

intelitek

JOBMASTER

Industrial Robotics

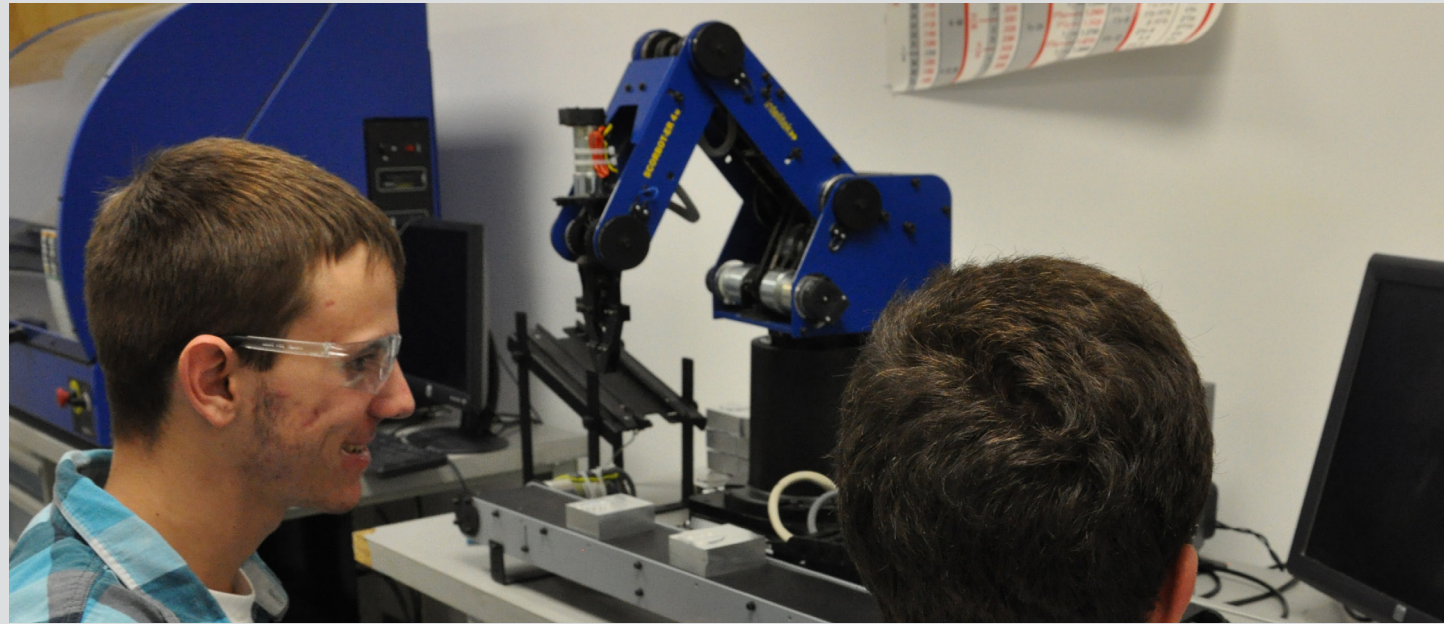
Intelitek's unmatched and world-renowned robotic training systems bring the exciting field of industrial robotics to your educational program. In partnership with Yaskawa Motoman Robotics, Intelitek delivers market leading solutions for education in robotics, manufacturing and Industry 4.0

The programs offer fundamental to advanced training using a blended learning approach to deliver a powerful educational experience.

Combining engaging e-learning content with superior quality robotic equipment and dynamic 3D simulations prepares students for rewarding careers.

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Robotics Education for CTE Programs

The Problem

The face of modern manufacturing has changed. Globalization and automation have transformed the factory floor from an army of hardworking men and women creating products with their skillful hands to an automated environment where machines do much of the work. One of the drivers of change and a core part of Industry 4.0 is the massive progress of automated manufacturing and robotics. Robots can do many of the manual tasks faster, more accurately and safer than a human.

The Solution

Industry needs robot operators and programmers. Companies need skilled employees to fill jobs building and operating advanced, automated industrial processes.

Intelitek CTE training programs deliver skills-based training using advanced blended learning that enable educators to prepare students to integrate into in-demand professions in Industry 4.0 production and manufacturing.

Robotics is one of the most important programs we offer to prepare students for Industry 4.0.

The programs delve into the use of robots, the functionality and capabilities of robots, how to integrate and use robots in industry, and how to design and program robots in your environment.

The focus is not only on learning theory, but on understanding the concepts and how to benefit from robots. Programs develop critical thinking capabilities, promote self-awareness and encourage out-of-the-box thinking and innovation. Students learn soft skills like teamwork, project management, decision making, and collaboration.

Quality Hardware

Intelitek provides exposure to industry-standard practices with hardware platforms designed for learning with industry-grade components. Intelitek educational robots partnered with Yaskawa industrial robots are the foundation of an advanced education program.



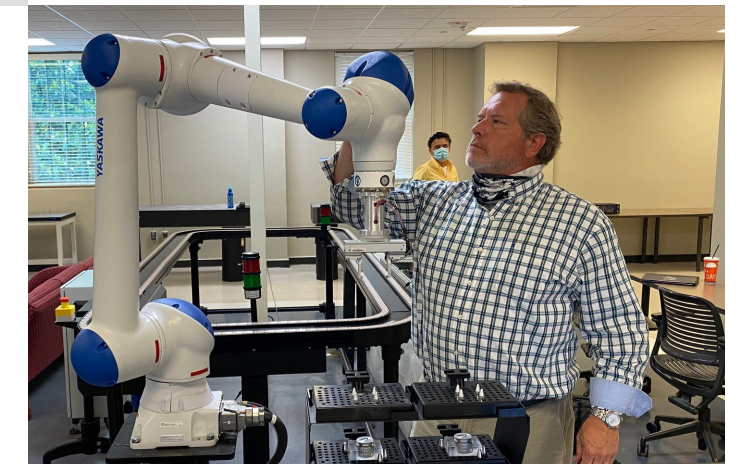
Skill-based E-learning

Curriculum are skill-based, developed by industry experts from Fortune 1000 companies across a wide range of sectors.

The skill-based training consists of individual exercises that reproduce essential tasks performed by robotic technicians, operators, maintenance staff and process designers.

Industry Competencies

Intelitek interactive and multi-disciplinary curriculum entrench values that help secure jobs and work skills that enable students to thrive in collaborative workplaces with the can-do and problem-solving attitude employers seek.



Aligned to Industry Credentials



Certification

Industry recognized certifications with industrial robots ensure students graduate with hands on experience, theoretical knowledge, programming skills and a certification recognized by industry worldwide.

Comprehensive Education Solution for Industrial Robotics

Range of Industrial Robotics Arms

Intelitek and Yaskawa robotic arms include a broad range of small to large devices suited for different industrial applications and the needs of any training program.

All robots and controllers can be flexibly integrated with peripherals and into larger training systems



Education Ready Training Platforms

Preconfigured robotics carts enable easy classroom setup and reliability. Training carts offer the opportunity to train beginners and enable advanced users to learn integration.

With student safety the primary concern, these solutions include multiple safety features for classroom use.

Simulation for Scalability

Robotic simulation s/w and h/w scale training to more students who can learn on life like systems before graduating to real hardware. Programs developed in simulation can be tested later on real hardware.

Training for Students and Instructors

Intelitek and Yaskawa curriculum, training and train the trainer programs guide educators and students through comprehensive learning paths and culminate with certification recognized by industry manufacturers worldwide.



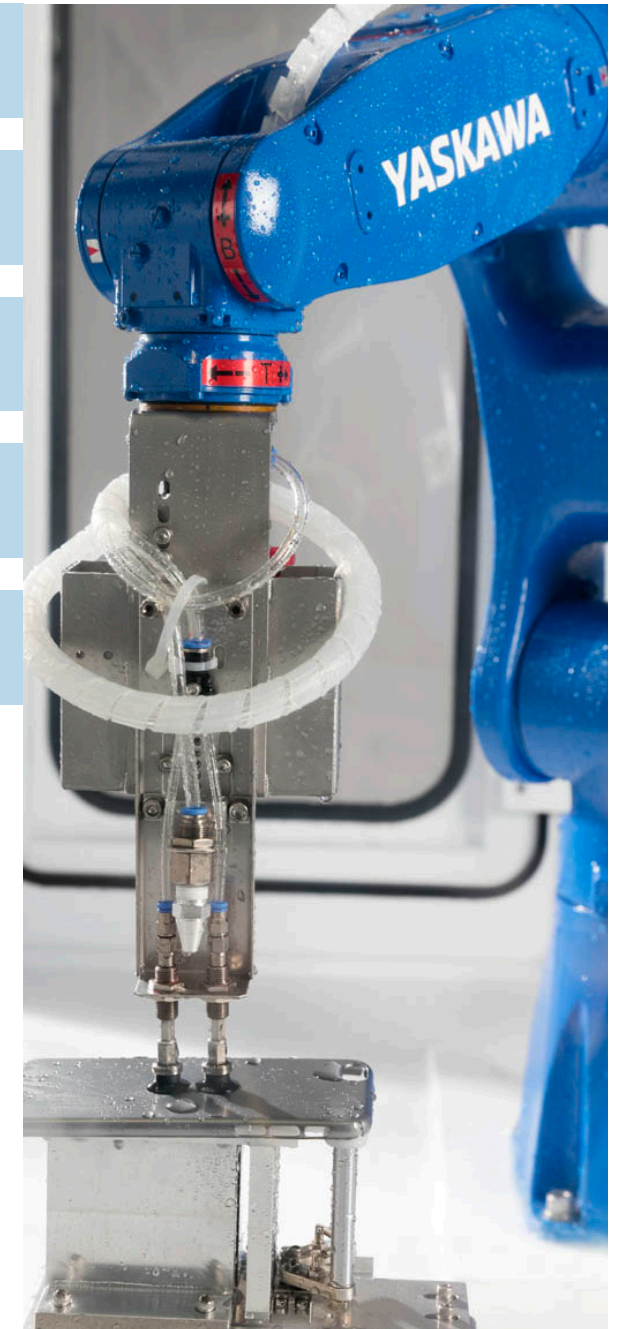
Robotic Programming and Simulation

Industrial Robotic Arm Kits

Educational Carts for Classrooms

Industry 4.0 with Robotics

Certification for Students and Instructors



What Students Learn

- Advanced manufacturing concepts and skills
- Capabilities, operation and configuration of industrial robots
- Programming and program optimization of robotic activities
- Programming techniques, languages, and smart learning
- Hands-on robotics through curriculum, projects and labs
- Manufacturing, mechatronics, quality control and inspection
- The link between Industry 4.0 and robotic automation
- Integration of robotics with manufacturing processes
- Integration and data exchange with ERP and MES applications

Outcomes

- Accelerated student skills and capabilities
- Encourages active inquiry and higher-level thinking
- Software and hardware familiarity
- High graduation employment rates
- Piqued interest in manufacturing career paths

ROBOTICS CAREER OPPORTUNITIES

- Maintenance Technician
- Robotics Operator or Programmer
- Mechatronics Engineer
- Industry 4.0 Systems Integrator

ScorBot ER-4U Educational Robot



The ScorBot ER-4U robot is a versatile and reliable 5-axis robotic arm system for educational use. The ScorBot ER-4U robot arm can be mounted on a tabletop, pedestal, or linear slidebase.

The robot's speed and repeatability make it highly suited for both stand-alone operations and integrated use in automated workcell and FMS applications such as robotic welding, machine vision and CNC machine tending. Together with ScorBase control software and RoboCell 3D simulation software, the system lets students design and control industrial workcells.

Features

- 5 Axis Vertically Articulated Mechanical arm
- Controller with USB communication
- Floor-, wall- or ceiling-mounted options
- 0.18 mm (0.007") repeatability
- 1 kg (2.2 lbs) payload

Motoman GP8 Industrial Robot

The Motoman GP8 is a 6-axis compact, high-speed robot. This advanced material handling robot offers high speeds, an 8 kg (17.64 lbs) payload, and 727 mm (28.62") reach. This robot is designed to provide easy set-up, operation, and maintenance with only a single cable needed to connect the manipulator and controller.

The GP8 offers superior performance in part applications such as assembly, dispensing, packaging, material handling, and machine tending. The robot supports both stand-alone applications as well as sophisticated automated workcells.

The GP8 is paired with the advanced Yaskawa YRC1000micro controller and a standard or smart programming pendant.

Features

- Compact, high speed, powerful and economical.
- Impressive reach and horizontal reach enables robot to operate in wider work areas.
- Environmentally friendly - IP67 standard protection class
- Floor-, wall- or ceiling-mounted options.
- Internally routed cables and hoses maximize system reliability.



Motoman HC10DT Human Collaborative Robot

Designed for a wide selection of applications, the 6-axis HC10DT human-collaborative robot is simple, safe and easy to program robotic arm.

Operator's safety is assured by a Power and Force Limit technology that stops the robot in case of contact with an operator. The robot arm can be hand guided by an operator and robot positions and gripper operation can be registered via the "Easy Teaching Switch Box". These features offer time saving during the robot programming. In addition, robot programming is available through the easy-to-use touchscreen Smart Pendant with built-in Smart Frame technology,

The HC10DT is paired with the advanced Yaskawa YRC1000micro controller and a standard or smart programming pendant.

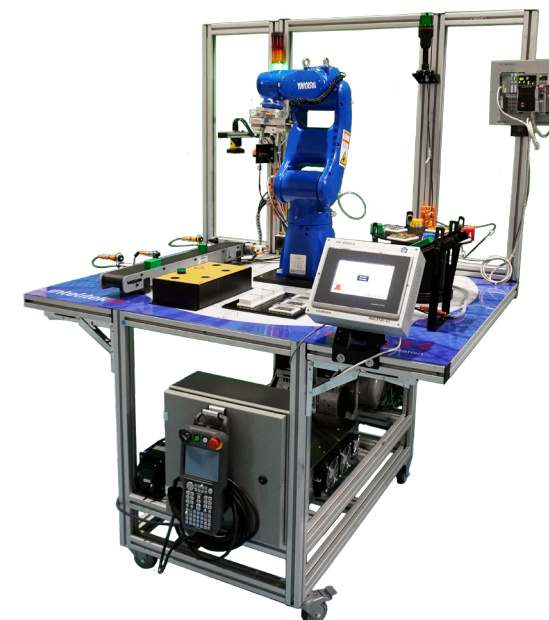
Features

- Collaborative robot enables humans to safely work with robots
- Power and force limiting technology protects the operator
- Arm geometry designed to avoid pinch points (finger protection)
- 10 kg (22 lb) payload with 1200 mm (47.3") reach
- Simple and easy to program with easy teaching
- Move the robot arm directly via hand guiding function: easy teaching mode with a switch box



SmartCart 4.0 Fenceless Mobile Training Cart

- Fully integrated Industry 4.0 Education Solution
- Robotics, Smart Sensors, PLC, Machine Vision, IoT, Networking, Integration, Automation, and more
- Training environment leading to certification
- Multi-function grippers
- Advanced industrial robotics platform with industry 4.0 curriculum, functionality, and lab exercises
- Extensive curriculum from basic to advanced level
- Hands-on, job-ready skills training for in-demand career paths in industry



The SmartCART 4.0 is an industrial robotics training system packed 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 manufacturing 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. Built around an industrial robot, the system integrates multiple smart sensors, a programmable logic controller, Human Machine Interface, and other accessories to teach students the complexities of how these systems interact in real industrial processes.

Certification aligned with:

Yaskawa
Robot Operator & Robot Programmer



NIMS
ITM & Industry 4.0 Smart Standards



Robotics Curriculum



Fundamentals of Robotics

The Fundamentals of Robotics course provides students with the skills needed to operate, maintain, program, and test robotic systems. The curriculum uses RoboCell, a 3D-solid modeling robotic simulation software, which allows students to develop programming skills through a variety of simulated robotic workcells.

Students will learn the core components and operating principles of robots and then develop programs that will drive the robots.

Learning Topics

En Es 15 hrs

- Introduction to Robotics
- How Robots Work
- Using Robotic Control Software
- Recording Robot Positions
- Programming a Simple Pick and Place Task
- Absolute and Relative Positions
- Basic Robotic Programming Tools
- Block Alignment Project
- Feeders and Templates
- Peripheral Devices
- Linear Slidebase Project
- Encoders
- Roll and Pitch
- Executing Linear and Circular Movements
- Final Project: Drawing a House

Advanced Robotics

Building on the Fundamentals of Robotics curriculum, Advanced Robotics courses explore advanced robotic programming.

In Advanced Robotics Programming, students will use RoboCell to teach positions, write programs, debug robotic applications, and test their execution offline using a virtual robot.

Learning Topics

En Es 15 hrs

- Review of Robotic Fundamentals
- Programming with Subroutines
- Digital Inputs
- Digital Outputs
- Project #1 - Delivering Materials with a Conveyor
- Conditional Branching
- Project #2 - Programming with Conditional Branching
- Analog Inputs and Outputs
- Loops and Counters
- Contact and Non-Contact Sensors
- Programming a Sorting System Project

Robot Grippers

Robot Grippers explores the tools that industrial robots use to perform material handling operations. The course investigates various gripper technologies, covering important physical specifications and other functional characteristics of these important peripheral devices.

Learning Topics

En Es 5 hrs

- Robot Structure and End Effectors
- Gripper Technologies
- The Physics of Grippers: Specifications
- The Physics of Grippers: Forces
- Choosing a Gripper

Robotics & Materials Handling

In Robotics and Materials Handling students work with the simulation and programming software to develop and write robot programs for manipulating objects and other automated tasks.

The activities challenge students to design solutions for industrial robotic applications, with emphasis on real industrial concerns, such as recording accurate positions, optimizing programming and increasing productivity.

Learning Topics

En Es 15 hrs

- Robotic Control Software
- Recording Robot Positions
- Writing and Running a Robot Program
- Cartesian Coordinates
- Inputs and Program Jumps
- Outputs
- Joint and XYZ Coordinate Systems
- Relative Positions
- Loops, Polling, and Counters
- Subroutines
- Contact and Non-Contact Sensors
- Servo Control of the Conveyor
- I/O Control of the Conveyor
- Manipulating Blocks (Project)
- Programming the Robot to Execute Circular Movements
- Roll and Pitch
- Block Alignment (Project)
- Feeders and Templates
- Peripheral Devices
- Linear Slidebase (Project)
- Programming Using Encoder Values
- Conditional Branching
- Analog Inputs and Outputs
- Programming a Sorting System (Project)



Yaskawa Credentialing and Certification

Intelitek CTE programs are designed to assist high schools, community colleges, technical schools and universities to offer industry-recognized robotics training based on the Yaskawa Motoman robotic arms and controllers. Graduates of the Intelitek training can be certified as a Motoman Operator or Programmer by taking a practical exam and final certification test with a certified instructor.

Certified Yaskawa Robot Operator:

Requires students to complete and pass the tests for the Fundamentals of Robotics for Motoman YRC1000 controller.

Certified Yaskawa Robot Programmer:

Requires students to complete and pass the tests for both the Fundamentals of Robotics and the Advanced Robotic Programming for Motoman YRC1000 Controllers

Benefits of Robotic Certification

Deliver Workforce-Ready Graduates – students leave experienced with multiple facets of robotics and automation. Graduates enter the workforce ready to operate any industrial Yaskawa robot.



Simulation & Programming Software

ScorBase

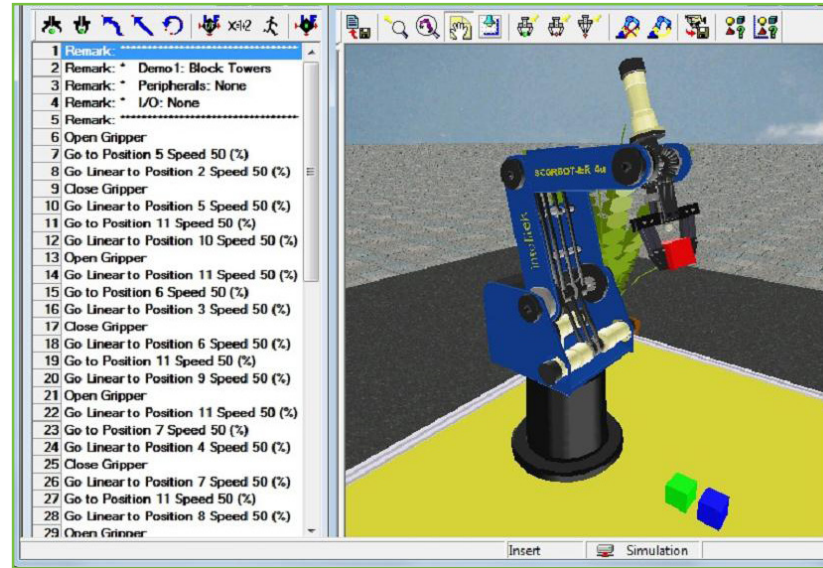
ScorBase robotics control and simulation software provides a comprehensive and intuitive tool for programming and operating robotic workcells. The software allows students to experiment with a variety of simulated workcells as part of the Intelitek curriculum or independently.

The software has several operational levels, each with progressively more functionality, making the software suitable for both novice and advanced users.

The software supports peripheral servo axes and both digital and analog I/Os, thereby providing a comprehensive tool for programming and operating an entire robotic workcell.

FEATURES:

- Intuitive user interface designed for training environments
- 3 operating modes: Online, Offline and Simulation
- Several operational levels, each with progressively more programming and operational features, allow novice and advanced users to work in environments best suited to their expertise
- Manual control of robot and peripheral axes
- Position recording
- Real-time data display

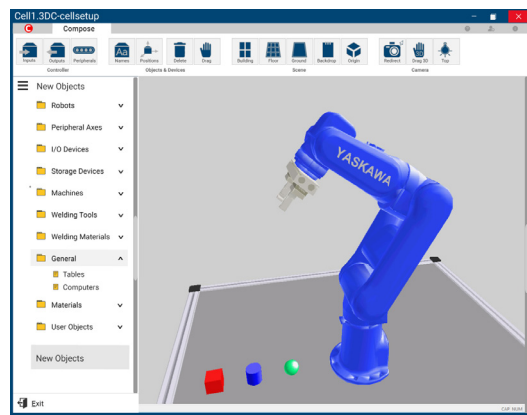


- Manipulation of 160 user-accessible parameters
- Learning optimized program editing interface
- Program execution both online and offline
- English, Spanish, Portuguese, German, Korean, Vietnamese, Polish Interface languages
- Comprehensive online help
- Demo projects

RoboCell

RoboCell integrates ScorBase's robotic control software with interactive 3D solid modeling simulation software. RoboCell's virtual robots and devices accurately replicate the actual dimensions and functions of Intelitek Robotic equipment. Students can teach positions, write programs and debug robotic applications offline before executing them in an actual workcell.

RoboCell allows students to experiment with a variety of simulated workcells, even if the actual workcells do not exist in the lab. Advanced students can even design 3D objects and import them into RoboCell for use in virtual workcells.



FEATURES:

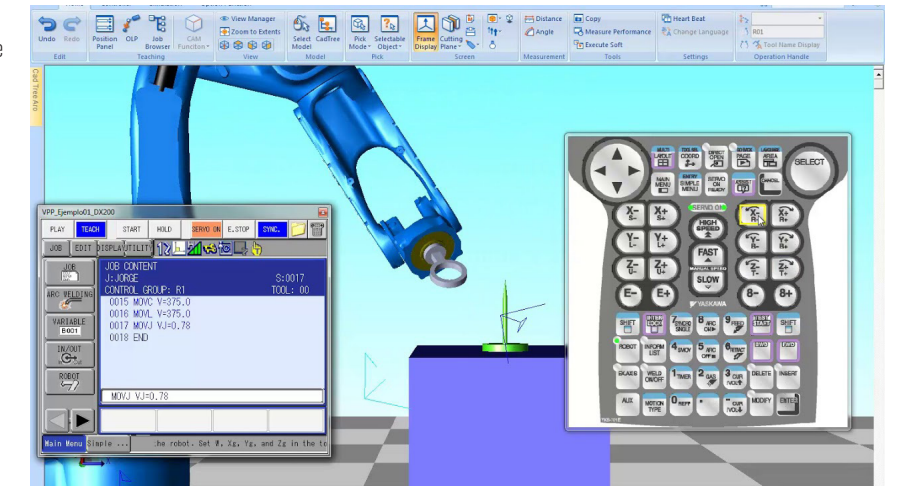
- Setup, programming and control of robotic workcells
- Simple point and click creation of virtual robotic workcells, peripheral axes, connection of sensors and I/O devices, storage devices and feeders
- English, Spanish, Portuguese, German, Korean, Vietnamese, and Polish Interface languages
- Dynamic 3D simulation
 - Robot movements and gripper part manipulation
 - Peripheral axes: Conveyor belts, XY tables, rotary tables, linear slidebases
 - CNC mills and lathes
 - Automated welding system
 - Parts and sensors
- Detection and response to impact conditions and axis limits
- Robocell can run ScorBase programs in 3 modes:
 - Online: Enables you to control the robotic cell
 - Simulation: Virtual robotic cell simulation in the 3D display
 - Offline: Enables debugging of ScorBase programs

MotoSIM Virtual Robot Simulation and Control

MotoSim® EG-VRC (Motoman Simulator Enhanced Graphics – Virtual Robot Control) is a comprehensive software package that provides accurate 3D simulation of Yaskawa robot cells for offline design, programming, testing and learning.

This powerful simulation software can be used to learn robot programming and operation and to optimize robot and equipment placement, perform collision detection, reach modeling and cycle calculations. It also provides accurate off-line programming of complex systems.

The MotoSIM EG-VRC simulation software operates like a real environment and displays the actual programming pendant interface for the controllers.



FEATURES

- Designed specifically for K-16 schools and training organizations, provides “real” robot experience while programming off-line on a PC
- Simulates a fully functional production environment while learning in a safe, virtual environment
- Setup in the classroom or robotics lab is quick and easy to learn robotic operation and programming with no hardware
- Programs created in MotoSim can be downloaded to the robot controller or shared
- Supports multi-robot and multi-controller simulation

MotoSIM Touch Virtual Robot Simulation and Control with Programming Pendant

MotoSIM Touch is a complementary solution to MotoSIM EG-VRC providing hands on virtual robotic training for students.

MotoSIM Touch integrates a real programming pendant with the simulator software package providing a hands-on accurate 3D simulation of robot cells for offline design, programming, testing and learning of Yaskawa Motoman Robots.

Pairing the simulation software with MotoSIM Touch allows students to toggle between a virtual pendant and a hardware pendant to experience a fully functional production environment.

FEATURES

- Designed specifically for K-16 schools and training organizations, MotoSIM Touch simulates a fully functional production environment.
- Setup is quick and easy, with only four cables to plug in.
- Provides “real world” virtual robotics experience at a fraction of the cost of an industrial robot
- Provides hands-on, STEM-aligned environment for robotic modeling and programming
- Teaches industry-recognized career ready robotics skills



Benefits of MotoSIM

- Large class access to robot training
- Virtual learning in safe environment
- Multi-user access to exercises with limited hardware
- Assessment environment for robotic training

Intelitek Industry 4.0 Training Programs

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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