

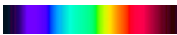
NCCG-51C.I

Gigabit-Ethernet-Flächenkamera NCCG-51C.I
Farbe, IP-Schutz

*Gigabit Ethernet area scan camera NCCG-51C.I
color, IP protection*



Technische Beschreibung / Specification

Chip / Sensor	2/3" CMOS Progressive Scan
Shutter / Shutter	Global
Größe / Scan area	8.44 mm x 7.06 mm
Pixelgröße / Pixel size	3.45 μm x 3.45 μm
Monochrom	
Auflösung / Resolution	2448 x 2048 pixels
Bildwechselfrequenz / Frame rates	24 fps (Full Frame) 36 fps (Binning)
Belichtungszeit / Exposure time	1 μs ... 60 s
Verstärkungsfaktor / Gain	0...48 dB
Pixelformat / Pixel formats	BayerRG8, BayerRG10, BayerRG12, BayerRG12p Mono8, Mono10, Mono12, Mono12p, RGB8, BGR8
Partial Scan / Partial Scan	Ja / Yes
Binning / Binning 2x2, 2x1, 1x2	Ja / Yes
Farbmodelle / Color models	Mono, Raw Bayer, RGB, BGR
Farbanpassungen / Color processing and adjustment	Ja / Yes
Objektivanschluss / Lens mount	C-Mount
Optischer Filter / Optical filter	IR Sperrfilter / IR cut filter
Prozesssynchronisation / Process synchronization	
Trigger Mode	Off (Free Running), On (Trigger)
Trigger Overlap Type	Readout
Trigger Sources	Hardware (Line 0, 1, 2, 3), Software, All ActionCMD (Action 1) or Off fixed Trigger Delay out of t_{readout} : 32 μsec @ 12 bit max. Trigger Delay during t_{readout} : 40.3 μsec @ 12 bit
Trigger Delay	0 ... 2 sec., Tracking and buffering of up to 256 triggers
External Flash Sync	via Exposure Active, $t_{\text{delay flash}} \leq 1 \mu\text{sec}$, $t_{\text{duration}} = t_{\text{exposure}}$

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Digital-Ein-Ausgänge / *Digital I/Os*

Lines	Input: Line 0...3, Output: Line 4...7, GPIO: No
Output Sources	Off, ExposureActive, Timer1, ReadoutActive
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 µsec

Speicher / *Memory*

Image Buffer	115 MB
Non-volatile Memory	8 Images (Trigger Mode) / 1 Image (Free Running Mode) 128 kB

Netzwerkeinstellungen / *Network Interface Data*

Interface	Gigabit Ethernet	1000BASE-T	1000 Mbit/sec
	Fast Ethernet	100BASE-T	100 Mbit/sec
Ethernet IP Configuration	Persistent IP, DHCP, LLA		
Package Size	576...9000 Byte, Jumbo Frames supported		

GigE Vision®

Eigenschaften / *Features*

Events (Transmission via Asynchronous Message Channel)	DeviceTemperatureStatusChanged, EventLost, ExposureEnd, ExposureStart, FrameEnd, FrameStart, FrameTransferSkipped, GigEVisionError, GigEVisionHeartbeatTimeOut, PrimaryApplicationSwitch, Line 0...7 FallingEdge, Line 0...7 RisingEdge, TransferBufferFull, TransferBufferReady, TriggerOverlapped, TriggerReady, TriggerSkipped
Action CMD	Yes, Action 1 for Trigger
Frame Counter	Up to 2 ³²
Payload Size	0...15040736 Byte
Timestamp	64 Bit, resolution in nsec, increment = 8
Packet Delay	0...2 ³² - 1 nsec
Packer Resend	Resend Buffer: 115 MB (8 images)
GigE Vision	V2.0 (v1.2 backward compatible)

LED Signalisierung / *LED signalling*

1	Gelb statisch / <i>Yellow static</i> Gelb blinkend / <i>Yellow flash</i>	Error TX active
2	Grün statisch / <i>Green static</i> Grün blinkend / <i>Green flash</i>	Link ON RX active

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Daten- und Versorgungs-Schnittstelle / Data and Power Interface

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

Gigabit-Ethernet-Anschluss mit PoE: Daten und Steuerung /
Gigabit Ethernet connection with PoE: data and control interface

Gigabit Ethernet Transfer Rate / *transfer rate*: 1000 Mbits/sec
 Fast Ethernet

Transfer Rate /
transfer rate:

100

Mbit/sec

Pin Belegung / *Pin assignment*

1 – MX1+

2 – MX1-

3 – MX2+

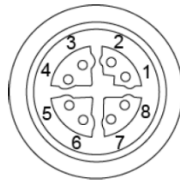
4 – MX2-

5 – MX4+

6 – MX4-

7 – MX3-

8 – MX3+



Prozessschnittstelle / Process Interface

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

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

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)

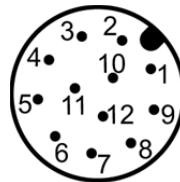
8 – IN3 (Line2)

9 – OUT4 (Line 7)

10 – IN4 (Line3)

11 – GND (IO)

12 – Power (IO)



Spannungsversorgung / Voltage feed

Power over Ethernet (PoE)

Über / *via* Data Interface (Power over Ethernet IEEE 802.3af, PoE)

Class 1 Gerät / *device*

Spannung / *voltage* VCC: 36...57 VDC

Strom / *current* I: 64 mA @ 48 VDC

Externe Spannungsversorgung / Power Supply (ext.)

Über / *via* Process Interface (extern / *external*)

Spannung / *voltage* VCC: 12...24 VDC ± 20%

Strom / *current* I: 102...205 mA

Leistungsaufnahme / Power Consumption

approx. 2.5 W @ 12 VDC and 24 fps

approx. 3.0 W @ 48 VDC (PoE) and 24 fps

Digital Input (Trigger)

Isoliert, kurzschlussgesichert / *Isolated, short circuit protection*

$U_{IN(low)}$ = 0.0 ... 4.5 VDC

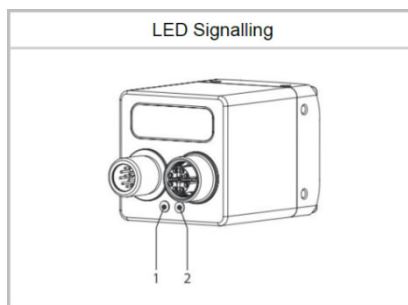
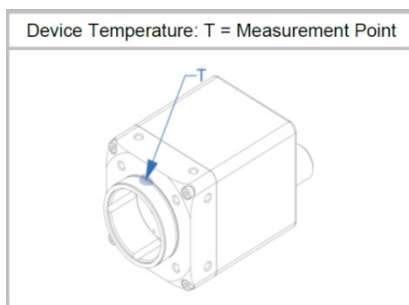
$U_{IN(high)}$ = 11.0 ... 30.0 VDC

I_{IN} = 3.0... 10.0 mA

min. impulse length (t_{min}): 2 μ s

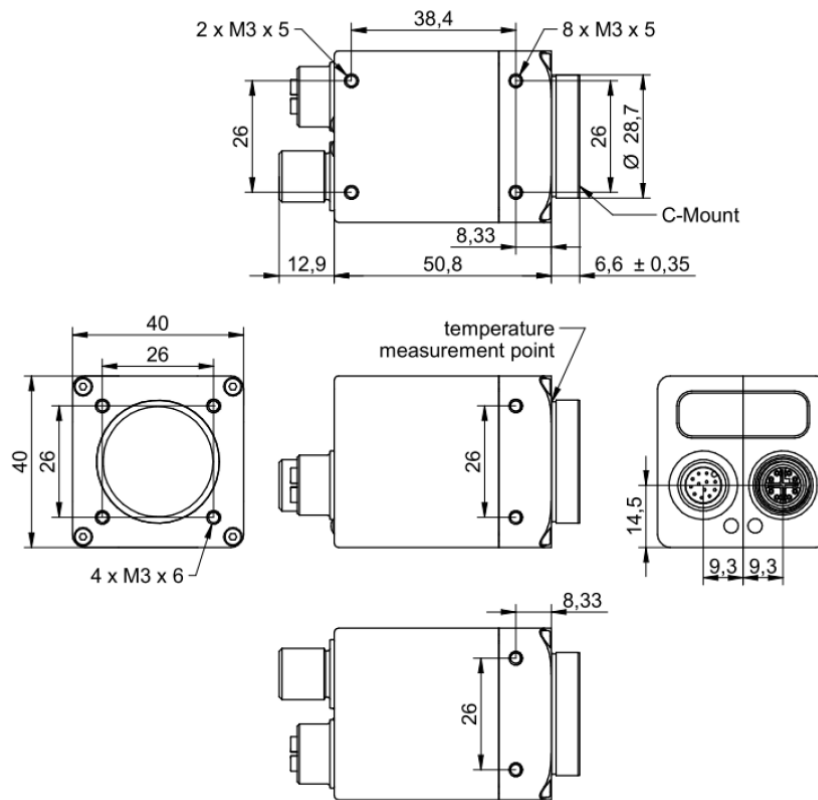
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Digital Output (Flash)	Isoliert, kurzschlussgesichert / <i>Isolated, short circuit protection</i> $U_{EXT} = 12 \dots 48 \text{ VDC}, 24 \text{ VDC [Power (IO)]}$ $I_{OUT} =$ Continuously: max. 1.5 A PWM t_{ON} max 1s / Duration max 40%: max. 2.5 A (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
Gehäuse / Housing	Aluminium, hartanodisierter, IP40 (mit montiertem Objektiv und GigE-Kabel) IP65/67 (mit montiertem Tubus und Kabel) / <i>Aluminum, hard anodized,</i> <i>IP40 (with mounted lens and GigE cable)</i> <i>IP65/67 (with mounted tube and cable)</i> Tubus und Adapter in zwei Größen als Zubehör erhältlich / Tube and adapter in two different sizes available as an accessory
Abmessungen / Dimensions	Gehäuse ohne Stecker / <i>Housing without connector:</i> 40 mm x 40 mm x 57.4 mm ($\pm 0.35\text{mm}$) Gehäuse einschließlich Stecker / <i>Housing including connector:</i> 40 mm x 40 mm x 70.3 mm ($\pm 0.35\text{mm}$)
Gewicht / Weight	137 g
Lagerungstemperatur / Storage Temperature	-10°C...+70°C
Betriebstemperatur / Operating temperature	+0°C...+65°C @ T = Messpunkt / <i>measurement point</i> +0°C...+70°C @ internem Temperatursensor / <i>internal temperature sensor</i> Bei einer Umgebungstemperatur oberhalb 45°C sind Kühlungsmaßnahmen erforderlich / Ambient temperature above 45°C requires cooling measures
Feuchtigkeit / Humidity	10%...90% nicht kondensierend / <i>non-condensing</i>
Konformität / Conformity	CE, RoHS, REACH
MTBF	44 years @ $T = 45^\circ\text{C}$ 29 years @ $T = 60^\circ\text{C}$ (T=Measurement Point)



Technische Zeichnung / *Technical drawing*

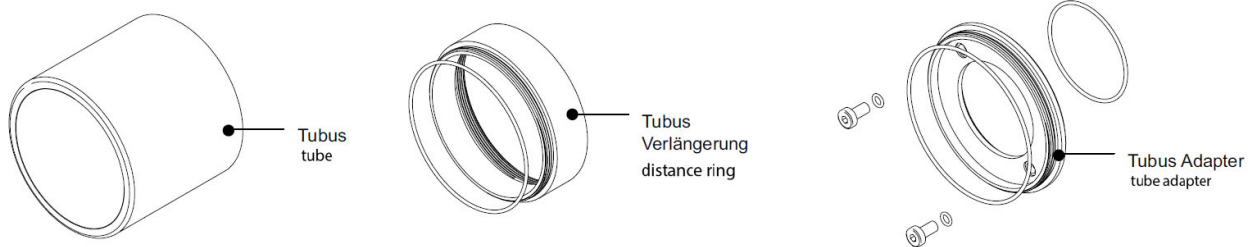
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Zubehör / *Optional Accessories*

Tubus, Verlängerung, Tubusadapter / *Tube, distance ring, tube adapter*



Tubus / <i>Tube</i>		Verlängerung / <i>Distance ring</i>		Tubusadapter / <i>Tube adapter</i>
Deckglas / <i>Cover glas</i>	Artikelnr. / <i>Article No.</i>	Length	Artikelnr. / <i>Article No.</i>	Artikelnr. / <i>Article No.</i>
M47 Acryl / <i>acrylic</i>	NCCG.I-Z-TUBE-M47/44	6 mm	NCCG.I-Z-TUBE-MV-M47/06	NCCG.I-Z-TUBE-AD-M47
	NCCG.I-Z-TUBE-M62/58	12 mm	NCCG.I-Z-TUBE-MV-M47/12	
		36 mm	NCCG.I-Z-TUBE-MV-M47/36	
M62 Verbundsicherheitsglas / <i>Tempered laminated safety glass</i>	NCCG.I-Z-TUBE-M47/44-VSG	6 mm	NCCG.I-Z-TUBE-MV-M62/06	NCCG.I-Z-TUBE-AD-M62
	NCCG.I-Z-TUBE-M62/58-VSG	12 mm	NCCG.I-Z-TUBE-MV-M62/12	
		36 mm	NCCG.I-Z-TUBE-MV-M62/36	

Zubehör / *Optional Accessories*

Adapterkabel für Anschluss von Beleuchtungen / *Adapter cable for lighting connection*



1 Beleuchtung / <i>Illumination</i> KAB-NCCG.x.I-TypB1	2 Beleuchtungen / <i>Illuminations</i> KAB-NCCG.x.I-TypB2	4 Beleuchtungen / <i>Illuminations</i> KAB-NCCG.x.I-TypB4
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Beschreibung / *Description*

- Splitkabel M12/12-pol Buchse auf 1x M8/3-pol Stecker (Stromversorgung von Kameras und I/Os sowie Hardware Triggerung über einen Input) und bis zu 4x M8/3-pol Buchsen zum Anschluss von bis zu 4 Beleuchtungen /
Split cable M12/12-pin female connector to 1x M8/3-pin male connector (to power the camera and I/Os, enable hardware trigger via input) and up to 4x M8/3-pin female connectors for up to 4 illuminations
- Die I/O Spannung wird über die Kamera direkt zur Beleuchtung durchgeschaltet. /
The I/O voltage is directly distributed to the illuminations.
- IP65/IP67 Schutzklasse / *Protection class*
- Länge 100 cm (M12/12-pol Kabel 80 cm, M8 Kabel 20 cm) /
Length 100 cm (M12/12-pin cable 80 cm, M8 cables 20 cm)

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Zusätzliche Abbildungen / Additional images

