ExCam® niteZoom

User manual

SAMCON
Prozessleittechnik GmbH

Content

Table of figures

Revision history

Product: ExCam® niteZoom
Title: User manual for the ExCam® niteZoom
Doc. -Id. 131106-PT03BA-SS-ExCam niteZoom_en_rev.01
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Date: November 06, 2013

Rev.-Index	Date	Name	Comments	Authorization of the ATEX Supervisor
00	Nov 06, 2013	S. Seibert	Compilation of the document	Tested and approved Nov 7, 2013 – S. Seibert
01	Aug 08, 2014	T. Gruber	Revision and correction	Tested and approved Aug 19, 2014 – S. Seibert

1 Document overview

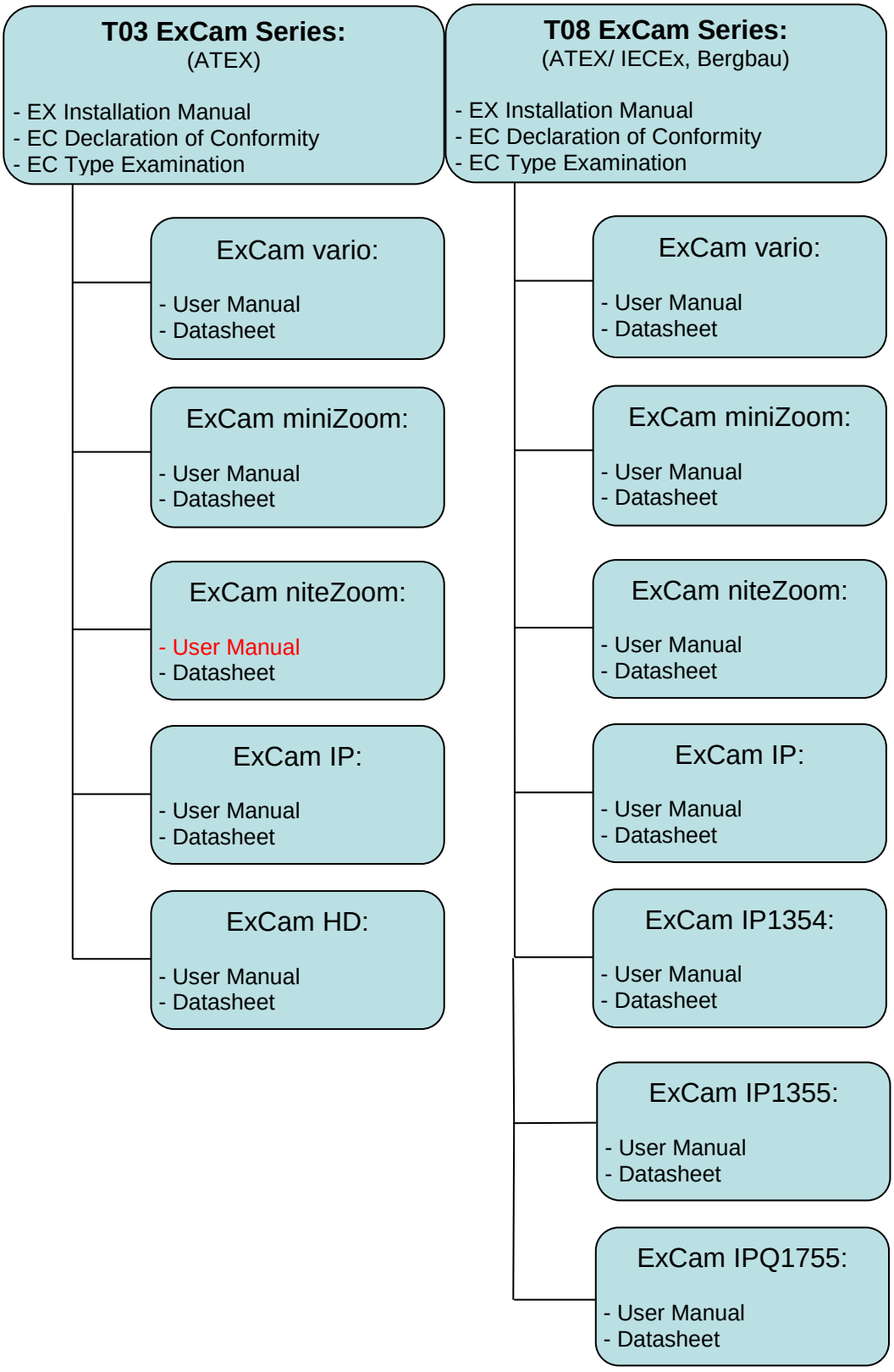

Figure 1.1 Document overview

The present document is marked in red.

2 Technical Data

2.1 Parameters of the explosion protection

Identification marks according to Directive 94/9/EG:	⟨Ex⟩ II 2G (zone 1 and 2) ⟨Ex⟩ II 2D (zone 21 and 22)
Explosion protection (gas):	Ex d IIC T6 Gb or Ex d IIB T6 Gb
Explosion protection (dust):	Ex t IIIC T80°C Db IP67
EC-type examination:	TÜV 09 ATEX 7697 X
Inspection record:	194/Ex.697.00/09
Allowed ambient temperature:	-20° C … +50° C

2.2 Electrical parameters

Camera:	
Supply voltage:	+12 VDC to +30VDC
Reference power:	+24 VDC
Power input:	270 mA to 540 mA
Maximum power input:	6.5 W (without heating)
Heating (optional):	
Supply voltage:	+12 VDC to +24 VDC
Reference power:	+24 VDC
Power input:	ca. 1000 mA
Maximum power input (-20°C):	10 Watt

2.3 System cable SKAxx

Outer diameter:	9.4 mm
Max. bending radius:	150 mm
Material outer sheath:	PUR – flame retardant according to IEC 60322-1-2
Color outer sheath:	RAL 9005 matt
Video:	1 x 75 Ω Koax, 19 x 0.127 mm tinned AWG 24, plated copper braid, shielded
RS 422:	2 x 2 x 0.25 mm^2 (twisted pair) Cu shielded double wrapping foil
Supply voltage camera:	2 x 0.75 mm^2, polyolefine insulated
Supply voltage heating:	2 x 0.75 mm^2, polyolefine insulated

2.4 Mechanical parameters

Housing material:	Stainless steel 1.4301 (AISI 304) and Stainless steel 1.4305 (AISI 303) Optional: Stainless steel 1.4401 (AISI 316) or Stainless steel 1.4404 (AISI 316L)
Glass material:	Borosilicate
Protection level:	IP 67 (IEC / EN 60529)
Weight T03-VA:	
With K1 flange:	ca. 2,000 g
With K2 flange:	ca. 2,500 g
Dimensions T03-VA [WxHxD]:	
K1 flange, without pin and cable gland:	79 x 79 x 128 [mm]
K1 flange, with pin and cable gland:	79 x 96 x 128 [mm]
K2 flange, without pin and cable gland:	79 x 79 x 141 [mm]
K2 flange, with pin and cable gland:	79 x 96 x 141 [mm]
Fitting of the flame proof gap Preventing the transmission of ignition (cylinder) T03-VA…:	Nominal diameter: 57 mm ISO fit: H8 f7

2.5 Temperature range

T03-VA-X-XXX-X-N (without heating):	0° C to +50° C
T03-VA-X-XXX-X-L (with heating):	-20° C to +50° C

2.6 Sensor

Sensor:	1/3‘‘ Super HAD CCD II - technology
Effective sensor resolution:	PAL: 440,000 pixel (ca. 752 x 582) NTSC: 380,000 pixel (ca. 768 x 494)
Horizontal resolution:	PAL: 530 TV lines NTSC: 530 TV lines

2.7 Lens

AF-Zoom lens:	10 x optical / 4 x digital
Focal distance (f):	5.1 mm to 51.0 mm
Angle of view:	52° (wide) to 5.4° (tele)
Aperture:	F1,8 to F2,1
Minimal illumination:	0.0004 lux (1/4 s, 1/3 s mode & ICR on)
Recommended illumination:	100 to 100.000 lux
Minimal object distance:	150 mm (wide) 800 mm (tele)

2.8 Electronical functions

- Electronical shutter function
- Serial control via VISCA/RS-422
- Composite video (VBS) video output 1 Vpp
- Back Light Compensation (BLC)
- Auto White Balance (ATW)
- Aperture correction (APC)
- DSP
- SNR: ≥50 dB

3 Safety guidelines

Please observe the safety guidelines indicated in the ATEX installation manual of the ExCam series!

4 Illustration of the model key

The following model options are currently available for the ExCam ® niteZoom:

Product name	Model option					
	ATEX Type	housing option(1)	Explosion group(2)	Meter SKA02(3)	Cable termin.(4)	Housing heating(5)
ExCam niteZoom	T03-	VA-	B-	005-	K-	N
	T03-	VA-	B-	005-	K-	L
	T03-	VA-	B-	005-	P-	N
	T03-	VA-	B-	005-	P-	L
	T03-	VA-	C-	005-	K-	N
	T03-	VA-	C-	005-	K-	L
	T03-	VA-	C-	005-	P-	N
	T03-	VA-	C-	005-	P-	L

(1) VA = Execution in stainless steel

(2) B = Explosion group IIB (standard - all gases except hydrogen, acetylene, carbon disulphide)
C = E Explosion group IIC (all gases)

(3) Length of the connection line in meter (001 - 200)
(5 meter is the standard length)

(4) K = Terminal block connection (standard)
All signaling lines are spliced to single strands and furnished with wire-end ferrules to allow connecting the camera to a terminal block
P = Plug- termination
Approximately 30 cm of the system cable's outer stealth is stripped.
The power supply strands (RD, BK) are furnished with wire-end ferrules.
The AWG24 cable is furnished with a BNC connector

(5) N = Normal Temperature (0° C – 50° C)
L = Low Temperature (-20° C – 50° C)

5 Commissioning

Attention!
Please observe the national regulations regarding security, installation, and accident prevention (e.g. DIN EN 60079-14) as well as the safety guidelines described in this user manual and the ATEX installation manual!

Attention!
Please observe the installation and commissioning advices described in the ATEX installation manual!

5.1 Step 1: Installation

Install the ExCam® niteZoom at the desired location.
Mounting options, accessories, as well as safety guidelines are described in the ATEX installation manual of the ExCam® Series.

Attention!
Please observe the national regulations regarding security, installation, and accident prevention (e.g. DIN EN 60079-14) as well as the safety guidelines described in this user manual and the ATEX installation manual!

Attention!
Please observe the installation and commissioning advices described in the ATEX installation manual!

Warning!
When the iris is open, the camera must not be directed toward the sun as this can cause damages to the sensor.

5.2 Step 2: Electrical connection

Attention!
The electrical connection of the equipment must be executed by qualified personnel only!

Attention!
It is mandatory that the housing of the ExCam® Series has to be grounded via a PE-connection!

Attention!
The minimum cable length of the connection line must not be less than one meter! The connection cable has to be laid in a protected manner!

Attention!
Please observe the national regulations regarding security, installation, and accident prevention (e.g. DIN EN 60079-14), as well as the safety guidelines described in this user manual and the ATEX installation manual!

The ExCam® niteZoom is delivered with an electrical connection cable type SKAxx (System Kabel Analog). The maximum cable length is 200 m and can be determined individually to reflect the particular customer specifications. The minimum cable length is 1 meter.

The ExCam® niteZoom is manufactured with a pigtail reflecting the desired cable length. Any electrical work inside the camera's flameproof enclosure, done by the user, is prohibited. Depending on the model option, the ending of the camera's cable connection is either stripped and furnished with wire-end ferrules or furnished with a BNC connector.

5.2.1 Potential equalization

Figure 5.1 Potential equalization T03-VA…

Depending on the housing execution, the equipment's potential equalization is to be carried out at the place indicated in above figure. The profile of the potential equalization has to reflect the national grounding instructions (min. 4 mm^2).

Connection table:

Potential	**Color** (IEC 60757)	**Profile**	**Comments**
PA	GN/YE	4 mm^2 (fix)	

5.2.2 Termination of the connection cable (pigtail)

Corresponding to the selected model key, the ExCam® niteZoom can be delivered with the following cable termination options:

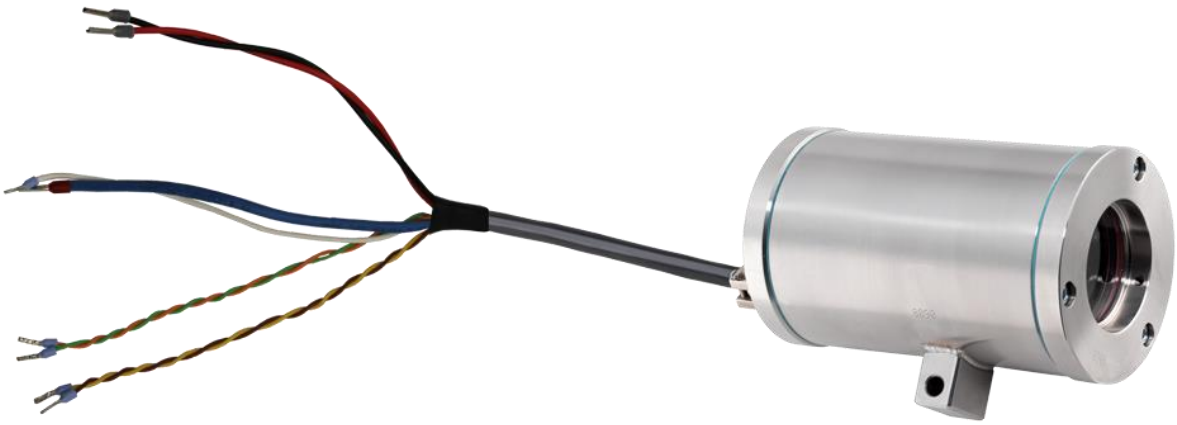

Figure 5.2 ExCam niteZoom – T03-VA-B-XXX-K-N

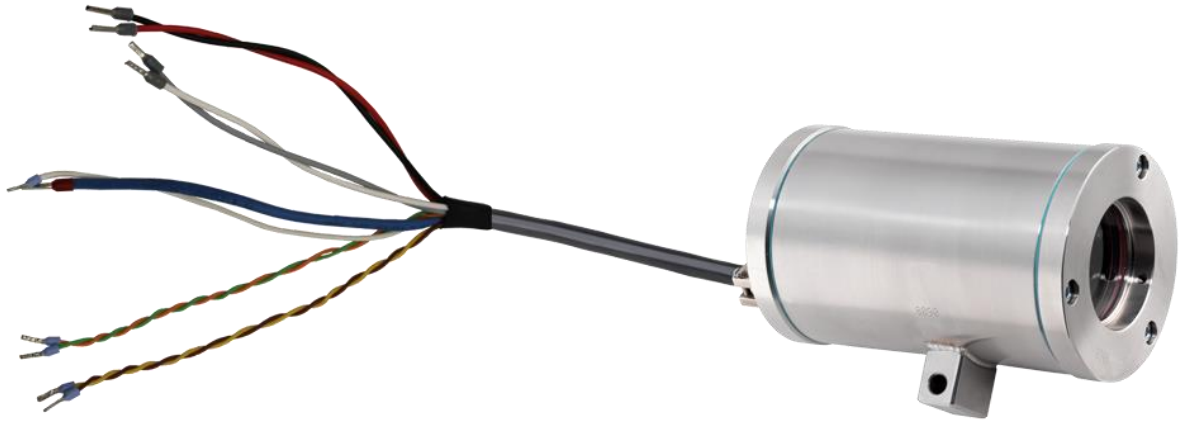

Figure 5.3 ExCam niteZoom – T03-VA-B-XXX-K-L

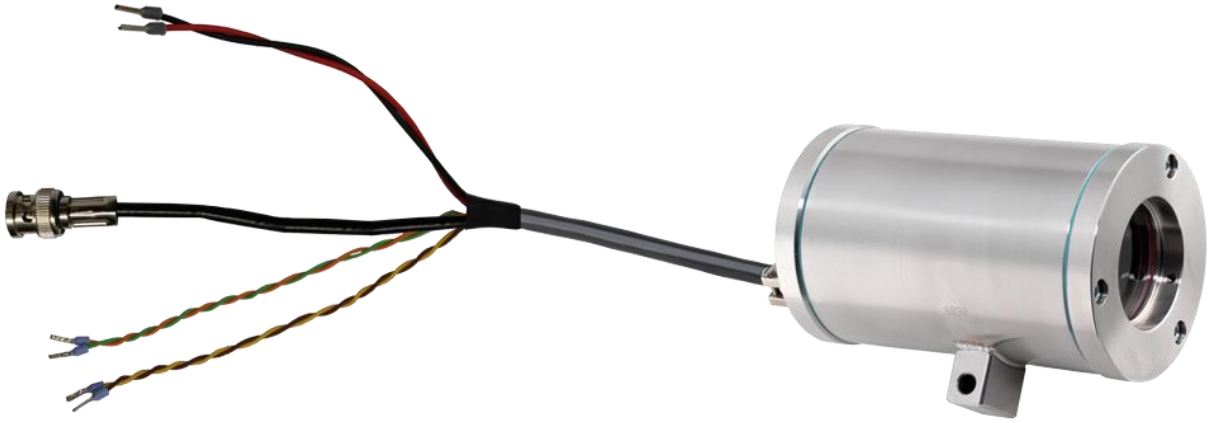

Figure 5.4 ExCam niteZoom – T03-VA-B-XXX-P-N

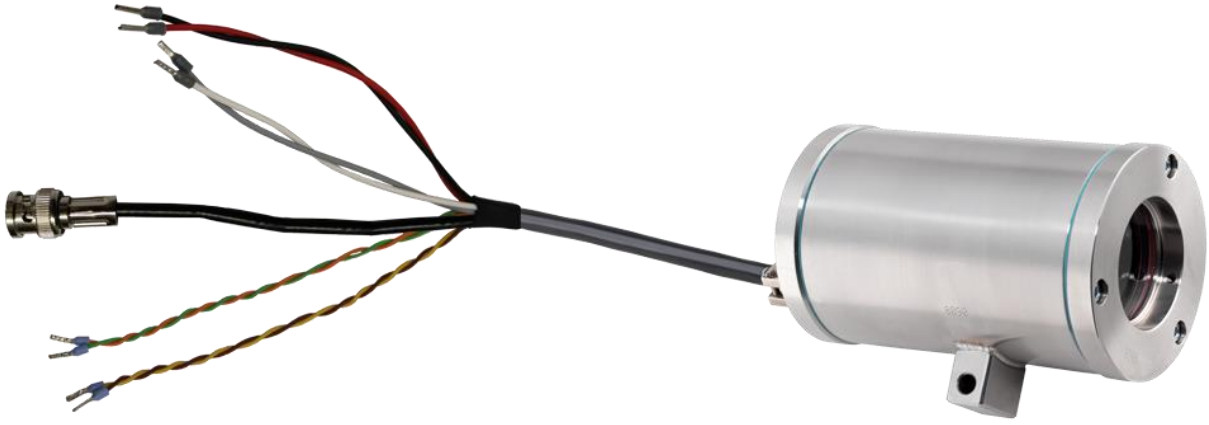

Figure 5.5 ExCam niteZoom – T03-VA-B-XXX-P-L

5.2.3 Power supply & protection

5.2.4 Power supply & protection of the camera's power circuit

The power supply is to be carried out via the red (RD) as well as black (BK) strand.

Connection table:

Potential	**Color** (IEC 60757)	**Potential level**	**Profile**	**Comments**
L+	RD	+12 VDC…+30 VDC	0.75 mm^2	
L-	BK	0 VDC	0.75 mm^2	

The camera's maximum power consumption is 6.5 Watt.

The dimensioning of the equipment or the supply protection depends on:

- The selected power supply
- The cable length
- The national regulations

The following safety recommendations may serve as a basis:

Supplied power	**Length system cable**	**Recommended protection**	**Comments**
12 VDC	< 200 m	mT500mA	
24 VDC	< 200 m	mT200mA	

The release current of the protection has to be less than the maximum short-circuit current of the power supply (switch-mode power supply)!

5.2.4.1 Power supply & protection of the heating's power circuit (optional)

The power supply is to be carried out via the grey (GY) as well as the white (WH) strand.

Connection table:

Potential	**Color** (IEC 60757)	**Potential level**	**Profile**	**Comments**
V+	GY	+12 VDC…+24 VDC	0.75 mm^2	
V-	WH	0 VDC	0.75 mm^2	

The heating's maximum power consumption is 10.0 Watt.

The dimensioning of the equipment or the supply protection depends on:

- The selected power supply
- The cable length
- The national regulations

The following safety recommendations may serve as a basis:

Supplied power	Length system cable	Recommended protection	Comments
24 VDC	< 200 m	mT650mA	

The release current of the protection has to be less than the maximum short-circuit current of the power supply (switch-mode power supply)!

5.2.5 Video picture connection (CVBS)

Depending on the model key, the video signal of the ExCam® niteZoom is either provided with wire-end (K option) or with a BNC connector (P option). The CVBS signal is only to be connected with the monitor, the video matrix, or the video server.

Connection table (T03-VA-B-XXX-K-L)

Potential	**Color** (IEC 60757)	**Potential level**	**Profile**	**Comments**
FBAS+	WH/ BU	1.0 Vp-p (sync negative)	0.5 mm^2	
FBAS_GND	BU	0 V	2.7 mm^2	

Connection table (T03-VA-B-XXX-P-L)

Potential	**Color** (IEC 60757)	**Potential level**	**Profile**	**Comments**
FBAS+	Center (Pin)	1.0 Vp-p (sync negative)		AWG24
FBAS_GND	Shield (bayonet cap)	0 V		

5.2.6 Control interface (RS-422)

Potential (Connection at the control board, video server, converter etc.)	**Potential** (ExCam niteZoom)	**Color** (IEC 60757)	**Profile**	**Comments**
TxA	RxA	BN	0.25 mm^2	
TxB	RxB	YE	0.25 mm^2	
RxA	TxA	GN	0.25 mm^2	
RxB	TxB	OG	0.25 mm^2	

5.2.7 Tests prior to switching on voltage

Attention!
Prior to commissioning, all tests as indicated by the national regulations have to be executed. In addition, it is mandatory that the proper functioning of the operating device in accordance with this user manual and all other applicable regulation has been executed.

Attention!
Incorrect installation and operation of the camera may lead to a loss of warranty!

5.3 Step 3: Adjusting the picture

Adjustment and optimization of the camera picture such as angle of view, zoom, focus, back light compensation, or IR cut filter are exclusively carried out electronically via the camera's control interface. Mechanical settings at the camera's block module (Sony FCB-EX20DP) are neither necessary nor allowed!
For example, control functions can either be operated manually by the means of a Control Board which has a serial interface (RS-422) and which supports the VISCA protocol (EVI-D70/D70P) or interactively via the web interface of a video server (figure 5.8) or the FCB Control Panel (figure 5.7). The transmission rate of the sending and the receiving end has to be synchronous (figure 5.6).

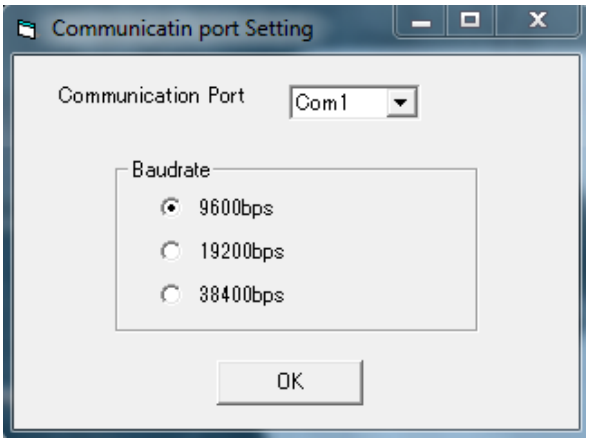

Figure 5.6 Setting the Baud-transmission rate

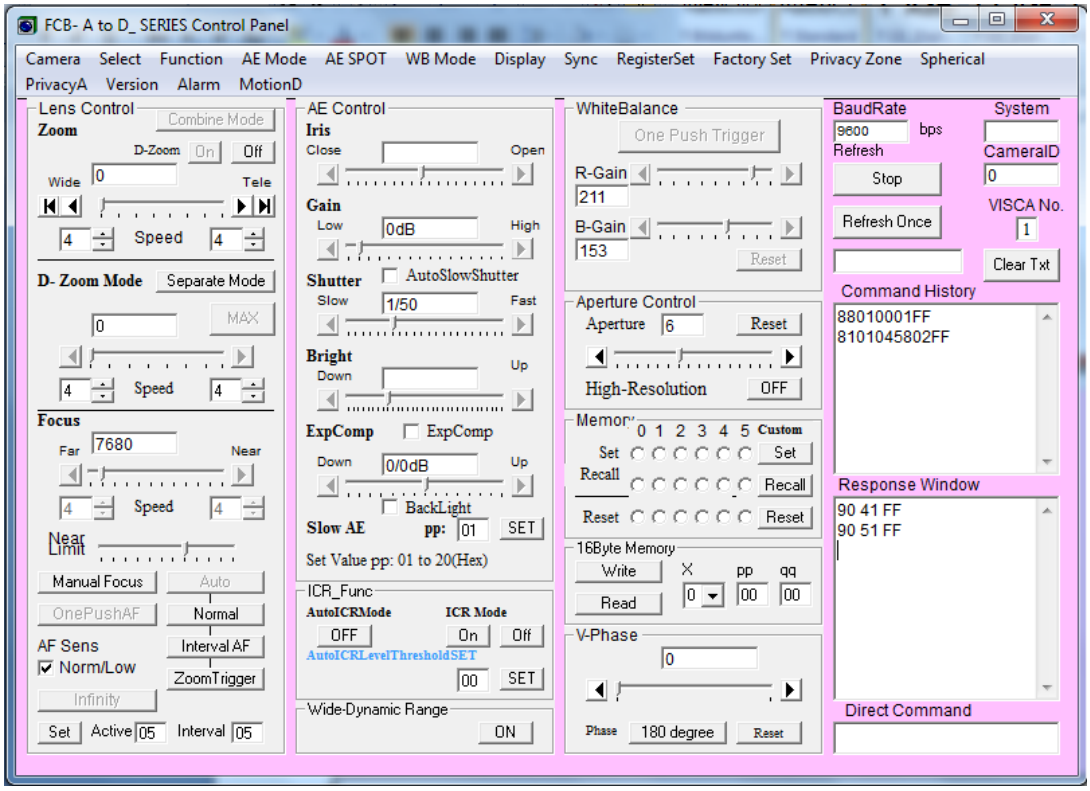

Figure 5.7 FCB Control Panel of the ExCam niteZoom

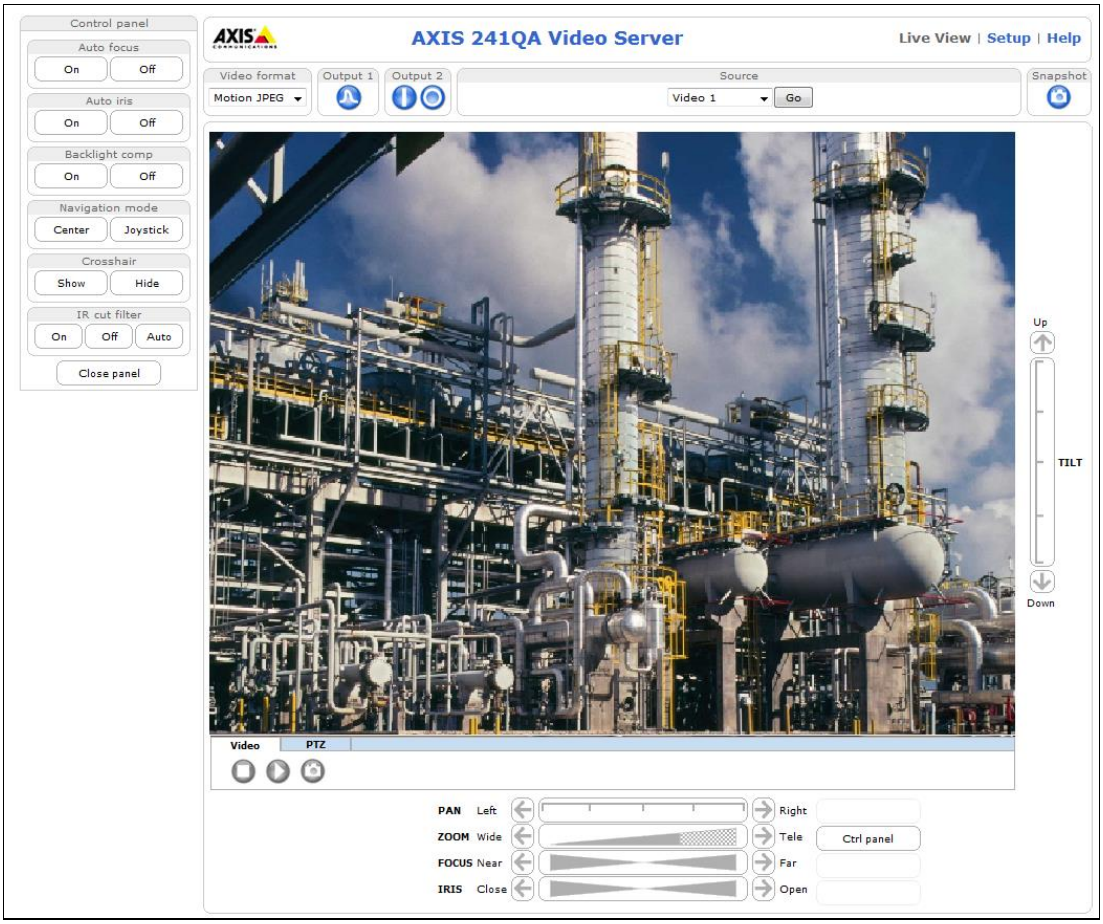

Figure 5.8 Control and visualization via a video server

Technical data Sony FCB-EX20DP:

Figure 5.9 ExCam® niteZoom – lens and sensor board

Lens type	Motorzoom
Lens	10x optical zoom f=5.1 mm (wide) to 51 mm (tele) (F1.8 to F2.1)
Digital zoom	12x (120x with optical zoom)
Sensor	1/3“-Super-HAD-CCD II
Focal distance	5.1 mm – 51.0 mm
Horizontally angle of view	52.0° (wide) – 5.4° (tele)
Effective pixel count	440,000
Shutter time	1/1 to 1/10000 s (22 steps)
Shutter time	16 steps
Minimal illumination	0.25 lux (F1.8, ICR off, 150 s)
Recommended illumination	100 … 100000 lux
Synchronisation system	Internal/ external (V-Lock)
MOD (Min. Object Distance)	0.01 m (wide end) to 0.8 m (tele end), 0.15 m (standard)

Information!
If not determined differently, the default setting of the ExCam® niteZoom is wide angle. This means that after the camera has been disconnected from the power supply and has been rebooted, it is set to wide angle mode and standard focus (auto functions are disabled).
In case that the ExCam niteZoom is supposed to resume certain settings after the reboot, it is possible to configure „PRESETS“ via the FCB Control Panel, the video server or the VISCA Control Board.

5.3.1 Work preparation

Attention!
Please carry out any preoperational work carefully and in accordance with the applicable regulations.

Note: Depending on the zone classification (DIN EN 60079-10), it might be necessary to obtain a work permit/clearance! When adjusting the camera settings potentially explosive atmosphere must be avoided by any means!

5.3.2 Opening the pressure-resistant housing

Opening the pressure resistance housing is not permitted. Any maintenance or repair work must only be carried out by the manufacturer. In case of noncompliance, ATEX certification is voided and any claim under guarantee expires.

6 Maintenance / Servicing / Alterations

The national regulations concerning the maintenance and servicing of electrical devices within hazardous areas are to be observed.

The required maintenance intervals are specific to the individual devices. The operating company has to determine these intervals depending on the application parameters. During maintenance, focus has to be put on checking parts concerning the ignition protection category such as the integrity of the housing, the sealings and the cable glands. If maintenance measures are necessary they have to be initiated and/or executed.

7 Repairs and Maintenance

Repairs must only be carried out with original parts of SAMCON Prozessleittechnik GmbH. Damaged pressure-resistant housings have to be replaced completely. If in doubt, return the applicable part to SAMCON Prozessleittechnik GmbH.
Repairs concerning the explosion protection must only be carried out by SAMCON Prozessleittechnik GmbH or a qualified electrical technician authorized by SAMCON Prozessleittechnik GmbH in accordance with nationally applied regulations. Rebuilding of or alterations to the devices are not permitted.

8 Disposal / Recycling

When disposing of the device, nationally applicable regulations must be observed.

This Document is subject to alterations and additions.

9 Drawings

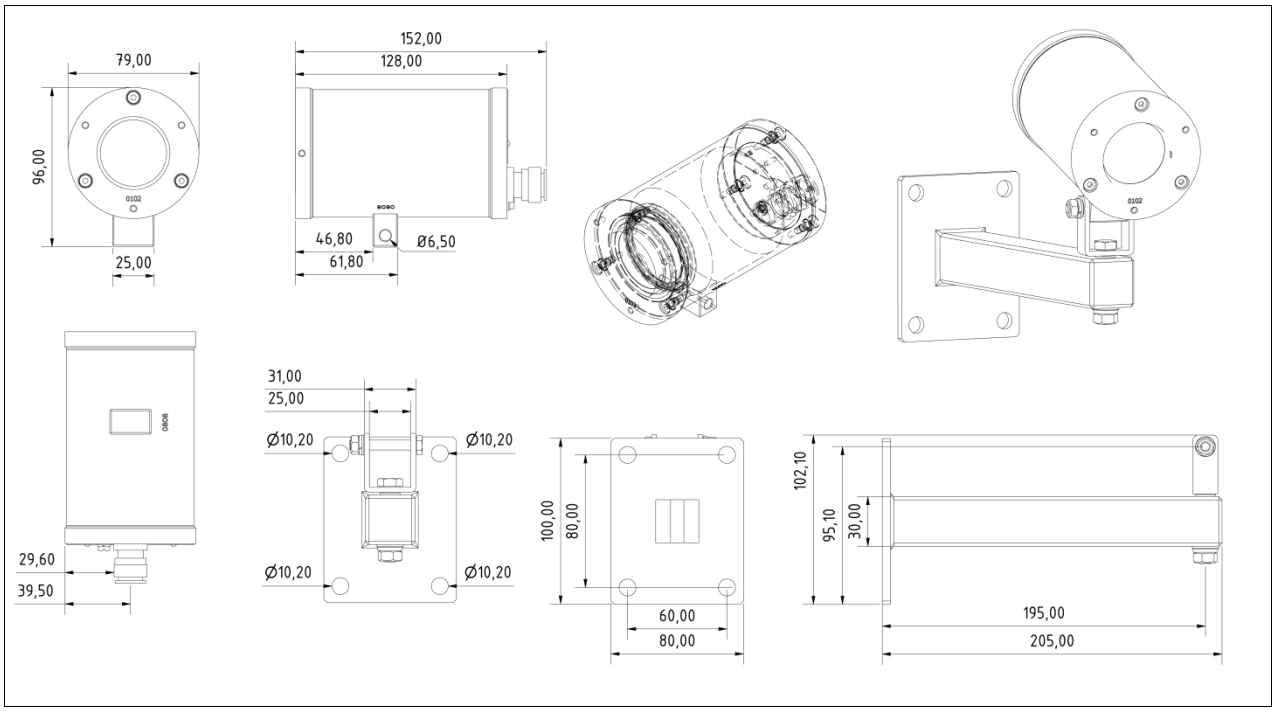

Figure 9.1 T03-VA-K1

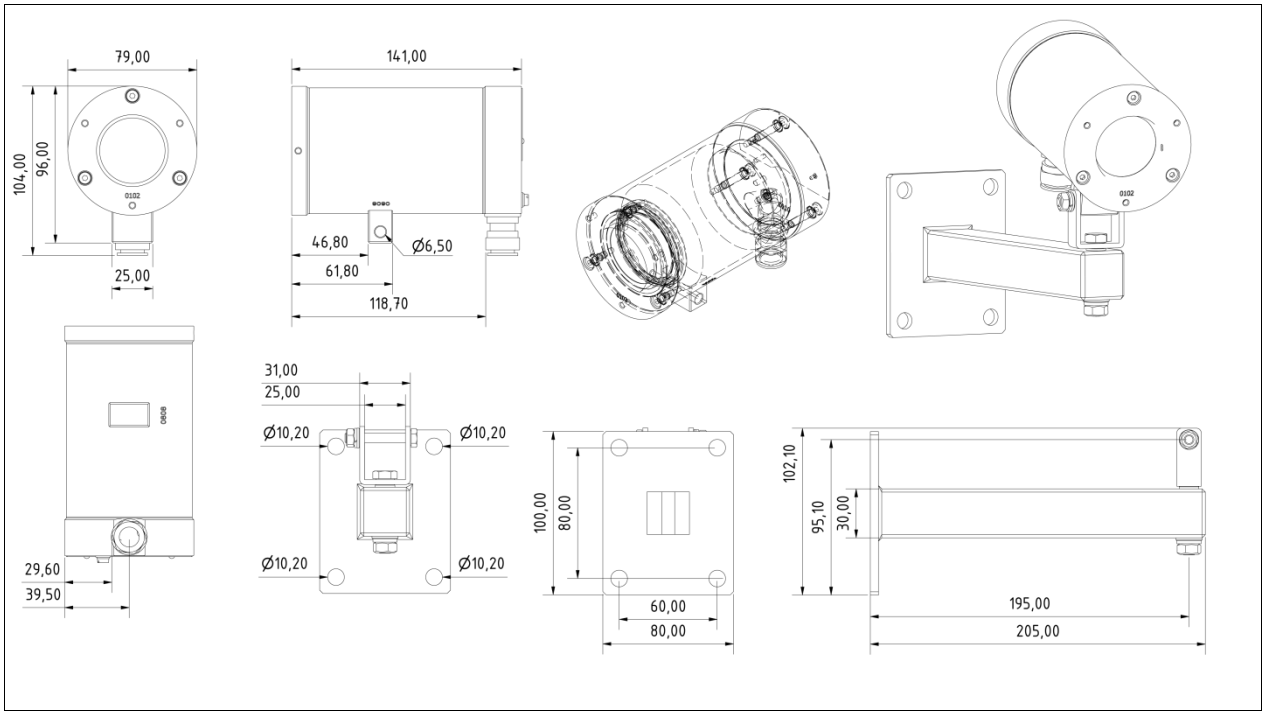

Figure 9.2 T03-VA-K2

10 Notes

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