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CIM AND FMS

Smart Factories and Industry 4.0 embody the transformation at the forefront of modernizing manufacturing processes to keep competitive in this fast changing world.

Employers need workers who are tech literate, process savvy, natural problem solvers to take a role in the on-going design and improvement of manufacturing systems.

Intelitek's CIM (Computer Integrated Manufacturing) and FMS (Flexible Manufacturing System) solutions are designed to introduce vocational and engineering classrooms to the industrial automation and industry applications needed in modern plants and to create skilled workers for next generation jobs.

Intelitek CIM and FMS training systems are modular and flexible solutions for educating and training students in the principles and technologies of computer integrated manufacturing.

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Intelitek Pedagogic Values

Rapid changes in global competition has manufacturers looking for ways to increase productivity by implementing new technologies, installing automated systems and adapting new management techniques and ideas. A common goal behind this push is to link and integrate all the manufacturing pieces into a Computer Integrated Manufacturing (CIM) system.

In today's industry, one can find the most modern machines: CNC mills and lathes, machining centers, laser engravers, machine vision quality control, robotic storage systems, etc. working in unison.

In addition, production lines no longer use isolated work stations and the development of computer control technology has enabled manufacturers to gain greater control over their critical manufacturing resources.

Another major change in production methods was driven by the introduction of Industrial robots into

manufacturing processes. In order to successfully utilize a robot in a production line, a robot must be integrated with other machines it serves.

As manufacturers increasingly bring CIM technologies into their organizations, so grows the need for technicians, programmers, engineers and managers who are knowledgeable and skilled in the design, installation, running and maintaining of CIM systems.

Education plays a major role in supplying the skilled professionals for CIM systems.

Intelitek's CIM and FMS training solution implements our more than 25 years of experience in the world of Automation, and forwards our mission to bridge the gap between classroom and industry.

CIM systems offer sophisticated and flexible solutions for educating and training students in the principles and technologies of Computer Integrated Manufacturing.

Complete Training Package Optimized for Education

Complete Training Solution

Flexible training systems give students hands-on experience with industrial level equipment and applications within a school lab environment.

The modularity and flexibility of the CIM system allow it to be configured and integrated in an educational program that best suits your school's particular needs and budget.

CIM and FMS systems from Intelitek are supplied as turnkey solutions, ready for work as soon as your students are.

Supports Your Curriculum

CIM systems integrate with stand-alone disciplines like Mechanical Engineering, Electrical Engineering, and Computer Science. Moreover, it is the perfect solution for cross-disciplinary programs – such as mechatronics, informatics and industrial engineering – that require the integration of multiple technologies.

Industrial level hardware combined with 3-D simulation software and interactive animated E-learning content is what makes Intelitek CIM solutions stand beyond and above other alternative solutions for CIM studies.!

Industry Aligned Training

An educational system that focuses on automated industrial management with an emphasis on research and programming tools. The stations in the Intelitek CIM cell are equipped with educational yet fully automated hardware components. This type of CIM cell solution enables significant CIM study, experimentation and training.

Students use the simulation capabilities of OpenCIM, RoboCell and CNCMotion software to gain proficiency in the management and integration of automated manufacturing processes.

The CIM system is typically configured to function as an automated factory that performs large production runs with infrequent retooling. The system is equipped fully and exclusively with industrial grade equipment and supports the design, manufacture and testing of products and components. Serving to prepare students for the transition into industry, this CIM solution provides high quality laboratory experiences in automated manufacturing technologies and management methodologies.

CIMflex – Computer Integrated Manufacturing & Flexible Manufacturing Systems

Computer Integrated Manufacturing (CIM) systems are complex interconnected manufacturing configurations that have several key components like automated storage and retrieval systems (ASRS), automated production workstations such as a CNC machine, a continuous-loop conveyor, a central management control station, a TCP/IP communication network, and OpenCIM software.

Additional workstations can be added at any time for a variety of automated tasks, such as laser engraving, hydraulic and pneumatic device operation, process control, and quality control inspection.

Stations Examples

1 STORAGE STATION

The ASRS storage station is a floor-mounted or a table top automated storage and retrieval (ASRS) system designed for educational use.

The system's dedicated Cartesian robot transfers parts between storage cells and conveyor pallets stopped at the ASRS station. The robot is controlled by Controller-USB and by a dedicated ASRS software module in the OpenCIM software. An optional hand-held teach pendant can also be used for direct control of the ASRS.
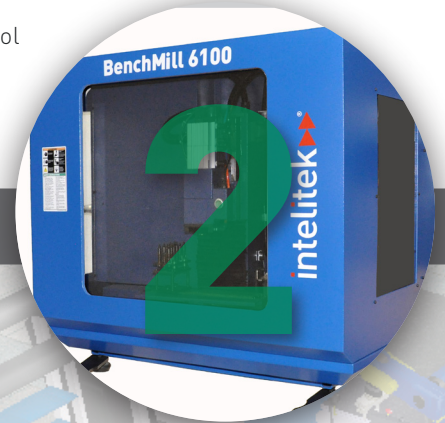
2 MACHINE TENDING STATIONS

This package can be used as a stand-alone workcell, or integrated within a CIM system. The robot tends the CNC machine and performs other part manipulation and/or assembly tasks. When used in a CIM system, the robot loads and unloads parts to and from the CIM conveyor. The robot is mounted on a linear slidebase for mobility and larger work area.

3 ASSEMBLY & QUALITY CONTROL STATIONS

The assembly and QC station is equipped with a variety of assembly and quality control devices as well as with local storage devices.

This turnkey station gives students training and skills in assembly, quality control, robotic programming and automated manufacturing systems.

- CIMflex is custom tailored to you your needs
- CIMflex is modular and expandable
- CIMflex is customizable and configurable
- CIMflex supports third-party components
- CIMflex is affordable and reliable

4 WELDING STATION

This automated welding station can be used as a stand-alone workcell, or integrated within a CIM system. When used in a CIM system, the robot loads and unloads parts to and from the CIM conveyor in addition to performing arc welding and part manipulation tasks.

5 CONVEYORS

The conveyor frame is constructed of extruded, black anodized aluminum, and its moving belt is a double flexible-chain rail. Pallets carry part templates (holders) that are loaded and unloaded at each station by robots and manipulators.

6 PROGRAMMABLE LOGIC CONTROLLER

The PLC (Programmable Logic Controller) controls and monitors the flow of pallets on the conveyor with the help of sensors and actuators that are built into the stop stations.

7 PALLET TRACKING STOP STATIONS

The conveyor stops alongside each CIM workstation (Stop Station) that has magnetic sensors for pallet detection and pneumatic pistons for halting and releasing the pallets. The stop stations enable the PLC to control and monitor the flow of pallets on the conveyor

8 MANAGEMENT STATION

The OpenCIM software is a computer-integrated systems management solution that contains all the elements found in fully-automated facilities.

Shop floor management controls the operation of all the elements of automated factory.

Administrative software connects the shop floor management to the production facility's Enterprise Resource Planning (ERP).

The OpenCIM software contains an ERP package which breaks down customer orders to analyze bill of materials, check availability of raw materials, produce vendor's purchase order and schedule production based on expected lead times.
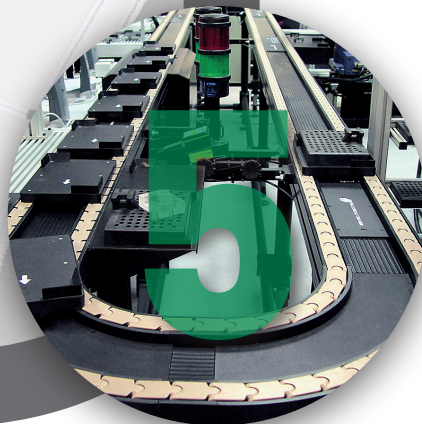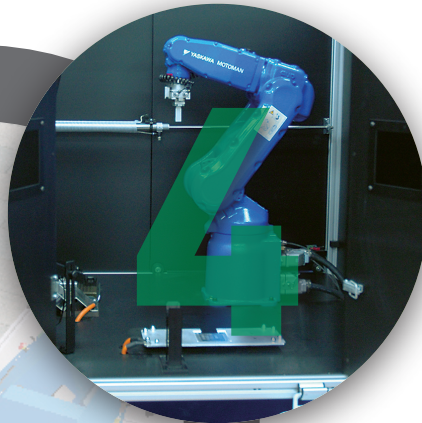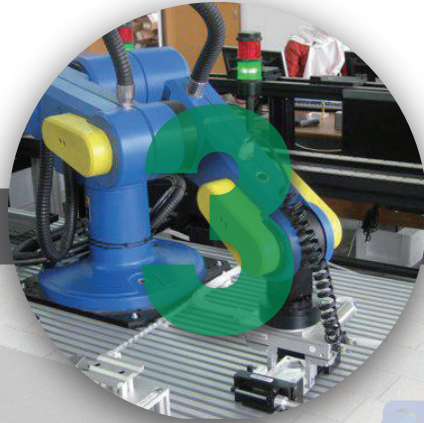
Flexible Manufacturing Systems (FMS)

HOURS OF INSTRUCTION: 15

TYPE

LANGUAGES Es En

The Flexible Manufacturing System (FMS) course exposes students to automation and industrial applications by combining CNC technology with robotics and materials handling. Students develop and edit programs, record precise robotic positions, accurately mill parts, and synchronize mill and robot operation.

Students gain "virtual hands-on" experience in CNC and robot programming, especially in I/O commands. Students design solutions for industrial FMS applications with emphasis on real industrial concerns, such as optimized CNC and robotic programming and accurate machine tending.

COURSE OUTLINE

- Introduction
- CNC Machining
- RoboCell Simulation and Control Software
- Designing an FMS Workcell
- Expanding the Workcell
- Writing a Program
- Programming Mill Operations
- Conditional Programming
- Storing Finished Parts
- Multiple Part Programming
- Lathe Operations
- Multiple Part Lathe Operations
- Program Integration
- Designing the Final Project
- Running the Final Project

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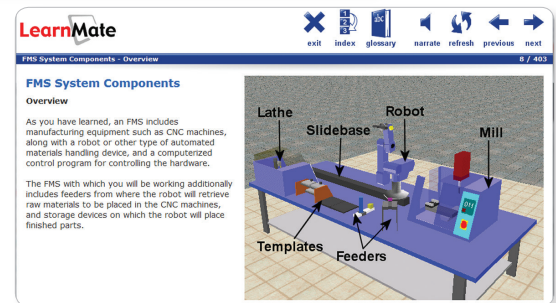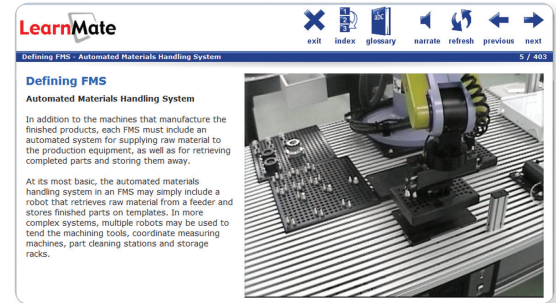
Computer Integrated Manufacturing (CIM) 1

HOURS OF INSTRUCTION: 15

TYPE

Computer Integrated Manufacturing (CIM) introduces the basic concepts and procedures of CIM production as well as the main components and devices in a CIM cell.

Using OpenCIM Software with a fully simulated industrial CIM, students learn about all the aspects of a CIM production cycle, from customer order and inventory control, through automated manufacturing of materials into finished parts, to quality inspection and final delivery.

LANGUAGES Es En

COURSE OUTLINE

- Introduction to CIM
- Introducing OpenCIM Software
- Parts and Production Flow
- Storage Setup
- Production Planning
- Processes and Machine Definition
- Part Definition
- Defining a Product Part
- Producing a New Part
- Timing and Optimization
- Viewing Production Details
  - in the device view
  - in the storage view
- Defining Part Production in the Lathe
- Integrated Production
- Tracking Integrated Production

CATALOG #: 77-3015-0000

Computer Integrated Manufacturing (CIM) 2

HOURS OF INSTRUCTION: 15

TYPE

CIM 2 builds on the basic concepts covered in CIM 1. Students design, set up and operate CIM cells and learn about mass production, robotic systems, location planning, QC devices, part feeding, assembly, purchase orders, MRP and CIM databases.

LANGUAGES Es En

COURSE OUTLINE

- Mass Production and CIM
- Robotic Systems
- Location Planning
- QC Devices
- Feeders
- Adding an Assembly Station
- Assembled Part Production
- Assembled Product Characteristics
- Expanding Assembly Capabilities
- Subassemblies and Multi-Level Assembly
- Purchase Orders and MRP
- Multi-Level Assembly Production
- CIM Databases
- Conclusion

CATALOG #: 77-3016-0000

CIM Management Software:
Open CIM/Open CIM Offline and Open FMS

Open CIM/Open CIM Offline and Open FMS software provides a comprehensive solution for the study and practice of CIM/FMS methods and operations:

- Students experience the concepts, uses and interconnections of the various software modules that comprise a CIM system.

- Students gain practical experience in translating theoretical manufacturing methods and processes into actual applications.

- Students can use and study components and subsystems individually as well as the entire integrated CIM system.

- Includes enhanced optimization functions and performance analysis to support studies in industrial management, operations research, management sciences and related fields.
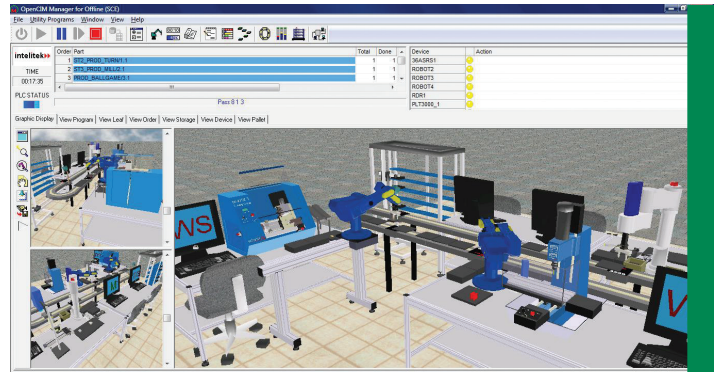

- OpenCIM Offline is the simulation version of OpenCIM. Users can design and run an unlimited variety of CIM or FMS cells in simulation mode.

CATALOG #: 63-7000-1200

STANDARD FEATURES

OpenCIM/FMS incorporates the latest advancements in CIM, FMS and manufacturing software technologies:

- Includes an enterprise resource planning (ERP) tool: OpenCIM/FMS combines a number of CIM cell and station management modules including MRP for defining parts, machines and processes, customer, purchase and production orders, inventory control and tracking, scheduling and dispatching, report generation.

- Implements manufacturing execution system (MES): OpenCIM/FMS integrates real-time information with the system's PC-based database, and maintains online communication with all subsystems through a local lab network or the Internet.

- Includes a 3D solid model graphic display module that dynamically simulates the components and processes: OpenCIM/FMS provides online graphic tracking of the manufacturing processes and off-line simulation that allows students to test procedures before executing an actual production run. OpenCIM Web viewer users can view realtime reports generated by the CIM manager, remotely track live production cycles in the 3D graphic display, and view details of CIM/FMS cell status.

- Open architecture: OpenCIM/FMS enables the integration of various hardware and software components, making it easy to expand and customize the CIM/FMS system.
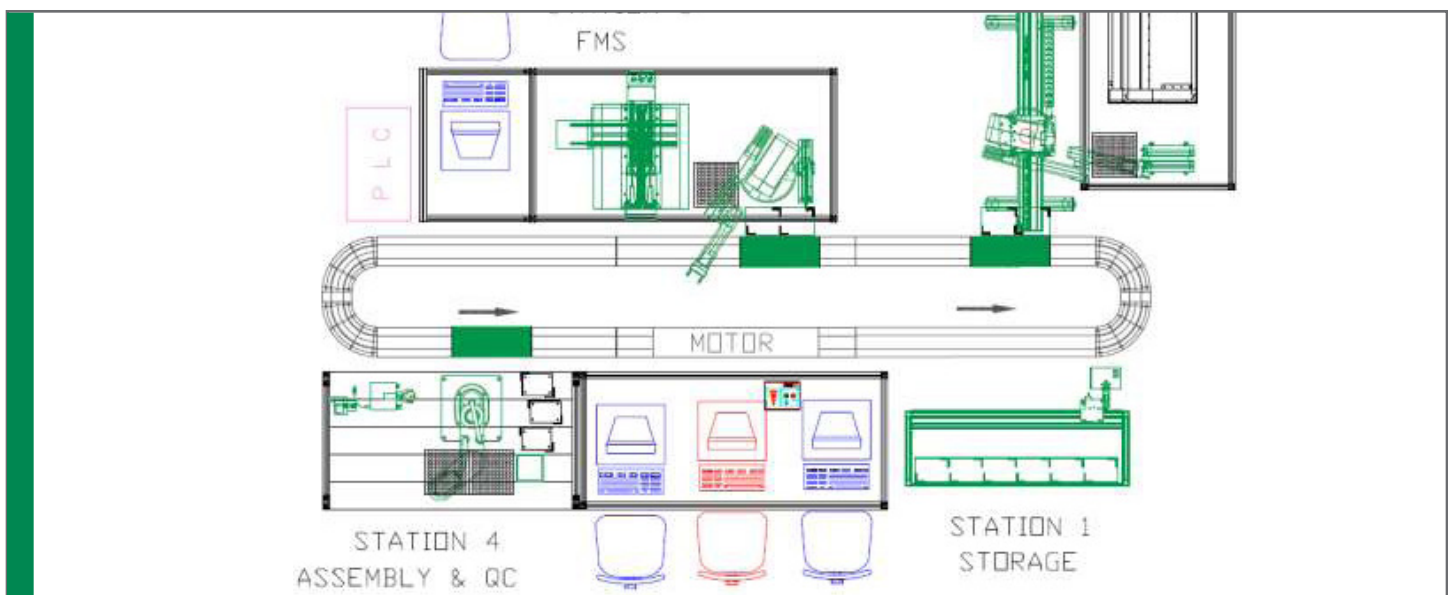
Intelitek Learning Solutions

Intelitek transforms education across the globe with comprehensive technology learning solutions. Our innovative tools and technologies empower instructors and inspire students to improve the world around them. We understand the changing needs of your career and technology classrooms and design flexible solutions that meet those needs.

With sustainable support and professional development to ensure the continued success of your programs, Intelitek programs deliver the competencies needed for in-demand careers.

At Intelitek we are producing results for students, teachers, nations and economies.

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