



Flexacam C3 Microscope Camera User Manual

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General Notes

General Notes

Safety concept

Before using your Leica camera for the first time, please read the "Safety Concept" booklet included with your camera. It contains additional information on handling and care.



Cleaning

- Do not use any unsuitable cleaning agents, chemicals or techniques for cleaning.
- Never use chemicals to clean colored surfaces or accessories with rubberized parts. This could damage the surfaces, and specimens could be contaminated by abraded particles.

Servicing

- Repairs may only be carried out by Leica Microsystems-trained service technicians. Only original Leica Microsystems spare parts may be used.

Responsibilities of person in charge of camera

- Ensure that the camera is operated, maintained and repaired by authorized and trained personnel only.

Important Safety Notes

User manual

The Flexacam C3 camera can be configured in a variety of ways in the Leica product range. You can find information on the CD-ROM together with all relevant user manuals in additional languages. Keep this CD-ROM in a safe place, where it is available to the user.

User manuals and updates are also available for you to download and print from our web site at www.leica-microsystems.com.

This user manual describes the usage of the Flexacam C3 and contains important instructions for operating safety, maintenance and the accessory parts.

For information on the On-Screen Display (OSD) in stand-alone mode, refer to the On-Screen-Display User Manual.

The "Safety Concept" booklet contains additional safety information regarding the service work, requirements and the handling of the camera, accessories and electrical accessories as well as general safety instructions.

Before installing, operating or using the camera and the accessories, read the user manuals listed above. In particular, please follow all safety instructions.

To maintain the camera in its original condition and to ensure safe operation, the user must follow the instructions and warnings contained in these user manuals.

Symbols Used



Read and understand this user manual before using the camera.



Warning! Safety hazard!

This symbol indicates especially important information that is mandatory to read and observe. Failure to comply can cause the following:

- Personal injury!
- Camera malfunctions and damage.



Warning of hazardous electrical voltage

This symbol indicates especially important information. Failure to comply can cause the following:

- Personal injury!
- Camera malfunctions and damage.

Camera malfunctions and damage



This symbol warns against touching hot surfaces, such as light bulbs.

Important information



This symbol indicates additional information or explanations that are intended to provide clarity.

Safety Instructions

Description

- The individual modules fulfill the high requirements for observation and documentation of the Flexacam C3 camera.

Intended use

- Refer to "Safety Concept" booklet

Non-intended use

- Refer to "Safety Concept" booklet

Never use the Flexacam C3 or its components for diagnostic procedures if it is not expressly intended for such use.

The camera and accessories described in this user manual have been tested for safety and potential hazards.

The responsible Leica affiliate must be consulted whenever the camera is altered, modified or used in conjunction with non-Leica components that are outside of the scope of this user manual!

Unauthorized alterations to the camera or noncompliant use shall void all rights to any warranty claims.

Place of use

- Refer to "Safety Concept" booklet
- Electrical components must be placed at least 10 cm away from the wall and from flammable substances.
- Avoid large temperature fluctuations, direct sunlight and vibrations. These conditions can distort the functionality of the camera.

- In warm and damp climates, the individual components require special care in order to prevent the build-up of fungus.

Responsibilities of person in charge of camera

- Refer to "Safety Concept" booklet

Ensure that:

- The Flexacam C3 and accessories are operated, maintained and repaired by authorized and trained personnel only.
- All operators have read, understood and observe this user manual, and particularly the safety regulations.

Safety Instructions (Continued)

Repairs, service work

- Refer to "Safety Concept" booklet
- Only original Leica Microsystems spare parts may be used.
- Before opening the camera, switch off the power and unplug the power cable.
- Avoid contact with powered electrical circuits, which can lead to injury.

Transport

- Before shipping the camera, please reset the camera to the factory default, so that no personal data like access details to E-Mail or network remain stored on the camera.
- Use the original packaging for shipping or transporting the individual modules of the Flexacam C3 and the accessory components.

- In order to prevent damage from vibrations, disassemble all moving parts that (according to the user manual) can be assembled and disassembled by the customer and pack them separately.

Integration in third-party products

- Refer to "Safety Concept" booklet

Disposal

- Refer to "Safety Concept" booklet

Legal regulations

- Refer to "Safety Concept" booklet

EC Declaration of Conformity

- Refer to "Safety Concept" booklet

Health risks

Workplaces with microscopes and cameras facilitate and improve the viewing task, but they also impose high demands on the eyes and muscles of the user. Depending on the duration of uninterrupted work, asthenopia and musculoskeletal problems may occur. For this reason, appropriate measures for reduction of the workload must be taken:

- Optimal arrangement of workplace, work assignments and work flow (changing tasks frequently).
- Thorough training of the personnel, giving consideration to ergonomic and organizational aspects.

The ergonomic optical design and construction of microscopes and cameras from Leica are intended to reduce the exertion of the user to a minimum.

Safety Instructions (Continued)

Camera safety and EMC

Our camera has been designed, produced and tested in compliance with

- EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements (for microscope)
- EN 62368-1: Audio/video, information and communication technology equipment - Part 1: Safety requirements (for optional external power supply only)
- Radio interference suppression in compliance with EN 55011 Class A
- EN 61326-1, Electrical equipment for measurement, control and laboratory use – EMC requirements

The camera meets the requirements of EU directives

- 2014/35/EU Low voltage directive
- 2014/30/EU EMC directive
- 2011/65/EU RoHS directive
- 2009/125/EC + VO EU 2019/1782
Ecodesign requirements for energy-related products

and carries the CE mark.



The camera must be disposed of in accordance with 2012/19/EU WEEE directive.

Intended for indoor use only in all EU member states, EFTA states and Switzerland.

EMC precautions

Prior to the installation of Flexacam C3, the electromagnetic environment needs to be evaluated. It is the responsibility of the operator to ensure compliance with the environment.

If the instrument is being installed in any other environment than an INDUSTRIAL, it cannot be guaranteed that the equipment does not interfere with other electronic devices.

INDUSTRIAL environments are part of a separate power network, in most cases supplied by a high- or medium-voltage transformer, dedicated for the supply of installations feeding manufacturing or similar plants.



If Flexacam C3 is being installed in any other environment than an INDUSTRIAL, it cannot be guaranteed that the radiated electromagnetic emissions are not interfering with other electronic devices.

End User License Agreement (EULA)

This End User License Agreement is entered into by and between Leica Microsystems ("Leica") and you, the end user, as the context requires, either individually or as an authorized representative of the company or organization acquiring and/ or using this camera ("User").

This camera can be used in a network and offers functionality such as automated submission of images to an E-Mail recipient defined by the User, or copying of images to a SMB file server selected by the User. Therefore, passwords will need to be chosen by the User which passwords will be stored on the camera in a separate password file. Direct access to the password file is denied; passwords are stored with an encryption which follows the Advanced Encryption Standard (AES), with a block and key size of 128 bits.

During any firmware update this password file will be deleted and the User will need to reenter the passwords.

When sending or forwarding the camera to third parties for any reason, or when returning the camera to Leica for service or maintenance, the User should always reset the camera to factory settings.

Use of network and/ or other connectivity functionality provided by or with this camera are at the User's discretion and risk; specifically, the User assumes full responsibility for network operation and safety. Leica does not guarantee any particular network safety standard and declines all responsibility, without limitation, for unauthorized access, security breach, data loss or corruption, or any financial or legal consequences thereof.

Introduction

Your Flexacam C3

We congratulate you on purchasing the Flexacam C3 camera from Leica Microsystems.

Real 4K display

The integrated HDMI output allows the camera image to be displayed on a high-definition (HD-capable) monitor, where the following resolutions are possible:

- 3,840 × 2,160 (4K UHD). To be used on 4K monitors.
- 1,920 × 1,080 (Full-HD). This resolution provides the characteristic imaging performance for a Full-HD-capable monitor.

On-Screen Display (OSD)

Your camera comes with a dedicated operating system (On-Screen Display menu, OSD menu) to provide stand-alone functionality. The user interaction is enabled via an on-screen display which superimposes a graphical user interface on the microscope image.

For information on the On-Screen Display (OSD) in stand-alone mode, refer to the On-Screen-Display User Manual.

Leica Application Software X (LAS X)

Your Flexacam C3 includes a quickstart guide with a download link to the latest "Leica Application Software X" software.

User-friendly even in the smallest detail

Like every digital camera, the Flexacam C3 reacts differently to different light sources. The white balance is set to match LED illumination from Leica at the factory.

In general, utilization of LED illumination from Leica is recommended.

Standard Delivery and Optional Accessories

Standard delivery

Standard delivery of the Flexacam C3 includes:

1. *Flexacam C3 camera*
2. *USB C / USB A cable, for connecting to a computer or to a power supply unit*



Optional "stand-alone kit"

3. *4K HDMI cable, for connecting to an HD / 4K monitor*
4. *USB power supply*
5. *USB thumb drive as storage device*
6. *Wireless USB mouse*



 Additional information about working on the computer and with Leica Application Software X is provided in the software's online help.

 The stand-alone kit is mandatory for using the OSD as the power supply is needed.

Optional Accessories

Handswitch/footswitch

Various functions can be assigned to the optional handswitch/footswitch (such as taking individual pictures, white balance, video recording).

For information on additional accessories, such as objectives and adapters, illumination or the dust cover for the camera, please contact your Leica Microsystems authorized dealer.



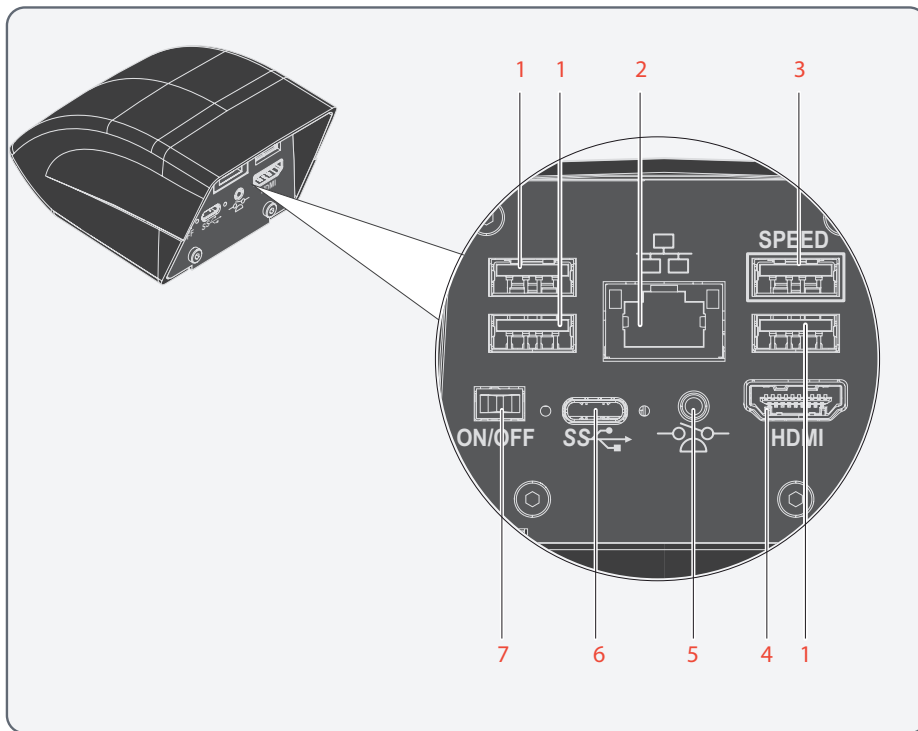
You can find detailed descriptions of different accessories in their corresponding user manual.

Wi-Fi dongle

The Wi-Fi dongle enables you to work under wireless condition with the Flexacam C3. Due to different country restrictions, there are different versions of Wi-Fi dongles available.

To get the latest information about the availability of Wi-Fi dongles in your specific country, please contact your local sales representative.

Overview of the Camera



1. 3x USB port for mouse, keyboard or Wi-Fi dongle (USB Type-A)
2. Ethernet connection
3. USB SPEED port (for stand-alone operation, insert USB thumb drive for data storage here)
4. Monitor port (stand-alone mode)
5. Connection for handswitch / footswitch (2.5 mm phone jack)
6. PC / power supply connection (USB Type-C)
7. ON/OFF switch

Assembly

Assembling the Camera

 The Flexacam C3 is mounted on a tube or on a microscope's photo port using a C-mount adapter.

 The Flexacam C3 is compatible with most stereo, macro and light microscopes from Leica Microsystems.

Assembly

1. Screw the camera onto a C-mount adapter.



2. Place the camera on the microscope's photo port or the tube using the previously mounted C-mount adapter.

Installation

Stand-Alone Mode: Cables and Terminals

General notes



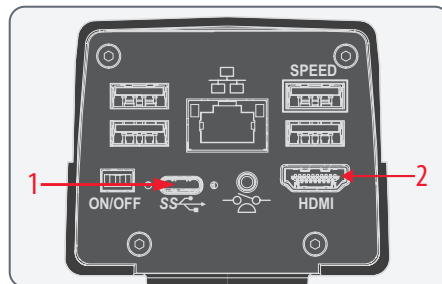
The Flexacam C3 is designed for the use of 4K and HD-capable (high definition) monitors. We recommend connecting the HD/4K monitor using an HDMI connector and not using any adapters (e.g. DVI), as otherwise proper function can no longer be guaranteed!



Please use only the provided 5 V power supply unit from the stand-alone kit. Using another adapter with incorrect voltage can substantially damage the camera.

The color of the LED indicates that the power supply is not sufficient: it's red when the supply doesn't provide enough current and it automatically turns off the 3 USB ports.

Power supply and HD / 4K monitor

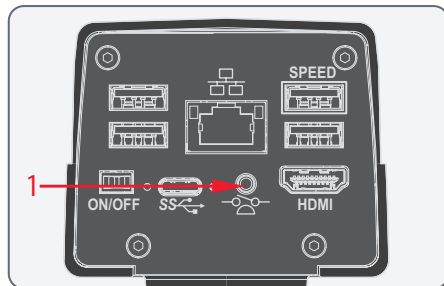


1. Connect the Flexacam C3 to a suitable power socket using the supplied power supply.
2. Connect the Flexacam C3 to the HD/4K monitor using the HDMI cable.

The camera detects the monitor automatically and displays a live image.

Stand-Alone Mode: Installing Optional External Devices

Installing the handswitch / footswitch



1. Plug the handswitch / footswitch in the designated connection port at the rear side of the Flexacam C3 (2.5 mm phone jack).



The optional handswitch / footswitch can be configured in the OSD menu. For information on configuration, refer to the On-Screen-Display User Manual.

Installing the USB thumb drive



Make sure to read the following instructions about formatting and handling the USB thumb drive provided in order to prevent malfunctions during image acquisition.

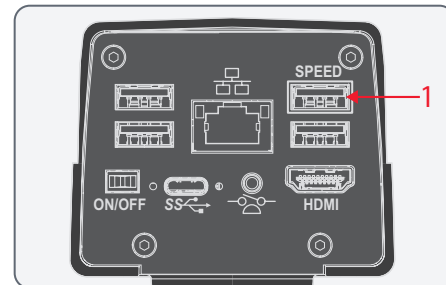
File system and formatting:

exFAT or FAT32 file system is required for the thumb drive to work correctly, as it is detected by the Flexacam C3. Most USB thumb drives are factory-formatted with FAT32 so that they can be used immediately.

If the USB thumb drive is formatted differently, the Flexacam C3 provides the ability to reformat as exFAT. You have to press "USB Eject" button but do not remove the stick and then go to the settings page to format. During this process all data on the stick are erased.



Make sure that the USB thumb drive is oriented correctly before inserting it into the Flexacam C3. If you accidentally insert the USB thumb drive the wrong way around, this could damage the camera.



1. To ensure the quickest possible way to store data, insert the USB thumb drive with sufficient free memory in the USB SPEED port at the rear side of the Flexacam C3. Use a fast USB thumb drive to ensure a quick operation.



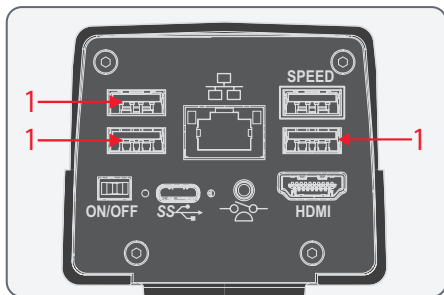
The optional USB thumb drive can be configured in the OSD menu. For information on configuration, refer to the On-Screen-Display User Manual.

Stand-Alone Mode: Installing Optional External Devices (Continued)

Installing the wireless USB mouse



We recommend using the Leica approved wireless USB mouse which is offered as an optional accessory. The wireless USB mouse is part of the "stand-alone kit".



1. Plug in the USB transmitter of the USB mouse in an unused USB port on the rear side of the Flexacam C3.

Please do not use the USB SPEED port as this is required for the USB thumb drive.

2. Switch on the wireless USB mouse.

The connection between the wireless transmitter and the camera will be arranged automatically. It is not necessary to "pair" the devices with each other.



The optional wireless USB mouse can be configured in the OSD menu. For information on configuration, refer to the On-Screen-Display User Manual.

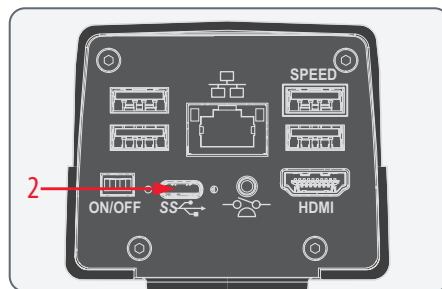
PC Mode: Connecting a Computer, Installing Software

Installation and connection



For instructions on installing and using the software for PC mode, refer to the "Quick Installation Guide".

1. After downloading the software, follow the instructions for installing the software. (The computer also has to have sufficient free hard drive space).



2. Connect the Flexacam C3 to a USB 3 port of the computer using the USB C / USB A cable.

The Flexacam C3 is powered by the computer via the USB C / USB A cable.

Network & WLAN Settings

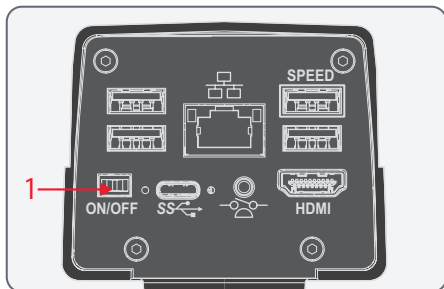


For information on adapting network and WLAN settings, refer to the On-Screen-Display User Manual.

Startup Procedure

Switching on the Flexacam C3

Stand-alone mode



Ensure that the camera can receive light from the microscope and is connected to a HD / 4K monitor and the power supply provided in the stand-alone kit.

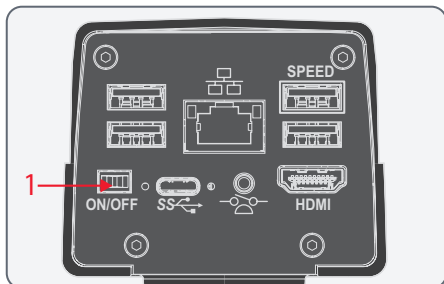
1. Set the ON/OFF switch to "ON" to switch on the Flexacam C3.

During the boot sequence the status LED is blinking green and switches to a continuously green the moment it is ready to use. Now the live image and the OSD are available throughout the connected HDMI monitor.

The camera automatically detects the HD / 4K monitor.

Switching on the Flexacam C3 (Continued)

PC mode



1. Set the ON/OFF switch to "ON" to switch on the Flexacam C3.

The status light's LED switches from blinking green to continuously green, a signal tone sounds and the live image is displayed on the computer.

The Flexacam C3 is ready to use.

2. Start Leica Application Software X (LAS X).
3. Follow the instructions in the software for adjusting and acquiring an image.



For additional information on Leica Application Software X, please refer to "LAS X Help".



You may be asked to specify the current camera configuration when starting LAS X for the first time.

Instead, run the LAS X Hardware Configurator to select the Flexacam C3

Operation (Stand-Alone Mode)

Operation in Stand-Alone Mode



For information on setting up and switching on the Flexacam C3 in stand-mode, refer to chapters:

- "Stand-Alone Mode: Cables and Terminals", page 19
- "Switching on the Flexacam C3", page 25, subchapter "Stand-alone mode", page 25



For information on working with the OSD menu, refer to the On-Screen-Display User Manual.

Operation (PC Mode)

Operation in PC Mode



For information on setting up and switching on the Flexacam C3 in PC mode, refer to chapters:

- "PC Mode: Connecting a Computer, Installing Software", page 22
- "Switching on the Flexacam C3", page 25, subchapter "PC mode", page 26

Additional parallel use of an HD / 4K monitor

General notes



When connected to a PC, the microscope image is always shown in the preview window of Leica Application Software X. To display a 4K live image at up to 60 fps in LAS-X / PC mode, please connect an optional 4K and HD-capable monitor to the HDMI port of the camera.

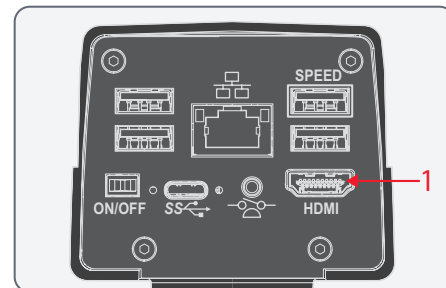


The resolution on the connected HD / 4K monitor is always a 16:9 format and independent of the PC resolution.



Additionally the on-screen display (OSD) functionality is turned off on the HDMI monitor.

Connecting the HD / 4K monitor



1. Connect the Flexacam C3 to the HD / 4K monitor using the HDMI cable.

Troubleshooting

Troubleshooting

Stand-alone operation

If the camera is configured for 4K resolution and attached to a Full-HD monitor with only 1,080 p resolution, the camera should detect this and switch automatically to the necessary resolution.

However, if no image appears and the screen reports an error message like "out of range" or something similar, you can reset the camera resolution to 1,080 p.

How to reset the camera?

1. Power the camera off.
2. Unplug the USB mouse.
3. Restart the camera.
The camera will restart in Full-HD 1,080 p mode and a live image will appear.
4. Plug in the USB mouse again and configure the correct live image resolution.

Recovery Mode

At every startup the camera checks whether the application image is valid. In case the image is corrupted, e.g. by an interrupted firmware update, the camera switches into a recovery mode:



RECOVERY MODE

Starting up fallback system ...

After 12 seconds the system asks for the firmware file which should be stored on the USB flash drive.



RECOVERY MODE

Please insert an USB flash drive with the latest firmware.
Download from www.leica-microsystems.com

The latest firmware can be downloaded from www.leica-microsystems.com. Please make sure the USB stick is inserted in the speed port so the system will automatically install the provided firmware.

Care and Maintenance

Care, Maintenance, Contact Persons

General

We hope you enjoy using your high-performance camera. Leica cameras are renowned for their robustness and long service life. Observing the following care and cleaning tips will ensure that even after years and decades, your Leica camera will continue to work as well as it did on the very first day.

Warranty benefits

The guarantee covers all faults in materials and manufacture. It does not, however, cover damage resulting from careless or improper handling.

Contact address

If your camera no longer works perfectly, contact your Leica representative. You can find information on worldwide Leica representatives on the Leica website: www.leica-microsystems.com.

Care

- Keeping all optical components clean is important for maintaining good optical performance.
- If any optical surface becomes badly coated with dust or dirt brush it off with a camel hair brush before attempting to wipe it clean.
- Optical surfaces should be cleaned using a lint-free cloth, lens cloth or cotton swab soaked in 70% ethanol or a commercially available glass cleaner. Do not use pure alcohol.
- Avoid excessive use of solvents. The lint-free cloth, lens cloth or cotton swab should only be lightly moistened with solvent.
- Protect your camera from moisture, fumes and acids and from alkaline, caustic and corrosive materials and keep chemicals away from the camera and its accessories.

- Plugs, optical systems and mechanical parts must not be disassembled or replaced, unless doing so is specifically permitted and described in this user manual.
- Protect your camera from oil and grease.
- Do not grease guide surfaces or mechanical parts.

Protection from dirt

Dust and dirt will affect the quality of your results.

- Put an optionally available dust cover over the camera when it will not be used for a long time.
- Keep accessories in a dust-free place when not in use.

Care, Maintenance, Contact Persons (Continued)

Cleaning polymer components

Some components are made of polymer or are polymer-coated. The use of unsuitable cleaning agents and techniques can damage polymers.

Permitted measures

- Remove dust on the filter glass with a bellows and a soft paintbrush.
- Clean the objectives with special optics cleaning cloths and pure alcohol.

Servicing

- Repairs may only be carried out by Leica Microsystems-trained service technicians. Only original Leica Microsystems spare parts may be used.

Danger of electric shock



Risk of electric shock. Removing the cover of the Flexacam C3 exposes electrically live parts, which, if touched, can cause potentially fatal injuries. Have technical service carried out by a Leica Microsystems authorized dealer.

Spare Parts

Item	Leica article number	Designation
1	10 726 529	HDMI cable (2 m)
2	19 002 015	C-Mount Cap
3	10 726 837	USB C / USB A cable
4	10 726 490	Power supply with USB C connector
5	10 726 491	Wireless USB mouse
6	10 747 551	USB stick 64 GB

Optional Sales Item

Item	Leica article number	Designation
1	12 730 229	Palm/footswitch
1	12 730 534	Flexacam C3 Standalone Kit

Disposal

Disposal

After the end of the product's life, please contact Leica Service or Leica Sales on how to dispose of it.

Like all electronic devices, the camera, its components and accessories may not be disposed of as general household waste!



Please observe the national laws and ordinances which, for example, implement and ensure compliance with EU directive WEEE 2012/19/EU.

Specifications

Technical Data

Digital camera

Characteristics	Value
Weight	0.37 kg (camera only)
Live image on an HDMI monitor	at up to 60 fps (3,840 × 2,160 pixels)
Full-screen image capture	at 12 MP
Sensor diagonale	7.81 mm (type 1/2.3" CMOS)
Pixel size	1.55 µm × 1.55 µm
Input	5 V DC / 3 A
Power consumption	15 W
Supported software	LAS X
File formats	JPG, TIF, MJPG, BMP; for overlays also PNG

Mechanical and optical interfaces

Characteristics	Value
Mechanical	C-mount thread
Color filter	IR-cut coating 650 nm, not replaceable

Electronic interfaces

Characteristics	Value
Compatibility	USB 3.0, standard USB type C, lockable
High-definition connector	HDMI 2.0a, HDMI plug type A
USB connectors	4x USB 2 connectors, type B
On / Off switch	1x (on rear side of the camera)
2.5 mm Jack connector	1x (for handswitch / footswitch)
Multicolor status LED	1x

Ambient conditions

Characteristics	Value
Operating temperature	10 °C to 40 °C (50 °F to 104 °F)
Relative humidity for storage/operation	10 % – 90 % (non condensing)
Pollution degree	2
Use	For indoor use only
Installation category	II (overvoltage category)
Altitude operation	0 m to 2,000 m (0 ft to 6,561 ft)

Technical Data (Continued)

Multicolor status LED

Mode	Color	Description
Boot mode	red	The camera is switched on.
	green, blinking (application)	The camera is booting.
	blue, blinking (fallback)	The camera is booting.
Stand-alone mode	green, continuously	The application is started.
	red, continuously	Power supply is insufficient. The USB ports are switched off. ► Connect the correct power supply to the power supply connection (USB Type-C).
	orange, flashing shortly	An image is captured.
	orange, blinking	A video is recorded.

Mode	Color	Description
PC mode	green, continuously	In PC mode, the status LED is always green, regardless of the camera status.
	orange, continuously	Only USB 2.0 connection. Operation is not possible.

Miscellaneous

Characteristics	Value
Power supply	Power supplied via USB from computer (PC mode / LAS-X mode) or by external power supply (stand-alone mode)
Min. computer configuration	Please consult the software used

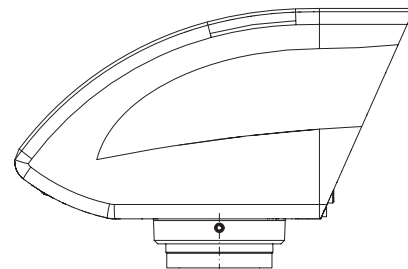
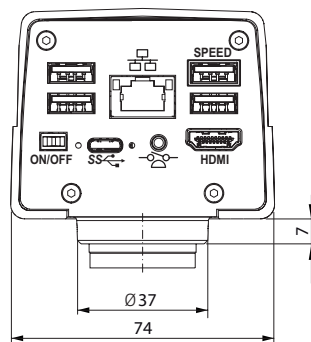
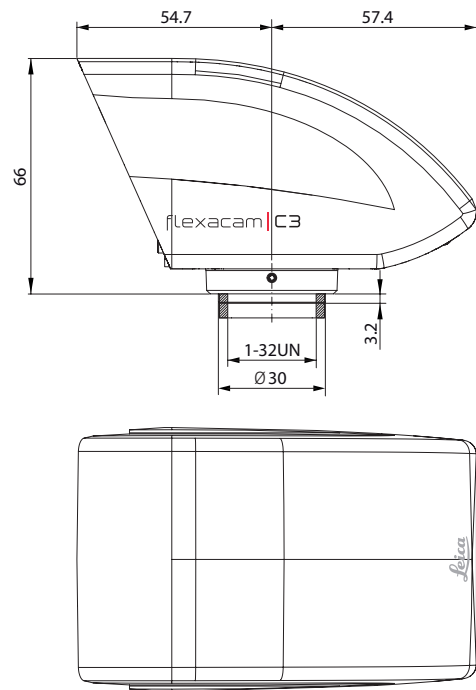
Technical Data (Continued)

Power supply (optional)

Characteristics	Value
Manufacturer	Sinpro Electronics Co., Ltd., 18F, NO.80, Minzu 1st Rd., Sanmin District, Kaohsiung City 807, Taiwan
Model identification	SPU25A-102
Input voltage	90–264 V AC
Input frequency	47–63 Hz
Output voltage	5 V DC
Output current	max. 3.3 A
Output power	max. 16.5 W
Average active efficiency	82.5 %
Efficiency at high load (10 %)	79.5 %
No-load power consumption	0.014 W

Dimensional Drawings

Dimensions in mm





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