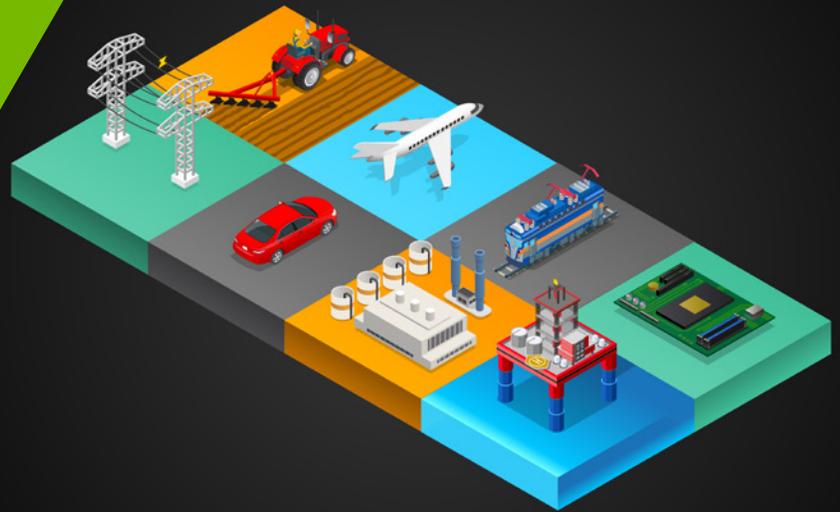




# OPERATIONAL AUTOMATION WITH NVIDIA DGX STATION A100



## In the manufacturing industry, AI has the potential to boost labor productivity by 40 percent and profits by 39 percent by 2035.<sup>1</sup>

The manufacturing industry's top priorities have always been to reduce costs and optimize processes, but a big portion of these costs can be largely avoided. A U.S. Department of Commerce study reveals approximately one-third of manufacturing maintenance costs are unnecessary or improperly carried out.<sup>2</sup> Another study has uncovered that 64 percent of unscheduled downtime can be largely prevented, driven by aging equipment and mechanical failure.<sup>3</sup> And with labor costs being the largest expense in the warehouse, at 50-70 percent of the average company's warehouse operating costs, manufacturers are constantly looking for ways to improve workforce efficiency.<sup>4</sup>

The changing industry dynamics—from the surge in data being captured from sensors to the increase in automation and connectivity—coupled with the sector's cost-driven nature, make this industry poised to benefit from AI. According to Accenture, AI can boost manufacturing industry profits by 39 percent by 2035.<sup>1</sup>

Manufacturers are increasingly using AI to improve efficiency, product quality, and employee safety and achieve the vision of Industry 5.0. While Industry 4.0 focuses on the interconnectedness of machines and systems for effective and efficient manufacturing, Industry 5.0 takes this a step further, emphasizing the transformation of factories into smart facilities and refining the interactions between humans and machines.

## An AI Appliance for Realizing Industry 5.0

**NVIDIA DGX Station™ A100** brings AI supercomputing to data science teams, offering data center performance without a data center or additional IT investment. Whether in the assembly line or the back office, DGX Station A100 is a powerful AI appliance that can provide computing resources to data scientists from anywhere.

> **Build AI trained on millions of maintenance records—faster.** Industry data is surging, being generated from a multitude of sources, from maintenance records to high-frequency industrial sensors. DGX Station A100 accelerates AI training performance by 3X over prior-generation computing and enables more accurate models for predictive maintenance.<sup>5</sup>



### INCREASING ASSET UPTIME

Predicting asset useful life, providing accurate alerts of future failures



### IMPROVING WORKFORCE PRODUCTIVITY

AI assistants help workers with installation, calibration, and maintenance procedures



### PERFORMING DANGEROUS TASKS

AI-based drone inspection explore places where humans can't, and lower inspection costs



### FREEING UP WORKER HANDS

Autonomous solutions perform tedious, time consuming work

- > **More tasks executed efficiently and precisely.** Natural language processing (NLP) in robotic process automation (RPA) analyzes manuals and engineering drawings, and when integrated into chatbots, voice assistants, and maintenance management systems, aids the workforce with mundane tasks or provides greater precision for performing complex procedures. Models deployed for inference on DGX Station A100 run 4X faster over the prior generation.<sup>6</sup> Integrated technologies like Multi-Instance GPU (MIG) scale inference workloads and provide the highest throughput and real-time responsiveness.
- > **AI in remote factory locations.** AI can flag physical infrastructure and facilities in need of repair, no matter where they're located. A powerful system with 2.5 petaFLOPS of AI performance, DGX Station A100 can be used out in the field and plugs into a standard wall outlet—no data center required. Many factories located in small towns and remote areas are now able to retrain models as data comes in and tweak inspection models accordingly.
- > **A shared team resource on the shop floor.** DGX Station A100 makes it possible to deploy more data science projects across industrial applications by running model development, AI training, analytics, and inference workloads in parallel. With MIG, it provides up to 28 separate GPU instances to individual users, optimizing GPU utilization and expanding access to compute resources.
- > **Success with DGXperts.** Owning a DGX Station A100 gives you direct access to **NVIDIA DGXperts**. A global team of AI-fluent practitioners, they offer prescriptive guidance and design expertise to help fast-track AI transformation with know-how and experience from NVIDIA's decade-plus of AI leadership.



Lockheed Martin is using AI-based predictive maintenance to more accurately predict when to take a part out of service for maintenance, improving availability of fleets. Using NVIDIA DGX Station, they experienced a 2X speedup in training time compared to CPU-based servers with no change to architecture or code. “We achieved a 10 percent boost in accuracy overnight because of the greater ability to train and tune parameters on the DGX,” says Sam Friedman, senior data scientist of the Data Analytics Innovations Group at Lockheed Martin.

[READ THE FULL CASE STUDY >>](#)

To learn more about DGX Station A100, visit [www.nvidia.com/DGXStationA100](http://www.nvidia.com/DGXStationA100)

1 Mark Purdy and Paul Daugherty, [How AI Boosts Industry Profits and Innovation](#), Accenture, 2017  
 2 National Institute of Standards and Technology, US Department of Commerce, [The Costs and Benefits of Advanced Maintenance in Manufacturing](#), April 2018.  
 3 Plant Engineering, [Maintenance Study](#), March 2019.  
 4 Peerless Research Group, [Labor Management Strategies in the Warehouse](#), August 2014.  
 5 DGX Station A100 320GB vs DGX Station with NVIDIA V100; Batch Size=64; Mixed Precision; With AMP; Real Data; Sequence Length=128  
 6 DGX Station A100 320GB vs DGX Station with NVIDIA V100; Batch Size=256; INT8 Precision; Synthetic Data; Sequence Length=128, cuDNN 8.0.4

