

Productivity And Ergonomics With Dell Arms And Stands: Ergonomics, Desk Real Estate And Productivity Impact Examined



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VISION
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ANALYSIS

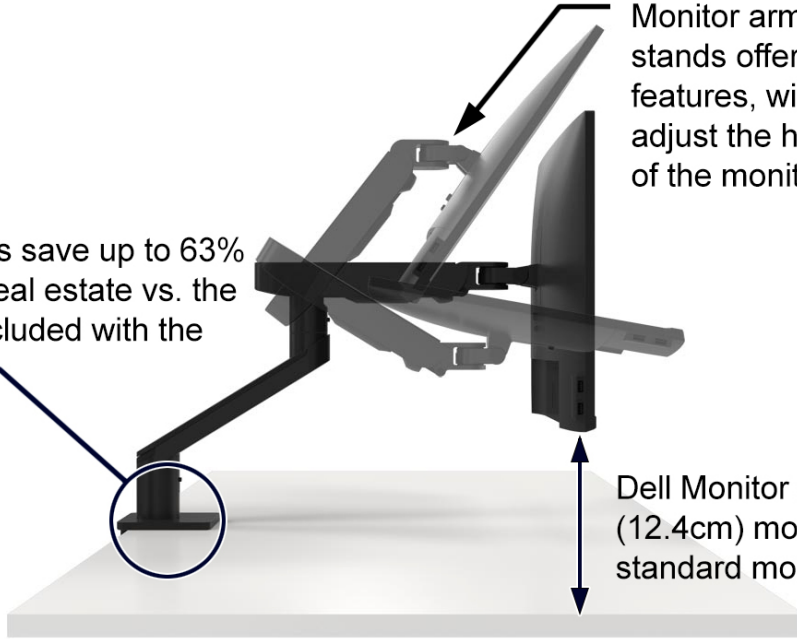
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Key Takeaways & Considerations

Dell Monitor Arms save up to 63% additional desk real estate vs. the monitor stand included with the Dell P2422H



Monitor arms and dual monitor stands offer additional ergonomic features, with more freedom to adjust the height, depth and angle of the monitor to optimize user comfort

Dell Monitor arms give you 4 7/8" (12.4cm) more height adjustment vs. a standard monitor stand



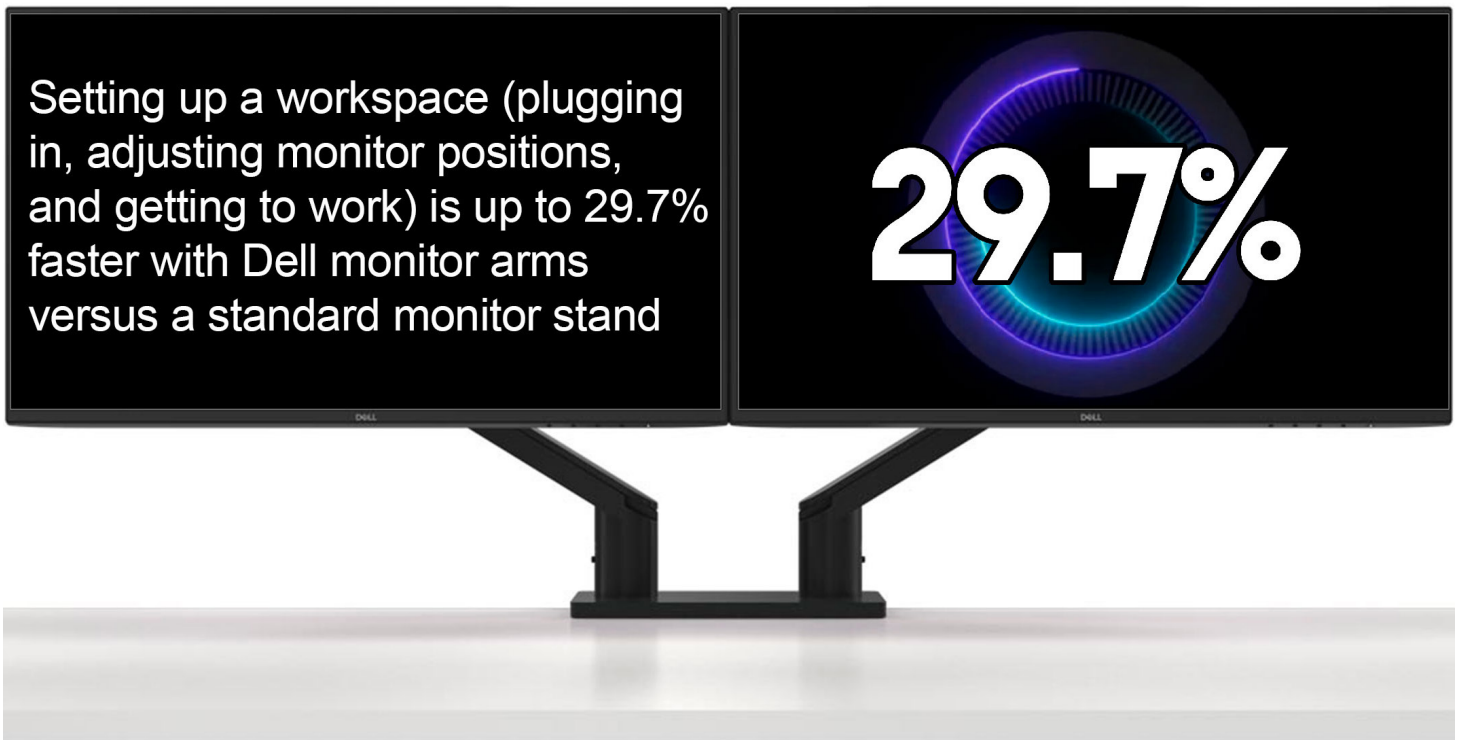
The Dell MDS19 Dual Monitor Stand allows easier fluid-motion alignment of two monitors versus dual standard monitor stands



The Dell dual monitor stand and monitor arms offer better cable management, allowing for a cleaner, more clutter-free workspace

Setting up a workspace (plugging in, adjusting monitor positions, and getting to work) is up to 29.7% faster with Dell monitor arms versus a standard monitor stand

29.7%



Introduction

An ergonomic workspace is vital for comfort and long-term employee health. A poorly optimized setup can result in increased fatigue, loss of focus, or even potential injuries. A worker's comfort and ergonomic needs, however, can vary over time, often as frequently as multiple times a day for different activities. As such, it is important for elements such as the keyboard, mouse, monitor(s), and chair to be as adjustable as possible.

This paper focuses on the desk space savings and the potential functional and ergonomic benefits of highly-adjustable monitor arms and specialized monitor stands. In particular, we examine the considerations when deciding between traditional-style, individual monitor stands, a dual monitor stand, or clamped monitors arms. Our primary considerations include relative desk footprint, the monitor's functional range of motion, and ease of adjustment.

The monitors included for testing are the Dell P2422H (in single- and dual-monitor arrangements) as well as the Dell UltraSharp Curved U3821DW. The Dell P2422H is the most popular Commercial monitor series and size in the company's line-up and the Dell U3821DW is the maximum size and weight supported by the Dell MSA20 Single Monitor Arm. These models represent some of the most common office workspace configurations, particularly with the rising popularity of ultra-widescreen displays.

We compared the stands included with the monitors to multiple alternative configurations using the Dell MDS19 Dual Monitor Stand, Dell MSA20 Single Monitor Arm, and Dell MDA20 Dual Monitor Arm. We assume the subject is a laptop-user in these scenarios, represented by a Dell Latitude 7400 2-in-1 notebook.



Testing Results And Analysis

Desk Area Footprint Impact Assessment

The desk footprint assessment is a straightforward comparison of how much desk-space is gained by using the Dell arms and dual stand solution versus the stands included with the monitors. The laptop's footprint (12.6" x 8" | 32 cm x 20.3 cm) is considered separately, and we are not accounting for any space lost to monitor overhang, cable clearance, peripherals, etc. which may vary significantly between individual user setups.

Single-Monitor Configurations

Configuration	Width (Max)	Width (Min)	Depth	Area
P2422H + Stand	9.75" (24.8 cm)	8" (20.3 cm)	6.9" (17.5 cm)	61.0 in ² (154.8 cm ²)
U3821DW + Stand	15.25" (38.7 cm)	10.9" (27.7 cm)	9.13" (23.2 cm)	119.2 in ² (320.8 cm ²)
MSA20 Single Monitor Arm	4.75" (12.1 cm)	4.75" (12.1 cm)	4.75" (12.1 cm)	22.6 in ² (57.4 cm ²)

For a single-monitor configuration, the MSA20 Single Monitor Arm represents a significant reduction in occupied desk space. Traditional monitor stands rely on a wide base to provide stability whereas the MSA20 Single Monitor Arm's clamp is both more secure and uses as little as 19% of the space of the larger Dell U3821DW monitor's included stand.

Another tangible benefit comes from the MSA20 Single Monitor Arm's mounting point at the rear of the desk. This frees up space below the monitor, which may be positioned closer to the user, that would otherwise be obstructed by the monitor stand. This can allow the monitor to be adjusted as needed without having to rearrange other items on the desk.

Dual-Monitor Configurations

Configuration	Width (Max)	Width (Min)	Depth	Area
2 x P2422H + Stands	31" (78.7 cm)	29" (73.6 cm)	6.9" (17.5 cm)	206.3 in ² (524 cm ²)
MDS19 Dual Monitor Stand	23" (58.4 cm)	18.5" (46.9 cm)	9.9" (25.1 cm)	204.9 in ² (520.4 cm ²)
MDA20 Dual Monitor Arm	10.63" (27 cm)	10.63" (27 cm)	4.75" (12.1 cm)	50.5 in ² (128.2 cm ²)

For the individual monitor stand configurations, we calculated the area by placing the monitors side by side with no gap and measured the width from the left side of the base of the left-hand monitor to the right side of the base of the right-hand monitor. This results in a comparable area to the unified MDS19 Dual Monitor Stand, which represents a space savings of less than 0.7%. The MDS19 Dual Monitor Stand affords other advantages too, such as a single post and unified cable management, but space savings is otherwise not a significant consideration.

The Dell MDA20 Dual Monitor Arm is significantly more compact, however, occupying less than 25% of the footprint of either of the other configurations. Like the MSA20 Single Monitor Arm, workers can further benefit from its mounting position at the rear of the desk. In either of these cases, the arms allow users to pull monitors closer as needed for work and comfort, while the desk below is freed up for documents, tools, or other objects.



Dell Single Monitor Arm - MSA20

Range Of Motion Ergonomic Assessment

One of the most important considerations of any monitor mounting solution is the range of motion it allows. Monitor mounting solutions typically allow adjustments of height, tilt, and rotation although the extent of each is variable. For desks against a wall, we must also take into account how near or far the monitors can be positioned.

Single-Monitor Configurations

Configuration	Height (Min Max)	Tilt Angle (Forward Back)	Rotation	Distance To Wall (Min Max)
P2422H + Stand	1.25" 7.13" (3.2 cm 18.1 cm)	+5° -20°	+/- 90°	5" N/A (12.7 cm N/A)
P2422H + MSA20 Single Monitor Arm	1.75" 12" (4.4 cm 30.4 cm)	+25° -80°	+/- 90°	6" 23" (15.2 cm 58.4 cm)
U3821DW + Stand	2" 6.75" (5.1 cm 17.1 cm)	+8° -18°	N/A	6.75" N/A (17.1 cm N/A)
U3821DW + MSA20 Single Monitor Arm	.13" 10.36" (.33 cm 26.3 cm)	+25° -80°	+/- 90°	5.9" 22.9" (14.9 cm 58.2 cm)

The MSA20 Single Monitor Arm vastly improves the practical range of motion for both the standard-sized P2422H and ultrawide U3821DW monitors. While the included stand for the P2422H can marginally reach lower and situate the monitor an inch closer to the wall, the MSA20 Single Monitor Arm more than compensates with 68% higher clearance and significantly more tilt angle.

The U3821DW benefits similarly, but without any of the drawbacks. This monitor's greater height combined with the MSA20 Single Monitor Arm allows it to all-but touch the desk in its lowest position whereas its included stand leaves a two-inch gap. The maximum clearance is 54% higher for the MSA20 Single Monitor Arm with this monitor as well. This extra height allows the monitor to be rotated a full 90-degrees, a capability absent from its included stand because its maximum height is insufficient.

Dual-Monitor Configurations

Configuration	Height (Min Max)	Tilt Angle (Forward Back)	Rotation	Distance To Wall (Min Max)
P2422H + Stand	1.25" 7.13" (3.2 cm 18.1 cm)	+5° -20°	+/- 90°	5" N/A (12.7 cm N/A)
P2422H + MDS19 Dual Monitor Stand	2.63" 7.63" (6.6 cm 19.4 cm)	+10° -20°	+/- 90°	8" N/A (20.3 cm N/A)
P2422H + MDA20 Dual Monitor Arm	1.63" 12.25" (4.1 cm 31.1 cm)	+35° -80°	+/- 90°	7" / 16" 23.5" (17.8 cm / 40.6 cm 59.7 cm)

The MDS19 Dual Monitor Stand is functionally equivalent to using the individual stands included with the Dell P2422H monitors. Users are unlikely to notice a range of motion difference in practical usage, however, in which case the other advantages of the MDS19 Dual Monitor Stand, which include its single post and unified cable management, can be more of a deciding factor.

The MDA20 Dual Monitor Arm extends a greater practical range of motion with the option to lift the displays much higher and with more tilt. The extra height is not quite enough to allow the P2422H monitors to be stacked vertically, but it could be an option with smaller 22"-class displays.

There is a potential drawback to the MDA20 Dual Monitor Arm. If the mount is centered between the displays and against a wall, the monitors are constrained to be at least 16-inches from the wall due to manner in which the arm segments rotate. This can be worked around by positioning the mount in an offset position where the spacing can be as little as 7-inches. This is a non-issue for desks that have open space behind them, keeping in mind that the arms may extend as far as 9.5" (24.1 cm) beyond the desk.

Speed Of Adjustment Assessment

Some workers may benefit from regular repositioning of displays. For example, many developers prefer a portrait orientation while working on code to display more lines at once, but want the option to revert to a landscape orientation for other tasks. Likewise, a shared workspace environment may need a setup that can adjust to suit the needs of different users quickly and easily.

Ease of adjustment is subjective and may be impacted by accessibility needs. Our testing is designed to assess the relative time required to connect a laptop, adjust displays from an initial position to an ergonomically correct position, and begin working. This can serve as an analog of ease of adjustment with the assumption that faster times correlate with less effort expended.

Single-Monitor Configurations

Configuration	Time In Seconds (Lower Is Better)
Latitude 7400 2-in-1 Only	0:17
1 x P2422H (Included Stand)	0:32
1 x P2422H (MSA20 Single Monitor Arm)	0:26
1 x U3821DW (Included Stand)	0:37
1 x U3821DW (MSA20 Single Monitor Arm)	0:26

Adjusting the monitor's rotation, tilt, and height each require a different application of force when using the included monitor stand. The MSA20 arm allows these to be adjusted with a single fluid movement, significantly easing the process. The MSA20 also makes fine adjustments easier, such as shifting the monitor left or right. Doing this with the included stand requires lifting and/or sliding the entire monitor setup which is both more strenuous and less precise, particularly when it may result in needing further adjustments (e.g. because the monitor height changed while lifting).

Dual-Monitor Configurations

Configuration	Time In Seconds (Lower Is Better)
2 x P2422H (Included Stands)	0:44
2 x P2422H (MDS19 Dual Monitor Stand)	0:49
2 x P2422H (MDA20 Dual Monitor Arm)	0:36

The dual-monitor configurations generally require a little more time to setup and adjust than the single-monitor configurations. While this is partially a result of needing a second display cable to be connected, most of the added time is due to adjusting and aligning the second monitor.

The alignment aspect is most impactful with the MDS19 stand. It requires more care to prevent the displays from colliding while gross adjustments are made, and getting both the height and tilt of the monitors to match is more tedious than with the other mounting options. The particular MDS19 we tested also required more force to adjust than the individual stands. It is possible this could become less of an issue as the MDS19 breaks-in after repeated adjustment over time. The MDA20 arm makes aligning the monitors significantly easier. The fluid motion allows the user to simply focus on where the monitors should be positioned rather than how to manipulate the mounting solution to get them there.

In regard to time savings, we should also mention a pertinent step during initial assembly. When paired with a Dell Monitor, a Dell Arm or Stand offers a feature called Quick Release, which allows the panel head to simply snap on and off. 3PP brands require a VESA adapter which often needs to be attached via four screws. This can take significant time if deploying multiple arms or stands.



Dell Dual Monitor Arm - MDA20

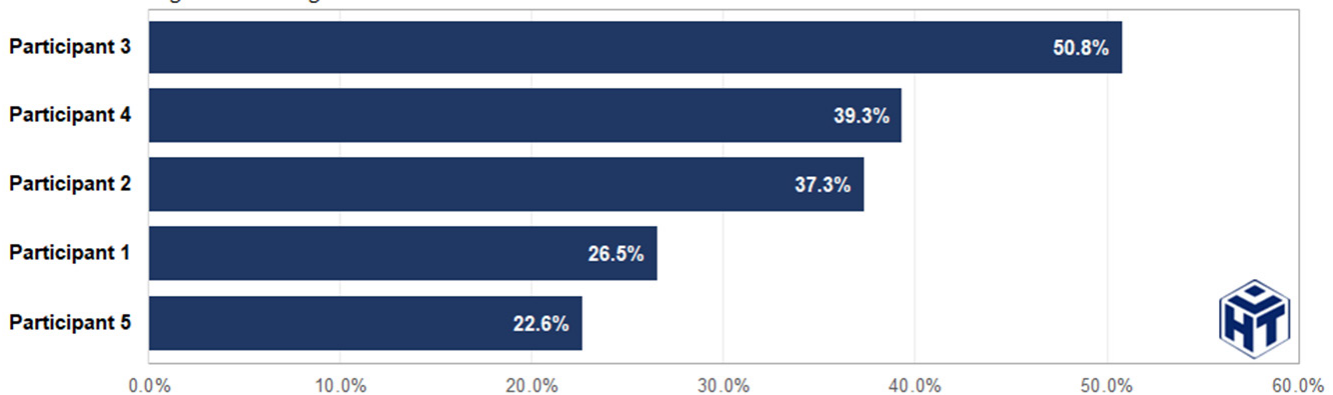
Multi-Monitor Productivity Benefits

In a previous study, five participants of various skill levels were tested on six different monitor configurations to ascertain if there was any [potential productivity benefit](#) to using larger or multiple monitors versus a laptop alone. The baseline configuration was a Dell Latitude 7400 which features a 14" Full-HD (1920 x 1080 resolution) display. To that system, we attached an array of peripherals and displays including a Dell KM717 Premium Keyboard and Mouse Combo, one or two Dell UltraSharp 24 Monitors (model U2419HC), a Dell 27 USB-C Monitor (model P2719HC), and a Dell UltraSharp 34 Curved Monitor (model U3419W). All five participants in the study performed a specific set of tasks on all six different display configurations.

The external monitors were configured in Extended Desktop mode to maximize available screen real estate, which allowed participants to use the laptop display in conjunction with the external monitors. And with all but the laptop and single 24" monitor configuration, Dell Display Manager was used to align and snap applications to various layouts across the screens, per each participant's personal preference. The goal of the study was to ascertain any potential time savings and productivity benefits that could be achieved by using full-sized input devices and increasing usable screen area with larger or multiple monitor configurations.

Productivity Improvements Versus Laptop Alone

Average Per User Time Savings For All Configurations
Higher Percentages = Better Performance



We timed the participants in this study while they completed and scripted array of randomized tasks. The test conditions were devised to mimic common use cases, and required application-switching, scrolling, and multiple Cut, Copy, and Paste operations.

Our average, per-participant results, which are represented in the graph above, revealed significant productivity improvements across the board. The data represents the average time-savings across all five upgraded monitor configurations, versus the laptop alone. The median improvement for all participants was 37.3%, though one user was able to complete the required tasks over 50% faster.



Summary & Conclusion

Leveraging Dell monitor arms to mount displays delivers many tangible productivity, ergonomic and experiential benefits for end users. Our testing and analysis revealed obvious advantages in regards to reclaimed desk space, range of motion, and ease of adjustment. These concrete metrics can translate to improved worker ergonomics and health, as well as better productivity, which contributes to an obvious return on investment for such configurations, and a cleaner office or home office aesthetic as well.

Appendix A: Dell Monitor Arms And Dual Monitor Stand Images

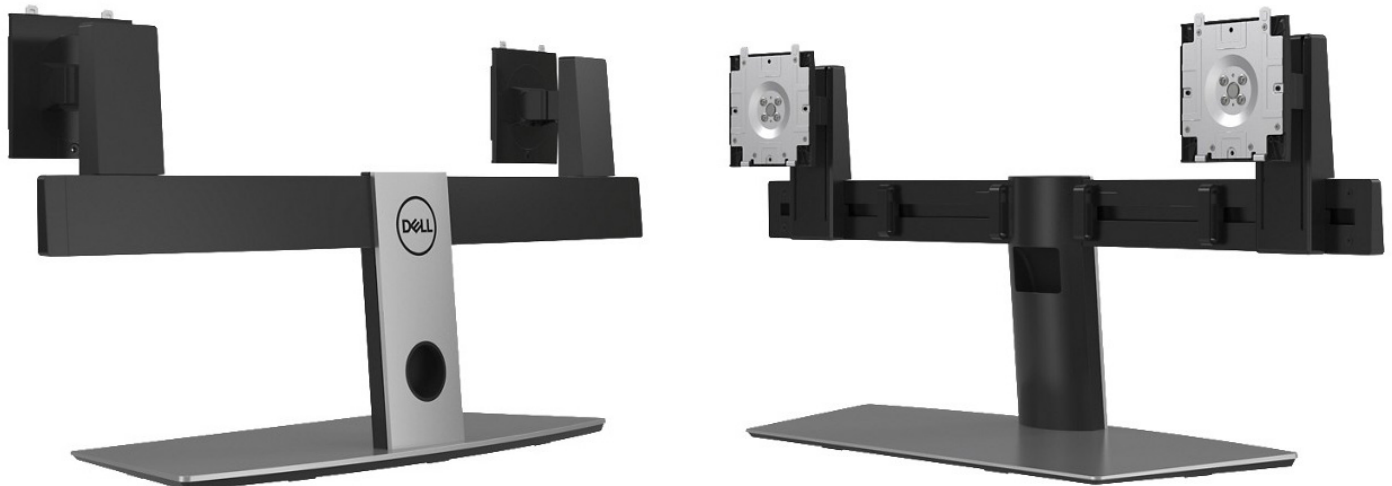
Dell Single Monitor Arm - MSA20



Dell Dual Monitor Arm - MDA20



Dell Dual Monitor Stand - MDS19



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