



Operating Manual

minCord 5



USA Borescopes

2061 Bearden Road | Clarksville, TN 37043

931-362-3304 | sales@USABorescopes.com | www.USABorescopes.com

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1 User information

In this chapter you will find some preliminary remarks on the use of the minCord 5 as well as explanations on the structure of this user manual and on the symbols and text labels used.

1.1 Purpose and target group

The purpose of this operating manual is to ensure that the operator of the minCord 5 knows how to use the system correctly and properly.

The target group is the following persons:

Target group	Tasks
Operator	<ul style="list-style-type: none"> • Keep this manual available at the place of use of the system, also for later use. • Encourage employees to read and observe this manual and the other applicable documents, especially the safety and warning instructions.
Specialist personnel	<ul style="list-style-type: none"> • Encourage employees to read and observe this manual and the other applicable documents, especially the safety and warning instructions.

1.2 Warranty and Liability

All information and notes in this operating manual are based on currently valid regulations and standards as well as the current state of the art. minCam accepts no liability for damage to property or personal injury caused by:

- Non-intended use of the equipment
- Non-compliance with the instructions, commands and prohibitions of the document
- Unauthorized structural changes to the system
- Inadequate monitoring of parts subject to wear and tear
- improper and untimely performance of maintenance and repair work

This will also void any manufacturer's warranty.

Avoid excessive stress on the camera head and large temperature differences.

1.3 Validity of the manual

This operating manual covers and is valid for the following topics:

- Transport and installation
- Commissioning
- Operation and use
- Maintenance and inspection
- Decommissioning and disposal

1.4 Copyright

The minCord 5 operating manual and all illustrations and information contained therein are the intellectual property of minCam GmbH. Use beyond the scope of device use is not permitted without the written consent of minCam GmbH.

1.5 Other applicable documents

- Assembly instructions for minCam locator
- Operating manual minLoc

1.6 Display conventions

1.6.1 Text labels

Instructions for action in a chronological order for operation and operation of the machine are presented as follows:

- ☐ A prerequisite to be fulfilled in advance.
 - 1) Action step
 - ↪ *An intermediate result is listed here.*
 - 2) Action step
 - 3) Action step
- ↻ Repeat an action instruction or action steps.
- ✓ Result of the action instruction

Individual instructions for action, without chronological sequence, are presented as follows:

- ⇒ Unordered action step

Display of lists

Numbered and unnumbered lists are displayed as follows:

1. Numbered list
2. Numbered list
 - List, level 1
 - List, level 2
 - List, level 2

Display of cross references

Cross-references to other chapters of the operating manual are indicated by naming the chapter and the page number, e.g. "Text markings on page 6").

1.6.2

Darstellung von Warnhinweisen

⚠ DANGER	
	<p>Indicates the type and source of the hazard.</p> <p>The occurrence of the specified hazard will result in irreversible personal injury or death.</p> <ul style="list-style-type: none"> ➤ Listing of all measures that must be taken to avoid the consequences.
⚠ WARNING	
	<p>Indicates the type and source of the hazard.</p> <p>The occurrence of the aforementioned hazard will possibly result in irreversible personal injury or death.</p> <ul style="list-style-type: none"> ➤ Listing of all measures that must be taken to avoid the consequences.
⚠ CAUTION	
	<p>Indicates the type and source of the hazard.</p> <p>The occurrence of the aforementioned hazard may result in reversible minor personal injury.</p> <ul style="list-style-type: none"> ➤ Listing of all measures that must be taken to avoid the consequences.
NOTE	
	<p>Indicates a possibly dangerous situation,</p> <p>which can lead to property damage if it is not avoided.</p> <ul style="list-style-type: none"> ➤ Listing of all measures that must be taken to avoid the consequences.



Important information!

For marking important notes, additional information or tips.

1.6.3 Used symbols

The following symbols are used in this operating manual:

Warning signs		Command signs	
	General warning sign		General command sign

1.7 EC Declaration of Conformity

The EC Declaration of Conformity can be found in the Appendix on page XX.

1.8 Manufacturer information

The minCord 5 camera system is manufactured by:

minCam GmbH
Bundesstraße 9
87538 Fischen im Allgäu / Germany

2 Safety

The minCord 5 camera system has been built according to the current state of the art and recognized safety regulations.

Nevertheless, danger to life and limb of the operator or third parties may occur during operation. The inspection system or other material assets may also be damaged.

The camera system may only be used if:

- it is in perfect technical condition.
- it is used as intended.
- the operator has the necessary safety and hazard awareness.
- the instructions in this operating manual are observed.
- the legal or other safety and accident prevention regulations as well as the applicable standards and guidelines of the respective country of operation are observed in addition to the overall documentation.

The following also applies:

- Rebuilding or modifying the product impairs product safety.
- The system must be visually inspected for damage and abnormalities before each start-up.
- The camera system is operated with an internal rechargeable battery. This must be charged using the supplied power supply unit. During the charging process, the minCord can continue to be operated without restriction.
- Never carry out repairs on your own. Make sure that you send the system to minCam for service.
- Never use contaminated cameras for fresh water operations.
- Only use original power supplies.
- Keep memory cards away from magnetic fields for smooth functionality.

Damage caused by improper operation will void any warranty.

2.1 Operator obligations

- Always keep this operating manual available at the minCord camera system.
- Make sure that the operating personnel have read and understood this manual before the camera system is put into operation.
- Observe the generally applicable safety measures specified by law.
- Always wear personal protective equipment in accordance with the legally applicable standards during operation.

2.2 Personnel qualification

Only allow the minCord camera system to be operated by trained or instructed persons. Define responsibilities according to the qualifications of the personnel.

2.3 Personal protective equipment

When operating the camera system, always wear personal protective equipment in accordance with the legally applicable standards.

2.4 Immediate measures in case of accidents

In case of danger and accidents, ensure that first aid measures can be taken as quickly as possible.

In case of an accident:

- 1) Switch off the system immediately.
- 2) Remove the affected person from the danger area and make him sit down or lie down.
- 3) Call first aiders.
- 4) Inform rescue service:
 - **Where** did something happen?
 - **What** exactly has happened?
 - **How** many people are affected?
 - What is the nature of the injury/emergency?
 - Wait for further inquiries. ist etwas geschehen?
- 5) Provide first aid until first responder arrives.
 - Stop bleedings.
 - Cool burns with lukewarm water for a short time.
- 6) Report all accidents to the supervisor.

In the event of an accident to the camera system, proceed as follows:

- 1) De-energize the system.
- 2) If possible, remove the camera system from the pipe.

⇒ In case of an accident, also make sure that the measures for accidents within the company are taken.

3 System overview

3.1 Overview front



3.2 Display elements

The following display elements are located on the display:

Symbol	Description
	WLAN on / off
	System in battery operation / mains operation
	No memory card inserted
	Lighting off
	Lighting level 1

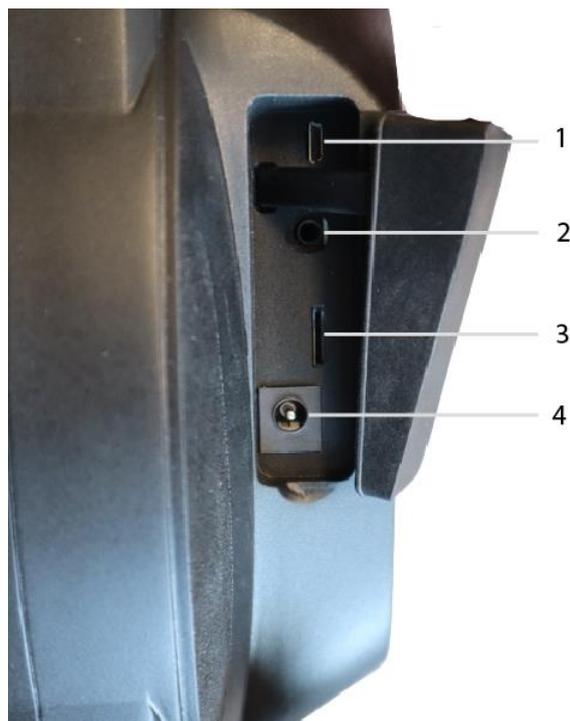
	Lighting level 2
	Lighting level 3
	Locator transmitter off
	Locator transmitter on (33kHz)
	Locator transmitter on (640Hz)
	Locator transmitter on (512Hz)
	Meter counter

The state of the functions is shown with the coloring of the background:

- Green background: function active
- Gray background: Function inactive

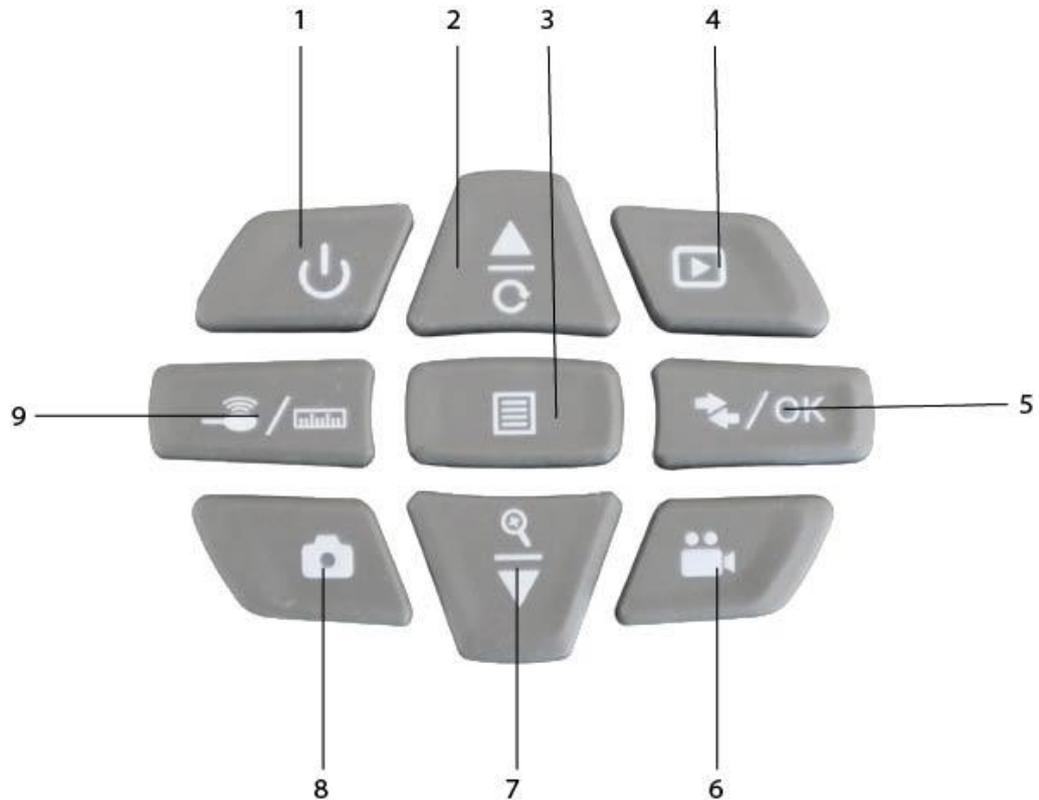
3.3 Connections and controls

3.3.1 Connections left



- | | | | |
|---|---------------|---|---|
| 1 | Micro-USB | 2 | 3.5mm jack (for service purposes only) |
| 3 | Micro-SD Slot | 4 | Charging port (no DC input - charger integrated in power supply unit) |

3.3.2 Control elements



- | | | | |
|---|--|---|-----------------------------------|
| 1 | On / Off | 2 | Menu navigation up / Rotate image |
| 3 | Open / close menu, submenus | 4 | Open / close playback menu |
| 5 | Toggle through quick menu / OK | 6 | Start / stop video |
| 7 | Display 4:3 / Zoom / Menu Down | 8 | Take photo |
| 9 | Change locator transmitter / reset meter counter | | |

3.4 Intended use

The minCord 5 camera system is built for the optical inspection of pipes and cavities. A medical inspection is not considered to be intended use. Any warranty or liability on the part of the manufacturer for damage to property or personal injury resulting from improper use is void. Use the camera system only for the applications mentioned above.

4 Transport, handling, storage

4.1 Transport

The minCord 5 camera system must always be transported in a bag or case (if included in the scope of delivery).

The camera system may also be transported by air, as the battery capacity is less than 100 Wh and it is a Li-Ion battery with 3400 mAh.

To prevent damage during transport, observe the following whenever transporting the camera system:

- Stow the camera in the cable reel.
- Secure the camera system against sliding around and falling over when transporting it in the vehicle.

4.2 Storage

Store the minCord 5 camera system in a bag or case (if included in the scope of delivery).

Store the camera system only at a storage temperature between - 20°C and +40°C.

Storage in temperature ranges other than those specified may damage the camera system.

For long-term storage, ensure that the battery charge level is between 50 and 80%.

5 Commissioning

5.1 Visual inspection

Before each inspection, the components must be visually checked for damage or contamination.

Do not use any damaged / soiled components.

5.2 Commission

Remove the minCord 5 camera system from the carrying case.

⇒ Press the On/Off button  for 5 seconds.

✓ The minCord 5 camera system is ready for use.

⇒ Make sure that the push cable of the cable management system and the camera are not damaged.

6 Operation

6.1 Switching the camera system on and off

- ⇒ To switch on the system, press the On / Off button for 5 seconds.
- ✓ The live video is displayed.
- ⇒ To switch off the system, press the On / Off button again for 5 seconds.

6.2 Charging the battery

NOTE	
	<p>Potential data loss</p> <ul style="list-style-type: none"> ➤ Connect the power cord to the minCord camera system to prevent data loss in the event of a low battery shutdown.

NOTE	
	<p>Damage to the camera system due to the use of non-original accessories</p> <ul style="list-style-type: none"> ➤ Make sure that only the minCam original power supply is used for charging.

The minCord 5 has an internal rechargeable battery.

- ⇒ To charge it, connect the supplied charging cable to the cable drum.

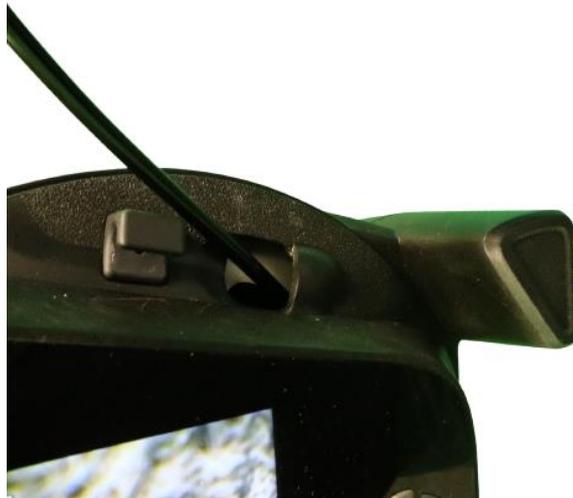
The charging times of the minCord 5 are as follows:

Charging capacity	Charging time
80%	Approx. 105 minutes
100%	Approx. 200 minutes

6.3 Winding / unwinding the cable reel

⚠ CAUTION	
	<p>Danger of crushing.</p> <ul style="list-style-type: none"> ➤ Wear work gloves when winding and unwinding the cable reel. ➤ Always hold the camera system by the handle when winding / unwinding.

- ⇒ To unwind the minCord, pull the sliding cable on the camera out of the cable reel.
- ⇒ To wind up the minCord properly, push the push cable into the cable reel.



- ⇒ Insert the camera into the designated recess on the upper right side to stow the camera.

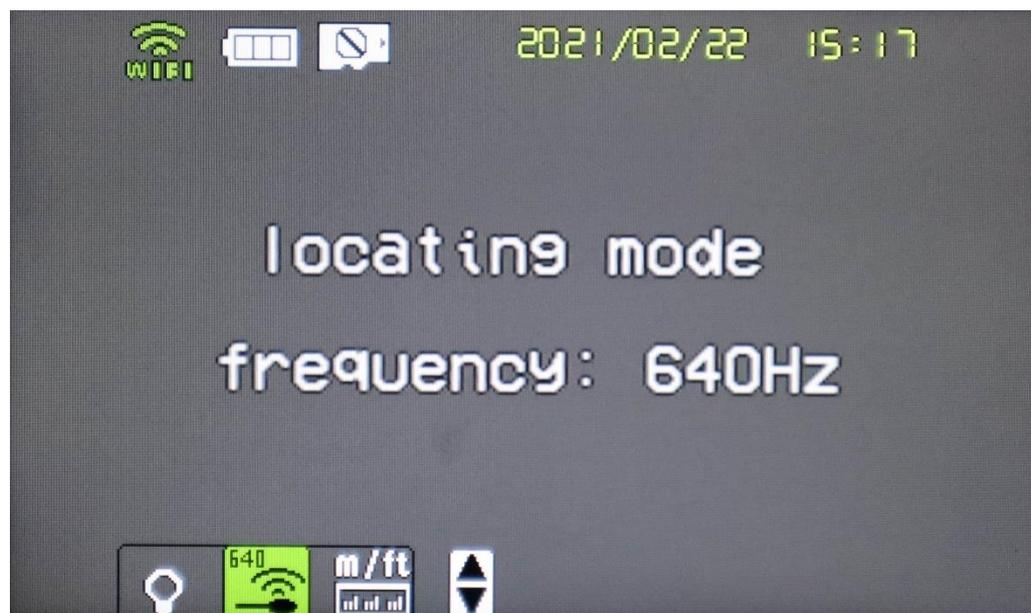
6.4 Locating the camera system

You have the option of locating the camera with a corresponding locating transmitter. Both the camera head and the push cable can be located. The camera head can be located using the point location function, and the push cable can be located using the lead location function.

How to perform a camera location using the minCam locator system can be found in the minLoc manual.

- ⇒ To locate the camera or the sliding cable, use a locating receiver.

- ⇒ To switch through the frequencies, press  or .



6.5 Working with the system

6.5.1 Menu navigation

⇒ To enter the main menu, press .



⇒ To navigate through menus, press  or .

⇒ To open a submenu, press .

⇒ To go back one level, press .

6.5.2 WiFi settings

To change the WLAN settings, proceed as follows:

1) In the main menu, navigate to the WiFi menu using  and .

2) Press .



⇒ To activate the WiFi, navigate to WIFI ON and press .

✓ The main menu is displayed.

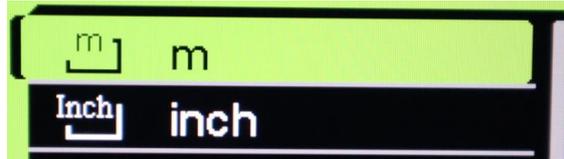
⇒ To disable the WLAN, navigate to WIFI OFF and press .

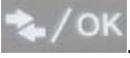
✓ The main menu is displayed.

6.5.3 Setting the meter counter

You have the option of displaying the value of the meter counter in meters or inches.

- 1) In the main menu, navigate to the "Meter counter" menu using  and .
- 2) Press .



⇒ To display the meter value at the meter counter, navigate to "m" and press .

✓ The main menu is displayed.

⇒ To display the inch value at the meter counter, navigate to "inch" and press .

✓ The main menu is displayed.

6.5.4 TV-OUT



Important Information!

The TV-OUT menu item is intended for service purposes only.
Do not change the existing setting.

6.5.5 Setting the language

To set the language, proceed as follows:

- 1) In the main menu, navigate to the "LANGUAGE" menu using  and .
- 2) Press .



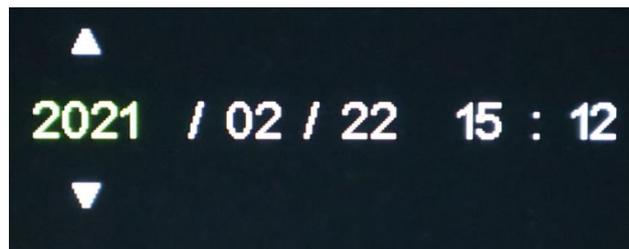
3) Select the desired language and press .

✓ The main menu is displayed.

6.5.6 Setting the date and time

To set the date and time, proceed as follows:

- 1) In the main menu, navigate to the "DATE & TIME" menu using  and .
- 2) Press .
- 3) To change the value, press  and .

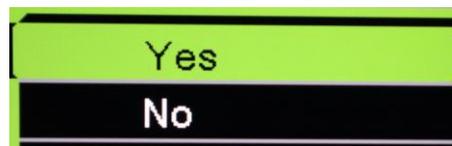


- 4) To move to the next value, press Locate button (Change Locate / Reset Meter Counter).
 - 5) Repeat the procedure until you have set the date and time as desired.
 - 6) To save the entered value and return to the previous menu, press .
- ✓ The values are saved.
 - ✓ The main menu is displayed.

6.5.7 Formatting the storage medium

To format the inserted storage medium, proceed as follows:

- 1) In the main menu, navigate to the "FORMAT" menu using  and .



- 2) To format the storage device, navigate to "YES" and press .
- ✓ The storage medium is formatted.
 - ✓ The main menu is displayed.

6.6 Taking a picture



Important information!

Make sure that a MicroSD card is inserted in the card slot.
Otherwise, an exposure is not possible.

Then start the camera system.

The free memory space is displayed on the start screen.

⇒ Make sure that the micro SD card is at least a class 10 card.

⇒ To capture a damage picture, proceed as follows:

⇒ Press  in live mode.

- ✓ The picture is saved.
- ✓ A photo camera is displayed at the bottom right edge of the display.

6.7 Recording a video

Important information!



Make sure that a MicroSD card is inserted in the card slot.

Otherwise, an exposure is not possible.

Then start the camera system.

The free memory space is displayed on the start screen.

⇒ Make sure that the micro SD card is at least a class 10 card.

⇒ To record a video, proceed as follows:

⇒ Press  in live mode.

- ✓ The recording is started.
- ✓ A REC symbol is displayed at the bottom right edge of the display.

⇒ To stop the recording press  again.

6.8 Saved data

The saved data (image captures and video recordings) are stored in chronological order.

6.8.1 Viewing saved images

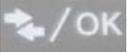
NOTE



Possible data loss

- To prevent data loss, ensure that the SD card is only inserted or removed when the system is switched off.

1) Open the playback menu .

- 2) To scroll through the saved data, press  and .
 - 3) To view an image, press .
 - 4) To return to the saved data, press .
- ✓ While viewing saved images, a red camera icon will be displayed in the lower right corner of the display.

6.8.2 Viewing saved videos

NOTE	
	<p>Possible data loss</p> <p>➤ To prevent data loss, ensure that the SD card is only inserted or removed when the system is switched off.</p>

- 1) Open the playback menu .
 - 2) To scroll through the saved data, press  and .
 - 3) To start playback, press .
 - 4) To pause the playback, press .
 - 5) To return to the stored data, press .
- ✓ While viewing the saved data, a red video camera icon will be displayed in the upper left corner of the display.

6.8.3 Locking saved data

You have the option to lock saved data against deletion. To lock the saved data, proceed as follows:

- 1) Open the playback menu .
- 2) Use  and  to select the saved file to be locked against deletion.
- 3) Select "LOCK..." with  and .
- 4) Confirm the operation with .

- ✓ The selected file is locked.

6.8.4 Deleting individual saved data

To delete stored data, proceed as follows:

- 1) Open the playback menu .
- 2) Use  and  to select the saved file to be deleted.
- 3) To delete the file, press .
- 4) Select "DELETE..." with  and .
- 5) Confirm the deletion with .

- ✓ The selected saved file is deleted.

6.8.5 Deleting all saved data

To delete all saved data, proceed as follows:

- 1) Open the playback menu .
- 2) Press .
- 3) Select "Format." with  and .
- 4) Confirm the deletion with .

- ✓ All saved data are deleted.

6.9 Accessories

6.9.1 Mounting the centering aid

The following centering aid is available for the KK13 camera of the minCord 5:

KK13 from DN24



⇒ Screw the centering aid apart.



⇒ Place the rear part of the centering aid on the camera.



⇒ Place the front half of the centering aid on the camera.



⇒ Screw the centering aid together by hand.



6.9.2 Dismounting the centering aid

- ⇒ Clean the centering aid before dismounting it.
- ⇒ Unscrew the cleaned centering aid.



6.10 Installing the WiFi module

You have the option of installing a separately available WiFi module in the minCord 5.

6.10.1 Opening the minCord 5

- ☐ A Tx 10 screwdriver is ready for use.
 - ☐ A Tx8 screwdriver is ready for use.
- 1) Use the Tx 10 screwdriver to unscrew the 6 M3x10 screws from the housing.



- 2) Remove the back of the housing.



- ✓ The back of the housing is unmounted.

- 3) Use the Tx 8 screwdriver to unscrew the M3 x 33 screw from the coil body. Make sure that you do not lose the O-ring.



4) Remove the coil body.



- ✓ The coil body is unmounted.
- ⇒ Carefully guide the camera head through the recess.

5) Unscrew the 4 M3 x 10 screws of the cover for the WiFi module.



6) Remove the cover for the WiFi module.



✓ The WiFi module can be installed.

6.10.2 Installing the WiFi module

- 1) Remove the WiFi module from the packaging.
- 2) Align the WiFi module.



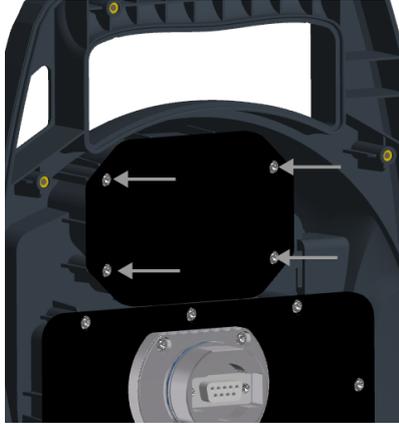
- 3) Insert the WiFi module into the slot.



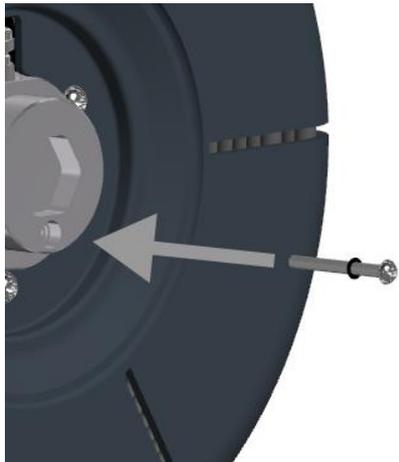
✓ The WiFi module is connected.

6.10.3 Closing the minCord 5

- 1) Position the cover for the WiFi module on the slot.
- 2) Use the Tx 10 screwdriver to screw the 4 M3x10 screws onto the cover for the WiFi module.



- ✓ WiFi slot is closed.
- 3) Carefully guide the camera head through the recess.
 - 4) Align the coil body.
 - 5) Use the Tx 8 screwdriver to tighten the screw and the O-ring on the coil body.



- 6) Put on the back of the housing.



- 7) Screw the back of the device in place with 6 M3 x 10 screws.

- ✓ The WiFi module is installed.



7 Maintenance

In case of a necessary repair, contact minCam GmbH or an authorized partner. A list of authorized partners can be found on the minCam website.

8 Cleaning and disinfecting

The following points must be observed when cleaning the camera system:

- Clean the camera head with soap and water only.
- Do not use alcoholic solvents.
- Do not use high-pressure cleaners to clean the camera system.
- Use a cloth / rag to keep dirt away from the camera during winding.

9 Disposal

Recycle the camera system after the total service life has expired.

10 Technical Data

10.1 Camera

Camera KK13

Dimensions	Diameter: 13mm Cylindrical length: 9mm Sapphire crystal: 2mm
Image sensor	1/4" Color CMOS
Resolution:	
PAL	560 TV lines
NTSC	500 TV lines
Light sensitivity	0.02Lux@F1.2
Lens	
Diagonal opening angle	84°
Lighting	Adjustable LEDs
Locator transmitter	33kHz / 512Hz / 640Hz (switchable)
Pressure tightness	1bar
Operating temperature range	-20°C to 60°C (-4°F to 140°F)
Storage temperature range	-20°C to 40°C (-4°F to 104°F)

10.2 Cable reel

minCord 5

Dimensions (BxHxD)	120mmx220mmx295mm (4.72"x8.66"x11.61")
Length of the push cable	15m (968 ft)
Weight	Max. 2.8 kg (6.17 lbs)
Operating temperature range	0°C bis 40°C (32°F to 104°F)
Storage temperature range	-20°C to 40°C (-4°F to 104°F)

10.3 Data storage

The minCord 5 camera system is supplied with a memory capacity of 16 GB.
A micro SD card (at least class 10 or higher) with up to 32 GB can be used for data storage.