

CMOS Compact Fluorescence Imager

Product overview

The Anitoa CFI x24 ($x = 1, 2, 3, 4$) is a family of compact multi-spectral fluorescence imagers for molecular sensing and imaging. CFIx24 is equipped with Anitoa's ultra-low-light CMOS image sensors. Its low cost, small form factor, ruggedness make it optimally suited for use in a portable device in medical, life science and industrial applications. An example of such application is a field portable nucleic-acid-test (NAT) system for molecular diagnostics, food or environment safety assurance.

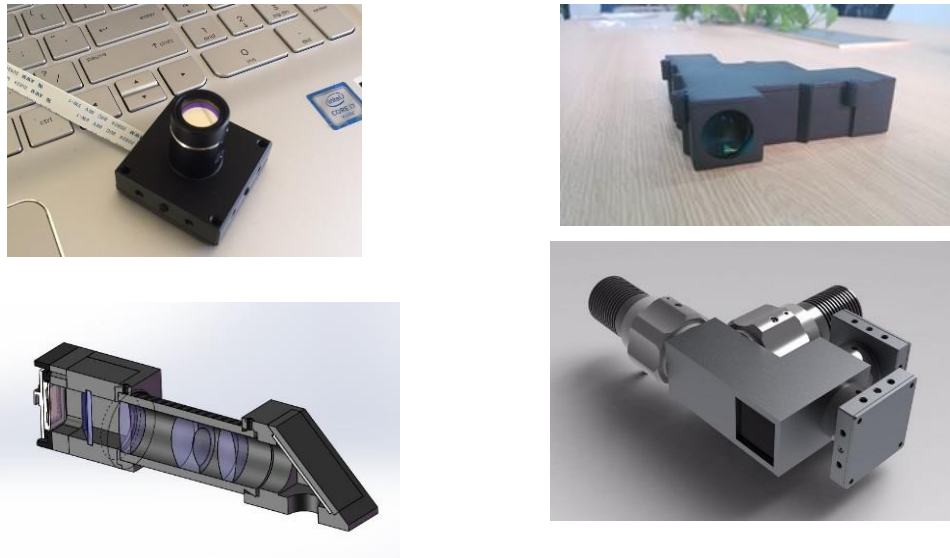


Figure 1. Compact multi-wavelengths fluorescence imager. Left top: 1-channel system with filter installed; left bottom: 2 channel system optimized for small field of view sensing in microfluidics applications; Right top: 3 channel System; Right bottom: Con-focal 2 channel imager with integrated 2 channel UV excitation LED for tissue imaging.

The CFI x24 compact multi-spectral fluorescence imager is offered in 1, 2, 3, or 4 channel configurations. CFI x24 has an USB interface (USB HID or USB 2.0). A Windows-based image capture software, ULVision from Anitoa, is provided to acquire and analyze fluorescence images. A software development kit (SDK) is also available for users who wish to develop custom image acquisition and analysis software.

Features of CFI x24

- Compact and rugged. No internal moving parts.
- Equipped with ultra-low-light sensitive CMOS image sensor.
- Multi-wavelength channels sensing capability.
- USB HID interface. No driver needed (USB HID option).
- Low power. USB provided 5V power. <200mW active power (3 channel system w/o LED).
- Wide operating temperature range -25 °C – 55 °C.
- Imaging software and SDK provided.
- Video mode support (up to 38 FPS)
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Sample configuration of CFI x24 (x = 3)

Size and weight (3 channel)	100mm (L) x 85mm (W) x 30mm (H). 150g
Imager resolution	24x24 pixels
Object dimension	24mm x 24mm
Focal distance	75mm
Integration time	1 ms - 100 seconds, software controlled
ADC resolution	12-bit
Signal Interface	USB HID (plug and play) or USB 2.0 (Video mode support)
Video Mode	Up to 38 fps in 12X12 mode; up to 12 fps in 24X24 mode
Detection threshold	~3.0 x 10 ⁻⁶ lux at the surface of the image sensor
Dynamic range	>85dB
SnR	Minimum 13dB at detection threshold
Supply	5.0V (through USB 2.0 interface)
Power consumption	< 200mW
Operating temperature	-25 – 65 °C
Temperature sensor spec	±0.1 °C accuracy
Wave length channel 1*	@525nm, 50nm bandwidth. (Fluorophors supported: FAM, Alexa Fluor 488, SYBR Green 1, etc.)
Wave length channel 2*	@560nm, 20nm bandwidth. (Fluorophors supported: JOE, HEX, TET, Alexa Fluor 514, etc.)
Wave length channel 3**	@630nm, 20nm bandwidth. (Fluorophors: ROX, Texas Red, CY 3.4, etc.)

*: Wavelength characteristics can be modified by changing filters.

** : We support 1 – 4 channels in different configurations.

ULVision Software

CFIx24 is offered with integrated ULVision software for multi-spectral fluorescence image capture and analysis. ULVision communicate with the CFI x24 in a complete plug and play fashion. ULVision allows the user to apply fine control of image capture in different operating modes, adjust resolution, sensitivity, exposure time, performing temperature compensated dark subtraction as a means of eliminating background noise.

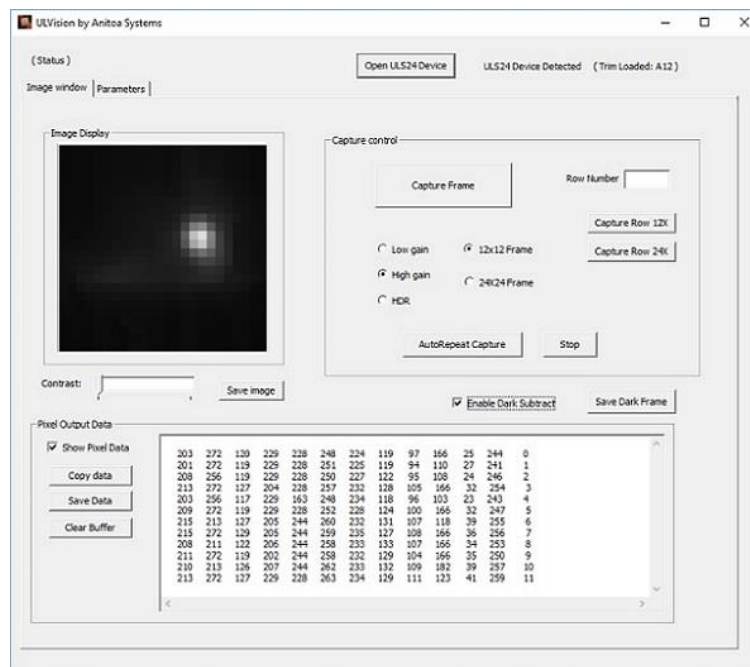


Figure 2 The Anitoo ULVision software

LED-based light source option

Matching excitation LED-based light sources and filters are also available from Anitoo. The LED light sources are provided with collimating lenses and excitation filters. LED light sources can be provided separately, or integrated with the imaging module in a con-focal configuration. LED light source power and timing control is supported seamlessly by the ULVision software.

Applications

Biomedical and life science

Molecular sensing/imaging based fluorescence signaling principles.

- DNA quantification or DNA microarray read out
- qPCR system, microfluidic qPCR and Digital PCR
- Microfluidic or Lateral flow immunoassay (ELISA)
- DNA sequencing
- Capillary electrophoresis
- Circulating Tumor Cell imaging.
- Tissue auto-fluorescence imaging for metabolic monitoring
- Fluorescence In-situ Hybridization (FISH)
- Read out of quantum-dot-tagged molecules or cells.

For more information about applications, please see application notes from AnitOA web site (<http://www.anitOA.com/technology.html>)

Application data showcase

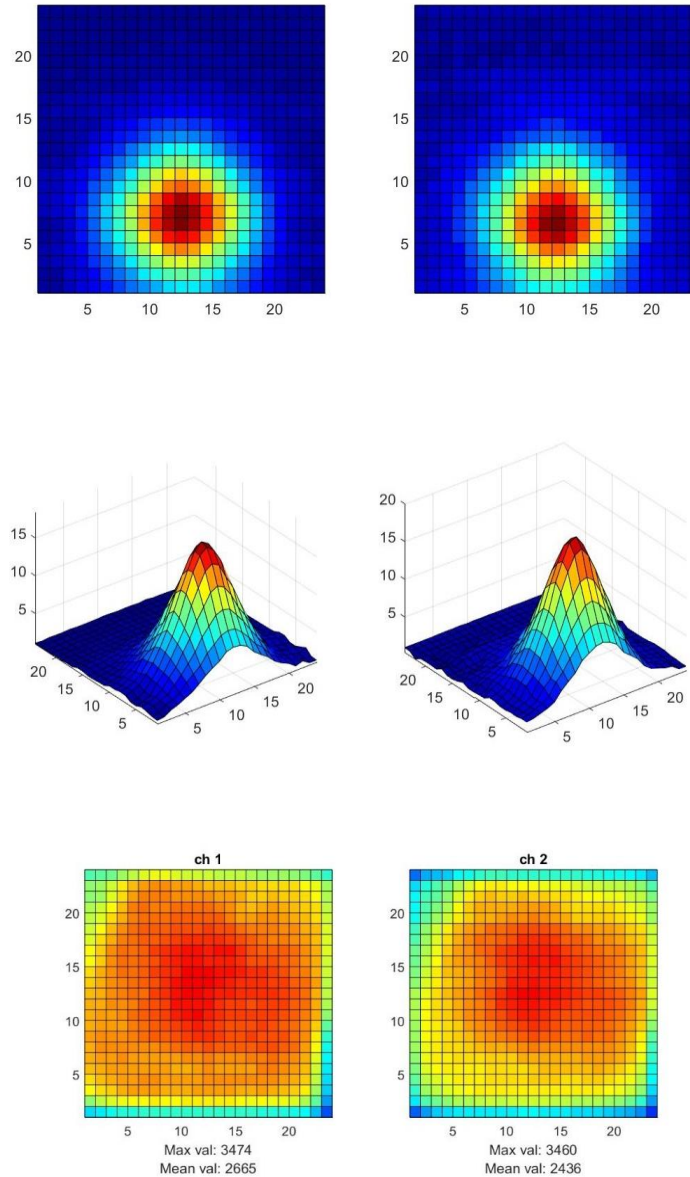


Figure 3. Auto-fluorescence emission from tissue sample. Top and middle: 2D and 3D histograms of collimated UV LED output measurement. Bottom, auto-fluorescence emission from tissue sample.



CFI x24 Preliminary Product Spec

Inquiry contact

CFI x24 is offered in a semicustom fashion. For quote and delivery time estimate, please contact us at address below. Anitoo will supply a questionnaire to gather customer requirement information before providing a quote and lead time estimate.

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