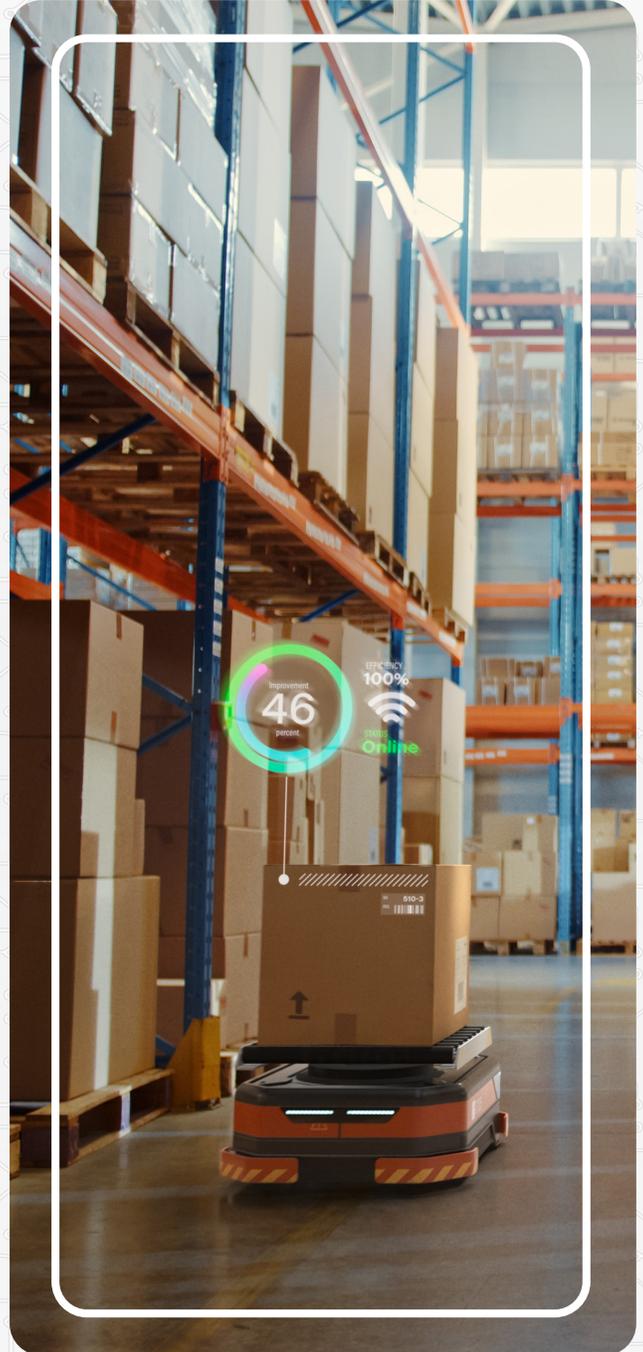# SmartLogistics 4.0

Commercial growth is driven by efficiency. The explosion of digital commerce has driven companies to invest heavily in automated logistics processes to enhance their supply chain. Automated warehouses, robotic delivery systems, machine vision driven quality control, and electronic identification systems are common in every business. These businesses need skilled technical teams to ensure the sophisticated logistics environments are installed, maintained, operated, and can be adapted if changes are required.

Training for Smart Logistics Professionals

Industry 4.0 is centered around the integration of systems that are sharing and using data to modernize processes and manufacturing. Smart logistics uses Industry 4.0 concepts and technologies to keep businesses competitive in this fast-changing world.

To keep up with the rapid changes in industry and logistics environments adopting new technologies, training programs and certifications for skilled employees need to focus on a multi-discipline approach. Employers need workers who are technically advanced, process savvy, and natural

problem solvers to take on roles in the ongoing installation, troubleshooting, and improvement of industry 4.0 logistics systems.

The Intelitek SmartLogistics 4.0 solution is a training program populated with Industry 4.0 technology to educate students not only on how these components work but how they work together. With the focus on advanced logistics technologies and how they are integrated to deliver automated systems, the platform is an ideal environment to delve into Industry 4.0 skills like advanced communication, Internet of Things, data analytics, and automation.
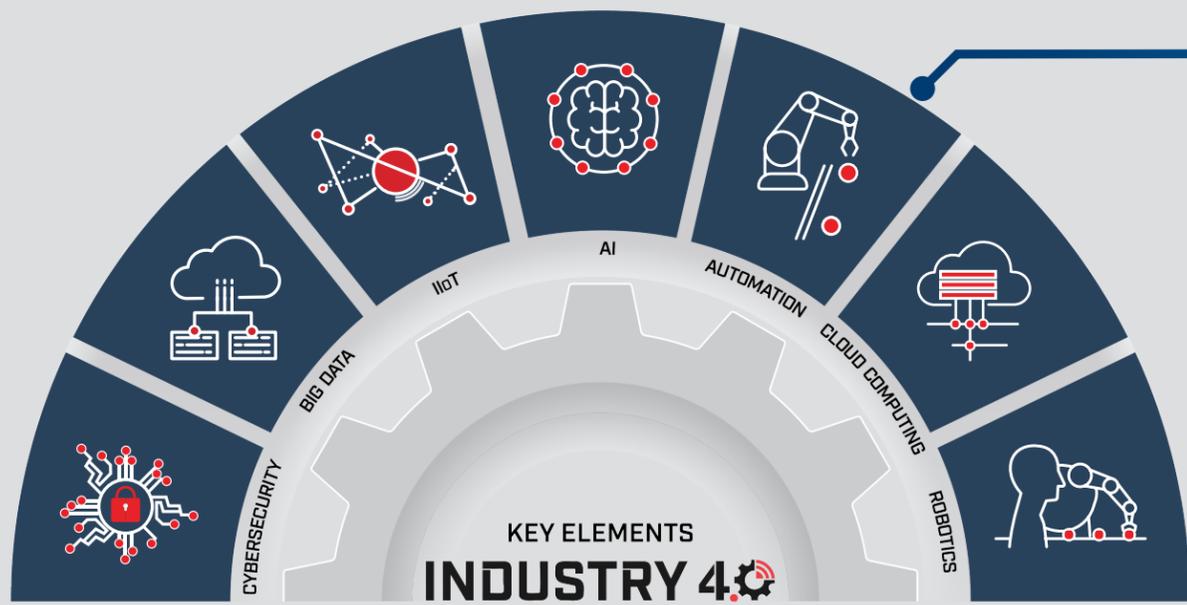
Building Expertise in Industry 4.0 Technologies

Intelitek SmartLogistics 4.0 Training Program with Industry 4.0

Intelitek's SmartLogistics 4.0 platform is an integrated, end-to-end process with real industrial equipment capable of working with real products. The cell has all the components found in state-of-the-art smart warehouses and is used to train students of all levels about logistics automation and Industry 4.0 concepts.

Centered around an AMR (Autonomous Mobile Robot), the system integrates automated storage, robotics, assembly, sorting, packing and palletizing so learners gain hands-on experience and are able to implement the skills and smarts they learn in the workplace.

The Intelitek SmartLogistics 4.0 solution is designed to introduce career tech education and engineering classrooms to the industrial automation and applications typical in modern logistics settings and to create skilled workers prepared for jobs in these industrial environments.
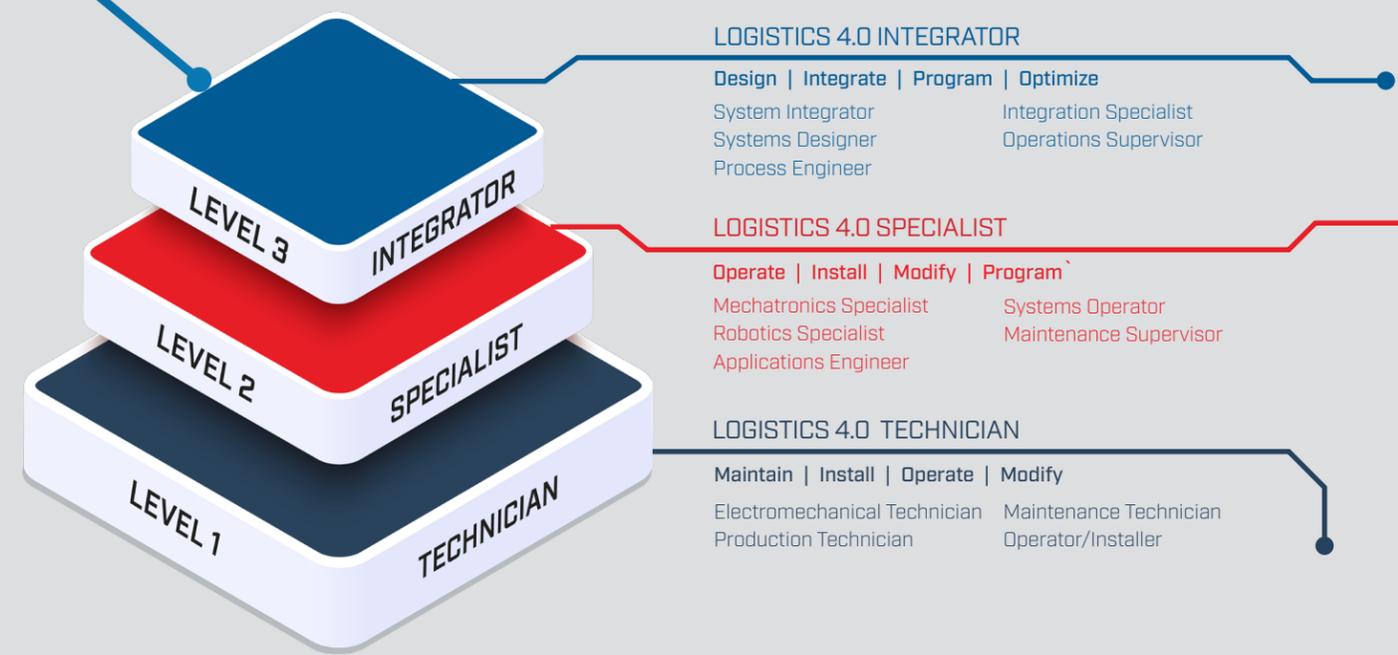
Taking a system-based approach, SmartLogistics 4.0 deals not only with individual components of training for industrial logistics, but also with networking and communications, systems integration, and the essential employability skills students need.

SmartLogistics 4.0 at a Glance

- Capstone education ecosystem for students to actively practice what they learn
- Includes curriculum for all components of the solution with a focus on system integration
- Centered around an advanced industrial Autonomous Mobile Robotics (AMR) platform
- Teaches Robotics, Smart Sensors, PLCs, Machine Vision, IoT, Networking, Integration, Automation, and more
- Training environment leading to certification
- Hands-on, job-ready skills training for an in-demand career path in industry

KEY ELEMENTS
INDUSTRY 4.0

BIG DATA | IIoT | AI | AUTOMATION | CLOUD COMPUTING | ROBOTICS | CYBERSECURITY

Careers in Logistics

LOGISTICS 4.0 INTEGRATOR

Design | Integrate | Program | Optimize

System Integrator — Integration Specialist
Systems Designer — Operations Supervisor
Process Engineer

LOGISTICS 4.0 SPECIALIST

Operate | Install | Modify | Program

Mechatronics Specialist — Systems Operator
Robotics Specialist — Maintenance Supervisor
Applications Engineer

LOGISTICS 4.0 TECHNICIAN

Maintain | Install | Operate | Modify

Electromechanical Technician — Maintenance Technician
Production Technician — Operator/Installer

LEVEL 3 — INTEGRATOR
LEVEL 2 — SPECIALIST
LEVEL 1 — TECHNICIAN

Partnering with Industry for Certification

Partnering with leading certification bodies like NIMS as well as industry leading vendors like Rockwell, Siemens, Cognex, and Yaskawa to deliver certifications, Intelitek has aligned our curriculum to industry recognized credentials. Using the Intelitek blended learning solutions with e-learning content, simulations, and training equipment students can gain the skills and credentials they need to advance in their careers.

Certification framework aligned with:

NIMS
ITM & Industry 4.0
Smart Standards

Micro-Credentials
- Yaskawa Robotics
- Cognex Machine Vision
- PLC Programming

YASKAWA

AB Allen-Bradley
by ROCKWELL AUTOMATION

COGNEX

SIEMENS

It's All About Employability

The concepts of Industry 4.0 center around multi-disciplinary systems and integration. Industry employers are searching for candidates who have technical skills as well as employability skills.

Smart Logistics is being implemented in every industrial company and the shortage of qualified technical staff ensures that students taking on this program to learn the fundamental concepts of smart warehousing and logistics are guaranteed long-term and well-paid jobs.

Components of the Smart Warehouse

- Smart tracking and inventory systems
- Industrial Internet of Things (IIoT)
- Autonomous mobile robots (AMR)
- Smart shelf and storage systems
- Robotic arms and robotic material handling
- Software for monitoring and control

Areas of knowledge for Smart Logistics

- Robot Programming and navigation
- Safety guidelines and collision prevention
- System automation programming
- Machine vision
- Assembly, sorting and palletizing
- System integration

Logistics 4.0 for Classroom & Lab Education

As with all technology training, it is essential to ensure students have the core theory as well as hands-on practical knowledge. Practical experience through project-based learning, lab exercises, and capstone projects prepare students for work in industry. Intelitek SmartLogistics 4.0 training program includes integrated platforms where students can practice with the technologies on actual industrial processes.

STANDALONE

STANDALONE LAB

State-of-the-art lab includes automated storage (ASRS), an AMR, industrial robotic arms, and materials handling for assembly, palletizing and packaging to augment advanced manufacturing training programs.

INTEGRATED

INTEGRATED INDUSTRY 4.0

SmartLogistics 4.0 with an AMR integrated into the Intelitek SmartCIM 4.0 uses robotics, machining, and mechatronics training to introduce the industry's most advanced capabilities to students.

Curriculum: Smart Warehouses for Industry 4.0

The online e-learning curriculum accompanying the SmartLogistics 4.0 solution is a combination of core learning courses and a program specifically focused on smart logistics. The curriculum is delivered through Intelitek's advanced LearnMate LMS and includes self-paced or instructor-led learning, labs, exercises, and evaluations.
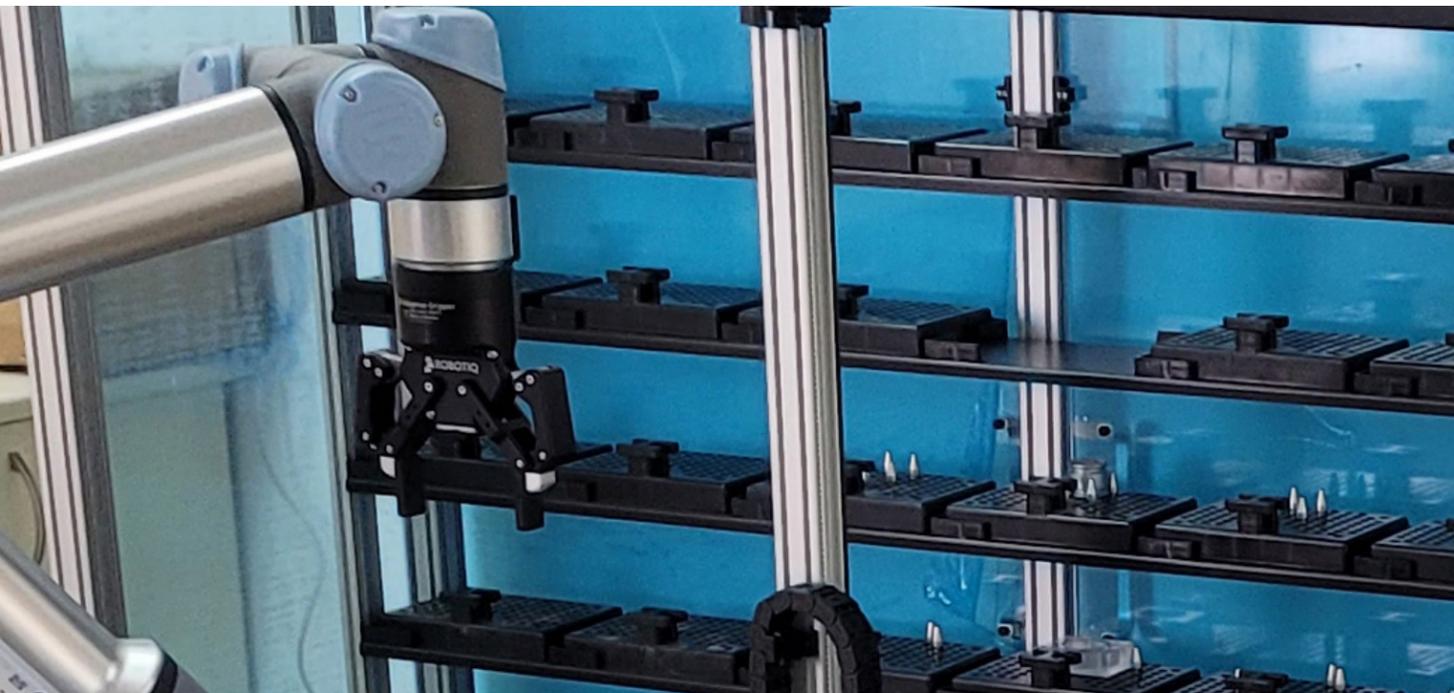
Students will learn:

- About robotics and the role of robotics in smart logistics
- About all the components in smart warehouses
- How robotics and other systems interact and are integrated
- About smart sensors in the warehouse
- To program, operate and maintain smart warehouses

Recommended core learning courses:

- Safety Fundamentals
- Intro to Industry 4.0
- Fundamentals of Robotics
- Advanced Robotics
- PLC Programming 1 & 2
- Smart Devices for Industry 4.0
- Intro to IoT and Connectivity
- Intro to Cybersecurity and Networking
- Intro to Big Data

Learning Topics

- Introduction to Supply Chains
- Warehouses in Modern Industry
- Automatic Storage and Retrieval
- Logistics Tracking
- How AMRs Work
- Robotic Arms in Warehousing and Logistics
- Cobots
- Sensors in Warehouses
- Safety in the Smart Warehouse
- IIoT in the Smart Warehouse
- Warehouse 4.0 Software
- Managing a Smart Warehouse
- Upgrading to a Smart Warehouse

Hardware Specifications: Smart Warehouses for Industry 4.0

ASRS

- Floor-mounted Automated Storage and Retrieval System
- 36 storage cells with pallets in 6 x 6 array
- RFID for pallet identification
- Cartesian robot with rotational axis movement of end effector
- Payload maximum capacity of 1.5 kg (3.3 lb)

AMR

- MIR-100 Autonomous Mobile Robot with industrial UR5 Robot mounted on a platform for pallet handling
  - Battery operated with charger
  - Docking station
  - AMR Control and programming software
- UR5 Cobot mounted on AMR
  - Gripper
  - Integrated robot guidance vision sensor
- Wireless communication with software control

Palletizing and Packaging Station

- Integrated workstation with industrial robot
- Motoman GP8 6 axis articulated robot arm with 8kg payload, programming pendant and gripper
- Variety of assembly, packing and palletizing activity options
- Cognex machine vision sensor for quality control

Control Software

- AMR management software
- Cognex Insight vision package
- PLC programming software
- OpenMES control software

PLC Controller

- Siemens SIMATIC S7-1200 PLC with 7" KTP700 touch panel HMI
  - Option: Allen Bradley CompactLogix 5000 with PanelView 5310 7" touch panel HMI

Intelitek Industry 4.0 Training Program

Industry 4.0 is a concept where industrial processes and manufacturing plants take advantage of the most advanced technologies and leverage data collected in real-time from the factory floor to monitor, maintain, and optimize the operation in real-time.

The Intelitek training programs for Industry 4.0 focus on three aspects of training: first, the core technology skills so students can understand the technologies and how they work; second, the interdependence of systems, the communications, automation, and interaction of systems within an industry 4.0 environment; and third, the benefits of integrated industry 4.0 systems and the employability skills required to work in this new, collaborative world of industry.

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