

Manual MiniFlex



MiniFlex[®]
CamTronics

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1. Introduction

1.1 Scope

Suitable for inspecting pipes Ø 32 mm till Ø 100 mm. Sharp bends can be taken starting from Ø 32 mm.

Note: variations can be caused by type of material, color, and contamination of the pipe.

1.2 The complete system

The system consists of the following components:

- Camera cable
- Reel
- DVR unit (optional without ordering)

1.3 Working with the system

All system components are manufactured from high quality materials and assembled with great precision. To use the system for a long time some maintenance is required. This guide provides instructions and tips on:

- Safety
- Use
- Maintenance
- Service

2. Safety

Read all safety warnings and instructions. Failure to follow the warnings and instructions may result in electrical shock, fire, and/or serious injury. When in doubt and / or if you have any questions, please contact your dealer or supplier

2.1 General safety rules

- **The system may only be used by a qualified person.** Improper use increases the risk of serious injury.
- **Keep your work area clean and well lit.** Cluttered or dark areas invite accidents.
- **Do not operate equipment in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Equipment can create sparks which may ignite the dust or fumes.
- **Keep children and bystanders away while operating equipment.** Distractions can cause you to lose control.
- **Avoid traffic.** Pay attention to moving vehicles when using on or near roadways. Wear high-visibility clothing or reflector vests.
- **Stay alert, watch what you are doing, and use common sense when operating equipment.** Do not use equipment while you are tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating equipment may result in serious injury.
- **Dress properly.** Do not wear loose clothing or jewelry. Loose clothes, jewelry, and long hair can be caught in moving parts
- **Always use appropriate personal protective equipment when handling and using equipment in drains.** Drains may contain chemicals, bacteria, and other substances that may be toxic, infectious, and cause burns or other issues. Appropriate personal protective equipment always includes safety glasses and may include a dust mask, hard hat, hearing protection, drain cleaning gloves or mitts, latex or rubber gloves, face shields, goggles, protective clothing, respirators, and steel toed, non-skid footwear.
- **Disconnect the plug from the power source from the equipment before making adjustments, changing accessories, or storing.** Preventive safety measures reduce the risk of injury.
- **Store idle equipment out of the reach of children and do not allow persons unfamiliar with the equipment or these instructions to operate the equipment.** Equipment can be dangerous in the hands of untrained users.
- **Maintain equipment.** Check for misalignment or binding of moving parts, missing parts, breakage of parts, and any other condition that may affect the equipment's operation. If damaged, have the equipment repaired before use. Many accidents are caused by poorly maintained equipment.
- **Do not overreach.** Keep proper footing and balance at all times. This enables better control of the equipment in unexpected situations.
- **Use the equipment and accessories in accordance with these instructions, taking into account the working conditions and the work to be performed.** Use of the equipment for operations different from those intended can result in a hazardous situation.

- **Use only accessories that are recommended by the manufacturer for your equipment.** Accessories that may be suitable for one piece of equipment may become hazardous when used with other equipment.
- **Keep Handle Dry, clean, and free from oil and grease.** Clean handle give better control of the equipment.
- **Protect the LCD from impacts during use.** Impacts to the front of the LCD can cause glass breakage and complete failure of the display.
- **Do not expose the unit to mechanical shocks.** Exposure to mechanical shocks can damage equipment and increases the risk of serious injury.
- **Carrying the system incorrectly may result in property damage and / or serious injury.** Always carry the system by the handle.
- **Under abusive conditions, liquid may eject from battery pack; avoid contact.** If contact occurs, flush with water. If liquid contacts eyes, seek medical help. Liquid ejected from the battery pack may cause irritation or burns.
- **Properly dispose of battery packs.** Exposure to high temperatures can cause the battery packs to explode; do not dispose of in a fire. Some countries have regulations concerning battery disposal. Follow all applicable regulations.

2.2 Electrical safety

- **Do not leave the device unattended while charging.**
- **There must be a smoke detector in the room where the device is charged.**
- **When the device is charged, remove the adapter from the wall socket.** Leaving the adapter in the wall socket unnecessarily increases the risk of a dangerous situation.
- **Avoid body contact with earthed or grounded surfaces such as pipes, radiators, ranges, and refrigerators.** There is an increased risk of electrical shock if your body is earthed or grounded.
- **Do not expose equipment to rain or wet conditions.** Water entering equipment will increase the risk of electrical shock
- **Keep all electrical connections dry and off the ground.** Touching equipment or plugs with wet hands can increase the risk of electrical shock.
- **Do not abuse the adapter cord.** Never use the adapter cord for carrying, pulling, or unplugging the adapter. Keep adapter cord away from heat, extreme cold, oil, sharp edges, and moving parts. Damaged or entangled cords increase the risk of electrical shock.
- **If operating equipment in a damp location is unavoidable, use a ground fault circuit interrupter (GFCI) protected supply.** Use of a GFCI reduces the risk of electrical shock.
- **Recharge only with the adapter specified by the manufacturer.** A adapter suitable for one type of battery pack may create a risk of fire when used with another battery pack.
- **Do not cover adapter while in use.** Proper ventilation is required for correct operation. Covering adapter while in use could result in fire.

- **Use and store device and adapter in dry, appropriate temperature areas according to their documentation.** Extreme temperatures and moisture can damage battery packs and result in leakage, electrical shock, fire, or burns.
- **The adapter is not waterproof and is intended for indoor use only.** To prevent electrical shock do not power the system with an adapter outdoors or in wet conditions.
- **Do not probe the battery pack with conductive objects.** Shorting of battery terminals may cause sparks, burns, or electrical shock.
- **The device is not designed to provide high voltage protection and isolation.** Do not use where a danger of high voltage contact is present.
- **The system operates at a voltage of 230V / 50Hz and / or the built-in battery.** Make sure the system is always placed in a dry environment and indoors. The camera is of course waterproof.
- **If you want to use a generator, you must be sure that the unit provides a continuous voltage of 230V / 50Hz.** If you have any doubts do not use aggregate. Using an incorrect and/or unstable voltage brings great damage to the system, this also voids the warranty

We recommend that you do not use an aggregate.

- **You can also use an inverter (12V DC to 230V AC). The output voltage (230V AC) must be a pure sine wave.** Your dealer can help you select an appropriate inverter that fits your system. Great damage may be inflicted to your system by using a converter with low power or with a non-pure sine wave output. This will void the warranty.

3. Use of the system

3.1 Before an inspection

To reduce the risk of serious injury from electrical shock or other causes, and to prevent damage to your equipment, inspect all equipment and correct any problems before each use.

Before beginning an inspection, the pipe should be properly cleaned.

1. Power off your equipment.
2. check all cables and connections for damage or irregularities.
3. Clean any dirt, oil, or other contamination from your equipment to ease inspection and to prevent it from slipping from your grip during transportation or use.
4. Inspect your equipment for any broken, worn, missing, misaligned, or binding parts, or any other condition which might prevent safe, normal operation.
5. Refer to the instructions for all other equipment to inspect and make sure it is in good, usable condition.
6. Check your work area for the following:
 - a. Adequate lighting.
 - b. The presence of flammable liquids, vapors, or dust that may ignite. If present, do not work in area until sources have been identified and corrected. The equipment is not explosion proof. Electrical connections can cause sparks.
 - c. A clear, level, stable, and dry place for the operator. Do not use the equipment while standing in water.
7. Examine the job to be done and determine the correct equipment for the task.
8. Observe the work area and erect barriers as necessary to keep bystanders away.

Pay attention! Never use the camera to unclog a pipe! Once you notice that the camera offers resistance and stops, gently pull the camera back and clean the tube before continuing. Then you can proceed with the inspection.

3.2 Connecting the system

- Open the display
- Connect the 230V plug to a wall outlet unless you want to do an inspection with the build-in battery .
- Switch the system on by pushing the red on/off button on the front panel. The LED will light, see section 3.9 for explanation.
- The LCD display is automatically enabled. The LED turns green.
- Adjust the brightness of the camera lights with the yellow keys on the front panel.

3.3 Greasing flex part

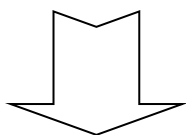
the camera can be easily pushed through curves due to its sophisticated shape of the rubber part behind the camera head. In order to easily take the curves, it is necessary to grease this part. Use acid-free Vaseline.



3.4 Storage sleeve

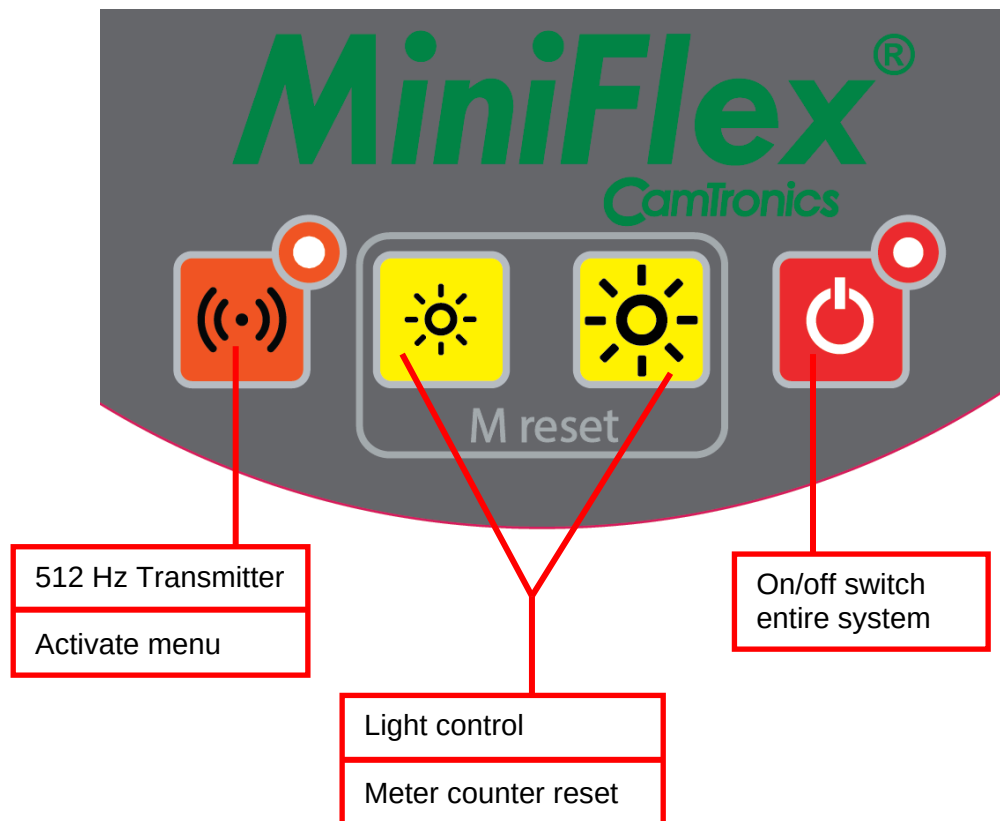
If the camera is not in use it should be kept in the storage sleeve. This ensures that the flexible rubber part remains straight, particularly if it is not used and stays in the drum. To start an inspection take the sleeve containing the camera out of the drum.

Take the camera out the sleeve and insert the sleeve into the holder on the right side of the reel. The inspection can begin. Afterwards put the camera back in the sleeve and put it as a whole back into the drum.



3.5 Control panel

The control panel of the MiniFlex includes the following features:



3.6 Using the transmitter

The camera head of the MiniFlex is equipped with a 512 Hz transmitter. With the aid of a receiver, the camera can be located without digging. During the use of the transmitter the image will contain stripes. They will disappear immediately after turning off the transmitter. Also on the recording this stripes will be visible.

Switching on the transmitter is easy. Press the transmitter button on the controller. During use of the transmitter the lighting is put at half strength. The lights cannot be adjusted when the transmitter is switched on.

By pressing the transmitter button again the transmitter is switched off. When the transmitter is turned off the lights will return to the previously set brightness.

3.7 Using the meter counter

To reset the meter counter, push both lighting buttons simultaneously. The meter counter will be reset to zero. See also 3.8

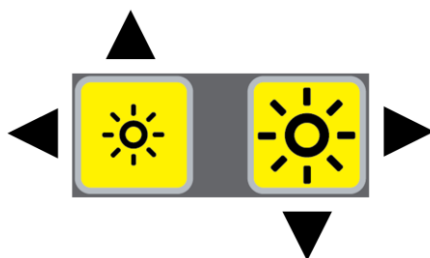
3.8 User Menu

To activate the main menu, hold the transmitter button down until the menu appears. It will appear after about 2 seconds.



1. Text writer
2. Text writer on/off
3. Time/date settings
4. Time/date on/off
5. Meter counter units
6. Meter counter on/off
7. Language
8. System
9. Back

Use the two light buttons to navigate through the menu. Depending on the main or submenu, you can use them to go to the left, right, up or down.



Use the transmitter button to confirm your selection.

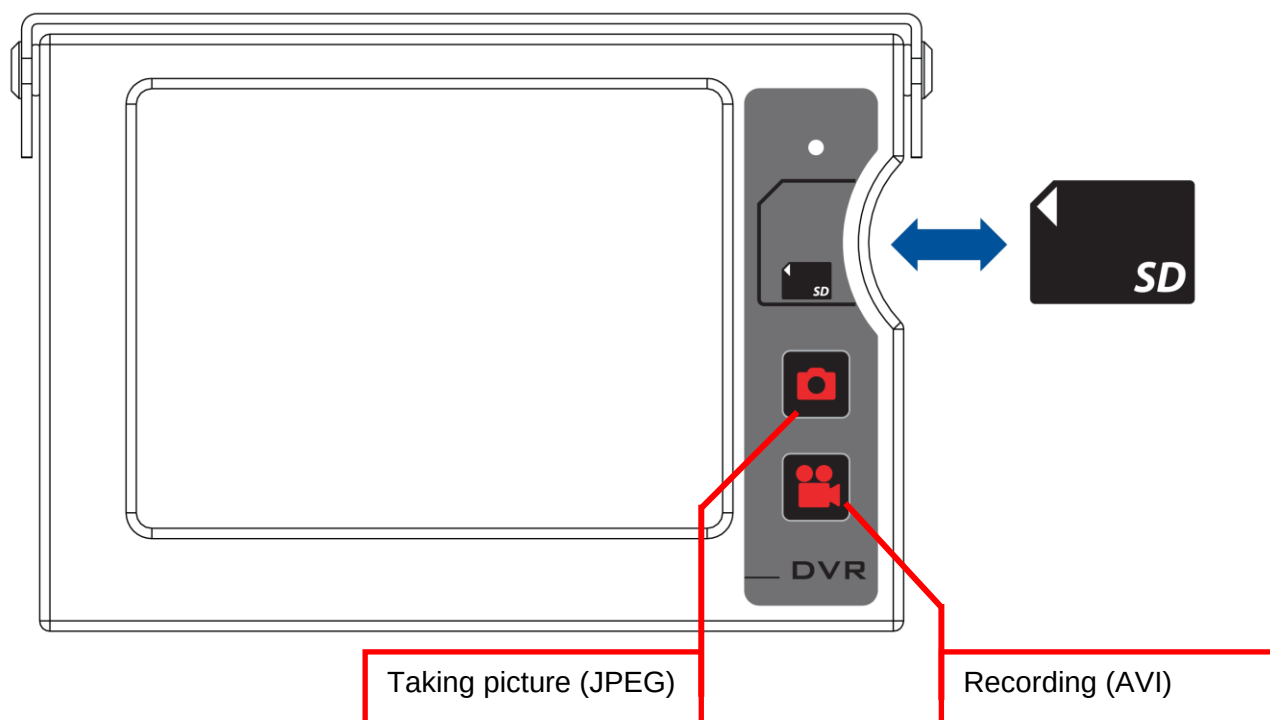


To leave the menu, select "**9. Back**"

You can enter text using the menu, and choose whether or not to display it. The date and time can also be set and displayed on the screen should you so wish. For the meter counter unit, you can choose between metres or feet, and you can also choose whether or not to display this information.

3.9 Control DVR display

The operator panel on the reel includes the following features:



When recording starts “REC” appears in the upper left corner.

Pay attention:

- No dirt / moisture into the slot of the SD card.
- Maximum recording is 30 minutes per file.
- SD card max size is 16GB

3.10 Use of the adapter

With a fully charged battery of the MiniFlex it is possible to work many hours without recharging. However, one can also work with the supplied adapter and simultaneously charge the battery. The third possibility is charging while the system is off.

The adapter and connector are located behind the cover on the left.

Use only the original 18V, 24W adapter.
Using another adapter will damage the system. The warranty will void.



Plug the connector of the adapter into the connector located behind the cover. This is a cable with a length of several centimeters. Then connect the adapter to a 230V socket. After finishing you can store the adapter and cable behind the cover.

3.11 Use of the Video out

The MiniFlex, has besides the optional DVR recorder with display, also an possibility to view the video or record it in a different way.
Behind the cover on the right side of the system a cable with a length of several centimeters is attached to a BNC female connector. This transmits a video out signal. Extension cables can be ordered from your supplier.



3.12 Indication of the LED's

Adapter not connected

System on, Battery charge 50% -100%	
System on, Battery charge 20% - 49%	
System on, Battery charge 10% - 19%	
System on, Battery charge 0% - 9%	 + Beep

Adapter connected

System on	
System off, Battery charge <100%	
System off, Battery charge 100%	

Battery error

Return the system to your supplier



Pay attention:

- Do not store the MiniFlex with low battery charge.
- Charge the system at least 1x every 8 weeks.

3.13 View and transfer recordings

You can view, edit and / or send the recorded photos and videos by an iPhone, iPad or Android phone / tablet.

See Appendix A for iPhone, iPad and Appendix B for Android phone / tablet

4. Maintenance

Maintenance is a very important aspect. If the system is properly maintained, the probability of failure and / or malfunction is smaller and the system will last longer.

A simple but very useful tip is to clean the system always good and keep it this way. By doing so you will reduce the chance of malfunctions. Make sure there cannot be dirt or other debris on the camera and moving parts. We recommend cleaning with a damp cloth or brush. Never clean the display to prevent scratches.

The reel should **never** be sprayed with water or a pressure washer.

The system should be stored in a ventilated, non-humid chamber at room temperature.

If you are not using the system, make sure it is stored in a dry and ventilated area. Do not store the system for a long period of time with an (almost) empty battery. This can shorten the life expectancy of your battery.

We recommend to have your system checked by your supplier every year. During this check, the system will be examined for functioning, any wear and safety.

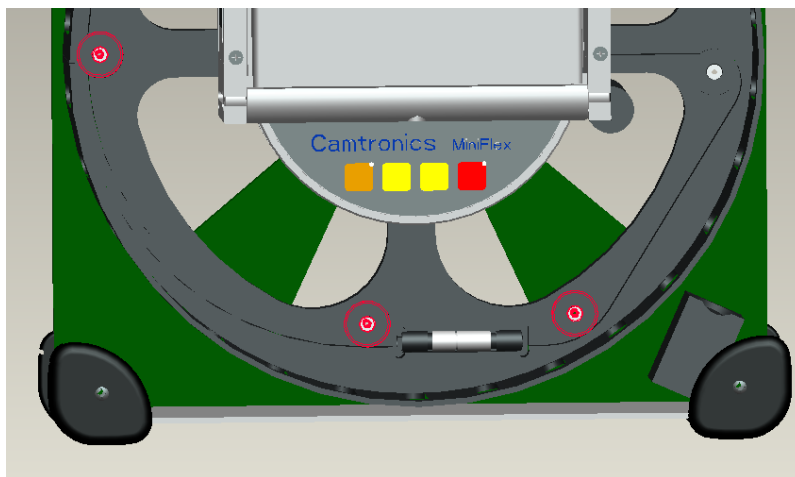


4.1 Replacing of the cable

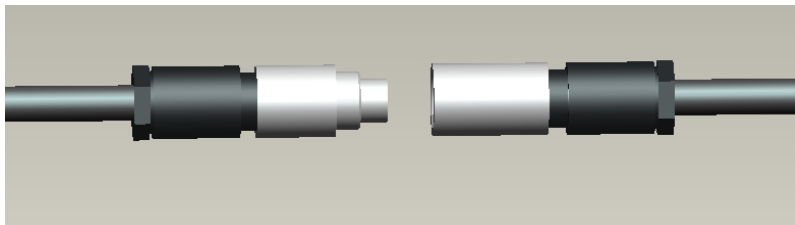
Attention !: By default the MiniFlex is tuned for cable lengths between 10 m and 20 m. There are also variants with a shorter or longer cable. Make sure that the new cable length is equal to the old cable length. If uncertain contact your supplier.



1. Ensure that the system is off.
2. Unscrew the camera head from the cable.
See instruction "Replacing the camera head"
3. Pull the entire cable from the drum till the first disc.



4. Unscrew the 3 discs (see picture above).
5. Pull the connection outside the drum.



6. Screw the connector of the camera from the connector of the drum.
7. Screw the new cable to the connector of the drum.
8. Insert the connection back in the space provided.
9. Place de cable in the chute.
10. Screw the discs back to its original position.
11. Wind up the cable into the drum.
12. Attach the camera to the cable.
13. Turn on the system.

4.1 Replacing the camera head

The camera head can be easily disassembled and assembled to the flexible cable.

Attention !: make sure the system is turned off during disassembling and assembling of the camera head. Perform these actions only in a clean and dry environment .

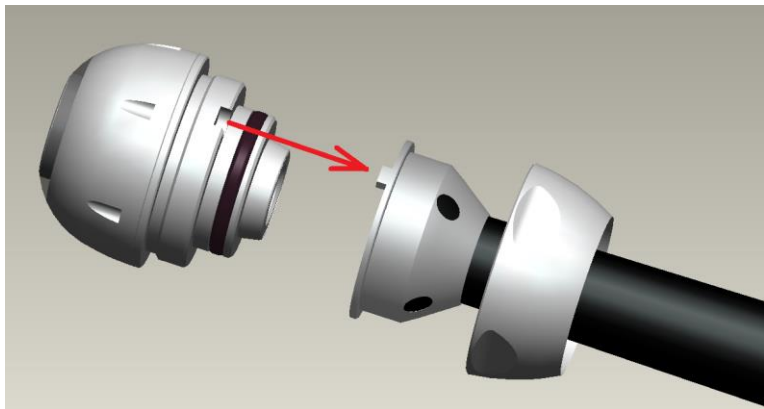
Disassembling

Keep the front of the camera head fixed and unscrew the rear ring.

Assembling

Make sure the parts are clean and dry. Caution is advised when cleaning the spring contact pins in the rubber part.

Line up the protruding tab on the rubber part with the recess in the camera head. Push the camera head and rubber part together in that position and keep it in position while tightening the ring completely. If well done there will be hardly a gap between camera and ring. This can be maximal up to 0.2 mm. Make sure that you are convinced that no moisture and / or dirt is embedded. The system can be switched on.



5. Service & Warranty

For service to the system, you should always contact your dealer.

Service on the system may only be performed by a designated dealer, authorized service technician or by the manufacturer. If repairs are performed and / or adjustments are made by an unauthorized technician the warranty on the system will void.

Warranty provisions / term funds under the terms of your dealer.

System warranty does not cover:

- Short circuit / lightning strike
- Cable Break
- Water damage
- Improper use and / or destruction
- Failure to follow these instructions, in particular the maintenance of the system (Chapter 4)

5.1 Troubleshooting

Stripes in view

Check if the transmitter is turned on and turn it off if necessary.

System does not switch on

The battery pack is empty. Plug the adapter to a power outlet.

Camera is not taking curves

Apply a little acid-free Vaseline on the flex part behind the camera.

System does not respond

Press the hidden reset button. After the system has been reset, Turn it on by the on / off switch (see chapter 3.5) for checking the system.



6. Specifications

Camera head

Material housing: stainless steel
Diameter: 19,5 mm (bullet shape)
Length: 23 mm (fitted)
Viewing angle: 105° diagonal
Lens: f=2,1 mm / F10.0
Focus: fixed
Glass: sapphire glass 1 mm
Camera: Color CMOS 400 TV-lines
Sensitivity: 1 Lux
Lighting: 12 white high power LEDs
Transmitter: 512 Hz
Water resistance: 3 bar

System

Dimensions: 395 mm x 470 mm x 107 mm
Weight (including DVR unit): 8.6 kg
Operating on battery: up to 7 hours
Power in: 100-240V 50-60Hz AC
Operating temperature *: -10 ° C to 45 ° C
Storage temperature: -10 ° C to 60 ° C
Relative humidity: 5 to 95 %
Menu languages: Dutch / English / German / French / Spanish / Italian / Portuguese / Polish

Cable: Combi cable Ø 5,5 mm 15 m (optional other lengths available)

DVR with display (optional without available)
Display size: 5.6 inch color
Display resolution: 640x480 pixels
Recording resolution: 720x576 pixels
Storage: SD card (max 16GB) (USB Adapter)

* The adapter is rated for 0°C tot 40°C

The specifications, design, way of acting and illustrations in this manual are not binding. We reserve the right to make changes without prior notice.

The MiniFlex® is a product of:

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Internet: www.camtronics.eu



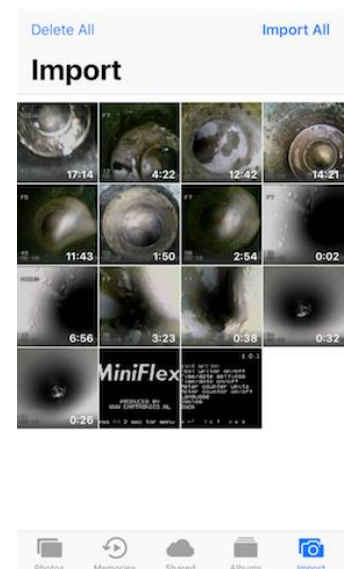
For iPhone

A.1 Transfer and view files

To transfer the files from the SD card to an iPhone or iPad use a "Lightning to SD card reader".



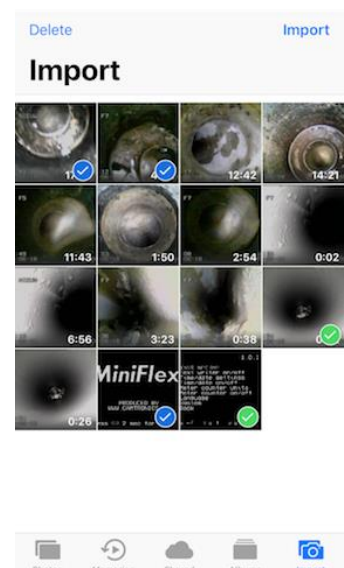
After plugging in the adapter with the sd-card into your iPhone, the "Import" screen opens itself.



Select the desired files.

A blue check mark will appear for selected files. (Green check mark means already imported.)

Press import.



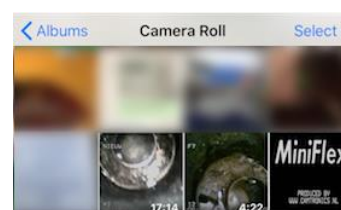
Once the files have been imported, you can choose to remove them from the SD card.



The imported files can be found at "Albums", "Last import".

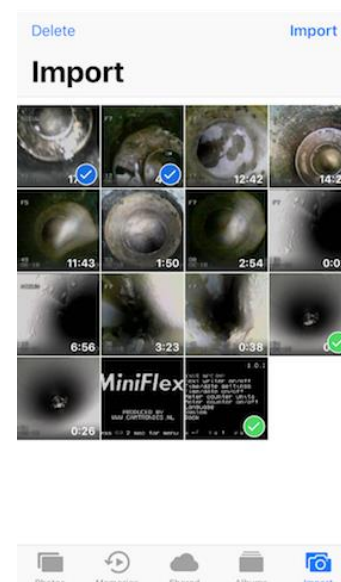


Also the files are in the "Camera Roll". (NOTE that not all imported files are in the timeline)

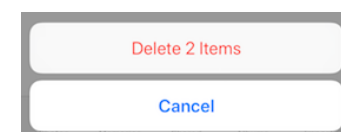


A.2 Delete files on SD card

Connect adapter with SD card. Select the desired files. A blue check mark will appear for selected files. (Green check mark means already imported) After selecting you can delete it.

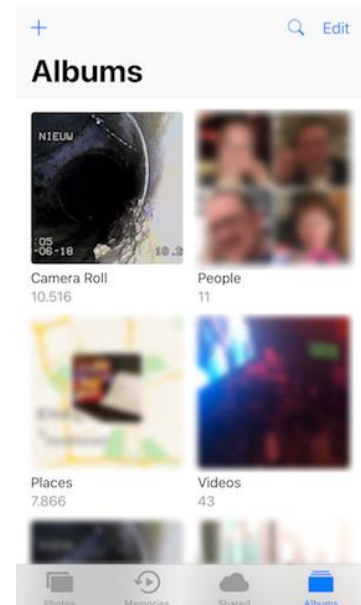


Confirm the deletion of the files.

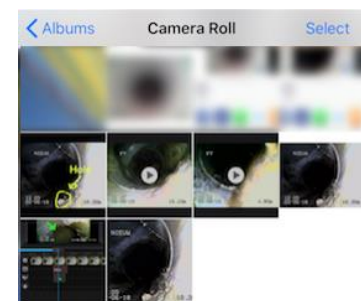


A.3 Send via WhatsApp/Dropbox/We-transfer/e-mail

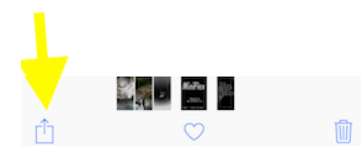
Open the photo app, go to “Albums”, “Camera Roll”



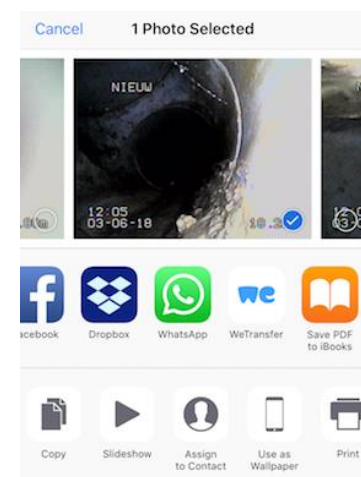
Select the file you want to send.



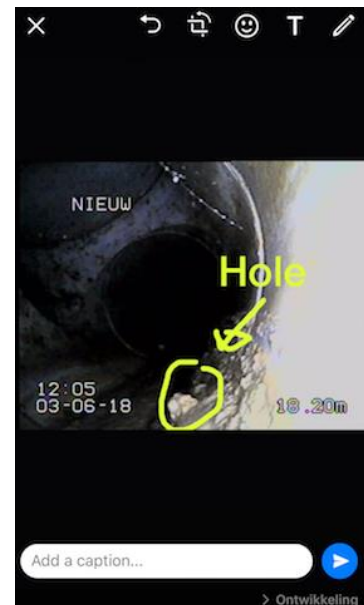
To end, tap on the “send symbol”.



Choose "WhatsApp" and select a contact person to whom you want to send the file.
Tap "Next" .If a video file is selected go to "Video file".



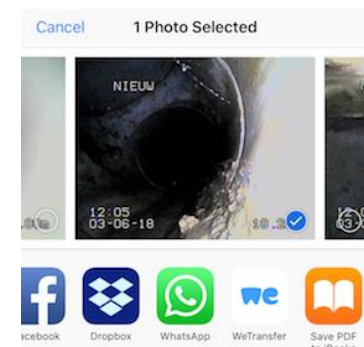
Take notes, crop and rotate the photo.
(NOTE notes only work if 1 file is selected)



"Video file" Select the part of the file you want to send with the yellow marked slider.
(NOTE there is a limit on the maximum size you can send)
Take notes, crop and rotate the video.



For sending with "Dropbox", "We-transfer" or "email" choose the relevant icon. And follow the instruction.



A.4 Advanced video editing

Taking notes on specific places in a video file you can use "Cute Cut Pro". (see example photo)



Install "Cute Cut pro" via the app-store.
(scan QR-code for download link)



You can see a tutorial on YouTube.
(scan QR-code for YouTube link)



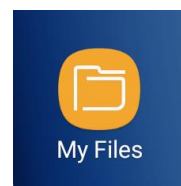
For Android

B.1 Transfer and view files

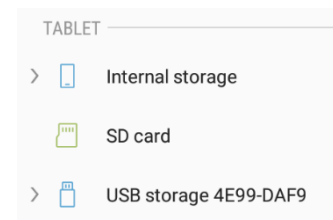
To transfer the files from the SD card to an Android device you use an "OTG card reader". (NOTICE your device must support OTG)



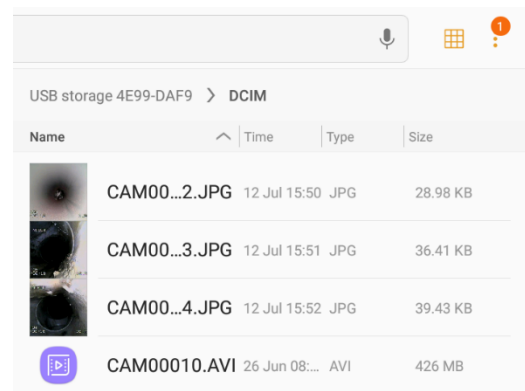
Plug in the adapter with SD card.
Open the app "MY FILES"



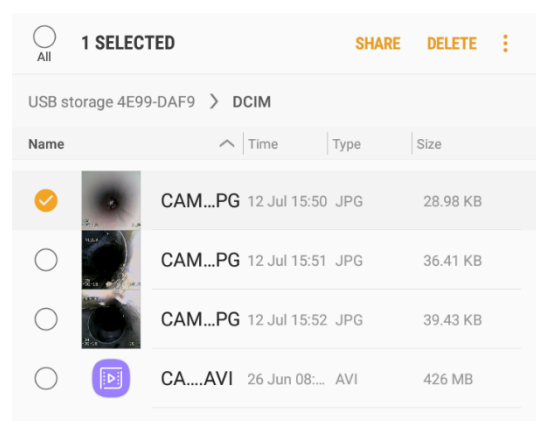
Select "usb storage".



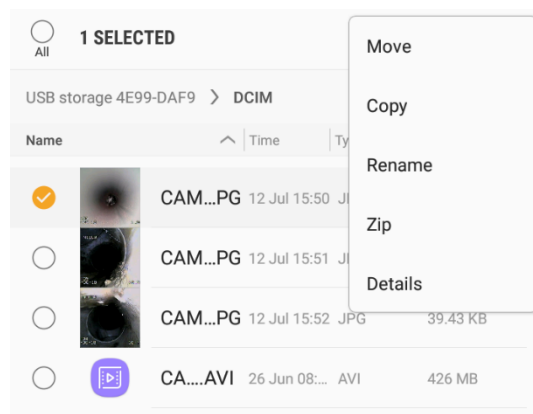
Select 1 file by tap and hold.



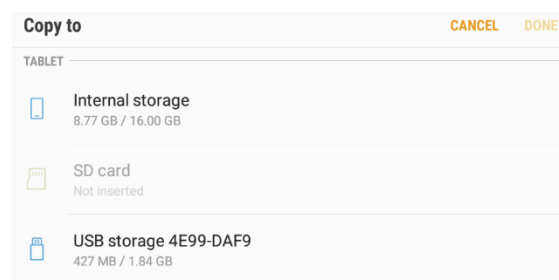
Select multiple files if necessary.



To copy files to your device, tap on the 3 dots at the top right of the screen and choose “Copy”.

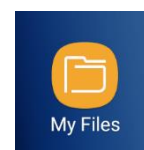


Copy the files to the "internal storage" or "if available to an "SD card".

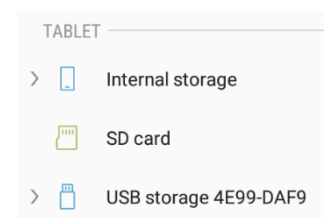


B.2 Delete files on SD card

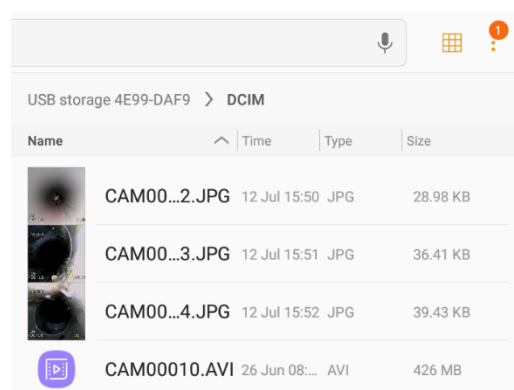
Plug in the adapter with SD card.
Open the app “MY FILES”



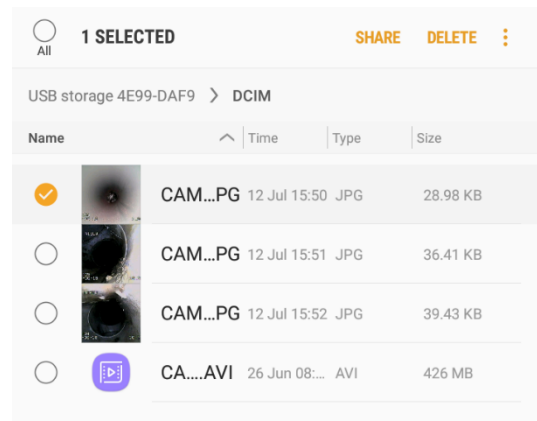
Select “usb storage”.



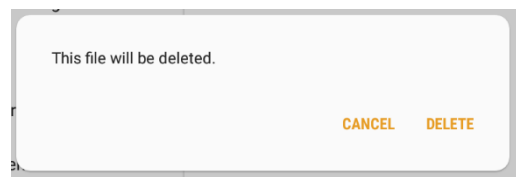
Select 1 file by tap and hold.



Select multiply files if necessary.
Tap on “DELETE”.

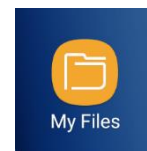


Confirm with “DELETE”.

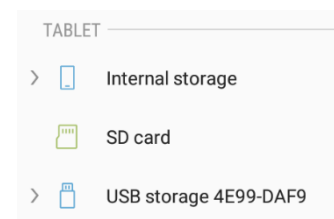


B.3 Send via WhatsApp/Dropbox/We-transfer/e-mail

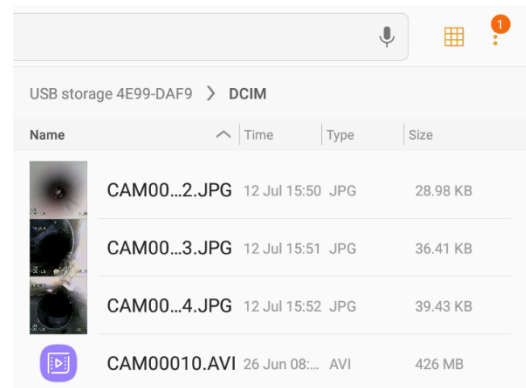
Plug in the adapter with SD card.
Open the app “MY FILES”



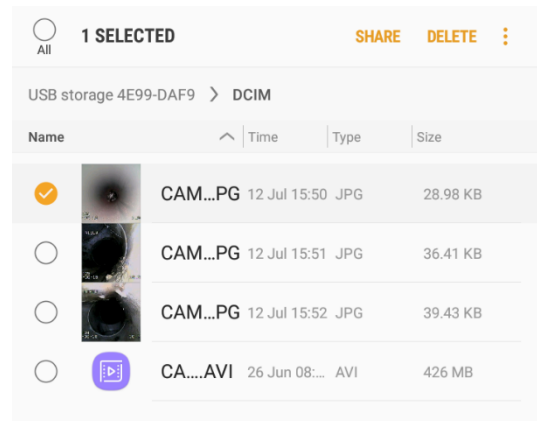
Select “usb storage”.



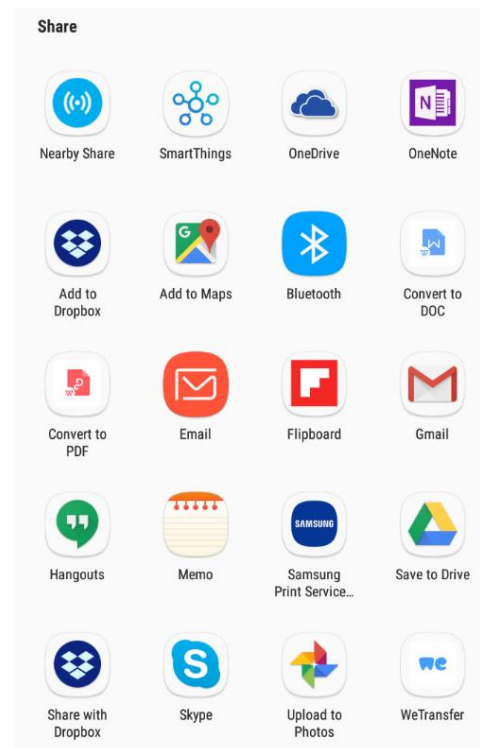
Select 1 file by tap and hold.



Select multiple files if necessary.
Tap on “SHARE”.



Choose which program you want to send the file with.
Follow the instructions.



B.4 Advanced video editing

Taking notes on specific places in a video file you can use "Cute Cut Pro". (see example photo)



Install “Cute Cut pro” via the play-store. Upgrade to the “Pro edition”.
(scan QR-code for download link)



You can see a tutorial on YouTube.
(scan QR-code for YouTube link)

