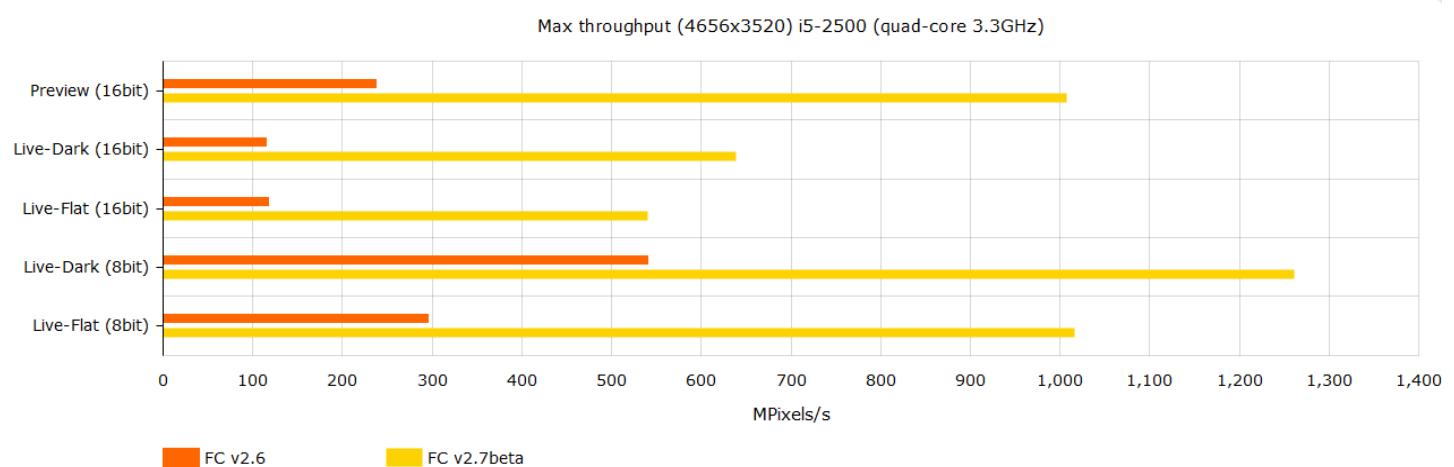


## Release notes FC v2.7

This release has been a 'tour de force' from the very beginning and I wanted to give up many times. The effort related to upgrading to Java 12 was completely underestimated from my side and ended in a hell-of-a-job with a lot of changes under the hood not visible to the user. I'm really glad this is over now... My special thanks to Anthony Wesley who not only contributed the new FLIR Spinnaker interface to FC but also did a lot of testing and many often 'kicked my butt' at the right time so I started fixing bugs which have been part of FC since ages.

### Performance

A lot of effort has been spent in improving performance. Two major things have been added: multicore support and threaded histogram calculation. Multicore support is available in the system/general settings and should especially improve 16bit preview and live dark/flat processing. The threaded histogram option is available in the histogram settings and completely eliminates any related latency from the cam worker thread resulting into higher throughput. The following comparison gives an overview of what has been achieved compared to the previous version:



### Camera interfaces

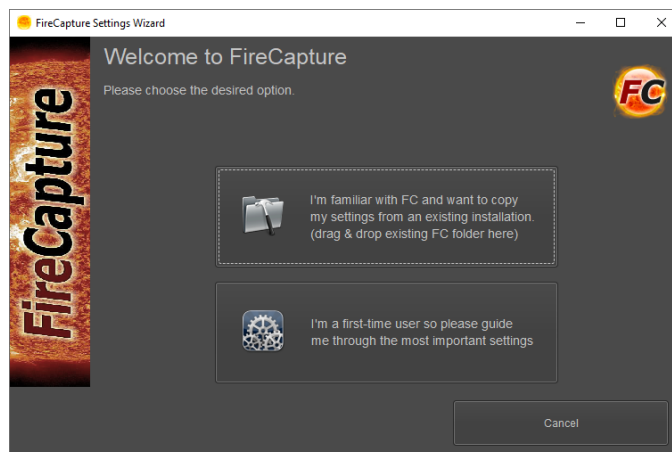
- added FLIR Spinnaker interface (Spinnaker Full SDK v2.0 required) \*
- added support for PlayerOne cameras
- added support for SVBony cameras (SV305Pro only)
- added support for Toupcam/Omegon cameras
- updated FLIR FlyCapture SDK v2.13
- updated Basler Pylon SDK v6.1 \*\*
- updated TIS IC Imaging Control SDK v3.5
- ZWO: added fan, anti-dew and green color balance control
- QHY: added DDR control
- removed obsolete Foculus and AlliedVision interfaces

\* Thanks to Anthony Wesley

**\*\*Note:** the Basler interface is completely untested and might have major issues because I don't have a Basler camera for testing. If you have issues try convincing Basler support to send me a test model which for unknown reasons seems to be big issue for them.

## Settings & Configuration

Please note that starting with this release all FC settings (FireCapture.ini, profiles, darks, flats etc.) are stored in the user home directory by default. When starting v2.7 the very first time FC will prompt you for copying settings from an existing installation or if you're a first-time user will guide you through the basic configuration:

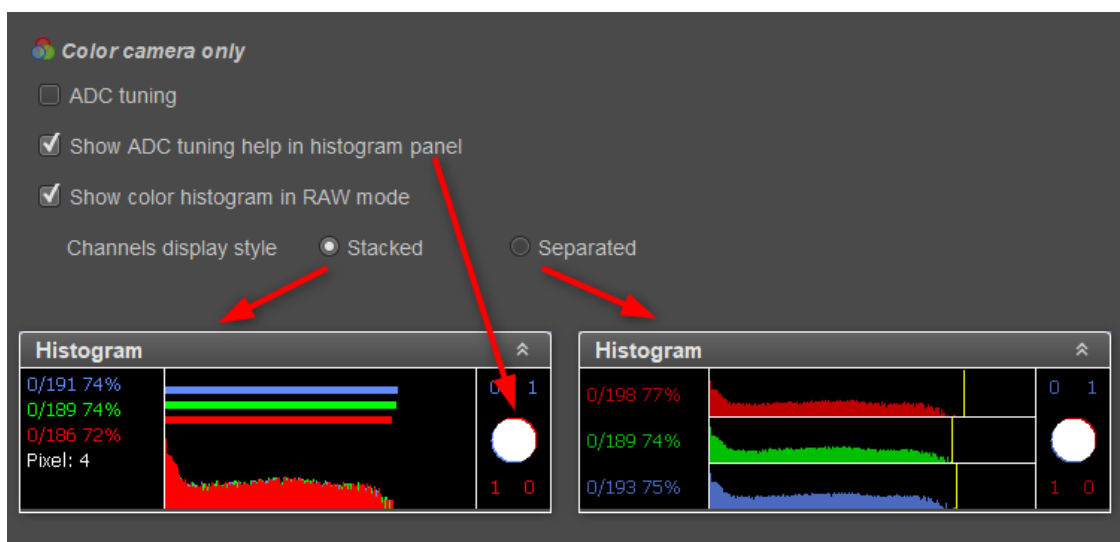


If you want to run multiple FC instances make sure not using the home dir and enable the new 'allow multiple FC instances' option in the general settings. Starting with this release FC also enables RAM buffer as default mode. If you want to revert to non buffer mode uncheck the related option in the general settings:



## Histogram

The histogram settings page has been reworked and a new display style for color cams is available. Optionally the ADC tuning help can be integrated into the histogram display. Please check the screenshots below which options are available:



## Status panel

The status panel has been cleaned up and only shows live framerate and the number of lost frames (during last minute). A yellow warning will blink after a couple of consecutive lost frames indicating potential bandwidth issues. In such a case ZWO/QHY users need to check/adjust their USBTraffic setting:

Status			
HDD	44 GB	FPS	17.5
Buffer	208 Bilder	Lost	⚠ 42

While recording a bit more information is shown in a separate panel. If a limit has been set and the 'show visual gimmick' option has been selected an additional progress bar with the remaining time/frames is visible. When the recording is finished the panel remains visible for a couple of seconds while showing the average numbers for this recording.

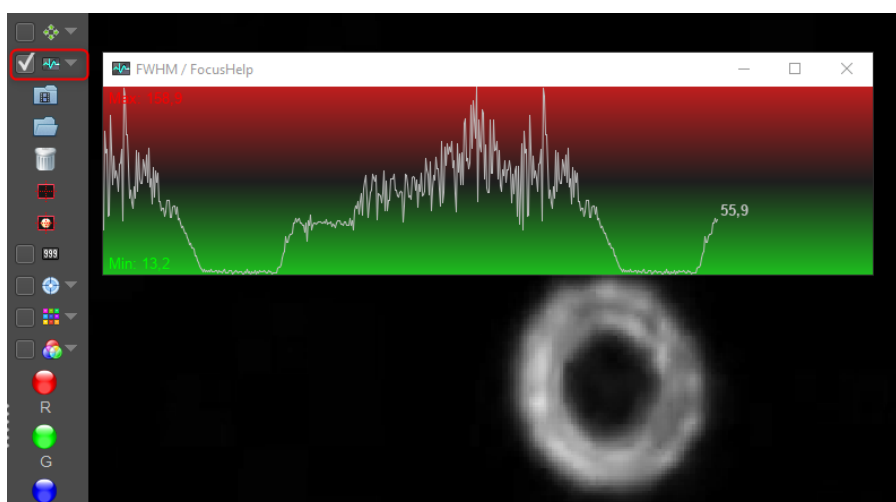
Recording #1 Remaining 385 Frames					
Frames	Saved	Time	MB	FPS	MB/s
115	115	00:05	1797	22	359

You might also check the new statistics panel with overall statistics for all recordings during the session. You can hide the panel in the layout settings if you are not interested in this kind of 'nerdy' info:

Statistics					
Frames	Lost	Time	GB	Ø FPS	Ø MB/s
2480	0	01:47	37,85	23	365

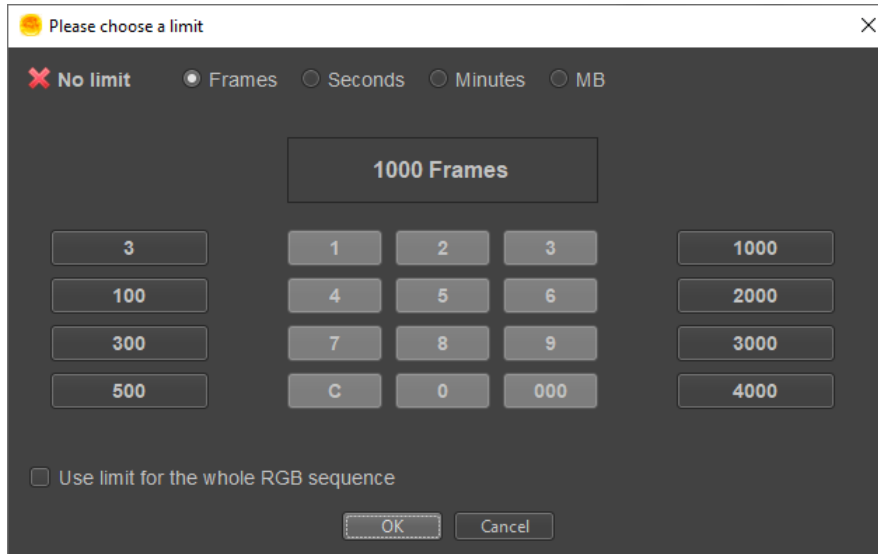
## FocusHelp / FWHM

The existing focus help never really worked and has been replaced by a FWHM-based calculation which most probably will also never work 😊. You can add the related action to the toolbar using the layout setting or by pressing the + sign in the toolbar:



## Limit picker

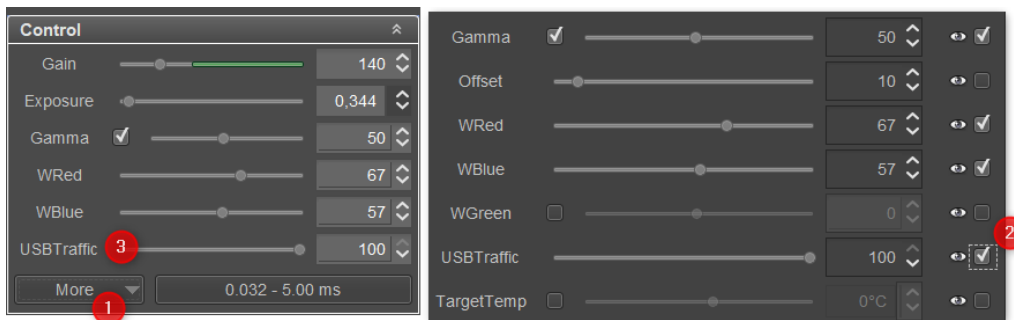
The existing limit popup has been replaced by a separate dialog which allows easier input without using the keyboard:



The center grey buttons act like a number keypad, the left and right buttons are pre-selected limits for direct selection.

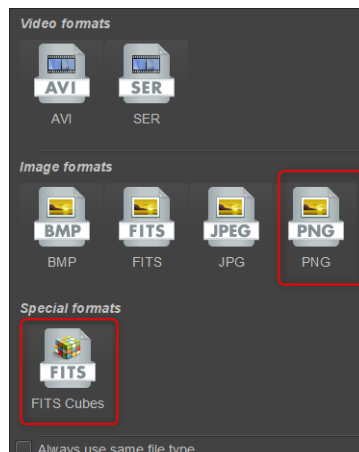
## Camera controls

The visible camera controls in the control panel are now fully configurable for display. To add a control to the panel click on the 'More' button (#1), select the visibility of the desired control (#2) and the control will be shown (#3):



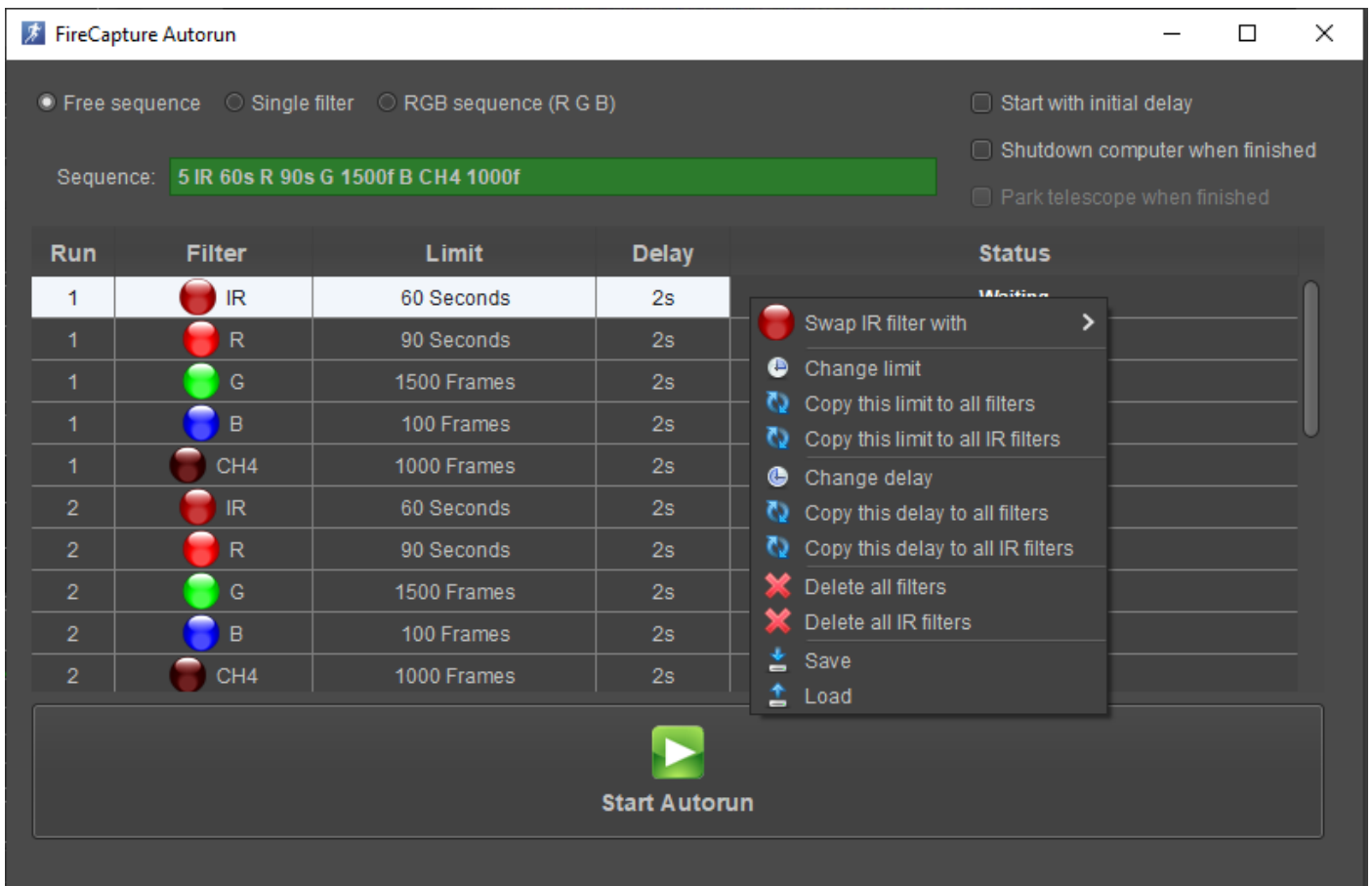
## PNG and FITS cubes

PNG and FITS cubes have been added as new file formats:

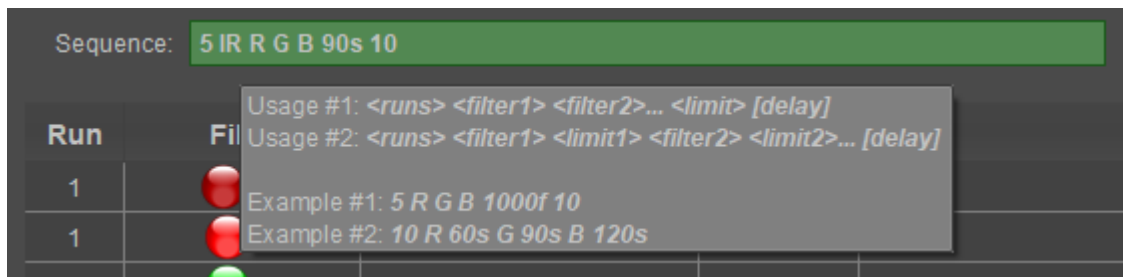


## Autorun

The autorun UI has been reworked completely and now offers 3 different input modes: free sequence, single filter and RGB sequence:

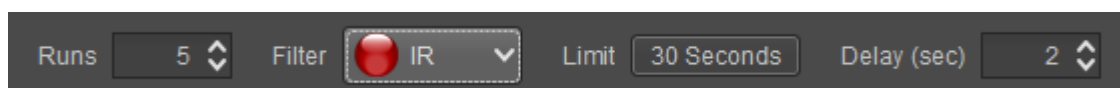


**Free sequence:** allows freely configurable sequences inserted into a text field. See the tooltip for the allowed patterns. FC will check if the inserted pattern is correct and mark the background color of the text field:









e.g. if you'd like to run 5x a sequence "R G B" with a delay of 10s between and a limit of 120s for all filters you'd insert: **5 R G B 120s 10** Note that if no explicit limit is defined FC will use the current default limit of this filter if available.

**Single filter:** usage is simple, select the desired filter and set runs, limit, delay and you're ready to go:



**RGB sequence:** is offered if you have setup an RGB sequence in the filter settings. Usage is similar to single filter mode but a single run consists of all filters of the sequence. Note that by default the current filter limits are used if available:

Runs	2	Limit	30 Seconds	Delay (sec)	2
Run	Filter	Limit	Delay		
1	 R	3000 Frames	2s		
1	 G	30 Seconds	2s		
1	 B	100 Frames	2s		
2	 R	3000 Frames	2s		
2	 G	30 Seconds	2s		
2	 B	100 Frames	2s		

### Misc

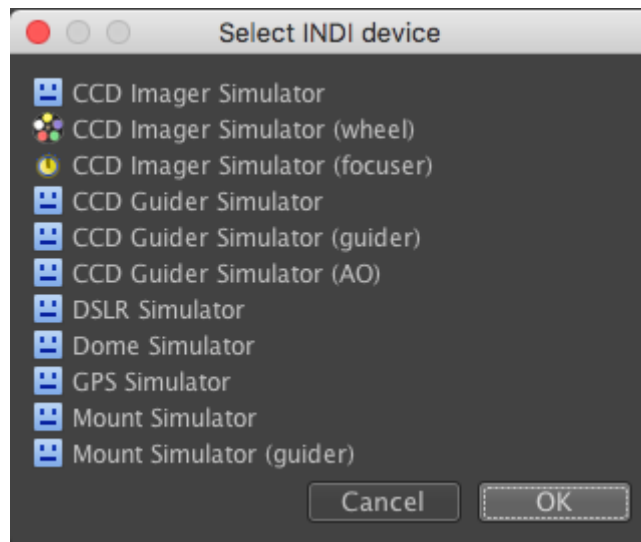
- INDI support for Mac/Linux (see next page)
- ASCOM rotator support
- new shortcut 'save configuration now'
- new option 'use same ROI for all filters' allowing different ROIs per filter
- new option to display capture details above preview window
- new option in general settings to allow running multiple FC instances
- added green color balance control for ZWO models
- selectable font size for capture details display
- added option to display capture details above preview if ROI size allows
- allowed repeating filters in RGB sequence (e.g. RGBB)
- increased emergency ringbuffer size to max 1GB
- added autoguider calibration mode when setup correction time
- added observer initials field used for PVOL and WinJUPOS naming
- preview zoom adjustable via mouse wheel
- added load/save option to autorun
- added normal and fast manual correction speeds
- added temperature output in temp panel for focusers

## INDI support for Mac/Linux

INDI support has been added into this release which allows using telescope, motorized filter wheels and focuser on Mac or Linux platforms. To connect to the INDI server open the FC INDI settings (Hardware -> INDI) and select the 'Use INDI Server' checkbox. Check host and port and press 'Connect'. After a few seconds the green light should be shown indicating a successful connection:



To select a device go to the related FC settings (telescope, filterwheel etc) and choose the desired device from the dialog. Note that it might take a couple of seconds until FC connects:



## A last word...

While testing please remember FC is still a one-man show and although I'm putting a lot of my spare time into some parts of the program might still contains bugs or not reach a quality level most users would be happy to see. This is especially true now as FC runs on 4 different platforms and proper care has to be taken for all of them. The effort here sometimes just eats me up...

Please let me know any issues, ideas or suggestions you might have because FC has grown from a strong community of dedicated imagers and hopefully will continue on...

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Landsberg/Germany