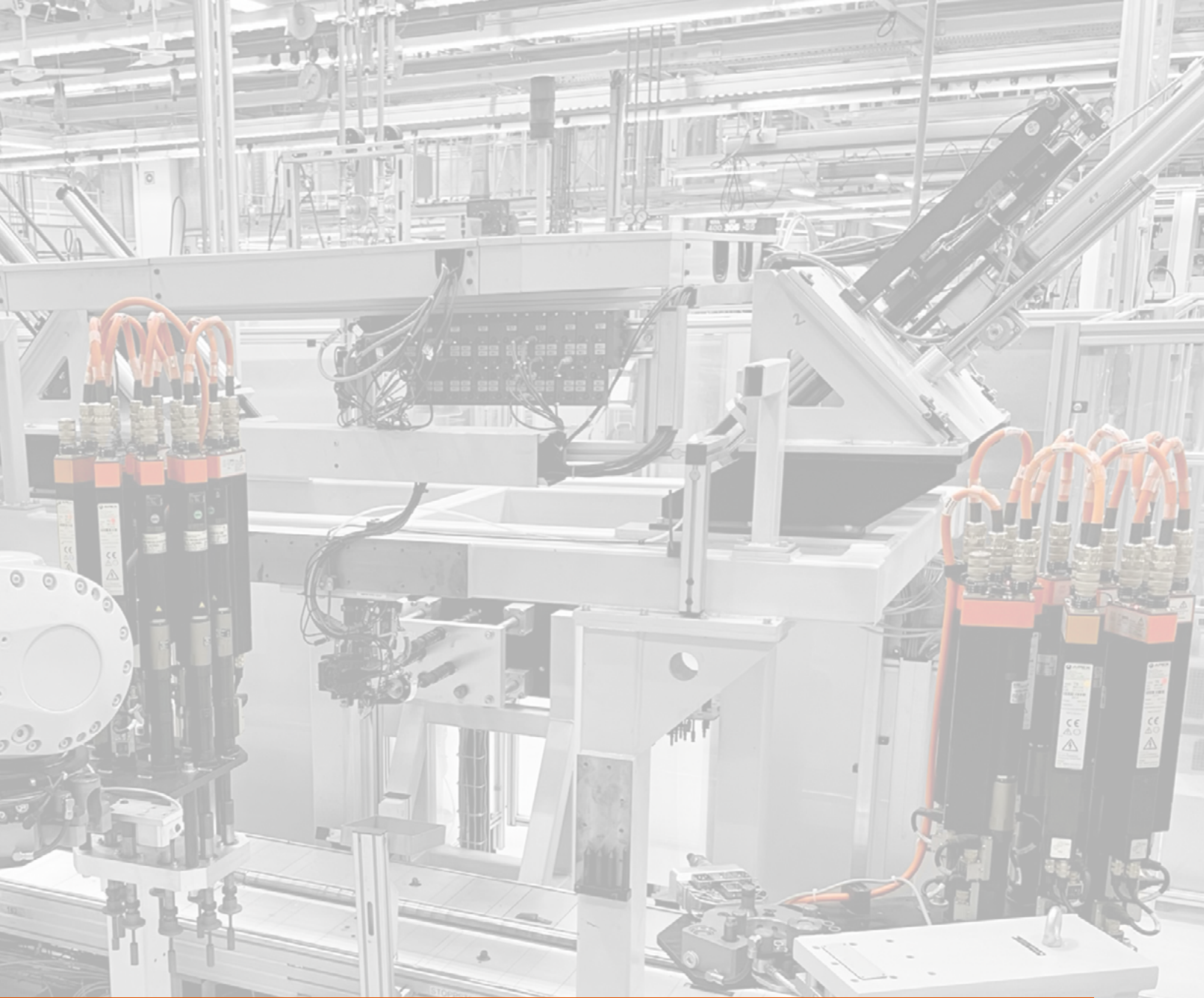


Cleco | Tame the Line



An Intelligent Solution for Automated Assembly
Associated Costs of Festooning Cables

HERMES
TOOLS

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Introduction

It's no secret that the assembly line is getting smarter and faster. In fact, according to Deloitte, the journey toward industry 5.0 and the “smart factory” is in full swing, with 83% of manufacturers expecting smart factory solutions to transform the way products are made. [1] From high-volume automotive runs to small-batch electronics, manufacturers are adding automation, sensors, and artificial intelligence to increase uptime and take human error completely out of the assembly equation.

One key to this shift has been the growing use of automation in manufacturing, especially robotics. Since 2018, the operational stock of industrial robots has been increasing by 12% on average each year, and there is no indication that the long-term growth trend will end any time soon. [2] In fact, the operational stock of industrial robots exceeded the 4-million-unit mark in 2023, with China leading the way at a whopping 1.76 million units (41% of the market). [1]

Experts estimate that assembly robots in particular are following the market's growth pattern, with a forecasted CAGR of 11.6% from 2023 to 2033

CAGR of

11.6%

from 2023-2033 [3]

McKinsey's 2022 survey estimates that automation will account for 25% of industrial companies' future capital spending [4]

Recent advancements in automated tightening and spindle systems are making robotic assembly requiring torque control more accessible and cost-effective, particularly in high-mix production runs with medium to low cycle times. By combining advanced intelligence with innovative machine tool design, manufacturers are finding they can add flexibility to their line, improve their **overall equipment effectiveness (OEE)**, eliminate the need for festooning, and easily troubleshoot—all of which adds up to higher productivity and substantial cost savings.

An Industry First: Daisy-Chain Design & Onboard Intelligence

Cleco's patented solution features a **single-cable design that nearly eliminates the need for festooning**. Whereas conventional spindles each require a separate cable, Cleco's system can run up to 16 intelligent spindles from a single field cable by cascading cables between spindles. This daisy-chain architecture greatly reduces the chances of cable failure but also simplifies integration, streamlines cable management, frees up floor space, and opens up a whole new level of flexibility in assembly operations.

The intelligent spindle system from Cleco was designed to address the number one cause of assembly line shut down with a fixtured nutrunner: cable failure.

The single-cable system is ideal for integration with a hollow wrist or solid wrist robot. This allows robotic assembly in high demand manufacturing operations and offers high performance as the system's **super high-flex field cables** have been **tested to 710 million cycles without failure**.

If an assembly line has high product mix, such as requires four fasteners to be run down, followed by six fasteners, and then eight fasteners a solution can be configured with multiple heads that can connect to only one controller for all three applications.



The tightening system's high-performance spindles are also **armed with sophisticated intelligence**. Nutrunners feature on-board servo modules and diagnostics, while still operating at an **industry-leading speed** with a **torque range of 2-2800 NM**. Built with sealed, long-life DC motors, the spindles are faster than conventional spindles at most every torque level, registering **up to 170% faster** in some applications.

One controller also means **simplified programming and fewer power interface points** and Cleco's spindle controller can handle **up to 32 spindles**. This makes it a cost-effective assembly solution for applications that have high complexity and production variations.

What Are the Bottom-Line Benefits?

While the innovation behind the new BTi Intelligent spindle system with daisy chain cable is compelling, the real value lies in the operational gains and cost savings it brings to the bottom line:

up to **30%**
savings on the initial purchase

Lower Initial Cost

Overall, the architecture of the system can add up to 30% savings on the initial purchase price of the system.

High Accuracy and Productivity.

The BTi intelligent spindle system is built with productivity and accuracy in mind. In addition to spindles system's industry-leading speed and accuracy of CMK > 1.67 @ +/- 5%.

speed and accuracy of

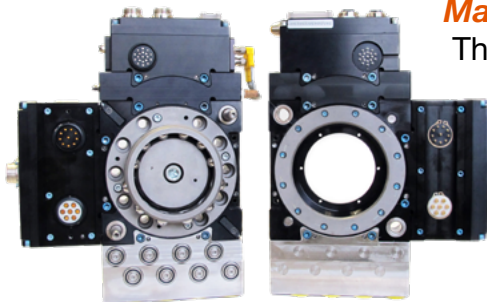
CMK > 1.67 @ +/- 5%

\$2.3M

Cost of 1 hour of downtime
in Automotive Mfg

More Uptime

The streamlined cable system reduces downtime, with a mean time between failure (MTBF) of 3 million cycles @ 80%. With experts estimating that every unproductive hour costs automotive manufacturers \$2.3 million [\[5\]](#), the benefits of BTi's productivity gains are significant. To keep mean time to repair (MTTR) low, the robotic assembly solution features a newly enhanced system for diagnostics and maintenance, complete with extensive fault logs, error codes, and troubleshooting software. When issues occur, line engineers can efficiently identify the problem and quickly get the line back on track.

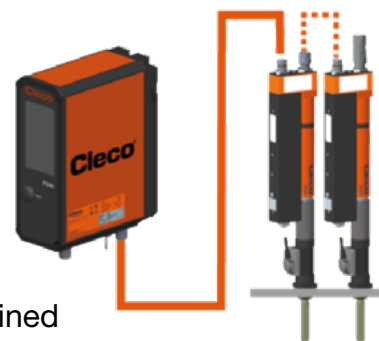


Maximum Flexibility

The architecture of the intelligent spindle system has expanded the possibilities of its use. The added benefit of the tool changer has opened up new use cases for robotic assembly that have historically been cost-prohibitive. Manufacturing operations with high complexity, large model mix scenarios, and medium-to low-cycle times can now run batches quickly. This allows manufacturers to manage greater product complexity and enables greater process flexibility, while improving cycle time and takt time. This type of agility is critical in today's market, especially as manufacturers deal with issues such as economic uncertainty, a tight labor market, rising costs, and continued supply chain stresses.

System Simplicity

Although equipped with advanced technology, the BTi Intelligent system is designed to simplify robotic assembly. Unlike the jumbled mess of cabling found in conventional spindle systems, Cleco's single-cable system takes up less production space and creates a cleaner, safer production environment. The daisy-chain design means there is only one cable to maintain—the main field cable that goes from controller to cluster of spindles. No festooning also leads to quick integration and set up, fewer replacement parts and cables, and streamlined troubleshooting. One controller running multiple spindles further simplifies system integration, operation, and maintenance.



Lower total cost of ownership

From an equipment standpoint alone, Cleco's solution offers manufacturers significant cost savings. First, many festooning-related costs are eliminated, including cables, cable management structures, and robot dress packs. The lightweight spindle system can also use robots with a lighter payload capacity, offering even more savings potential.

Intelligence Has Never Been So Easy

In an increasingly competitive market, the use of robotic assembly with smart manufacturing solutions continues to gain momentum as companies seek new ways to increase productivity and improve quality.

Cleco's patented daisy chain intelligent spindle system is designed to help manufacturers stay competitive and improve OEE, while offering substantial cost savings and opening up a whole new level of manufacturing flexibility.

Manufacturing operations can reap the productivity gains of an efficient robotic system without the need for costly festooning meaning an Intelligent solution has never been so easy.

Trusted by these leading brands



Sources

- [1] <https://www2.deloitte.com/us/en/insights/industry/manufacturing/manufacturing-industry-outlook.html>
- [2] <https://ifr.org/ifr-press-releases/news/u.s-companies-invest-heavily-in-robots#:~:text=Chicago%2C%20Apr%2030%2C%202024%20%E2%80%94,light%20vehicles%20worldwide%2C%20following%20China.>
- [3] [https://www.factmr.com/report/assembly-robot-market#:~:text=Assembly%20Robot%20Market%20Outlook%20\(2023%2D2033\)&text=Assembly%20robot%20forms%20a%20vital,at%20the%20end%20of%202022.](https://www.factmr.com/report/assembly-robot-market#:~:text=Assembly%20Robot%20Market%20Outlook%20(2023%2D2033)&text=Assembly%20robot%20forms%20a%20vital,at%20the%20end%20of%202022.)
- [4] <https://www.mckinsey.com/industries/industrials-and-electronics/our-insights/unlocking-the-industrial-potential-of-robotics-and-automation>
- [5] <https://blog.siemens.com/2024/07/the-true-cost-of-an-hours-downtime-an-industry-analysis/>

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