

# PC Recommendation for **ORCA-Fusion / Lightning**

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# Purpose

This document provides the recommended PC configuration for Hamamatsu ORCA-Fusion / Lightning camera and Hamamatsu [HCImage](#) software.

- [C14440-20UP](#) : ORCA-Fusion
- [C14120-20P](#) : ORCA-Lightning
- Notice
  - Optimum performance can be achieved under the conditions describe in this document, but it is not guaranteed.

# Single Camera with CoaXPress

Items	Recommended	
Camera	<a href="#">C14120-20P (ORCA-Lightning)</a>	<a href="#">C14440-20UP (ORCA-Fusion)</a>
Model	<a href="#">Dell Precision™ 5820 Tower Workstation</a>	
CPU	<a href="#">Intel Xeon W-2123</a>	
OS	Windows 10 Professional 64-bit (Driver for 32-bit OS is not prepared)	
RAM	64 GB or more	32 GB or more
Frame Grabber	<a href="#">Active Silicon AS-FBD-4XCXP6-2PE8</a>	<a href="#">Active Silicon AS-FBD-2XCXP6-2PE8</a>
	installed in SLOT1_PCl3x8 or SLOT4_PCl3x16	
Drivers	<a href="#">DCAM-API</a> v19.1 or later	

- To achieve full speed recording at max resolution and max 31,000+ fps for Lightning / 41,000+ fps for Fusion speed at small regions.
- These BIOS settings may need to be adjusted:
  - Disable (uncheck) SpeedStep and C-State under the Performance section.
  - Enable (check) Turbo Boost and Hyper-Threading under the Performance section.

# Single Camera with USB 3.0 (USB 3.1 Gen1)

Items	Recommended
Camera	<a href="#">C14440-20UP (ORCA-Fusion)</a>
Model	<a href="#">Dell Precision™ 5820 Tower Workstation</a>
CPU	<a href="#">Intel Xeon W-2123</a>
OS	Windows 10 Professional 64-bit
RAM	8 GB or more
Interface connector	Front-side USB 3.1 interface connector
Drivers	<a href="#">DCAM-API</a> v19.1 or later

- To achieve full speed recording at max resolution and max 41,000+ fps speed at small regions with frame bundle.
- These BIOS settings may need to be adjusted:
  - Disable (uncheck) SpeedStep and C-State under the Performance section.
  - Enable (check) Turbo Boost and Hyper-Threading under the Performance section.

# Recommended DIY PC configuration for Single Camera

Camera Interface	CoaXPress (ORCA-Lightning)	CoaXPress (ORCA-Fusion)	USB3.0 (USB 3.1 Gen1)	Note
CPU	<a href="#">Intel Xeon E5-1630 v4</a> or <a href="#">better</a>			We recommend that you use at least a single 3.2Ghz Quad (or more) Core High End CPU with a CPU Mark equal or higher than the E5-1630 v4 from this benchmark table: <a href="#">High End CPU's - Intel vs AMD</a> Frequency is more important than the number of CPU cores.
OS	Windows 10 Professional 64-bit			Regarding CoaXPress, 32-bit Edition is not prepared because of performance and memory size limitations
RAM	>= 64 GB	>= 32 GB	>= 8 GB	<a href="#">DDR4</a> 2400MHz or higher-speed
Chipset	<a href="#">Intel C610 series</a> or newer			e.g. <a href="#">C612</a> , <a href="#">C236</a> , <a href="#">C422</a> , <a href="#">C624</a> If you are using <a href="#">Intel C620 series</a> (e.g. <a href="#">C624</a> ), and CoaXPress 2xCXP-2PE8 board with ORCA-Fusion, Windows may <a href="#">BSoD</a> when the drivers attempt to access the frame grabber. If this happens, contact your local <a href="#">Hamamatsu Support</a> for assistance.
Free Slot	PCIe2(3) x8 wired		PCIe2(3)	PCIe Gen2 is mandatory but Gen3 should cover Gen2.
BIOS	Latest			PCIe slot performance sometimes is improved in the latest BIOS. We highly recommend to adjust the following BIOS settings: <ol style="list-style-type: none"> <li>1. Disable Processor C-state_control to force C0 state for all processors.</li> <li>2. Enable Intel <a href="#">Turbo Boost</a>.</li> <li>3. Disable Intel <a href="#">SpeedStep</a> if allowed with Turbo Boost Enabled. Enable Turbo Boost may mutually exclude disabling SpeedStep.</li> <li>4. Enable Intel <a href="#">Hyper-Threading</a>.</li> </ol>

ORCA-Fusion

# Storage Size vs. Number of Recorded Images

Free space	Number of Recorded Images <sup>(1)</sup>	Time in seconds <sup>(2)</sup> (Approx.)		
		Ultra Quiet (5.42 fps) <sup>(3)</sup>	Standard (23.2 fps) <sup>(3)</sup>	Fast (89.1 fps) <sup>(3)</sup>
8 GB	809	149 ( ~2 min )	34	9
16 GB	1,618	298 ( ~4 min )	69 ( ~1 min )	18
32 GB	3,236	597 ( ~9 min )	139 ( ~2 min )	36
64 GB	6,472	1,194 ( ~19 min )	278 ( ~4 min )	72 ( ~1 min )
128 GB	12,945	2,388 ( ~39 min )	557 ( ~9 min )	145 ( ~2 min )
256 GB	25,890	4,776 ( ~79 min )	1,115 ( ~18 min )	290 ( ~4 min )
512 GB	51,781	9,553 ( ~159 min )	2,231 ( ~37 min )	581 ( ~9 min )
1 TB	103,563	19,107 ( ~318 min )	4,463 ( ~74 min )	1,162 ( ~19 min )

1. In case of Mono16, 1x1 binning and full size.
2. Numbers are rounded down.
3. Depends on storage writing speed and application writing to storage performance. Writing frame rate is sometimes slower than camera capturing speed.

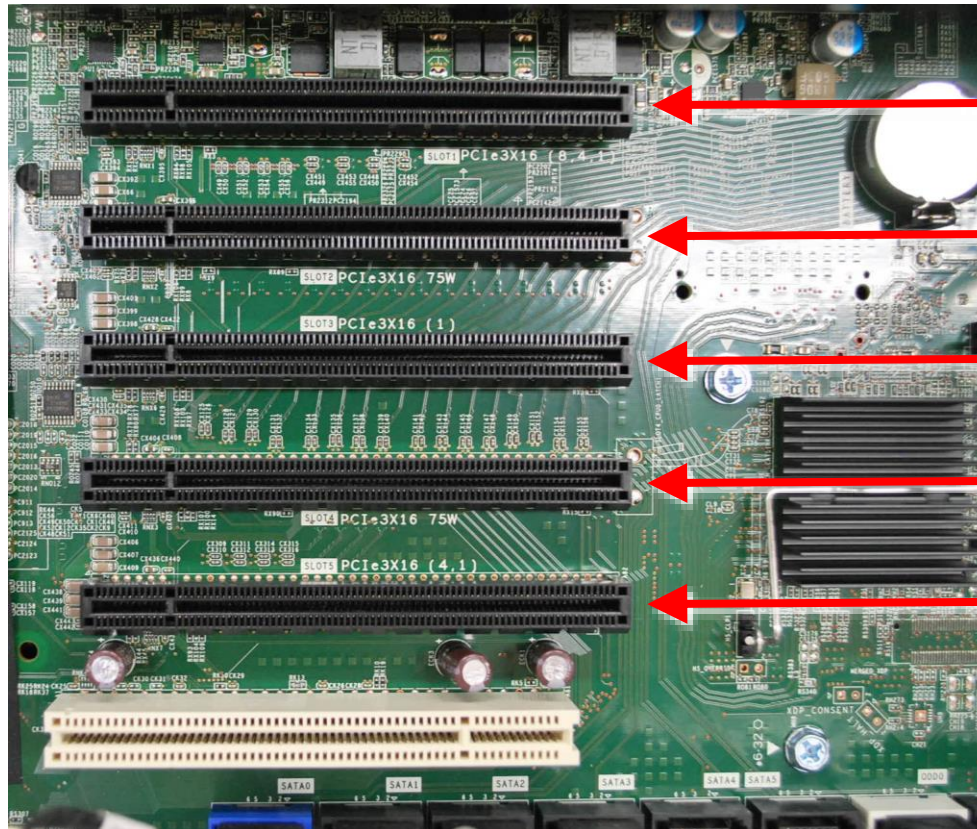
ORCA-Lightning

# Storage Size vs. Number of Recorded Images

Free space	Standard Full Well Capacity mode (121 fps) <sup>(3)</sup>		High Full Well Capacity mode (30 fps) <sup>(3)</sup>	
	Number of Recorded Images <sup>(1)</sup>	Time in seconds <sup>(2)</sup> (Approx.)	Number of Recorded Images <sup>(1)</sup>	Time in seconds <sup>(2)</sup> (Approx.)
64 GB	3,835	31	2,876	95 ( ~1 min )
128 GB	7,671	63 ( ~1 min )	5,753	191 ( ~3 min )
256 GB	15,342	126 ( ~2 min )	11,507	383 ( ~6 min )
512 GB	30,685	253 ( ~4 min )	23,014	767 ( ~12 min )
1 TB	61370	507 ( ~8 min )	46,028	1,534 ( ~25 min )
2 TB	122,741	1,014 ( ~16 min )	92,056	3,068 ( ~51 min )
4 TB	245,482	2,028 ( ~33 min )	184,112	6,137 ( ~102 min )

1. In case of 1x1 binning and full size.
2. Numbers are rounded down.
3. Depends on storage writing speed and application writing to storage performance. Writing frame rate is sometimes slower than camera capturing speed.

# Dell Precision™ 5820 Tower Workstation Slot Configuration



**SLOT1\_PClE3x8**

**SLOT2\_PClE3x16**

**SLOT3\_PClE3x1**

**SLOT4\_PClE3x16**

**SLOT5\_PClE3x4**



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