WHITE PAPER

IO-Link Enabled cGMP Biopharma Washer

Reducing Device Downtime in the Pharmaceutical Industry

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Abstract

Reducing downtime in the pharmaceutical industry is critical as it directly impacts production efficiency. Implementing technology that can help reduce commissioning and unexpected equipment servicing needs minimizes overhead costs. The resulting increased uptime can lead to improved production safety by avoiding potential quality control issues that result from undetected performance fluctuations, helping to maximize uptime. Increased uptime can also reduce drug shortages caused by manufacturing disruptions.

For these reasons, Getinge has integrated IO-Link technology into the Getinge GEW 888 neo, a compact cGMP biopharmaceutical washer/dryer designed for small cleanrooms and clean spaces. IO-Link enables real-time monitoring of critical parameters like temperature, pressure, detergent flow, and conductivity through integrated sensors.

This technology ensures high precision and dependability, supporting consistent and validated cleaning processes. The bidirectional data transfer and enhanced diagnostics capabilities of IO-Link facilitate precise monitoring, reducing downtime and operational costs. The global acceptance and fieldbus neutrality of IO-Link ensure easy integration into facility-wide automation systems and simplifies and shortens commissioning and installation times. Overall, the integration of IO-Link technology in the Getinge GEW 888 neo washer significantly enhances operational reliability and efficiency in pharmaceutical and cleanroom environments.

Glossary:

Analog Signals
Electrical signals that can represent physical quantities like sound, temperature, or pressure through a continuous wave that should change smoothly over time. Because of this continuous wave, they are more susceptible to external factors, such as noise, which can impact accuracy.

Digital Signals
Use discrete values, such as 0s and 1s, to convey information. Digital signals have a higher level of resistance to noise and interference, which results in improved accuracy when transmitting and reproducing data, particularly over long distances or with complex information. They are also easier to identify as either "on" or "off" states.

Fieldbus Neutrality
This means a device is designed to enable connection to nearly any fieldbus, making it a globally accepted solution that works for all automation environments long-term.

Industrial Fieldbus
A form of digital communication used to link industrial field devices, like sensors, actuators, and controllers, with a control computer. It allows for real-time exchange of data and control signals between different components.

Industrial Internet of Things (IIoT)
A system of interconnected devices that gather, exchange, and process information to enhance industrial operations. This technology links sensors, tools, and automated devices via the Internet to industrial software.

I/O
Computers communicate with the external environment via I/O, or input/output, technology, which allows them to send and receive data.

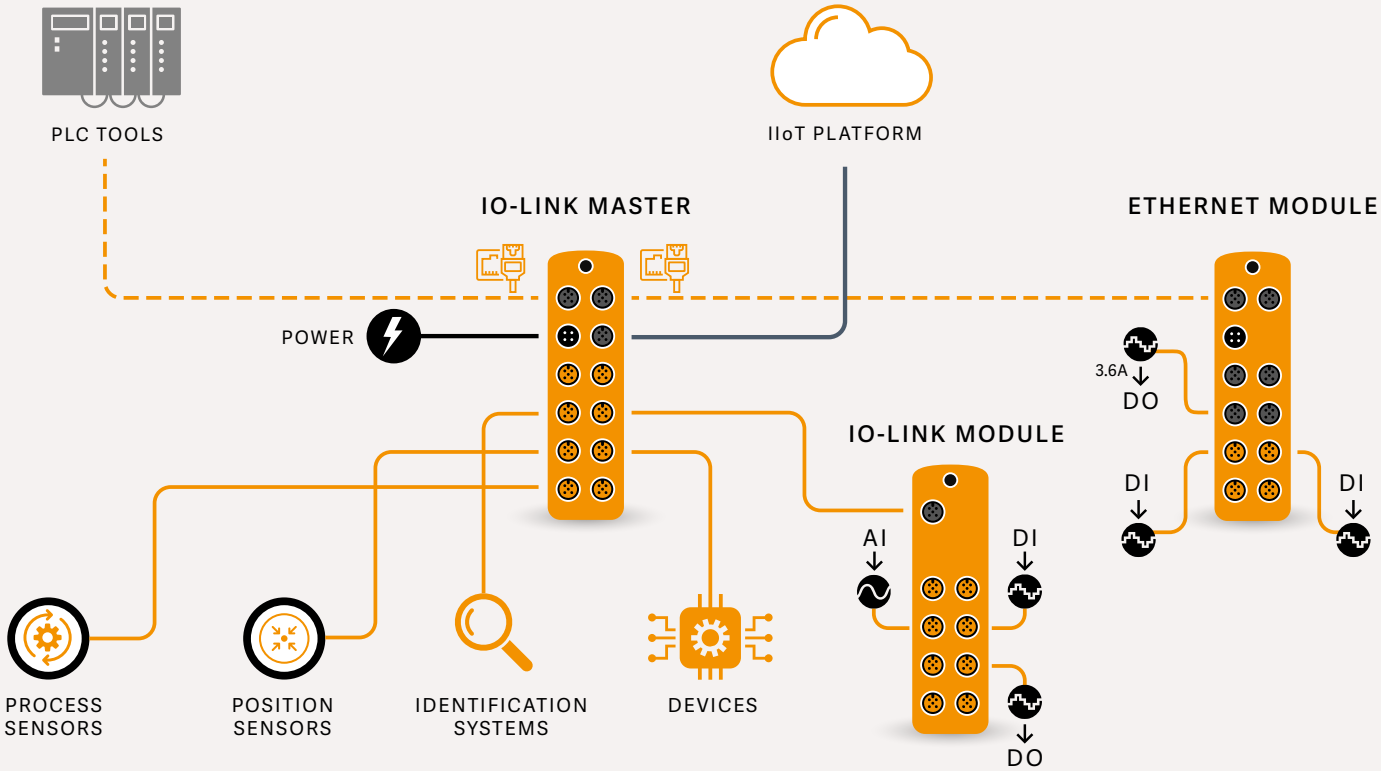
Point-to-Point Communication (P2P)
Refers to a direct exchange of data between two devices that is accomplished using cables or virtual connections across a network.

Sensors & Actuators
Automation systems rely on sensors to gather data from connected devices and actuators to perform certain actions in our system.

Introduction

Through the Industrial Internet of Things (IIoT), biopharmaceutical producers, QC laboratories, pilot plants, and other cGMP and cleanroom applications can improve operational efficiency. IIoT capabilities offer numerous benefits, including remote monitoring and control, predictive maintenance, faster compliance, and improved uptime. Maintaining precise process parameters and monitoring for possible issues in real time provides invaluable efficiency that can help significantly reduce unplanned downtime.

In determining the best technology, it is important to select a solution that is easy and cost-efficient to incorporate into existing infrastructures or new industrial automation systems. Adopting a solution with fieldbus neutrality can help ensure compatibility and enable standardization between factory devices.



Getinge GEW 888 neo

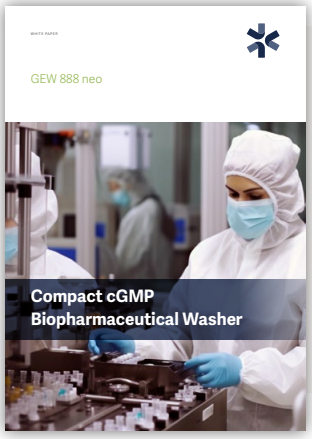
As the demands of pharmaceutical manufacturing and industrial automation technology continue to see rapid advancements, Getinge is committed to keeping pace to meet customer needs. The Getinge GEW 888 neo is a compact cGMP biopharmaceutical washer that provides validated component cleaning. It is designed to meet high throughput washing and drying needs in small cleanrooms and clean spaces with highly consistent, repeatable component cleaning results.

The IO-Link interface enables seamless connection with other devices in the IIoT, helping you standardize devices across your facility. Real-time, digital monitoring of temperature, pressure, detergent flow, and conductivity through integrated IO-Link sensors enables unprecedented monitoring of device performance. High throughput coupled with enhanced diagnostics further improves efficiency and uptime.

Getinge GEW 888 neo cGMP Washer/Dryer

The Getinge cGMP GEW 888 neo is an innovative solution that combines compact design with high throughput, making it an ideal fit for cleanrooms where space is at a premium.

Specifications: https://www.getinge.com/int/products/gew-cgmp-888-neo/



White Paper: Compact cGMP Biopharmaceutical Washer

With cleanroom space at a premium, it can be challenging to find a high throughput cGMP washer that provides the requisite quality for cleanroom use in a compact footprint.

Learn more: getinge.com/int/products-and-solutions/pharmaceutical-production/

Understanding the Capabilities and Benefits of IO-Link

The development of IO-Link has changed the face of field device communication capabilities. It is the first sensor and actuator-based I/O technology to get accepted as an international standard (IEC 61131-9).[1] The utilization of the IO-Link communications protocol has seen dramatic growth over the last decade. According to figures published by PROFIBUS & PROFINET International (PI), a total of 51.6 million IO-Link nodes have been installed worldwide as of the end of 2023.[2]

The use of a completely digital signal offers improved precision and dependability compared to an analog signal. This also allows for more consistent processes and ongoing validation through the use of sensor-generated predictive data.

What is IO-Link

IO-Link is the foundational technology of the IIoT and is able to quickly fit into existing control systems. It connects sensors and actuators to control systems, providing a point-to-point interface that ensures secure, lossless, and interference-free data transmission. By using digital (numeric, rather than analog) signals, IO-Link provides more accurate data from your connected devices. IO-Link facilitates bidirectional data exchange between the system's master device, sensors, and actuators.

How it Works

IO-Link master: A dedicated device that acts as the interface between the controller (like a PLC) and the IO-Link sensors.

Standard cable: IO-Link sensors connect to the master using a single, standardized 3-wire cable, simplifying wiring.

Data transmission: The IO-Link master communicates with each sensor digitally, allowing for the transfer of complex data beyond just basic on/off signals.

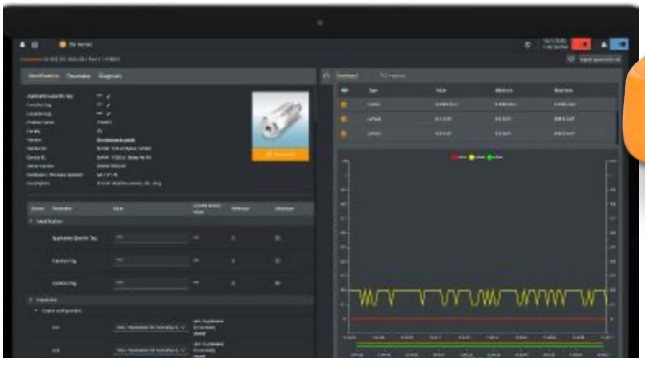
Installation & Commissioning

IO-Link greatly reduces commissioning time. The configuration file verifies and validates sensing and network devices automatically at the same time. Manual parameter setting of each device is eliminated. Instead, configuration data is digitally communicated directly from the control system to the sensor or actuator. The use of bidirectional digital communication eliminates the need for calibration, further reducing installation and commissioning time. These features significantly reduce installation, commissioning, and the need for repeated interval SOP recalibration, resulting in less downtime and reduced equipment operational costs.

Maintenance & Repair

Ease of service – reduction of downtime: Through point-to-point device communication, IO-Link provides location-based, point-of-issue diagnostics on connected systems, simplifying service calls. After verifying the sensor value, a customer service technician only needs to replace the sensor if a deviation is detected. The system recognizes the sensor and automatically carries over all configurations made on the previous sensor. This automatic device replacement and verification makes maintenance "plug-and-play," significantly reducing overhead costs and device downtime.

When used with software to monitor device performance data, IO-Link can be used for preventive maintenance.



Conclusion:

The Getinge GEW 888 neo cGMP washer represents a significant advancement in cGMP biopharmaceutical automated washing and drying processes. By leveraging advanced IO-Link technology the GEW 888 neo integrates seamlessly into new and existing IIoT automation systems. The use of IO-Link enables remote monitoring and control, enhanced diagnostics, faster compliance, improved uptime, and significantly reduces installation and commissioning times. Furthermore, maintaining precise process parameters and monitoring for possible issues in real-time provides invaluable efficiency that can help reduce unplanned downtime and simplify necessary maintenance.

The Getinge GEW 888 neo is designed to ensure precise control and real-time monitoring of critical parameters. It is an ideal solution for small cleanrooms and cGMP environments. The seamless connectivity of the GEW 888 neo further underscore its role in enhancing overall efficiency and reliability.

Standardized communication: IO-Link is an internationally accepted standard for IIOT. As such, sensors from Getinge and other manufacturers can communicate with the same IO-Link master, streamlining your facility's automation.

Bidirectional data transfer: Expanded communication capabilities allow for monitoring and control of sensor settings. Unlike simple sensors that can only provide sensor readings (data sent to the controller), bidirectional data transfer of IO-Link sensors also enables the controller to send commands to change sensor settings.

Enhanced diagnostics: Highly accurate diagnostic data of several device parameters helps reduce downtime. When a condition exceeding a preset threshold is detected by a sensor it generates alarms and alerts so you know of a potential problem as soon as it occurs.

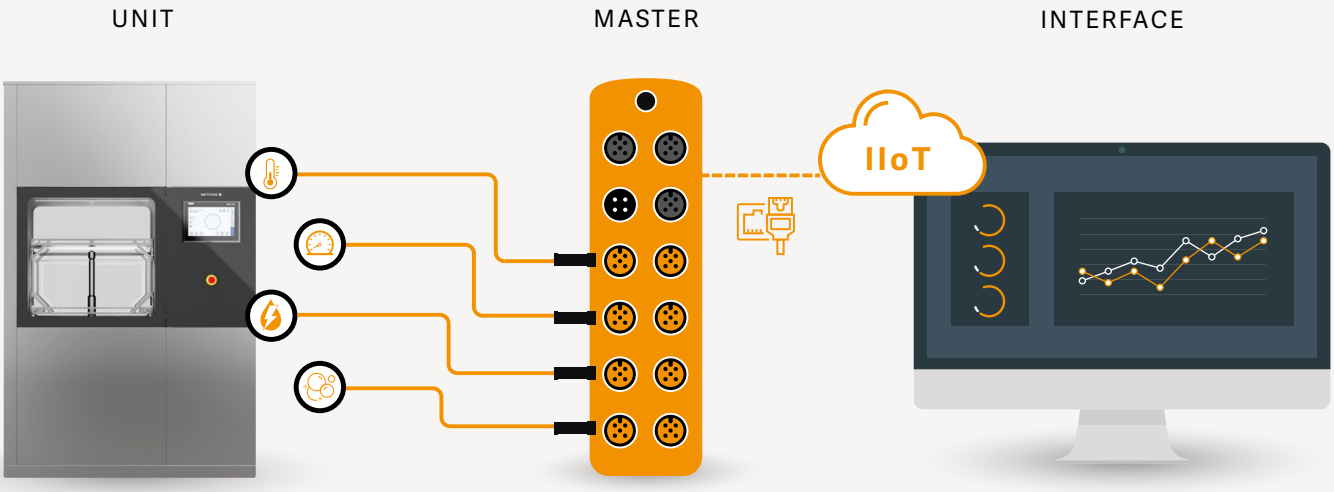
Key IO-Link Benefits:

Level Sensor 

Flow Sensor 

Pressure Sensor 

Temperature Sensor 



*Options can be added that could change the number of sensors.

Getinge Technical Services

We offer a complete range of technical services designed to maximize the useful life and long-time value of your investments. With enhanced diagnostics and a variety of preventive service plans, we make sure your equipment delivers optimal performance over its entire lifetime.

Learn more: https://www.getinge.com/int/services/technical-services/

Complete Line of Sterile Isolators

ISOFLEX Isolators

ISOPRIME Isolators

ISOFLEX-S Isolators

ISOTEST Isolators

Complete Range of cGMP GEW Washer/Dryers

GEW 888 neo
480 L (17 cu.ft.)

GEW 9109
810 L (29 cu.ft.)

GEW 101210
1212 L (43 cu.ft.)

GEW 131313
2146 L (76 cu.ft.)

GEW 131820
4680 L (165 cu.ft.)

Pharmaceutical Production Solutions

Getinge is an industry leader in product solutions for pharmaceutical production sterility testing, API handling and aseptic transfer. Our isolation technology and isolator manipulation devices are trusted worldwide to provide a safe and controlled environment for your most critical steps.

Learn more: getinge.com/int/products-and-solutions/pharmaceutical-production/

References

1. "IO-Link System Description: Technology and Application." IO-Link, March 2018. https://io-link.com/share/Downloads/At-a-glance/IO-Link_System_Description_eng_2018.pdf.
2. "New Record Figures for IO-Link Technology." IO-Link. April 23, 2024. https://io-link.com/en/Global/newsmeldung.php?showId=1267#:~:text=In%20its%20annual%20survey%20of,by%20the%20end%20of%202023.

GETINGE

With a firm belief that every person and community should have access to the best possible care, Getinge provides hospitals and life science institutions with products and solutions aiming to improve clinical results and optimize workflows. The offering includes products and solutions for intensive care, cardiovascular procedures, operating rooms, sterile reprocessing and life science. Getinge employs over 10,000 people worldwide and the products are sold in more than 135 countries.

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