partial Scan / Partial Scan	Ja / Yes
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Binning / Binning 2x2, 2x1, 1x2	Ja / Yes
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Bildformate, Binning, Bildrate / Image formats, Binning, frame rates	Full Frame	2448 x 2048 Px,	max. 163 fps
	Binning 2x2	1224 x 1024 Px,	max. 163 fps
	Binning 2x1	1224 x 1024 Px,	max. 163 fps
	Binning 1x2	2448 x 1024 Px,	max. 163 fps

Bildaufnahme max. (Burst Mode) / Acquisition frame rate max. (Burst Mode)	163 fps t _{readout} = 6.1 ms (max. Res. Full Frame) @ 8 Bit
	147 fps t _{readout} = 6.79 ms (max. Res. Full Frame) @ 10 Bit
	89 fps t _{readout} = 11.16 ms (max. Res. Full Frame) @ 12 Bit

Pixelformate / Pixel formats	BayerRG8, BayerRG10, BayerRG12, BayerRG12 Packed Mono8, Mono10, Mono12, Mono12 Packed, RGB8, BGR8
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Farbanpassungen / Color processing	Ja / Yes
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and adjustment

Prozesssynchronisation / Process synchronization

Trigger Mode	Off (Free Running), On (Trigger)
Trigger Overlap Type	Readout
Trigger Sources	Hardware (Line 0, 1), Software, All ActionCMD (Action 1) or Off fixed Trigger Delay out of $t_{readout}$: 41.7 μ sec @ 8 bit, 42.8 μ sec @ 10 bit, 49.1 μ sec @ 12 bit max. Trigger Delay during $t_{readout}$: 39.7 μ sec @ 8 bit, 41.0 μ sec @ 10 bit, 49.3 μ sec @ 12 bit
Trigger Delay	0 ... 2 sec., Tracking and buffering of up to 256 triggers
External Flash Sync	via Exposure Active, $t_{delay\ flash} \leq 1\ \mu$ sec, $t_{duration} = t_{exposure}$
Encoder Function	Yes, via counter and trigger source

Digital-Ein-Ausgänge / Digital-I/Os

Lines	Input: Line 0...1, Output: Line 4...7, GPIO: No, RS232: Line 2...3 (reserved for future use)
Output Sources	Off, ExposureActive, Timer1, ReadoutActive, UserOutput 1-3 and TriggerReady
Output Line Mode	Yes, Tri-State, PushPull, OpenDrain, OpenSource
Output PWM function	Yes, Line 4...7 PWM Mode: Off, One Pulse, FixedFrequency PWM Feature: PWMDuration, PWMDutyCycle Configuration Mode for lightning protection: MaxPWMDuration, MaxPWMDutyCycle
Line Debouncer	Low and high signal separately selectable Debouncing time 0...5 msec, Step size: 1 μ sec

Speicher / Memory

Image Buffer	1024 MB 207 Images (Trigger Mode) / 1 Image (Free Running Mode)
Non-volatile Memory	128 kB

Netzwerkeinstellungen / Network Interface Data

Interface	10 Gigabit Ethernet	10GBASE-T	10.000 Mbit/sec
	5 Gigabit Ethernet	5GBASE-T	5.000 Mbit/sec
	2.5 Gigabit Ethernet	2.5GBASE-T	2.500 Mbit/sec
	Gigabit Ethernet	1000BASE-T	1.000 Mbit/sec
	Fast Ethernet	100BASE-T	100 Mbit/sec
Ethernet IP Configuration	Persistent IP, DHCP, LLA		
Packet Size	576...9000 Byte, Jumbo Frames supported		

GigE Vision® Eigenschaften / GigE Vision® Features

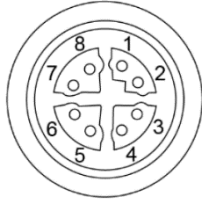
Events (Transmission via Asynchronous Message Channel)	DeviceTemperatureStatusChanged, EventLost, ExposureEnd, ExposureStart, FrameEnd, FrameStart, FrameTransfer-Skipped, Error, GigE VisionHeartbeatTimeout, Line 0...3 FallingEdge, Line 0...3 RisingEdge, PrimaryApplicationSwitch, TransferBufferFull, TransferBufferReady, TriggerOverlapped,
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	<i>TriggerReady, TriggerSkipped</i>
Action CMD	Yes, Action 1 for Trigger
Frame Counter	Up to 2 ³²
Payload Size	0...15040752 Byte
Timestamp	64 Bit, resolution in nsec, increment = 8
Packet Delay	0...2 ³² – 1 nsec
Packer Resend	
GigE Vision	V2.0

Schnittstellen und Anschlüsse / Interfaces and Connectors

Daten- und Versorgungs-Schnittstelle / Data and Power Interface



10 Gigabit-Ethernet-Anschluss für Daten und Steuerung /
 10 Gigabit Ethernet connection data and control interface

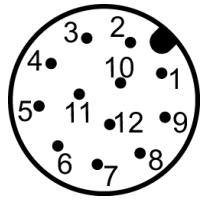
10 Gigabit Ethernet	Transfer Rate	10.000 Mbits/sec
5 Gigabit Ethernet	Transfer Rate	5.000 Mbits/sec
2.5 Gigabit Ethernet	Transfer Rate	2.500 Mbits/sec
Gigabit Ethernet	Transfer Rate	1.000 Mbits/sec
Fast Ethernet	Transfer Rate	100 Mbit/sec

M12 Buchse, 8 polig, X-codiert, verschraubbar /
 M12 female connector, 8 pin, X-coded, screwable
 (SACC-CI-M12FS-8CON-L180-10G)

Pin Belegung / Pin assignment

1 – MX1+	2 – MX1-
3 – MX2+	4 – MX2-
5 – MX4+	6 – MX4-
7 – MX3-	8 – MX3+

Prozessschnittstelle / Process Interface



Spannungsversorgung, Trigger, Blitz /
 Voltage feed, trigger, flash

M12 Stecker, 12 polig, A-codiert, verschraubbar /
 M12 male connector, 12 pin, A-coded, screwable
 (SACC-CI-M12MS-12CON-L180)

Pin Belegung / Pin assignment

1 – Power VCC	2 – GND (Power)
3 – IN1 (Line 0)	4 – OUT1 (Line 4)
5 – IN2 (Line 1)	6 – OUT2 (Line5)
7 – OUT3 (Line 6)	8 – RS232 TxD (Line2)
9 – OUT4 (Line 7)	10 – RS232 RxD (Line3)
11 – GND (IO)	12 – Power (IO)

Schnittstelle für Optik-Steuerung / Lens Control Interface

Steuerung einer Corning Varioptic Autofokus-Flüssiglense /
 Controlling an electrically focusable Corning Varioptic liquid
 lense

6 Pin Anschluss / 6 pin connector
 (JST BM06B-SRSS-TB)

Pin Belegung / Pin assignment

1 – Power (lens)	2 – GND (lens)
3 – UART RxD	4 – UART TxD
5 – NC	6 – NC

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Elektrische Daten / Electrical Data

LED Signalisierung / LED signalling	1	Gelb statisch / <i>Yellow static</i> Gelb blinkend / <i>Yellow flash</i>	<i>Error</i> <i>TX active</i>
	2	Grün statisch / <i>Green static</i> Grün blinkend / <i>Green flash</i>	<i>Link ON</i> <i>RX active</i>
Spannungsversorgung (ext.) / Power Supply (ext.)	Extern / External (Über Prozessschnittstelle / <i>via process interface</i>) Spannung / <i>voltage</i> VCC: 12...24 VDC ± 20% Strom / <i>current</i> I: 429...859 mA		
Power over Ethernet (PoE)	NA (not available)		
Leistungsaufnahme / Power Consumption	approx. 10.3 W @ 12 VDC and 163 fps (Factory Setting "Default")		
Digital Input	Isoliert, kurzschlussgesichert / <i>Isolated, short circuit protection</i> $U_{IN(low)} = 0.0 \dots 4.5 \text{ VDC}$ $U_{IN(high)} = 11.0 \dots 30.0 \text{ VDC}$ $I_{IN} = 3.0 \dots 10.0 \text{ mA}$ min. impulse length (t_{min}): 2 μs		
Digital Output	Isoliert, kurzschlussgesichert / <i>Isolated, short circuit protection</i> $U_{EXT} = 12 \dots 48 \text{ VDC}, 24 \text{ VDC [Power (IO)]}$ $I_{OUT} =$ Continuously: max. 1.5 A PWM t_{ON} max 1s / Duration max 40%: max. 2.5 A (Max. current for each output itself or summary of all outputs) $t_{ON} = < 0.2 \mu\text{s}$ $t_{OFF} = < 0.2 \mu\text{s}$ max. Frequency: 500 kHz		
GPIO	NA (not available)		
RS232 (reserviert für spätere Verwendung / reserved for future use)	RS232 kompatibel, nicht optisch isoliert / <i>RS232 compatible, not optically isolated</i> Baud Rate: up to 115200, Data bits: 8, Stop bits: 1, Parity: none, Flow control: none		
Optik-Ansteuerung / Lens control	Ansteuerung der Varioptic Caspian C-39N0 Flüssiglinsen-Serie / Support for Varioptic Caspian C-39N0 series liquid lenses (C-C-39N0-160-R33, C-C-39N0-250-R33, up to 2/3") VCC: 5V DC ± 20% I: 100 mA UART 3.3 V		

Mechanische Daten / Mechanical Data

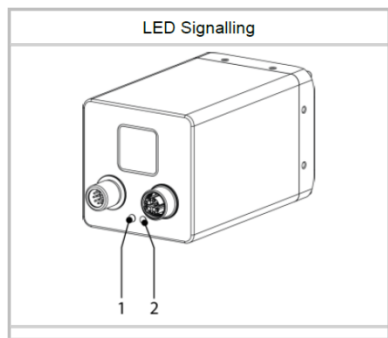
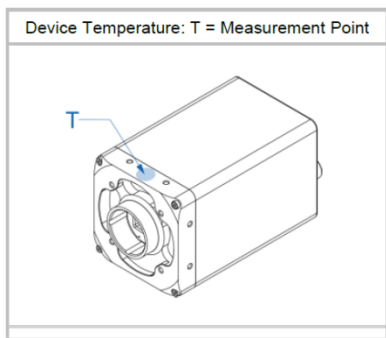
Gehäuse / Housing	Aluminium, hartanodisiert, IP40 (mit montiertem Objektiv und 10 GigE-Kabel) IP65/67 (mit montiertem Tubus und Kabel) / <i>Aluminum, hard anodized,</i> <i>IP40 (with mounted lens and 10 GigE cable)</i> <i>IP65/67 (with mounted tube and cable)</i> Tubus, Adapter und Verlängerung als Zubehör erhältlich / Tube, adapter and extension as accessories available
Abmessungen / Dimensions	Gehäuse ohne Stecker / <i>Housing without connector.</i> 60 mm x 60 mm x 99.7 mm (±0.4mm) Bitte verbundene Stecker bei der Gesamt-Dimensionierung berücksichtigen! /

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Please consider plugged-in connectors when designing overall dimensions!

Gewicht / Weight	≤485 g
Material / Material	Aluminium
Umgebungsdaten / Environmental Data	
Lagerungstemperatur / Storage Temperature	-10°C...+70°C
Betriebstemperatur / Operating temperature	+0°C...+65°C @ T = Messpunkt / measurement point oder/or +0°C...+71°C @ internem Temperatursensor / internal temperature sensor Bei einer Umgebungstemperatur oberhalb 30°C sind Kühlungsmaßnahmen erforderlich / Ambient temperature above 30°C requires heat dissipation measures
Interner Temperatursensor / Internal temperature sensor	Ja / Yes, Genauigkeit / Accuracy: ±2°C (typ) -40°C...0°C ±1°C (typ) 0°C...+85°C
Feuchtigkeit / Humidity	10%...90% nicht kondensierend / non-condensing
Konformität / Conformity	
Konformität / Conformity	CE, RoHS, REACH
KC Registrierungs-Nr. / Datum / KC Registration No. / Date	- / -
MTBF	30 years @ T = 45°C 20 years @ T = 60°C (T=Measurement Point)

Technische Beschreibung / Specification



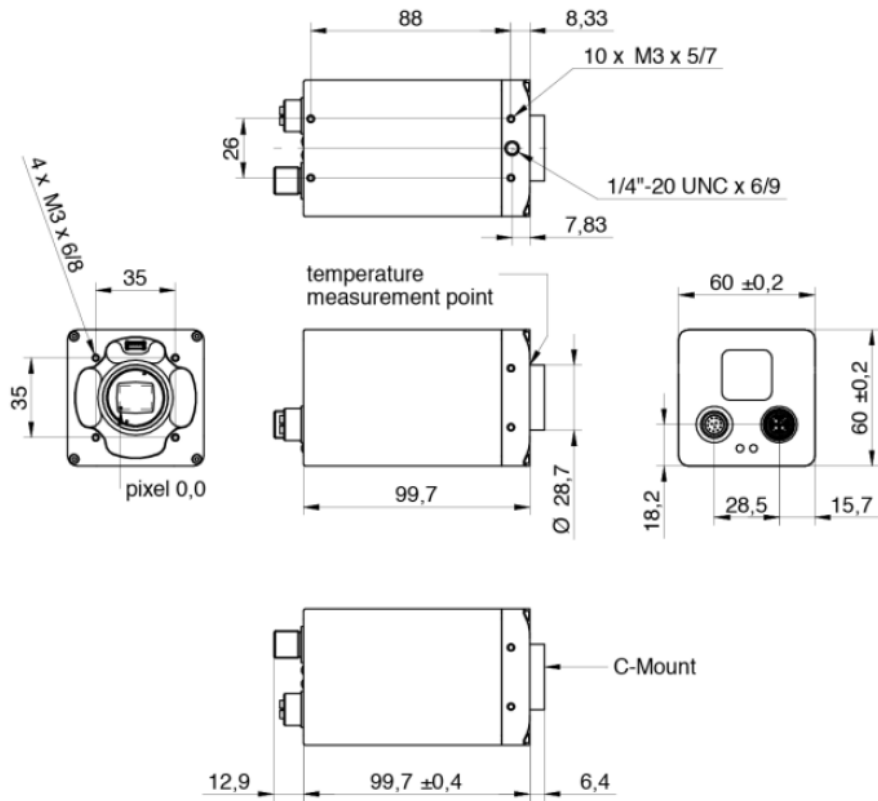
GEN<i>i>CAM



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Technische Zeichnung / Technical drawing

Dimensions



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Optionales Zubehör / Optional Accessories

Abbildung / Image	Bezeichnung / Description	Artikelnummer / Item number
	Hartanodisierter Tubus-Adapter C M62 für NCLT.I-Serie (inkl. Dichtung und Schrauben) / <i>Hard anodized tube adapter C M62 for NCLT.I-series (incl. seal and screws)</i> Gewinde / Thread: M62 x 0,75 Außenmaß / Dimensions: Ø 65 mm x 5,25 mm	NCLT.I-Z-TUBE-AD-M62
	Hartanodisierte modulare Verlängerung für Objektivschutz M62 (inkl. Dichtung) / <i>Hard anodized modular extension for lens protection tube M62 (incl. seal)</i> Gewinde / Thread: M62 x 0,75 Außenmaß / Dimensions: Ø 65 mm x 6 mm	NCCG.I-Z-TUBE-MV-M62/06
	Hartanodisierte modulare Verlängerung für Objektivschutz M62 (inkl. Dichtung) / <i>Hard anodized modular extension for lens protection tube M62 (incl. seal)</i> Gewinde / Thread: M62 x 0,75 Außenmaß / Dimensions: Ø 65 mm x 12 mm	NCCG.I-Z-TUBE-MV-M62/12
	Hartanodisierte modulare Verlängerung für Objektivschutz M62 (inkl. Dichtung) / <i>Hard anodized modular extension for lens protection tube M62 (incl. seal)</i> Gewinde / Thread: M62 x 0,75 Außenmaß / Dimensions: Ø 65 mm x 36 mm	NCCG.I-Z-TUBE-MV-M62/36
	Hartanodisierter Objektivschutz mit Deckglas aus Acryl / <i>Hard anodized lens protection tube with acrylic cover slip</i> Gewinde / Thread: M62 x 0,75 Außenmaß / Dimensions: Ø 65 mm x 58 mm	NCCG.I-Z-TUBE-M62/58
	Hartanodisierter Objektivschutz mit Deckglas aus gehärtetem Verbundsicherheitsglas SCHOTT Xensation® / <i>Hard anodized lens protection tube with hardened shatterproof glass SCHOTT Xensation® cover slip</i> Gewinde / Thread: M62 x 0,75 Außenmaß / Dimensions: Ø 65 mm x 58 mm	NCCG.I-Z-TUBE-M62/58-VSG