

PC Recommendation for **ORCA-Fire / Quest / Fusion BT / Fusion / Lightning**

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This document provides the recommended PC configuration for Hamamatsu ORCA-Fire / Quest / Fusion BT / Fusion / Lightning camera.

- [C16240-20UP](#) : ORCA-Fire
- [C15550-20UP](#) : ORCA-Quest
- [C15440-20UP](#) : ORCA-Fusion BT
- [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	C16240-20UP (ORCA-Fire) C15550-20UP (ORCA-Quest) C14120-20P (ORCA-Lightning)	C15440-20UP (ORCA-Fusion BT) C14440-20UP (ORCA-Fusion)
Model	Dell Precision™ 5860 Tower Workstation	
CPU	Intel Xeon W3-2435	
OS	Windows 11 / 10 Professional 64-bit Operation confirmed Linux Ubuntu22.04.02, Debian11 amd64 kernel v5.x (Driver for 32-bit OS is not prepared)	
RAM	64 GB or more	32 GB or more
Frame Grabber	Active Silicon AS-FBD-4XCXP6-2PE8	Active Silicon AS-FBD-2XCXP6-2PE8
Drivers	installed in SLOT2, 4 or 5 DCAM-API v2x.x or later	

- By using the frame bundle, it is possible to realize high-speed capture (Fire : 19,500 or more / Quest : 19,000 or more / Fusion : 41,000 or more / Lightning : 31,000 or more) with a small area setting.
- Changing the following BIOS settings will help to achieve highest performance.
 - Disable (uncheck) Intel Speed Shift Technology under the Power section.
 - Enable (check) Intel Trusted Execution Technology(TXT) under the Virtualization Support section.
 - Disable (uncheck) SpeedStep and C-State under the Performance section.
 - Enable (check) Turbo Boost and Hyper-Threading under the Performance section.
 - Disable (uncheck) VT for Direct I/O under Virtualization Support. (Debian)

Single Camera with USB 3.0 (USB 3.1 Gen1)

Items	Recommended
Camera	C16240-20UP (ORCA-Fire) C15550-20UP (ORCA-Quest) C15440-20UP (ORCA-Fusion BT) C14440-20UP (ORCA-Fusion)
Model	Dell Precision™ 5860 Tower Workstation
CPU	Intel Xeon W3-2435
OS	Windows 11 / 10 Professional 64-bit Operation confirmed Linux Ubuntu22.04.02, Debian11 amd64 kernel v5.x
RAM	16 GB or more
Interface connector	USB 3.2 Gen1 interface connector
Drivers	DCAM-API v2x.x or later

- By using the frame bundle, it is possible to realize high-speed capture (Fire : 19,500 or more / Quest : 19,000 or more / Fusion : 41,000 or more) with a small area setting.
- Changing the following BIOS settings will help to achieve highest performance.
 - Disable (uncheck) Intel Speed Shift Technology under the Power section.
 - Enable (check) Intel Trusted Execution Technology(TXT) under the Virtualization Support section.
 - 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 (Quad CXP-6)	CoaXPress (Dual CXP-6)	USB3.0 (USB 3.1 Gen1)	Note
CPU	Intel Xeon E5-1630 v4 or better			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: High End CPU's - Intel vs AMD Frequency is more important than the number of CPU cores.
OS	Windows 11 / 10 Professional 64-bit			Regarding CoaXPress, 32-bit Edition is not prepared because of performance and memory size limitations
RAM	>= 64 GB	>= 32 GB	>= 16 GB for Fusion (>= 32 GB for Quest, Fire)	DDR4 2400MHz or higher-speed
Chipset	Intel C610 series or newer			e.g. C612 , C236 , C422 , C624 If you are using Intel C620 series (e.g. C624) and CoaXPress board, Windows may BSoD when the drivers attempt to access the frame grabber. If this happens, contact your local Hamamatsu Support for assistance.
Free Slot	PCIe2+ x8 wired		PCIe2+	PCIe Gen2 is mandatory, but faster Gen 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"> 1. Disable Processor C-state_control to force C0 state for all processors. 2. Enable Intel Turbo Boost. 3. Disable Intel SpeedStep if allowed with Turbo Boost Enabled. Enable Turbo Boost may mutually exclude disabling SpeedStep. 4. Enable Intel Hyper-Threading. 5. Disable (uncheck) VT for Direct I/O under Virtualization Support. (Debian+CXP) 6. Disable IOMMU for AMD CPU. (Linux+CXP) 7. Disable Intel Speed Shift Technology.

Storage Size vs. Number of Recorded Images

Free space	Number of Recorded Images ⁽¹⁾	Time in seconds ⁽²⁾ (Approx.)
		Standard (115 fps) ⁽³⁾
32 GB	1,636	13
64 GB	3,273	27
128 GB	6,547	54
256 GB	13,095	109 (~1 min)
512 GB	26,191	218 (~3 min)
1 TB	52,382	436 (~7 min)
2 TB	104,765	873 (~14 min)
4 TB	209,531	1,746 (~29 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.

Storage Size vs. Number of Recorded Images

Free space	Number of Recorded Images ⁽¹⁾	Time in seconds ⁽²⁾ (Approx.)	
		Ultra Quiet (5.00 fps) ⁽³⁾	Standard (120 fps) ⁽³⁾
32 GB	1,820	364 (~6 min)	15
64 GB	3,640	728 (~12 min)	30
128 GB	7,281	1,456 (~24 min)	60 (~1 min)
256 GB	14,563	2,912 (~48 min)	121 (~2 min)
512 GB	29,127	5,825 (~97 min)	242 (~4 min)
1 TB	58,254	11,650 (~194 min)	485 (~8 min)
2 TB	116,508	23,301 (~388 min)	970 (~16 min)
4 TB	233,016	46,603 (~776 min)	1,941 (~32 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.

Storage Size vs. Number of Recorded Images

Free space	Number of Recorded Images ⁽¹⁾	Time in seconds ⁽²⁾ (Approx.)		
		Ultra Quiet (5.42 fps) ⁽³⁾	Standard (23.2 fps) ⁽³⁾	Fast (89.1 fps) ⁽³⁾
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.

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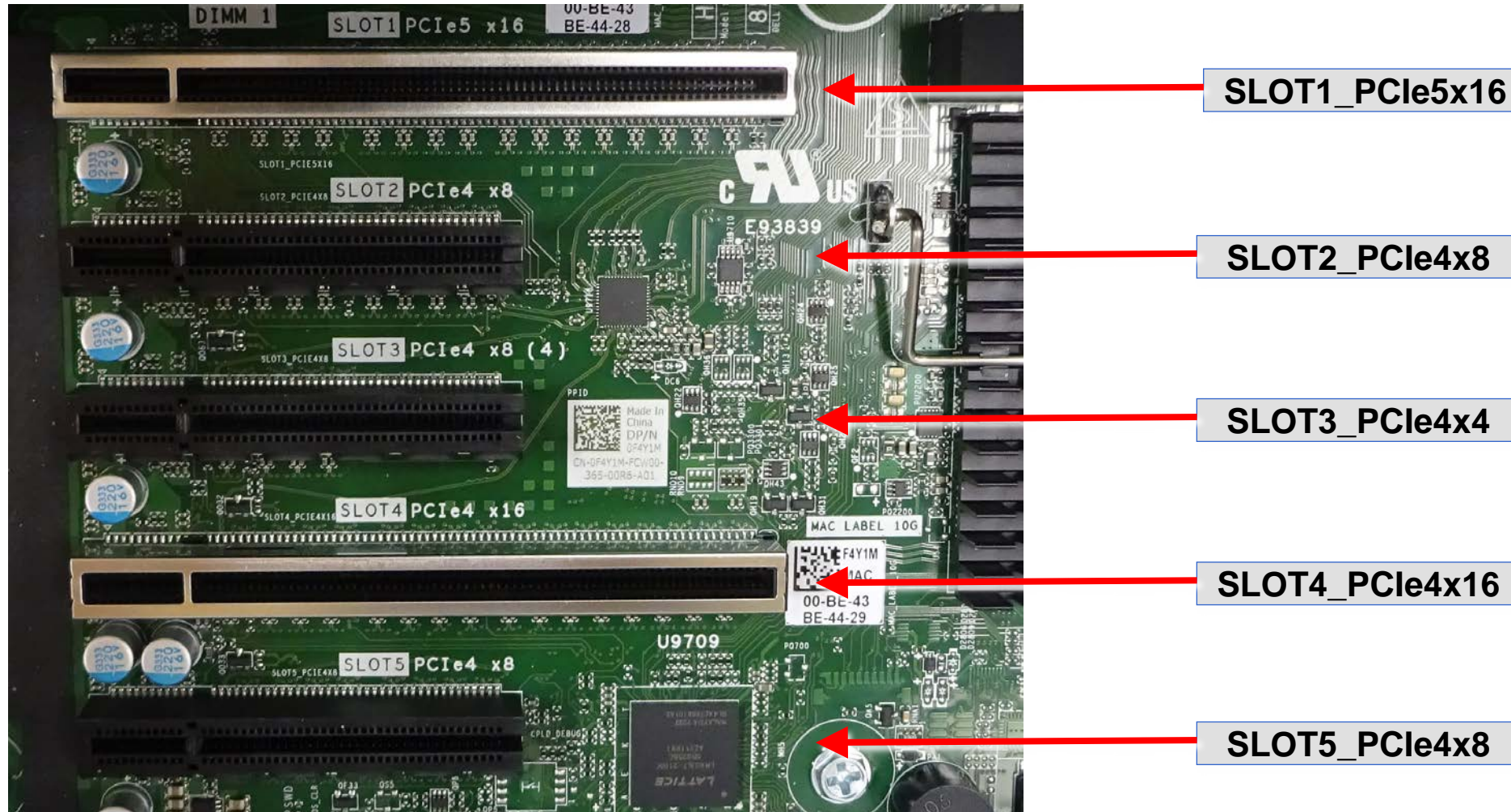
Free space	Standard Full Well Capacity mode (121 fps) ⁽³⁾		High Full Well Capacity mode (30 fps) ⁽³⁾	
	Number of Recorded Images ⁽¹⁾	Time in seconds ⁽²⁾ (Approx.)	Number of Recorded Images ⁽¹⁾	Time in seconds ⁽²⁾ (Approx.)
64 GB	3,835	31	2,876	95 (~1 min)
128 GB	7,671	63 (~1 min)	5,753	191 (~3 min)
256 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.

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Dell Precision™ 5860 Tower Workstation Slot Configuration



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