

White Paper

Echoing Government's Productivity 4.0, IoT Automation Boosts Taiwan's Competitiveness



To lead industrial sectors toward smarter manufacturing, the US, Germany, Japan, and China have launched initiatives including Advanced Manufacturing Partnership (AMP), Industry 4.0, New Robot Strategy, and China Manufacturing 2025. Facing challenges of labor shortages and aging labor forces, Taiwan's Ministry of Economic Affairs is implementing "Productivity 4.0" to stimulate economic growth and upgrade industries.

Built upon smart automation, the Productivity 4.0 aims for smart automatic production, service, and agriculture to renovate industries like machine tools, metal processing, consumer electronics, food, health care, logistics, and agriculture. Combining technologies of robots, cyber-physical systems, IoT, and big data, the time is ripe for smart automation.

Modular Robots Encourage Self Development

Robot technologies include precision machinery, precise measurement, intelligent control, digital design, man-machine coordination, and knowledge feedback. Robotic total solutions used to be mainstream; however, modular robots allow more flexibility to meet various orders. "Modularizing core components of robots avoids the rigidity of robotic total solutions and grants hardware and software developers with customizability. This is a critical strategy to Taiwanese robot providers to get a foothold in the robot industry," said Joe Lin, GM of IoT Automation Solutions Business Group, NEXCOM.

NEXCOM's robotic solutions can be divided into the following modules: controllers, control I/O, EtherCAT communication, software development platforms, HMI, and teach pendants. Such modularization provides flexibility and openness for widening robot applications and research projects in industrial and academic realms.

The Gateway to Big Data Analysis

To link IoT and big data relies on gateways, which connect sensors, machinery, and systems via fieldbus protocols and remote I/O. With real-time operating system, operators can grasp latest operational status while off-site managers can remotely monitor manufacturing process with virtual HMI via mobile devices.

The IoT gateway allows the convergence of cyber and physical systems while transferring field data to the cloud for analytics. Targeting industrial IoT applications, cloud platforms including IBM Bluemix, Microsoft Azure, GE Predix, and PTC ThingWorx offer management and monitoring of asset and events. Furthermore, they allow predictive modeling and behavioral prediction, data fusion, and data mining, which stimulate smarter industrial applications.

The Last Mile Landing to Smart Manufacturing

Initiated IoT automation in 2012, NEXCOM launched its IoT gateway featuring embedded API and C2C (Click-to-Connect, Connect-to-Cloud) software engine. Partnered with above cloud platforms, the gateway collects data for predictive maintenance, optimized production process, and enhanced business management.

Working with petro-chemical, consumer electronics, and machine tool companies, NEXCOM has connected thousands of manufacturing equipment to networks. NEXCOM also works with manufactures to introduce robots to production lines. Wet wipe providers, for instance, used to rely on human labor for procedures like grabbing, gluing, sticking. With the NEXCOM's assistance and man-machine coordination, its manufacturing efficiency was much enhanced.

Themed with Industry 4.0 at Hannover Messe and cohered Production 4.0, NEXCOM's demonstration based on PC-based architecture and integrated

with manufacturing execution systems (MES) was a presentation of smart factory application. In the course of increasing Taiwan's competitiveness, NEXCOM will play vital roles in Productivity 4.0, helping realize man-

machine coordination, extended machine uptime, flexible manufacturing planning and scheduling, shortened lead time, and zero inventory for the ultimate goal of industrial transformation and value-added industries.



The Intelligent Systems

Founded in 1992, NEXCOM integrates its capabilities and operates six global businesses, which are Multi-Media Solutions, Mobile Computing Solutions, IoT Automation Solutions, Network and Communication Solutions, Intelligent Digital Security, and Medical and Healthcare Informatics. NEXCOM serves its customers worldwide through its subsidiaries in five major industrial countries. Under the IoT megatrend, NEXCOM expands its offerings with solutions in emerging applications including IoT, robot, connected cars, Industry 4.0, and industrial security.

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