

RoughCam[®] SUFA4115

User Manual



Content

1	Introduction	4
2	Connection options and required hardware	4
3	Technical Data	5
3.1	Illustration of the model key.....	5
3.2	Electrical parameters.....	6
3.3	System cable.....	6
3.4	Video-technical characteristics	7
3.5	Other technical data	7
4	Safety Instructions	9
5	Installation	10
6	Electrical connection	12
6.1	Potential equalization	12
6.2	Connection work at the device (terminal box) and fuses	13
6.2.1	Plug assignments (RJ12) of the sensor unit.....	14
6.2.2	Appropriate cables & cable entries.....	15
6.2.3	Tests prior to switching on voltage	15
7	Working inside the housing	16
7.1	Opening the housing	16
7.2	Closing of the housing.....	17
8	Maintenance / Modification.....	18
9	Disposal / Recycling	18
10	Drawings, 3D models and other documentation.....	18

Table of Figures

Figure 2-1 Connection options.....	4
Table 3-1 – Model key	5
Figure 3-1 Sectional view of SKD04-T.flex	6
Table 3-2 Other technical data	7
Table 5-1 Mounting accessories.....	11
Figure 6-1 RoughCam SUFA4115 Potential equalization.....	12
Table 6-1 Potential equalization	12
Figure 6-2 RoughCam SUFA4115 T10-VA0.1.K1.BOR-N.N-xxx.N-P with FA54 Main Unit	13
Table 6-2 Pin assignment of the RJ12 plug (SKD04-T.flex)	14
Figure 7-1 – Opening the RoughCam SUFA4115 (Fig. similar).....	16

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1 Introduction

The RoughCam SUFA4115 is an ultra compact and robust sensor unit (type T10) which is manufactured by SAMCON Prozessleittechnik GmbH and can be used very flexibly for various applications. The RoughCam SUFA4115 is equipped with a varifocal lens.

The RoughCam SUFA4115 is made for use with a Main Unit (FA54 Main Unit). Due to the usage of high-quality PTFE sealings, not only the protection level IP68 is met but also the chemical resistance is maximized.

For more information <https://www.samcon.eu>

2 Connection options and required hardware

RoughCam SUFA4115 is part of a modular camera. The ultra compact sensor unit needs a main unit (FA54 Main Unit, not included) for image processing and network connection. Such a main unit supports up to 4 sensor units simultaneously. Sensor unit and main unit could be placed separately.

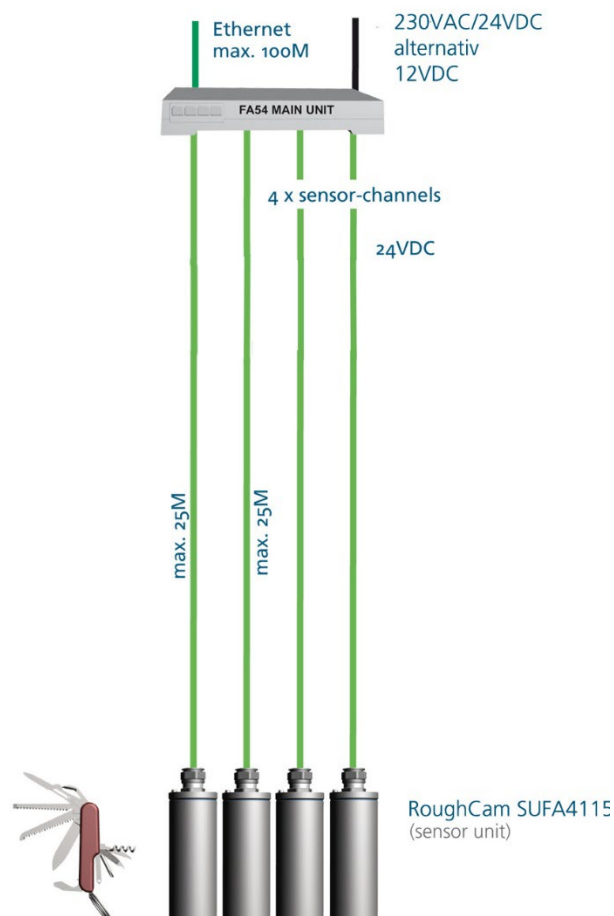


Figure 2-1 Connection options

3 Technical Data

3.1 Illustration of the model key

Product-name	Model version				
1)	2) Type	3) Housing- combination	4) Temp.- range	5) Cable length [m]	6) Termination
RoughCam SUFA4115	T10-	VA0.1.K1.BOR-	N.N-	005.N-	P-

Table 3-1 – Model key

Explanations:

- 1) RoughCam SUFA4115 = Functional camera description of the RoughCam Series (technical data / specification of the individual camera module)
- 2) **T10** = SAMCON Production type 10
- 3) **VA0.1.K1.BOR** = Housing (stainless steel 1.4404) with small diameter ($\varnothing_{VA}=48\text{mm}$)
VA0.1.K1.BOR = T11 VA0.x housing with maximum body length ($L_{VA0.1,R} = 127\text{mm}$)
VA0.1.K1.BOR = K1 cable gland flange (axial cable gland, standard)
VA0.1.K1.BOR = Borosilicate sight glass DIN7080 standard execution, for video cameras within visible spectral range and photographic infrared range (NIR), not suitable for thermographic applications (MIR/ FIR)
- 4) **N.N** = Normal ambient temperature range ($T_{amb} > -20^{\circ}\text{C}$)
N.N = No cooling system installed ($T_{amb} < +50^{\circ}\text{C}$)
- 5) **005.N** = Length of the connection line in meter at delivery. The standard cable length is 5 m, minimum / maximum cable length is: 25 [m]
005.N = Non armoured cable
- 6) **P** = Plug- termination
RJ-12 plug connector; shielded

3.2 Electrical parameters

Power supply of the Sensor Unit via FA54 Main Unit: max. 1.2W@4VDC

3.3 System cable

Description:	Data transfer and power supply of the camera module
Jacket colour:	Green (GN), similar to RAL 6018
Outside diameter:	8.7 ± 0.3 mm
Bending radius:	8 x D _a when installed and 4 x D _a after installation
Temperature:	-25°C ... +80°C during installation -60°C ... +80°C fixed installed
Data line:	4 x 2 x AWG24/7 blank, CAT.6
Shielding:	Copper, tinned wire 0.10, optical cov. app. 80%
Outer jacket/ Properties:	PUR FHF, halogen-free, flame-retardant (EN 60332-1-2), EMV shielded, suitable for drag chains, (see www.samcon.eu)

Quicklink:

https://www.samcon.eu/fileadmin/documents/en/60-Assembling%26mounting/SKD04-T.flex_Datasheet.pdf

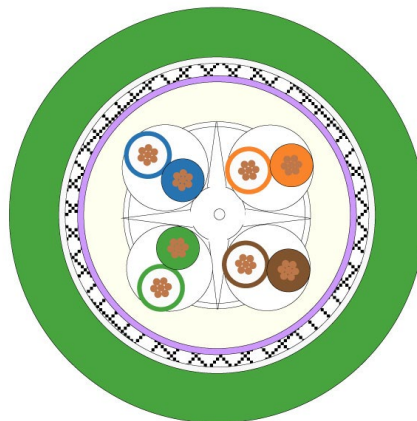


Figure 3-1 Sectional view of SKD04-T.flex

3.4 Video-technical characteristics

We use the AXIS FA4115 Sensor Unit in an enclosure. For details, please refer to the Product Documentation, video-technical data of AXIS®:

<https://www.axis.com/products/axis-fa4115>



3.5 Other technical data

	Sensor Unit
Permissible ambient temperature	-20°C ... +50°C
Protection class as per EN 60529/IEC 529	IP68 (Test conditions: 0.5h/8m water column 5°C)
Housing material	stainless steel, mat. no. 1.4404
Weight	about 0.7 kg
Dimensions	D48mm x 127mm

Table 3-2 Other technical data

Housing material (standard)

MNo.: 1.4404 (X2CrNiMo17-12-2),
AISI 316L / V4A

Additional metallic and non-metallic materials of the T11-VA0.1.x.x housing:

Zincd spring steel MNo.: 1.0330, PTFE with glass microbeads (GYLON® Style 3504 blue), silicone-coating (Silcoset 105 incl. CureAgent 28), MVQ (silicone), thermos transfer foil made of polyester (acetone resistant), cable glands made of brass, nickel-plated (MsNi)

Sight glass material:

Borosilicate glass "Ilmadur 10/ I-420"
 (DIN7080¹:2005-05)

Internal materials:

Optical and electrical components, div. thermoplastic plastics: polyamide (PA6.6/ PA2000) and polyoxymethylene (POM) isolators and supporting adapters, aluminum die cast, zincd adapter (EN AW-ALSi1MgMn), PTC-ceramics, PUR, etc.

Weight (without accessories):

600 g (with K1 cable flange

Weight of accessories:

800 g (wall mount bracket WMB-VA1.X)

50 g (hinge attachment SCH-VA1.x)

(further accessories upon request)

¹ Valid standards for translucent components in a pressure-tight housing: DIN7080:2005-05 „Round sight glasses made of borosilicate glass for compressive stress without limitation of the low temperature ranges“

Dimensions housing (wxhxd): 48.0mm x 48.0mm x 127.0mm
Dimensions with accessories (WxHxD): 97.0mm x 193.0mm x 299.5mm

Cable glands

1x **M20*1.5**_12 mm (ISO metrical fine thread acc. to *DIN13-2*), **Quality 6H** (medium or fine (acc. to. *ISO 965-1 / ISO 965-3*))

Media resistance:

Exclusively checked upon request!
Generally: Corrosion as well as chemical highly resistant against a variety of fluid and gaseous components of the industrial area and suitable for offshore applications (see general specification of stainless steel MNo.:1.4404 / AISI316L), surface finish and modification of the Ex d housing², elastomer sealings of the cables, as well as the GYLON® flat seals of the housing flange, etc.)

² Protective coating, electro polishing, etc. ...

4 Safety Instructions



Attention!

Repairs may only be carried out by using original parts from the manufacturer. Repairs which affect the explosion protection may only be carried out in accordance with the nationally applied regulations and exclusively by the manufacturer.



Attention!

Prior to installation, take external sources of heat or cold into account! The temperature ranges prescribed for storage, transport and operating must be adhered to!

5 Installation

For the sensor unit's installation and operation, the relevant national regulations, as well as the generally accepted rules of technology shall prevail. Before mounting the device, thoroughly check it for any transportation damages, especially at the housing and cable. Installation, electrical connection, and the first commissioning must only be carried out by qualified personnel.

Work preparation:



Attention!

Prepare your work carefully and in accordance with the relevant regulations.

To ensure the best image quality delivered by the sensor unit, plan the installation site carefully (consider light conditions, object distance or size, angle and minimum object distance to the focus).

- Use appropriate tools and aids.
- When working, ensure a safe stand.
- Make sure that any static charge is avoided.

The RoughCam SUFA4115 consists of a sensor housing. The sensor unit is equipped with a flexible cable (5 to 25 m). Mount the sensor unit according to the desired field of view. Install the (extra) main unit so that a good accessibility is provided, in order to facilitate electrical connection. Connect the sensor unit with a suitable main unit.

Drawings for drill hole patterns and further information can be viewed on our product page:

Quick link:

<https://www.samcon.eu/en/products/network/modular/excam-sufa4115/>



Optional mounting accessories

Wall bracket WMB-...		<p>WALL MOUNT WMB VA0.x Wall bracket for devices of T10-VA0-series Suitable for hanging the camera on walls. Material: stainless steel 1.4404 Weight: 0.68 kg Dimensions: 80 x 100 x 205 mm</p>
Pole adapter PMB-...		<p>POLE MOUNT PMB VA0.x Pole adapter for VA wall mount Material: stainless steel 1.4404 Suitable for pole diameters between 50 and 105 mm Load-bearing capacity: 45 kg Dimensions: 120x180x130 at masts of Ø 60 mm)</p>
Hinge attachment SCH-...		<p>Hinge attachment SCH-VAx.x Hinge attachment for easy mounting on round sight glasses acc. to DIN 28120/28121 or similar for VA Material: stainless steel AISI 316L/1.4404 Weight: ca. 0.04 kg Dimensions WxHxD [mm]: 29.2x40x73.1</p>

Table 5-1 Mounting accessories

6 Electrical connection



Attention!

The electrical connection of the equipment may only be carried out by qualified and skilled personnel!



Attention!

It is absolutely necessary to ground the RoughCam® series' housing via the PA connection.

The delivered RoughCam® SUFA4115 is equipped with an electrical connection cable of the type SKD04-T.flex. The maximum transmission range from the sensor unit to the main unit is 25 meters. The user is NOT authorised to do electrical connection procedures inside the enclosure.

6.1 Potential equalization

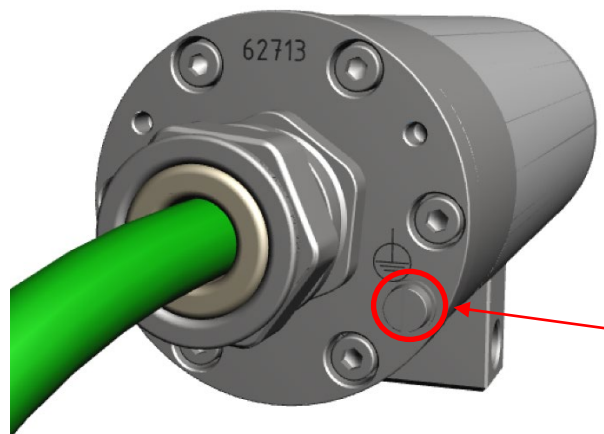


Figure 6-1 RoughCam SUFA4115 Potential equalization

Potential equalization/grounding of the camera housing is absolutely necessary, in order to avoid static charges and thus the formation of sparks. For this purpose, a screw terminal is provided at the rear side, at the bottom (right) (see Figure 6-1). The cross-section of the potential equalization should comply with the National Ground Rules (at least 4mm²).

Wiring table:

Potential	Colour (IEC 60757)	Cross-section	Comment
PA	GN/YE	4 mm ² (rigid)	Terminal: Slotted screw M3x0.5 (DIN 84) with washer Ø9mm (DIN 125A), Keep 1.2 Nm tightening torque!

Table 6-1 Potential equalization

6.2 Connection work at the device (terminal box) and fuses

The sensor unit has to be used together with a main unit (FA54 Main Unit).

Power supply for the sensor unit

Voltage supply:	via a main unit
Maximum power consumption:	1.2W@4VDC
Typical power consumption:	0.5 W

The figure 6.2 illustrates the potential connection-variant of the RoughCam SUFA4115 - sensor unit with RJ12 plug and main unit FA54 (purchased separately) for safe areas.

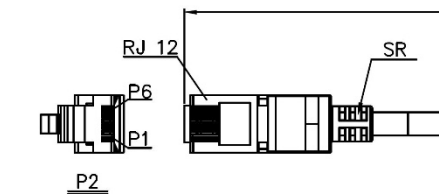


Figure 6-2 RoughCam SUFA4115 T10-VA0.1.K1.BOR-N.N-xxx.N-P with FA54 Main Unit

6.2.1 Plug assignments (RJ12) of the sensor unit

If the cable of the Sensor Unit needs to be shortened (the cable must not be extended), the plug needs to be disassembled professionally. When re-mounting the plug it is mandatory to observe the correct pin assignment according to EIA/TIA-568B (q.v. tab.6.2). Usually two strands of the same color code (IEC60757) are connected.

The pin assignment of the SKD04-T.flex is as follows:



WIRE CONNECTION TABLE			
P1	SIGNAL NAME	WIRE COLOR	P2
1	VCC	Blue/Whitie	5
5	GROUND	Blue	6
2	-DATA	Brown/Whitie	2
3	+DATA	Brown	1
Shell	Drian wire	--	Shell

WIRE CONNECTION TABLE			
P2	CODE	WIRE COLOR	SIGNAL
1	Brown	BN	+ DATA
2	Brown White	BN / WH	- DATA
3	-	-	-
4	-	-	-
5	Blue White	BU / WH	VCC
6	Blue	BU	Ground
SH	Shield	Shield	Drian wire

Table 6-2 Pin assignment of the RJ12 plug (SKD04-T.flex)

It is necessary to make sure that the cable shield is grounded on side of the terminal block!



Attention!

Finally, check your network installation with a Class-D Link Test.

6.2.2 Appropriate cables & cable entries

An integral part of the device safety is the correct selection of the cables, wires and cable entries.



Attention!

The supply line must have a sufficient cross-section. The cable protection must comply with national and international regulations.

For non-binding configuration and planning guidelines, please visit our website:



6.2.3 Tests prior to switching on voltage



Attention!

Prior to starting the device, perform all tests as indicated by the national regulations. Furthermore, check the correct function and installation of the device in accordance with this User Manual and other applicable regulations.



Attention!

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



Attention!

Do not switch on the camera at temperatures below 0°C!

7 Working inside the housing



Attention!
 Prepare your work carefully and in accordance with the relevant regulations.

7.1 Opening the housing



Attention!
 Pay attention not to damage the thread surface of the flame-proof gap.

Opening the sensor unit's housing is only permitted to change the focus. Afterwards, the housing has to be closed again! The steps below have to be followed very carefully.

Attention:

For opening the RoughCam SUFA4115's stainless steel housing T11 VA0.1.K1.BOR, it is mandatory to follow the step-by-step instructions!

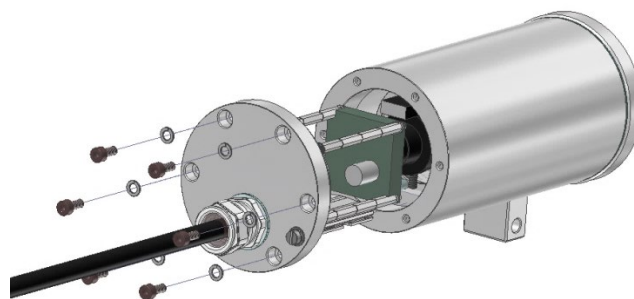


Figure 7-1 – Opening the RoughCam SUFA4115 (Fig. similar)

Loosen the six M3 cylinder-head hexagon screws (DIN 912/ ISO 4762) together with their spring rings (DIN 127A) on the rear side of the cable and power supply flange. Caution: do not touch the screw threads with your skin or clothes! On the threads, there is LOC-TITE® 243™ (chemical basis is dimethacrylate ester) applied to prevent the bolted connection from unintentional loosening because of impacts and vibrations and to seal them tightly. It is not permitted for the customer to open the front-side sight glass flange! There is no need of such an action.

Carefully pull out the cable and supply flange to the rear, as straight as possible. Because of negative pressure, it may be difficult to remove the flange. The cylindrical clearance fit (H8f7 - DIN ISO 286) of the camera body and flange may not be tilted!

Attention: The mounting adapter with camera modul and the optics are fixed on the cable and supply flange. Dealing with these components, too, you have to work very carefully and precisely in order to avoid canting and damage to the in-built components! Cau-

tion: do not touch the cylindrical fit surface with your skin or clothes! On the surface, there is oil lubricating paste to protect the surface against fretting corrosion and mechanical stresses.

When you open the housing, pay attention that you do not damage the GYLON® flat seal (blue, RAL5012) and do not make it dirty! The flat gasket is loosely attached to the cable and power supply flange. It is fixed only by the bolted connections!

Pull out the camera carefully and pay attention not to clamp the cables.

7.2 Closing of the housing

For closing the housing, proceed in reverse order as when opening. Use exclusively original screws included in the supply.

Check whether the threaded holes are undamaged and clean. Before closing, it is also absolutely imperative to check the gap.



Attention!

Do not lock-in any foreign objects in the housing.

Dismantled screw locks (spring washers DIN 127A) must be used again.

The GYLON® gasket must be used in undamaged condition, according to the flange hole pattern, and placed between the flange and the hull. The lateral position of the flat surface / contact surface is arbitrary.

If, when closing the housing, you see that the surface of the fitting gap is dirty or insufficiently lubricated, clean it with a clean cloth and de-grease it with a suitable cleaning agent. Then re-grease it with lubricant suitable for this specific application (e.g., Molykote® P-40 gel for standard applications or special grease OKS 403 in the event of heavy seawater influence).

The screwed connections of flange and body components must always be tightened *crosswise* to a torque of **1.2 Nm**! Do not tighten the screw too strongly! It can cause rupture of the cylinder head or over-stretching the threads, and thus to impairment of the pressure resistance or ignition protection class



Cylinder-head bolts for explosion-proof connection of the camera body with the flange component must always be tightened at a 1.2 Nm torque - crosswise and evenly!

8 Maintenance / Modification

The applicable regulations for the maintenance and servicing of electrical devices must be adhered to.

The required maintenance intervals are specific to the individual devices. The operating company has to determine these intervals depending on the application parameters. The maintenance tasks include examination all parts (e.g., proper condition of the casing, seals and cable entry points). If maintenance measures are necessary they have to be initiated and/or executed.

Repairs may only be carried out with original parts of SAMCON Prozessleittechnik GmbH. Damaged housings have to be replaced completely. In case of doubt, send the part in question back to SAMCON Prozessleittechnik GmbH.

Reparations must only be carried out in accordance with nationally applied regulations by SAMCON Prozessleittechnik GmbH or by an authorised electrical technician authorised by SAMCON Prozessleittechnik GmbH. Rebuilding of or alterations to the devices are not permitted.

9 Disposal / Recycling

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

This Document is subject to alterations and additions.

10 Drawings, 3D models and other documentation

All drawings, 3D models and other information are available in the download area of the product page on our website:

<https://www.samcon.eu/en/products/network/modular/roughcam-sufa4115/>

If you wish additional technical information, please contact us at: support@samcon.eu



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