ICX825 Based Camera Comparison

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Category	Parameter	Atik Infinity C	SX Ultrastar C	MC StarVision C
Physical	Sensor	Sony ICX825		
	Sensor Size [mm]	11 (Type 2/3")		
	Resolution [pixels]	1392 x 1040		
	Pixel Size [µm]	6.45 x 6.45		
	Dimension: Width [mm]	112	31	52
	Dimension: Height [mm]	69	31	52
	Dimension: Depth [mm]	47	87	48
	Mass [g]	340	80	180
	Interface	T-thread	C-thread	C-thread
	Sensor-to-Casing Depth [mm]	~12.5 (~16.3 w/T-to-C adapter)	11.5	12.5
	Optical Window	Yes	No	Yes
	Sealed Sensor Chamber	Yes	No	Yes
	Connections	USB B, 5.5mm 12VDC, RJ12 Guiding Port	mini-B USB, RJ12 Guiding Port	USB B w/locking connection
	Indicator LED	Red	Green	Red
	1/4" Tripod Mount Thread	No	No	Yes
	Metallic Case	Yes	Yes	Yes
	Accessories	3m USB/USB B cable, T-thread 1.25" nosepiece, 1.8m cigarette lighter 12VDC power cable, driver CD, quickstart guide	3m USB/mini-USB cable, 2m RJ12/RJ12 cable, rubber endcap, foam padded plastic case, driver CD	15' USB/USB B cable with locking connection, C-thread 1.25" nosepiece, rubber endcap, MFR-8 focal reducer
	MSRP [USD]	$1,000	$995	$1,099
Performance	Max Frame Rate [fps]	2 to 3	2 to 3	19
	Frame Download Time [s]	2	<< 1	<< 1
	Min Exposure Time [ms]	1	20	0.04
	Max Exposure Time [s]	120	300	3600
	Analog-to-Digital Conversion	16-bit	16-bit	12-bit
	Binning	2x2 mono, 4x4 mono, 8x8 mono	2x2 mono, 3x3 mono, 4x4 mono	2x2 colour, 2x2 mono, 4x4 mono
	Adjustable Gain	No	No	2x to 100x
	Program	Infinity v1.3	StarlightLive v3.1	MC StarVision v1.x
	OS	Windows	Windows / iOS	Windows
	Auto Exposure	Autorange Histogram Only	No	Yes, Gain or Exposure
	Countdown Timer	Yes	Yes	Yes
	Countdown Timer Visible From All Tabs/Windows	Yes	Yes	No
	Sum Stack	No	Yes	Limit 100 Frames
	Mean Stack	Yes	Yes	Limit 10 Frames
	Median Stack	No	Yes	No
	Sigma Clip Mean Stack	No	No	No
	Stack With Star Alignment	Yes	Yes	No
	Show Stack Accumulating	Yes	Yes	Sum Stack Only
	Display Histogram	Yes	Yes	Yes
	White Point/Black Point Adjust	Yes	Yes	Yes
	Gamma Adjust	Yes	Choice of 3 Curves	Yes
	Contrast Adjust	No	Yes	Yes
	Black Level Adjust	Yes	Yes	Yes
	Sharpness Adjust	No	No	Yes
	Noise Reduction	No	No	Yes
	3D Noise Reduction	No	No	Yes
	Horiz/Vert Flip	Yes	No	Yes
	Monochrome Mode	No	Yes	Yes
	Inverse Mode	No	No	Yes
	Visualize Saturation	No	No	Yes

Software	Debayer Algorithm Select	Yes; "raw" or "blended" pixels	Yes; "raw" or "smooth" pixels	Yes; "normal", "smooth", "edge" or "sharp"
	Show One Colour Channel At A Time	No	Yes	No
	Auto White Balance	Yes	Yes	Yes
	Manual White Balance	Yes	Yes	Yes
	Key-In Adjust Values	No	Exposure Only	Exposure Only
	Cursor Key Adjust Values	No	Yes	Yes
	Clicker/Slider Adjust Values	Yes	Yes	Yes
	Dead Pixel Removal	No	Yes	Yes
	Dark Frame Collect	No	Yes	Yes
	Dark Frame Subtract	No	Yes	Yes
	Dark Frame Subtract Type	n/a	Neighbour Replace (?)	Simple Subtract
	Region-Of-Interest	No	No	Yes
	Setting Changes Appear Immediately	Yes	Yes	No, Appear at next refresh
	Save Image BMP	No	No	Yes
	Save Image PNG	Yes	Yes	Yes
	Save Image RAW	No	No	Yes
	Save Image FITS	Yes	Yes	No
	Save Image JPG	Yes	No	Yes
	Continuous Image Snap	No	No	Yes
	Save Video AVI - uncompressed	No	No	No
	Save Video AVI - compressed	No	No	Yes
	Record Observing Session	Yes	No	No
	Playback Observing Session	Yes	No	No
	Zoom % From List	No	No	Yes
	Zoom In/Out w/Mouse Wheel	Yes	No	Yes
	Zoom In/Out w/Click	Yes	No	Yes
	Zoom w/Mouse Window	No	Yes	No
	Public Access To Program Author	No	Yes	No
	Broadcast Features	Direct to Youtube or Video Astronomy Live	Second Display Window	No
	Focusing Features	Focus Mode, FWHM display	Focus Mode, FWHM, Maximum ADU, Star Roundness Indicators, Crosshair	No

		- Power cable pulls out easily.	- Vertical fixed pattern line along left edge, not intrusive.	- Software reports 12-bit mode but image appears to be 8-bit
		- Disconnect/reconnect of camera causes software to freeze/crash.	- Colours are tinged slightly yellow (fix by increasing contrast on Blue and Green channels).	- Ample hot/warm pixels, distracting unless under darksky conditions and/or observing bright objects.
		- Camera mass caused issues with focuser on some telescopes.	- Brighter stars appear odd, have jagged halo around them. Stacking smooths jaggedness but halo remains.	- Having to wait for next exposure to finish before seeing effects of changing settings greatly slows down usage.
		- Lack of monochrome mode makes use of Halpha filter unpleasant.	- Lack of optical window means sensor & circuit board exposed to outside air.	- PNG image file output is 8 bit only.
		- When histogram stretched heavily to give good sensitivity, ample warm pixels are present.	- Perceived light leak through back of camera; headlamp use at scope visible in image.	- Video recording in MPEG4 format only, no uncompressed option for SLP imaging.
		- When histogram stretched heavily to give good sensitivity, image shows an obvious brightness gradient top to bottom.	- USB Mini-B jack somewhat delicate and prone to being broken with repeated use - good strain relief on cable needed.	- Even with limit to MPEG4's, SLP imaging capabilities pretty good due to reasonable frame rate and very good sensitivity.

Notes	Other Observations Unique to Each Camera	- When tracking very good, stacked images shows several fixed pattern vertical lines in the image.	- Camera's 1.25" diameter body provides great flexibility when configuring sensor-to-focal reducer spacing.	- Sharpen and Noise Reduction tools work extremely well for SLP observing.
		- Frame rate and min exposure time make this camera not useable for Solar/Lunar/Planetary.	- Frame rate and min exposure time make this camera not useable for Solar/Lunar/Planetary.	- When Mean Stacking, have to wait for initial stack to finish before seeing result, then rolls for each new exposure after.
		- Not being able to directly key in exposure time, but instead only click up or down is inefficient and a pain.	- Very good tracking reveals fixed pattern of many faint vertical lines when stacking.	- Dark frame subtraction is simple algorithm, leaves dark holes where hot/warm pixels used to be.
		- Not being able to directly key in histogram adjust values or use cursor keys is an inconvenience.	- Software has a good selection of features and is reasonably easy to use.	- Very bright stars bloom in the image, resulting in horizontal bar across whole FOV.
		- Program crashes sometimes when adjusting exposure time.	- In general software was very stable, locking only occasionally when the camera was suddenly unplugged.	- Stacking reveals thin vertical fixed pattern lines like on Infinity.
		- Software in general was the easiest to use, at the cost of features.		- Software has the largest number of features, but is still reasonably easy to use.
		- In general was found to be the least stable software, being significantly worse than the other two used.		- In general the software was very stable, locking only occasionally when the camera was suddenly unplugged.
		For all 3 cameras, best results occurred when operating at f/4 or faster.		