


# NCCG-15M.I

Gigabit-Ethernet-Flächenkamera NCCG-15M.I  
Monochrom, IP-Schutz

*Gigabit Ethernet area scan camera NCCG-15M.I  
monochrome, IP protection*



## Technische Beschreibung / Specification

Chip / Sensor	1/2.9" CMOS Progressive Scan
Shutter / Shutter	Global
Größe / Scan area	4.96 mm x 3.72 mm
Pixelgröße / Pixel size	3.45 µm x 3.45 µm
Monochrom	
Auflösung / Resolution	1440 x 1080 pixels
Bildwechselfrequenz / Frame rates	79 fps (Full Frame) 120 fps (Binning)
Belichtungszeit / Exposure time	1 µs ... 60 s
Verstärkungsfaktor / Gain	0...48 dB
Pixelformat / Pixel formats	Mono 8 / 10 / 12 / 12 Packed
Partial Scan / Partial Scan	Ja / Yes
Binning / Binning 2x2, 2x1, 1x2	Ja / Yes
Farbmodelle / Color models	Mono
Farbanpassungen / Color processing and adjustment	Nein / No
Objektivanschluss / Lens mount	C-Mount
Optischer Filter / Optical 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 $t_{readout}$ : 56.8 µsec @ 12 bit max. Trigger Delay during $t_{readout}$ : 60 µsec @ 12 bit
Trigger Delay	0 ... 2 sec., Tracking and buffering of up to 256 triggers
External Flash Sync	via Exposure Active, $t_{delay flash} \leq 1 \mu\text{sec}$ , $t_{duration} = t_{exposure}$

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### Digital-Ein-Ausgänge / *Digital I/Os*

<b>Lines</b>	Input: Line 0...3, Output: Line 4...7, GPIO: No
<b>Output Sources</b>	Off, ExposureActive, Timer1, ReadoutActive
<b>Output Line Mode</b>	Yes, Tri-State, PushPull, OpenDrain, OpenSource
<b>Output PWM function</b>	Yes, Line 4...7 PWM Mode: Off, One Pulse, FixedFrequency PWM Feature: PWMDuration, PWMDutyCycle Configuration Mode for lightning protection: MaxPWMDuration, MaxPWMDutyCycle
<b>Line Debouncer</b>	Low and high signal separately selectable Debouncing time 0...5 msec, Step size: 1 µsec

### Speicher / *Memory*

<b>Image Buffer</b>	36 MB
<b>Non-volatile Memory</b>	8 Images (Trigger Mode) / 1 Image (Free Running Mode) 128 kB

### Netzwerkeinstellungen / *Network Interface Data*

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

### GigE Vision® Eigenschaften / *Features*

<b>Events</b> (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
<b>Action CMD</b>	Yes, Action 1 for Trigger
<b>Frame Counter</b>	Up to 2 <sup>32</sup>
<b>Payload Size</b>	0...3110624 Byte
<b>Timestamp</b>	64 Bit, resolution in nsec, increment = 8
<b>Packet Delay</b>	0...2 <sup>32</sup> – 1 nsec
<b>Packer Resend</b>	Resend Buffer: 24 MB (8 images)
<b>GigE Vision</b>	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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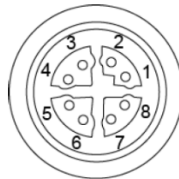
**Daten- und Versorgungs-Schnittstelle / Data and Power Interface**

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 / <i>transfer rate</i> :	Pin Belegung / <i>Pin assignment</i>	
100	1 – MX1+	2 – MX1-
Mbit/sec	3 – MX2+	4 – MX2-
	5 – MX4+	6 – MX4-
	7 – MX3-	8 – MX3+



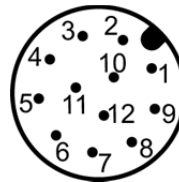
**Prozessschnittstelle / Process Interface**

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: 63 mA @ 48 VDC

**Externe Spannungsversorgung / Power Supply (ext.)**

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

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

Strom / *current* I: 100...200 mA

**Leistungsaufnahme / Power Consumption**

approx. 2.4 W @ 12 VDC and 79 fps

approx. 3.0 W @ 48 VDC (PoE) and 79 fps

**Digital Input (Trigger)**

Isoliert, kurzschlussgesichert / *Isolated, short circuit protection*

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

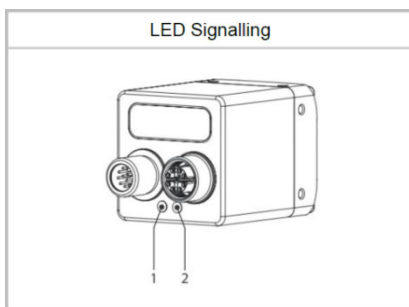
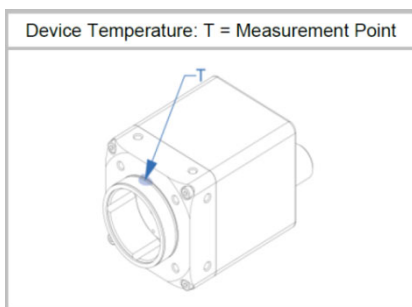
$U_{IN(high)}$  = 11.0 ... 30.0 VDC

$I_{IN}$  = 3.0...10.0 mA

min. impulse length ( $t_{min}$ ): 2  $\mu$ s

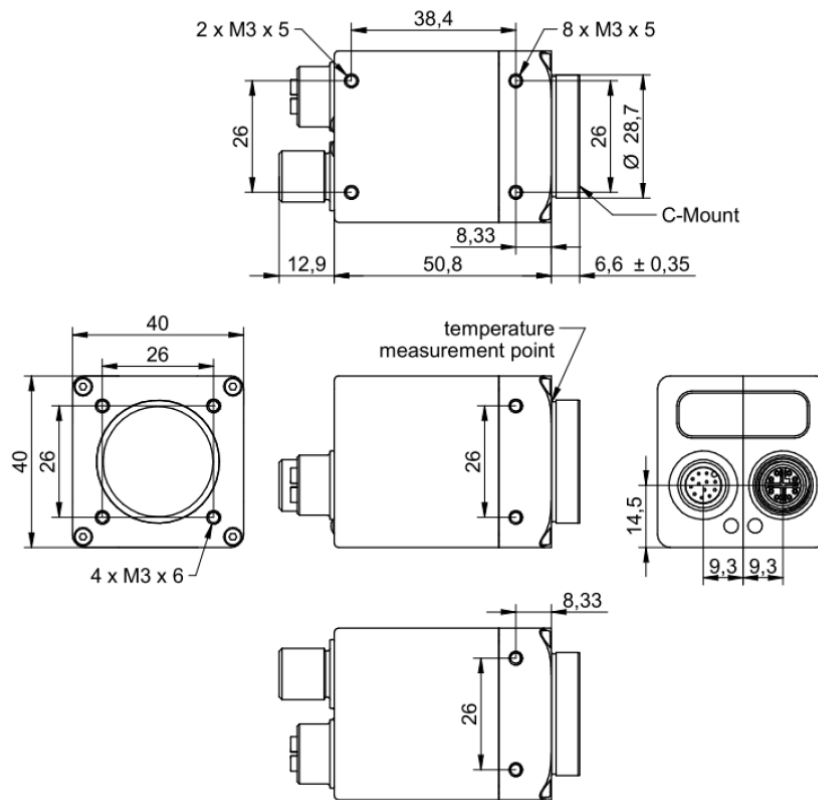
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<b>Digital Output</b> (Flash)	Isoliert, kurzschlussgesichert / <i>Isolated, short circuit protection</i> $U_{EXT} = 12 \dots 48 \text{ VDC}, 24 \text{ VDC [Power (IO)]}$ $I_{OUT} =$ Continuously: max. 1.5 A PWM $t_{ON}$ max 1s / Duration max 40%: max. 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
<b>Gehäuse / Housing</b>	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
<b>Abmessungen / Dimensions</b>	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 ( $\pm 0.35\text{mm}$ )
<b>Gewicht / Weight</b>	137 g
<b>Lagerungstemperatur / Storage Temperature</b>	-10°C...+70°C
<b>Betriebstemperatur / Operating temperature</b>	+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
<b>Feuchtigkeit / Humidity</b>	10%...90% nicht kondensierend / <i>non-condensing</i>
<b>Konformität / Conformity</b>	CE, RoHS, REACH
<b>MTBF</b>	48 years @ $T = 45^\circ\text{C}$   32 years @ $T = 60^\circ\text{C}$ (T=Measurement Point)



## Technische Zeichnung / *Technical drawing*

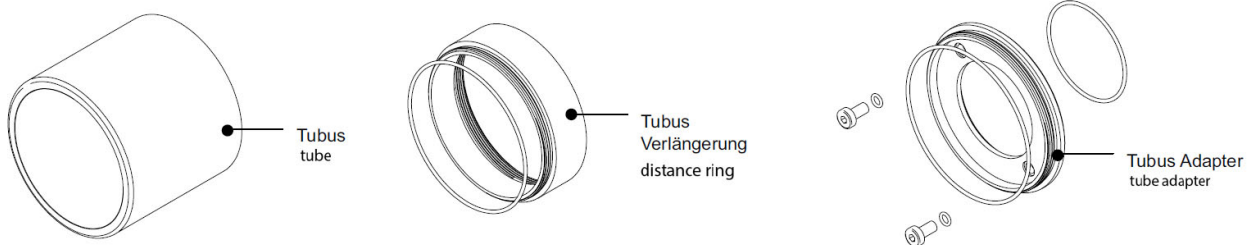
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## Zubehör / *Optional Accessories*

### 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

