

C-RED 3

Quick Start Manual

C-RED 3 Quick Start_20191030









Thank you for choosing C-RED 3!

C-RED 3 features and performances are described in detail within the User Manual, that you can find on your USB key or on our website: www.first-light-imaging.com/user-manuals/

Please contact our support for any question at: support@first-light.fr







1. WARNINGS

-  *Your C-RED 3 camera contains fragile components, handle it with care.*
-  *Do not open the camera, your warranty will be void.*
-  *Always use the supplied power unit.*
-  *Always follow the instructions of use.*

2. SYMBOLS AND INDICATIONS

Please read this Quick Start guide and the following definitions carefully to understand the potential dangers and the precautions to take.

Please refer to the User Manual if a WARNING symbol is marked on the camera.

-  The CE marking indicates the conformity of the camera to the European legislation
-  This pictogram indicates a direct current operation
-  This pictogram invites the user to refer to the instructions / user manual
-  This pictogram refers to indoor use
-  This pictogram refers to Protection class category 1
-  This pictogram indicates that the product is compliant with the RoHS limitation

3. DISPOSAL



In case of disposal, do not throw your camera in waste disposal and send it back to First Light Imaging

4. WARNINGS

4.1. General warnings

The equipment must be plugged on an electrical wiring compliant with the relevant standards in the country (in France: NF C 15-100). This wiring must be protected from overcurrent, overvoltage and ground defaults.

Connected equipments must be compliant with the EN 60950-1 Ed.2006 standard, or to their own standards.

The power cable plug serves as a disconnection device and should be easily accessible.

Do not place the equipment close to a heating source or a humidity source.

The security of the system which integrates the equipment is the responsibility of the system assembler only.

For your safety, the equipment must be **TURNED OFF AND UNPLUGGED** before any technical intervention.

The security provided with this equipment is only guaranteed with a use in accordance with the specified purpose. Only use the provided (MEAN WELL USA Inc, model GST18A12-P1J) power supply.



5. TECHNICAL SPECIFICATIONS AND OPERATIONAL ENVIRONMENT










| | | |
|----------------------|---------------------|-------------------------------|
| Power supply | Voltage | 85 – 264 VAC |
| | Frequency | 47 – 63 Hz |
| | AC Current | 0.5A / 115VAC – 0.3A / 230VAC |
| Camera's dimensions | Length | 60 mm |
| | Width | 55 mm |
| | Height | 55 mm |
| Operation conditions | Maximum temperature | 35°C |
| | Minimum temperature | -40°C |
| | Humidity | 95% |
| Storage conditions | Maximum temperature | 60°C |
| | Minimum temperature | -40°C |

6. CONTENTS OF PACKAGE*





6.1. C-RED 3 Camera Pack

| Item name | Quantity | Picture |
|--|----------|---|
| Camera | 1 |  |
| Power supply | 1 |  |
| Power supply cable (IEC or NEMA) | 1 |  |
| USB3 cable (if USB version) | 1 |  |
| C-Mount adapter | 1 |  |
| USB key with User manual + Demo software + Test report | 1 |  |
| Quick start Manual | 1 |  |

6.2. Accessories

Please note that accessories can be ordered separately. Please contact your sales representative for details and pricing of our different accessory packs.

| Item name | Quantity | Picture |
|--|----------|---|
| LEMO male connectors for synchronization | 1 |  |
| Cooling adapter | 1 |  |

* Items may differ from pictures.

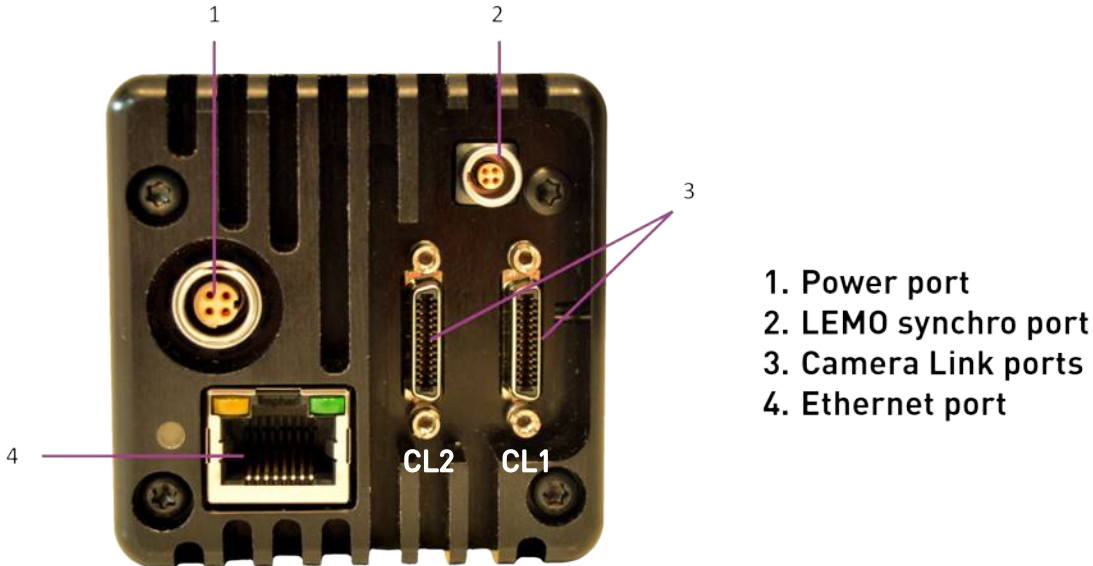


7. CAMERA DESCRIPTION AND START UP



Please refer to the following figure and follow the order listed below, before connecting your camera:

7.1. Camera Link version:



7.2. Camera Link® connection

The camera is compatible with Camera Link® Full configuration and requires two data cables with male SDR-26 Mini Camera Link® connectors.

The Camera Link® plugs are numbered: CL1 is on right, CL2 is on left.

The Camera Link® connectors can be plugged and fastened in any order but reversing the order will prevent camera operation. The Camera Link® connections can be plugged or unplugged either if the camera is ON or OFF.

Please install the demo software for the acquisition board which is provided on the USB key.

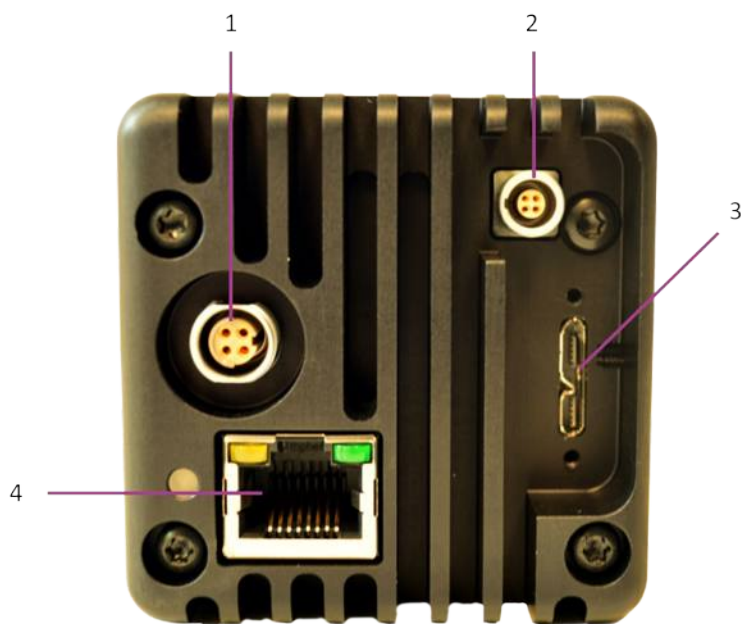
Please note that our cameras have been developed and tested with specific grabbers that we highly recommend using. Please refer to the demo software manual.

List of tested recommended grabbers:

- MATROX Radiant eV-cl full (Windows® and Ubuntu® 16.04 x64 LTS)
- Teledyne DALSA X64 Xcelera-CL (Windows® only)
- EDT visionLink F4 (drivers available for linux and windows) (NEW)



7.3. USB Version



1. Power port
2. LEMO synchro port
3. USB3 port
4. Ethernet port

7.4. USB connection

The camera only supports USB3 connection. The USB3 interface requires a standard USB 3.0 Type micro B connector.

⚠ Latest Windows® 10 x64 release is highly recommended for USB acquisition on Windows®.

Also, before using USB3 connection, the C-RED 3 drivers must be installed on the PC. Please refer to the demo software manual.

⚠ We recommend using Ubuntu® 16.04 LTS for USB acquisition on Linux.



8. POWER SUPPLY CONNECTION



Please plug firstly the provided power supply Fischer Connectors cable to the back of the camera (1), then connect it to the line plug.

8.1. Synchro connection (2) and Ethernet connection (4)

Please refer to the User Manual.



9. POWERING UP/DOWN



9.1. Power ON:

When the power supply Fischer Connectors cable is connected to the camera, and the power supply to the line plug, the camera is ON.

9.2. Power OFF:

Please use the CLI command “shutdown” from a simple terminal before turning off the camera. First unplug the power supply from the line plug, then unplug the Fischer Connectors cable from the camera.

10. CAMERA CONTROL

10.1. Demo GUI software

The Graphical User Interface (GUI) demo software is provided in the USB key supplied with C-RED 3, or available on demand at support@first-light.fr.

10.2. Camera status

Once the camera is properly powered up the system boots and C-RED 3 is ready to operate.

A purple diode signal, visible on the back of the camera, confirms the operability.



| Camera status | Camera's led color | Description |
|------------------|------------------------|---|
| Starting | Blue ● | Camera starting |
| Configuring | Blue ● | Camera configuration is applied |
| Operational | Purple ● | Camera is operational |
| Safe | Red double blink ●● | The camera detects an error. The detector is turned off. To be able to reuse the camera, you must restart it. |
| Prevsafe | Yellow ● | |
| Locked | Red ● | The camera detects a critical error. The camera is unusable, please contact First Light Imaging for support. |
| Safe (rescue FW) | Orange double blink ●● | The camera detects a critical error. The camera is unusable, please contact First Light Imaging for support. |

Note: turned off led does not necessary mean that there is an issue with the camera. Indeed, the camera can be configured to switch off the led automatically once boot is completed.



11. OPERATION



By default, the camera operates in CDS mode.
The camera can operate in full frame or in cropping mode.

11.1. Integration/readout function

The acquisition speed can be set to any value from 0.0001 to 600 fps.
The integration time can also be set. The integration time range is $[50\mu\text{s} - \sim 1/\text{fps}]$ *

*For integration time below $50\mu\text{s}$, please contact First Light Imaging at support@first-light.fr

11.2. Conversion gain

Signal can be integrated in low, medium or high gain corresponding to high, medium and small integration capacity, respectively. The modification of the integration capacity impacts the dynamic of the signal and thus implies a change of the noise level.

11.3. Bias/Flat Correction

Bias/Flat correction can be done on the fly by the camera.
Flat and Bias correction files can be computed automatically by the camera
Alternatively, custom correction files can be uploaded to the camera using serial connection (either USB or CL).

To apply the image corrections: First, build the bias file and apply it, then, build the flat file and apply it.

Please refer to the software demo user manual for further details.

11.4. Bad pixel Correction

Bad pixel correction can be done on the fly by the camera.

When enabled, bad pixel correction is the first correction applied on pixel values received from the sensor.

The bad pixel is replaced by one of the adjacent pixels.



12. PRECAUTIONS



C-RED 3 is a high-end scientific instrument and should not be exposed to shocks, extreme temperatures, humidity, dusty environment, and static shocks.

Any electronic equipment that has to be connected to C-RED 3 should be fitted with appropriate protection on all power lines.

Any connected equipment should be powered off before removing any connection between the computer and C-RED 3.

13. MAINTENANCE

13.1. Cleaning of window

Never use an unclean cloth to wipe the window of the camera.

The window should be cleaned with a dry and soft cloth.

You can also use a clean cloth dampened with ethanol and gently wipe the window.

Please avoid touching the window.

13.2. Storage

When not in use, please store your camera in a dry place, in its box.



14. CONTACTS



14.1. For the USA:

FIRST LIGHT IMAGING Corp.
185 Alewife Brook Parkway, Ste 210
Cambridge, MA 02138
USA

Phone: + 33 4 42 61 29 20
E-mail: support@first-light.fr
Website: www.first-light.us

14.2. For the rest of the world:

FIRST LIGHT IMAGING SAS
Europarc Sainte Victoire, Bât. 6
Route de Valbrillant, Le Canet
13590 Meyreuil
France

Tel.: + 33 4 42 61 29 20
E-mail: support@first-light.fr
Website: www.first-light-imaging.com







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