SYMPHONI[™] DIGITAL ASSEMBLY PLATFORM



ATS SYMPHONI[™]: REVOLUTIONIZING ASSEMBLY AUTOMATION

Welcome to the future of assembly automation with ATS SYMPHONI[™], a high-performance digital assembly platform that delivers unmatched speed, versatility, and precision.





ATS SYMPHONI[™]: Revolutionizing Assembly Automation

SYMPHONI IS THE ANSWER TO THE MAIN CHALLENGES THAT MANUFACTURERS FACE:

- Meeting just-in-time delivery (JIT)
- Reducing risk
- Moving quickly from prototype to production
- Increasing machine utilization
- Reducing floor space
- Producing multiple products

MAXIMIZE UTILIZATION, REVENUE & PROFIT

The multi-product versatility of SYMPHONI allows quick changeover to different products, maximize throughput and asset utilization. Its compact structure and lean, high-speed efficiency maximize throughput and factory space productivity.

THE ATS ADVANTAGE

SYMPHONI is brought to you by ATS, the world's leading supplier of factory automation. With years of development and proven operation, coupled with multiple patents, **SYMPHONI** is touted as the **most significant development** in automated assembly technology in 40 years.





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SYMPHONI is a **pre-configured**, **highly standardized**, **and modular** digital assembly platform. It's an innovative high-speed manufacturing solution that combines standardization and speed with gentle part handling.

SYMPHONI helps accelerate development and time-to-market, and streamlines inventory and the supply chain by producing where and when needed, ideal for the assembly of medical devices and consumer goods.



SYMPHONI offers high flexibility of pallets and robots

PRE-CONFIGURED DESIGN

It has a pre-engineered, plug-and-play design

STANDARDIZED AND MODULAR

SYMPHONI is 85% standardized and modular

ULTRA-PRECISE MOTION CONTROL

It offers ultra-precise motion control **with a delicate touch**

SYMPHONI



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• Applications



In the **life sciences and medical devices** market, SYMPHONI is recommended for autoinjectors and pens with 4 - 10 components at an output of up to 320 ppm. Perfect for process development, clinical trials, and both low-volume and high-volume production of medical devices:

- R&D
- Clinical and low-volume production
- High-volume/low-mix & lowvolume/high-mix products

In the **consumer goods** market, accelerate development and time-to-market, and streamline inventory and the supply chain for reshoring manufacturing of:

- Cosmetics
- Personal care items
- Electronics
- Roller bottles
- Foam/Spray pumps

- Toothbrush heads
- Plumbing fittings

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- Stop cock assembly
- Three-piece actuator, etc.

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Multiple Applications and Capabilities

SYMPHONI systems have been validated according to **GAMP5** and are suitable for applications in the life sciences industry. SYMPHONI Standard Libraries are additionally pre-validated before integration into a full production system.

SYMPHONI solutions are deployed in regulated environments with the data and user functionality to adhere to the **21 CFR Part 11 (FDA)** guidelines for equipment and data.

SYMPHONI standard design is compatible with **ISO 6 Cleanroom** environments.

While SYMPHONI is compatible with conventional vibratory, centrifugal bowl, and flexible feeders, the **SYMPHONI Flex Feeder**¹ offers additional benefits:

- Novel flexible solution to component feeding
- Rates: 120 150 ppm
- Up to 10 lanes
- Standard flex feeder design; no high frequency vibratory tooling
- Customized contact tooling and sorting trays
- Reduced air consumption
- Less noise² \leq 80 dBA
- 100% inspection of outgoing parts



¹ Patent pending ² Application-specific noise levels to be verified









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Pre-automation Solutions / Prototyping

Drawing upon a broad technical base and experience in multiple markets, our experts collaborate with you using a disciplined data-driven approach. Using standard SYMPHONI cells at our Innovation Center, production processes can be demonstrated through a wide range of speeds with prototype parts.

While completing design for manufacturability / design for assembly activities with confidence, a phased manufacturing strategy can be developed, and equipment investment determined.

We can show you exactly how we would optimize your future production with SYMPHONI simulations. Because SYMPHONI is **a fully digital technology, and all the components, elements and robots have been standardized,** we have developed dozens of motion profiles and corresponding simulations. These simulations yield an accurate understanding of the precision versus speed balance.

Simulations show how the same hardware can provide **flexibility for potential product changes, product variants, or even different products and processes,** perfect for life sciences and other high-risk regulated applications.

THE BENEFITS

You will be able to accurately describe full-scale production processes at the time you seek product approval and, further, can then **use the same equipment** for prototyping, clinical trials, early-stage production, and high-volume commercial manufacturing.









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SYMPHONI[™] Case in Point: Force Position Monitoring for Autoinjector Assembly

When increased demand requires higher throughput for a delicate process such as autoinjector assembly, issues can include:

- Traditional assembly processes that drive to a fixed stop position regardless of part variation,
- Breakage from increased force,
- Multiple assembly stations resulting in increased machine footprint in order to achieve the desired throughput,
- Downstream quality checks that aren't as effective as in-line monitoring.

In the Innovation Centre, the team believed they could achieve high speeds and have very precise control at all points of the assembly process. Using existing SYMPHONI technology as the foundation, the ATS team created a robust design to ensure gentle syringe assembly while monitoring on multiple critical-to-quality variables against acceptance criteria.

The assembly process is impacted by many factors: incoming part dimensional tolerance issues, insertion station alignment issues, component alignment issues, and the dynamic insertion forces on the product. Furthermore, all of these factors have the potential to change over time.

For optimized high-speed production, the monitoring system is required to have **complete force and position monitoring throughout the entire assembly process**, detecting systemic issues before rejects and waste are created.

The digital monitoring of the insert process on SYMPHONI provides the data to characterize good and reject insertions, and allows the normal and abnormal profiles to be used to identify good and rejected assemblies.

THE RESULT:

Using the SYMPHONI high-speed digital assembly platform, and a process for data acquisition and analysis throughout the assembly process, ATS was able to assemble pre-filled syringes 3x faster and with lower reject rates.







VERSATILE PRODUCT ASSEMBLY

SYMPHONI can assemble a wide range of products. Its gentle part handling respects critical process times, ensuring high-quality assembly.

SUPERTRAK CONVEYANCE[™]

SuperTrak CONVEYANCE platforms are the foundation for world-leading automation processes offering higher availability, and improved quality. A linear motion-based technology, with individually controlled shuttles for increased throughput without an increased footprint, resulting in less complex and more adaptable systems.

MODULAR DESIGN

SYMPHONI features a scalable, modular platform. Its systems are standard assets configured with product-specific touch tooling. They are rapidly deployed, easily reconfigured, and manage variants with quick, economical changeover.

ROBUST PLUG-AND-PLAY MODULES

SYMPHONI combines the best features of robotics and linear motion conveyance, continuous motion, and synchronous indexing machines, in robust plug-and-play modules equipped with high-performance hardware.

Real-time IIoT manufacturing intelligence software that drives and sustains your manufacturing OEE and factory floor management. Improve sustainability in production with the Energy & Emissions Module add-on.









Technology that Transforms

Transforming the way you invest in automated assembly with enhanced servo-based motions and e-Cams, mean a single system can run multiple product lines 24/7 with **90% less retooling**.

ORCHESTRATED MOTION. POWERFUL RESULTS.

SYMPHONI's modular building blocks are designed for plug-and-play configuration, enabling easy retooling, reordering, and repurposing to accommodate product changes.

Its control system directs and synchronizes all functions, eliminating non-value-added movement waste from cycle time, thus ensuring fluid and seamless automation performance.

Digital assembly automation technology featuring an unmatched combination of speed, versatility, and precision in a scalable, modular platform.

RSM TECHNOLOGY°

The essence of SYMPHONI is RSM Technology[®], a patented control method that maximizes the efficiency of tool motions. RSM Technology precisely coordinates the movement of SYMPHONI devices, electronically gearing them together as if they were tied to a mechanical line shaft. This technique results in astonishingly high output rates in a compact footprint.













RSM ARMS

The lightweight RSM Arm is the workhorse of the system, using two axes and servo-controlled motion to efficiently move, manipulate, load, and assemble parts. The e-Cam's variable machine rate provides significant operational flexibility enabling operation at different speeds depending on the requirements of the task.



RSM DISCS

The RSM Disc is a device that functions like a continuous motion dial, but is 90% smaller and free of the inherent mechanical constraints. It is digitally cammed to remove non-value-added cycle time by eliminating traditional escapements and stop/start in-line parts feeding. It transfers parts from an infeed system and synchronizes their motion with the SYMPHONI assembly cell.

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INDUSTRIAL AUTOMATION

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RSM WELDERS

The RSM Welder uses the same synchronized motion planning before and after welding, eliminating waste and using fewer welders as a result. When compared to other ultrasonic (US) welding applications limited to <45 cpm, the RSM Welder offers more control during welding, more opportunities for monitoring and testing, and higher weld strength. The SYMPHONI US Welder is capable of rates of 90 ppm per head, and proven in a 410 ppm platform solution – a rate 192% faster than the US weld market leader.

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Benefits

SPEED

SYMPHONI operates with astonishing speed and efficiency, eliminating non-value-added delays while carefully respecting essential process time.

CONFIGURABLE MODULES

Modules can house up to two stations that may include pick-and-place, vision for part orientation/ pre-inspection, and process-specific stations such as welders and filling heads.

STANDARDIZATION

SYMPHONI offers more output per CAPEX dollar, more output per square meter of floor space.



SYMPHONI[®] CAN ACHIEVE ASSEMBLY RATES FROM **10 – 1100 PPM**.

Performance Metrics

- Footprint: A SYMPHONI machine is 30-80% smaller in footprint than conventional equipment.
- Resolution in Motion Control: SYMPHONI offers 1 millisecond resolution in motion control.









EXPERIENCE TRANSFORMATIVE CHANGE FOR YOUR BUSINESS WITH ATS SYMPHONI[™]



FOR MORE INFORMATION AND TO SEE SYMPHONI IN ACTION, PLEASE VISIT OUR WEBSITE.

Contact us at symphonitech@atsautomation.com

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SYMPHONI[®] ASSEMBLY TECHNOLOGY