



Test Workstation: Boxx Apexx S4 Intel Core i9-13900K, 128 GB DDR5-4800 MHz memory 1 TB Seagate 530 Firecuda SSD, Microsoft Windows 11 Pro	AMD Radeon Pro W6400	AMD Radeon Pro W6600	Intel Arc Pro A40	Intel Arc Pro A50	Nvidia T1000	Nvidia RTX A2000	Nvidia RTX A4000
GPU memory	4 GB GDDR6	8 GB GDDR6	6 GB GDDR6	6 GB GDDR6	4 GB or 8 GB GDDR6	6 GB or 12 GB GDDR6	16 GB GDDR6
Peak Single-Precision Performance	3.54 Teraflops	10.4 Teraflops	3.5 TFLOPs	4.8 TFLOPs	2.5 TFLOPs	8.0 TFLOPS	19.2 TFLOPS
Hardware Ray Tracing / AI	Yes	Yes	Yes	Yes	No	Yes	Yes
Form Factor	Half Height, Single Slot	Full Height, Single Slot	Half Height, Single Slot	Half Height, Dual Slot	Half Height, Single Slot	Half Height, Dual Slot	Full Height, Single Slot
Display Connectors	2x DisplayPort 1.4	4x DisplayPort 1.4	4 x mini DisplayPort 2.0 ready	4 x mini DisplayPort 2.0 ready	4 x mini DisplayPort 1.4	4 x mini DisplayPort 1.4	4x DisplayPort 1.4a
Max Power Consumption	50W	130W	50W	75W	50W	70W	140W
Power Connectors	Not required	6-pin PCIe	Not required	Not required	Not required	Not required	6-pin PCIe
Price (Ex VAT) <small>(from scan.co.uk 9/12/22)</small>	£192	£483	N/A	N/A	£290 (4 GB) £355 (8 GB)	£429 (6 GB) £550 (12 GB)	£950
Benchmarks (score) (bigger is better)							
Autodesk Inventor Professional 2023							
Invmark Graphics - FHD	5,589	5,747	4,957	4,980	5,962	5,923	6,046
Invmark Graphics - 4K	3,635	4,698	3,050	3,249	4,007	4,760	4,797
Solidworks Professional 2022							
SPECapc benchmark AA (shaded with edges) - FHD	1.25	1.69	N/A	N/A	1.80	3.15	3.97
SPECapc benchmark AA (shaded with edges) - 4K	0.60	1.38	N/A	N/A	0.57	1.20	2.52
SPECapc benchmark AA (shaded RealView with edges) - FHD	2.20	2.60	N/A	N/A	2.18	3.96	6.96
SPECapc benchmark AA (shaded RealView with edges) - 4K	0.63	1.58	N/A	N/A	0.68	1.31	2.68
Benchmarks (frames per second) (FPS) (bigger is better)							
Solidworks Professional 2022							
Computer model (shaded with edges) - FHD	128.77	165.40	N/A	N/A	128.30	217.02	380.59
Computer model (shaded with edges) - 4K	78.65	133.74	N/A	N/A	55.91	105.09	199.63
Computer model (shaded RealView with edges) - FHD	119.98	152.87	N/A	N/A	90.17	159.82	277.92
Computer model (shaded RealView with edges) - 4K	69.27	123.74	N/A	N/A	43.22	81.13	155.66
Snow Bike model (shaded with edges) - FHD	19.97	30.76	N/A	N/A	22.86	34.57	57.18
Snow Bike model (shaded with edges) - 4K	4.53	29.38	N/A	N/A	18.07	28.87	52.50
Snow Bike model (shaded RealView with edges) - FHD	8.90	29.57	N/A	N/A	20.74	32.13	53.78
Snow Bike model (shaded RealView with edges) - 4K	4.27	28.10	N/A	N/A	15.97	26.42	47.77
Enscape 3.1							
Enscape 3.1 architectural sample project - FHD	12.30	28.95	N/A	N/A	40.53	74.20	131.47
Enscape 3.1 architectural sample project - 4K	4.85	15.85	N/A	N/A	16.00	27.00	48.67
Unreal Engine 4.26							
Audi Car Configurator model - FHD	11.40	54.49	19.61	23.72	23.87	47.29	84.54
Audi Car Configurator model - 4K	1.42	14.06	2.82	3.06	6.01	13.14	25.89
Audi Car Configurator model (Ray Tracing enabled) - FHD	N/A	19.52	N/A	N/A	N/A	26.56	50.23
Audi Car Configurator model (Ray Tracing enabled) - 4K	N/A	0.60	N/A	N/A	N/A	6.99	14.05
Autodesk VRED Professional 2023							
Automotive test model (no Anti-Aliasing) - FHD	10.50	21.025	N/A	N/A	30.00	71.48	129.20
Automotive test model (no Anti-Aliasing) - 4K	Too slow	16.20	N/A	N/A	12.48	25.55	52.20
Automotive test model (medium Anti-Aliasing) - FHD	9.55	18.925	N/A	N/A	19.175	38.88	70.90
Automotive test model (medium Anti-Aliasing) - 4K	Too slow	12.95	N/A	N/A	7.85	16.25	32.15
Automotive test model (ultra-high Anti-Aliasing) - FHD	6.90	14.125	N/A	N/A	8.90	18.18	36.18
Automotive test model (ultra-high Anti-Aliasing) - 4K	Too slow	6.80	N/A	N/A	3.00	6.35	12.75
Benchmarks (time - seconds) (smaller is better)							
Autodesk Revit 2021							
RFO 3.1 benchmark - Graphics standard view - FHD	17.22	17.04	24.29	24.25	14.19	14.08	14.11
RFO 3.1 benchmark - Graphics standard view - 4K	40.33	25.85	36.38	33.39	18.59	16.33	15.70
RFO 3.1 benchmark - Graphics sketchy view - FHD	16.09	14.36	21.22	20.55	11.62	11.51	11.74
RFO 3.1 benchmark - Graphics sketchy view - 4K	51.46	33.85	44.33	42.59	20.66	17.69	17.20
Solidworks Visualize 2022 (smaller is better)							
1969 Camaro model (iRay) (100 passes + denoise) (4K)	N/A	N/A	N/A	N/A	N/A	39	23
1969 Camaro model (iRay) (1,000 passes) (4K)	N/A	N/A	N/A	N/A	N/A	386	218