

nanotronics



ADVANCED PROCESS CONTROL FOR NEXT GEN MATERIALS



~170 EMPLOYEES

~300+ PATENTS*

200+ CUSTOMERS

**GLOBAL PLATFORM DEPLOYED
ACROSS 15 COUNTRIES**

- Nanotronics is an artificial intelligence and deep tech company solving the unique inspection and process control challenges of precision manufacturing.
- Nanotronics' flagship product, nSpec[®], is advanced optical inspection system used in precision manufacturing processes.
- Nanotronics SaaS AIPC[™] platform, is a full factory solution utilizing both hardware and software to automate and steer production pipelines that enable intelligent, self-inspecting, self-optimizing factories to function securely utilizing real-time data.
- Fully redundant and vertically integrated manufacturing facilities within the United States.
- Customers include leading-edge companies across large and diverse end-markets, including semiconductors, aerospace, automotive, healthcare, and consumer electronics.

COMBINING MICROSCOPY, ARTIFICIAL INTELLIGENCE, AND ROBOTICS, NANOTRONICS IS BUILDING THE TOOLS TODAY FOR THE FACTORY OF TOMORROW.

**Issued and pending worldwide*



Nanotronics



OVER 200
GLOBAL
CUSTOMERS



4 PATENTS

13 PATENTS

20 PATENTS

45 PATENTS

300+ PATENTS [ISSUED & PENDING]

2010

2011

2012

2013

2014

2015

2016

2017

2018

2019

2020

2021

2022

2023

FIRST SUPER-RESOLUTION PATENTS

FIRST nSPEC™ SALE TO ASIA

FIRST nSPEC™ FOR LIFE SCIENCES

FIRST QUANTUM COMPUTING INSTALLATION

FIRST GENERATIVE AI PATENTS

nCONTROL™ DEPLOYMENT

nSPEC™ SUBSCRIPTION MODEL

OPENS FIRST OHIO OFFICE

FIRST nSPEC™ SALE TO COMPOUND SEMI CUSTOMER

FOUNDERS FUND LEADS SERIES B ROUND

ACQUISITION OF NANOTRONICS AUTOMATION IN HOLLISTER, CA

ICD LEADS SERIES D ROUND

SUCCESSFUL PROOF OF CONCEPT GENERATIVE AI FOR MANUFACTURING

FIRST AUGMENTED REALITY PATENTS

RIBBON CUTTING FOR FLAGSHIP FACTORY IN HISTORIC BUILDING 20

FIRST nCONTROL™ FOR SEMICONDUCTOR CUSTOMERS

FIRST USE OF AI FOR nSPEC's™

AI DEPLOYED ON ALL nSPEC's™

FIRST GENOMICS CUSTOMER

OPENING OF MUNICH OFFICE

PRODUCTS

nSPEC™

nSPEC™ 2

nSPEC™ 3D

nSPEC™ CPS

nSPEC™ WIFT

AIPC™

nTELLIGENCE™

nCONTROL™

nCONTROL™ SECURITY

nCONTROL™ LIVE

nSPEC™ TURBO

nSPEC™ PRISM



The Nanotronics Ecosystem

AIPC™

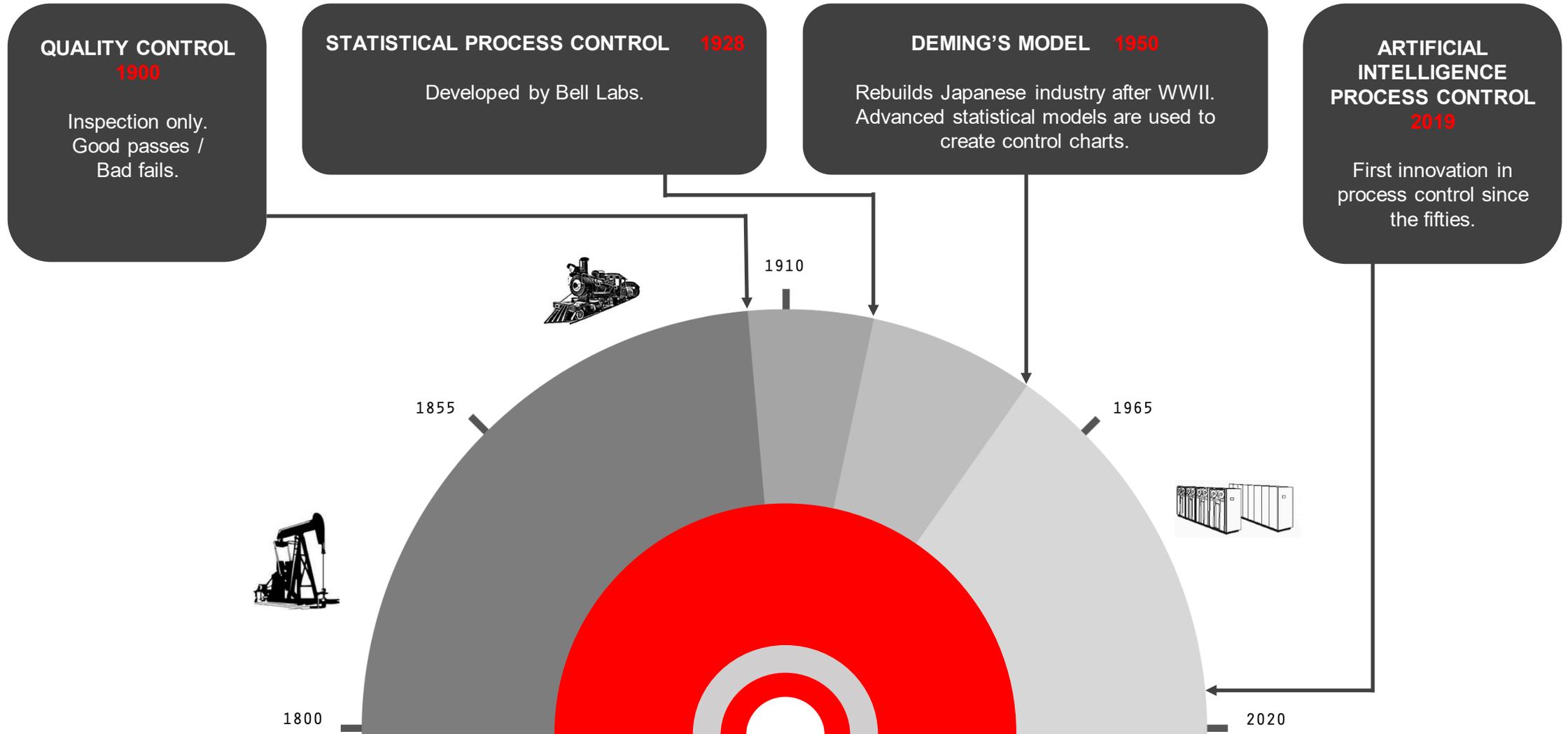
- Utilizing effortlessly expandable modular fabrication plants adaptive to specific applications that can be replicated and deployed in multiple locations.
- The platform is modular and configurable to accommodate end application, location, and materials.
- A full-service platform enabling accelerated electronic device manufacturing through leveraging our AIPC™ technology.

nSpec®

- Artificial Intelligence (AI) powered, vertically integrated, super-resolution, high throughput microscope used to inspect the world's most advanced technologies, including semiconductors, electronics, genomics, EVs, aerospace hardware, nanomaterials, biotech, quantum, and more
- Combines AI, optical microscopy and robotics to detect and classify defects and provide feedback to the process
- Increases yield, reduces footprint and waste, reduces costs and accelerates design iteration
- Eliminates laborious manual inspection

nControl™

- Uses reinforcement learning, generative AI, and other deep-learning networks to make truly intelligent self-inspecting, self-optimizing factories a reality
- nControl™ harnesses data that smart factories and infrastructure are already generating to anticipate problems in the process and implement a solution
- Improves yields, significantly reduces by-products, shortens supply chains and controls costs and carbon footprint, while fostering higher levels of creativity and innovation





Cutting Edge AI Technology

Generative AI

Multi-Modal Learning

Natural Language Processing

Computer Vision

nSpec™

A LEADING ARTIFICIAL INTELLIGENCE PLATFORM FOR PROCESS CONTROL AND SECURITY



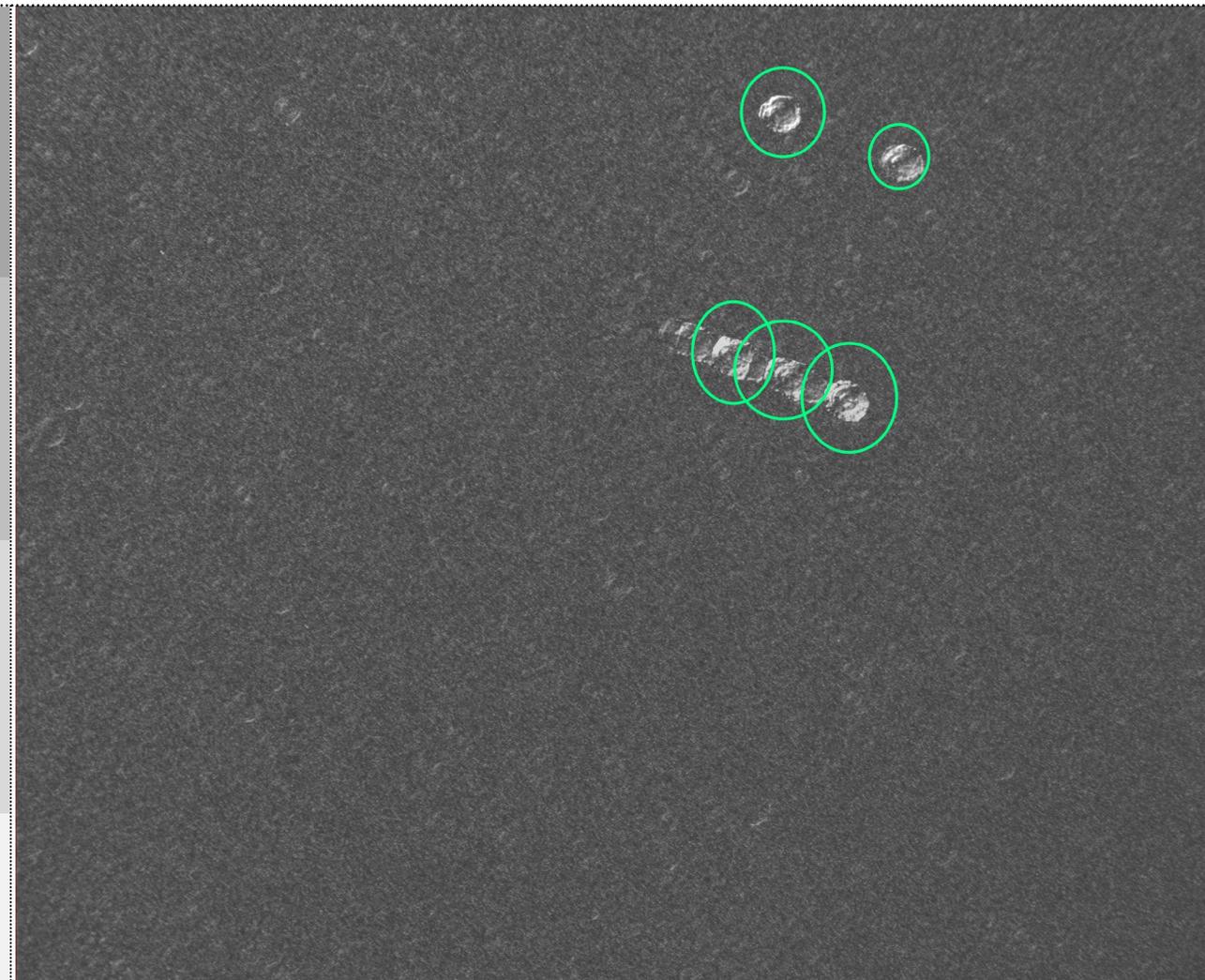
THE FIRST TO BRING AI TO OPTICAL INSPECTION

nSpec™'s uses AI modeling to detect and classify defects, bridging the substantial gap in research models and industry deployed models.

Eliminates the need for manual inspection because nSpec™ AI platform identifies subtle different between defect types or alternative processing methods.

Offers a generalizable solution for customers regardless of the step in the production process or product.

Enables our customers to identify the causes of defectivity in their process reducing the amount of re-work, waste, and power consumption.



AUTOMATICALLY IDENTIFYING CAUSE AND EFFECT

Integrating AI Powered Optical Inspection Into Your Process

[1]



[2]



[3]



[4]



[5]



1. **nSpec® LS** : Lab series for R&D and process development.
2. **nSpec® PS** : Fully-automated system for high volume manufacturing settings.
3. **nSpec® CPS** : Cabinet series for highly controlled environments, with multiple load ports.
4. **nSpec® TURBO** : Revolutionary, lightning-fast throughput with all capabilities of nSpec® CPS.
5. **nSpec® nPATH** : Groundbreaking multiple modalities Fluorescence, PLUV and flexible image; well suited for microfluidics and biological applications.

FUELED BY AIPC™

A LEADING ARTIFICIAL INTELLIGENCE PLATFORM FOR PROCESS CONTROL AND SECURITY



THE FIRST GENERATIVE AI PLATFORM FOR MANUFACTURING AND INFRASTRUCTURE

nControl™ Monitoring

Data Management

Delivering real-time analytics that provide process monitoring and autonomous control based on customer's goals and process variables. nControl™ allows customers to scale, reduce waste, and save on operational costs.

nControl™ Feedback

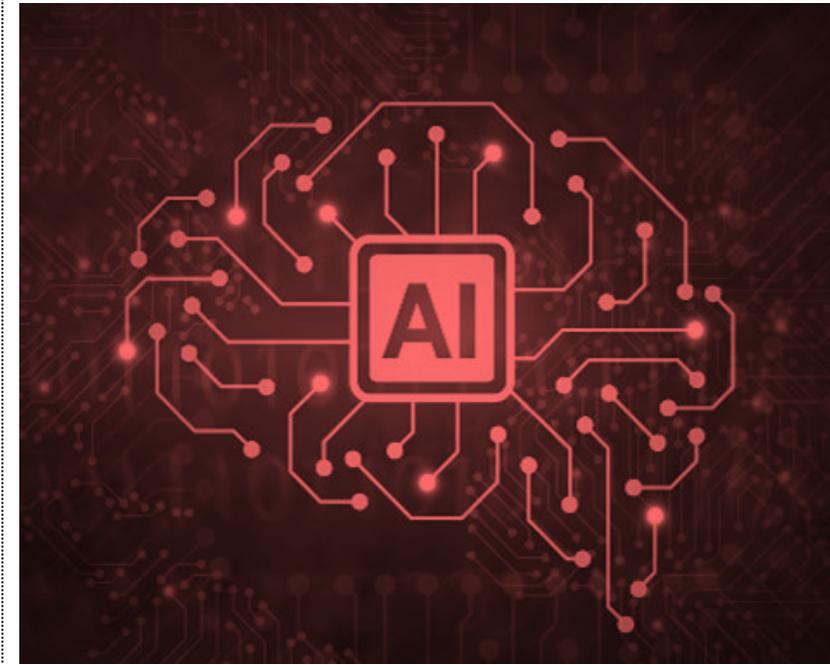
Quality Prediction

nControl™ observes anomalous patterns indicative of process failure, or if it predicts a drop in KPIs, operators will be alerted so they can take corrective action. By predicting process failures before they occur, nControl™ can localize impending failures to pieces of equipment that need repair or replacement.

nControl™ Security

Process Reliability

Producing an alerting system that informs operators and other personnel of process anomalies or potential malicious attacks. nControl™ Security addresses security issues such as the "Evil PLC" or man-in-the-middle attacks with critical infrastructure.

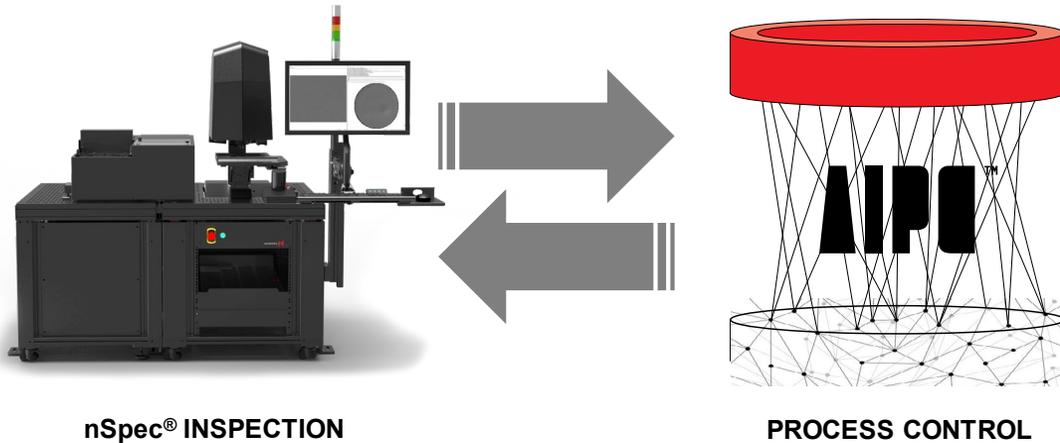


Tying in the Ecosystems

WHAT IS AIPC™

- The AIPC™ platform is an intelligent, self-inspecting and self-optimizing process control system to autonomously correct for irregularities
- Utilizes fundamental nSpec® technology to innovate to legacy process control
- Harnesses data that factories are already generating

THE OBSERVATION LEADS TO CONTROL



CASE STUDY

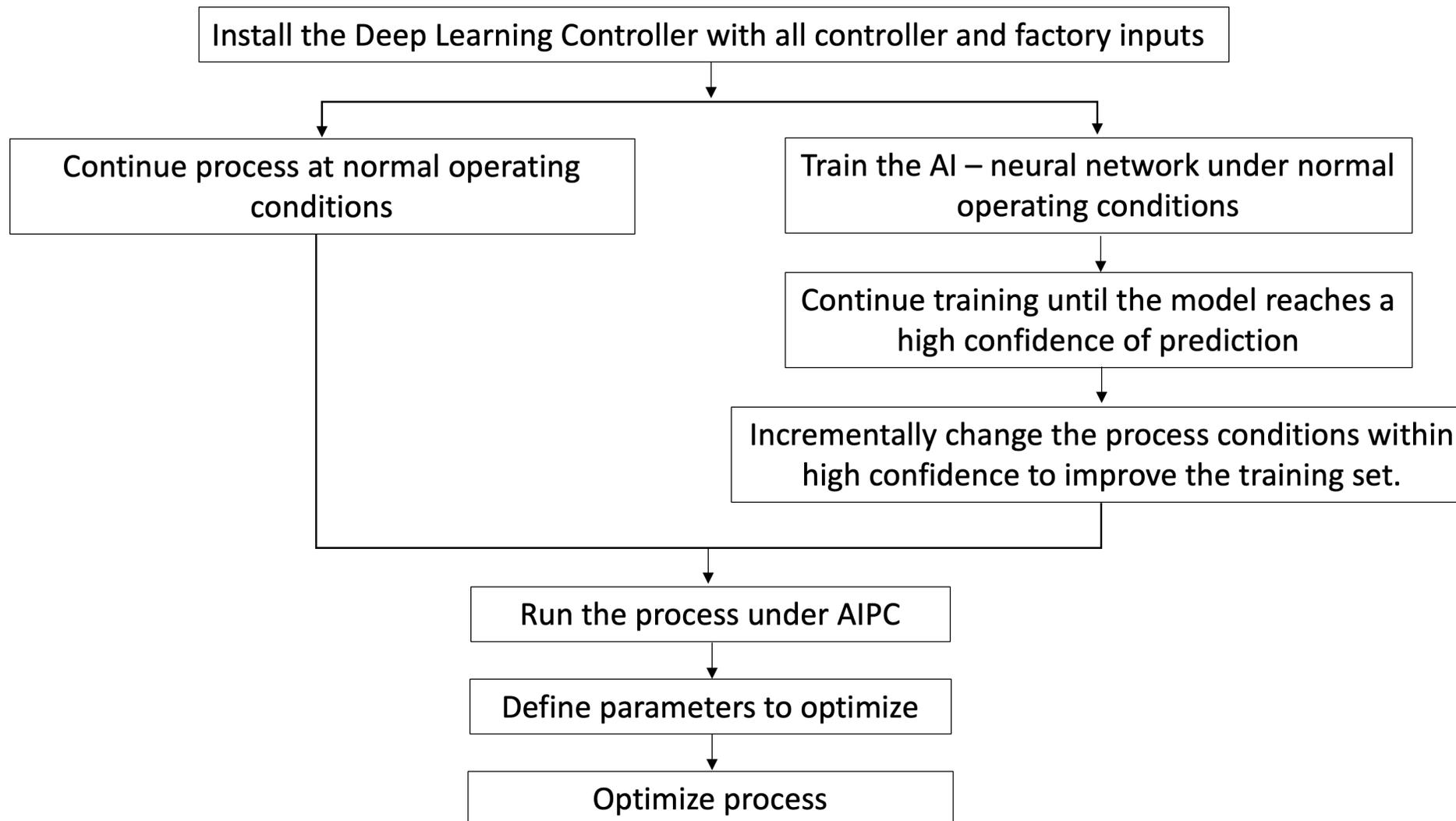
AIPC™ SECURITY FOR CHEMICAL MANUFACTURING AT SOLUGEN

Solugen used AIPC™ in their peroxide manufacturing process to characterize typical function and detect anomalies at the system level, indicating suspicious activity likely to affect yields or CQAs. Sensor splitting and Deep Learning Controllers deployed to remove PLC monitoring as a single point of failure.





Zero Process Downtime



A FULL FACTORY SOLUTION

A LEADING ARTIFICIAL INTELLIGENCE PLATFORM FOR PROCESS CONTROL AND SECURITY





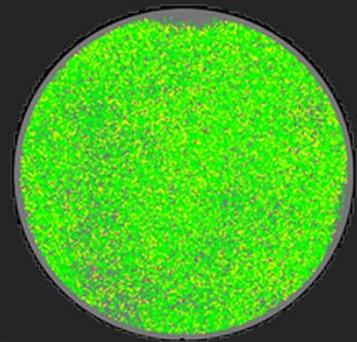
Tighter Control of Manufacturing



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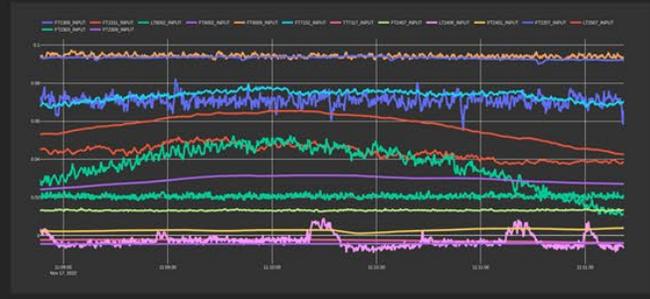
REACTOR SENSORS



Overall Uptime

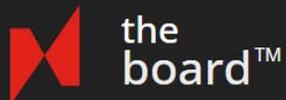
5%

+ Add Event





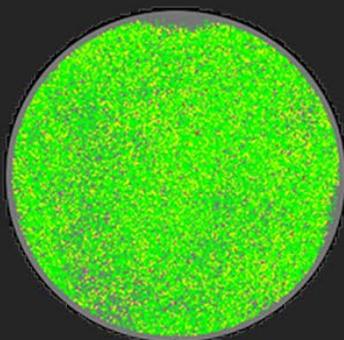
Track and Monitor Production Quality on Lots and Batches Overtime



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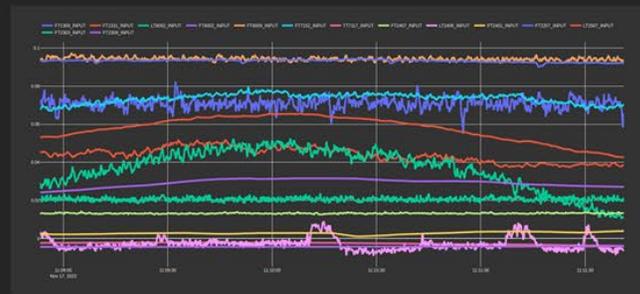
REACTOR SENSORS



Overall Uptime

5%

+ Add Event



IN CONCLUSION

A LEADING ARTIFICIAL INTELLIGENCE PLATFORM FOR PROCESS CONTROL AND SECURITY





The Facility of Tomorrow Today

nControl™ can monitor and control commercial, residential, or industrial facilities.

It can use sensors and remote control of HVAC and IoT infrastructure to measure, predict, and improve outcomes such as:

- Air quality
- Temperature control
- Energy consumption
- Emissions
- Fire safety





Reduce Downtime and Costs

nControl™ monitors patterns in sensor data to detect when equipment performance is degrading.

This triggers alerts for equipment maintenance or replacement.

nControl™ alerts avoid “alarm fatigue” by ONLY calling for unscheduled maintenance when the model predicts a harmful impact on overall facility performance or safety.



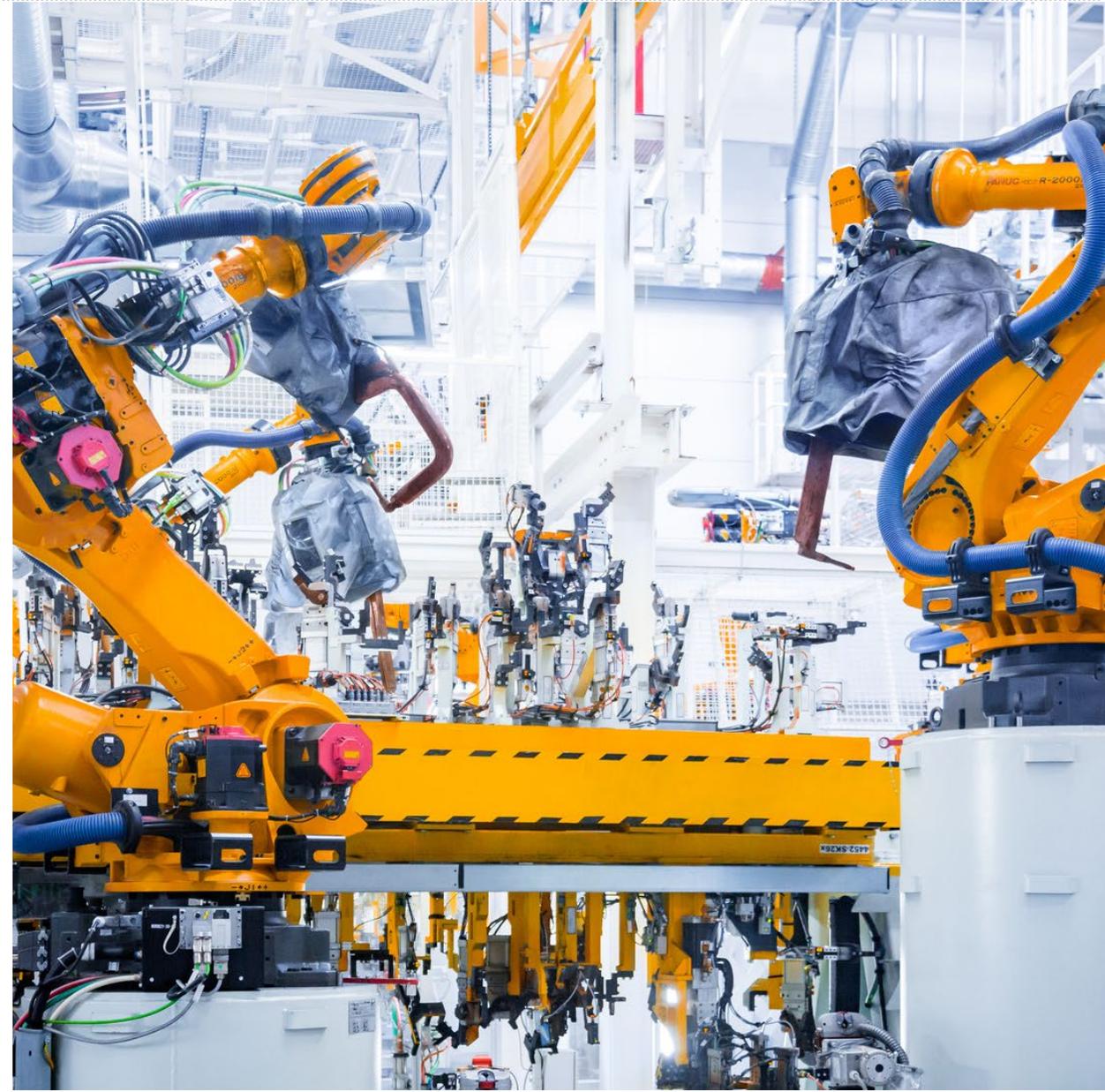
AI-Driven Self-Inspecting Process Control

Ingests real time data from a company's existing sensors and actuators.

Generates an interpretable AI model of the whole production process including all large-interconnected systems.

Monitors, analyzes, and predicts performance metrics, including output, quality and safety parameters.

Predicts optimization of processes in real-time with adaptive control to improve performance metrics.



THANK YOU

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