Industrial Education Solutions
“This system was developed to bring alignment between Industry and Education to directly tie into the FANUC CERT program, foundational skills in robotics, vision, and integrated solutions.”

- Paul Aiello
Director of Education
FANUC America Corporation

“The success of our training programs has allowed us the opportunity to share the best practices to help other training programs develop the same student outcomes.”

- Anthony Nighswander
President
APT Manufacturing Solutions

“Our goal is to integrate Rockwell products with robots to bridge the learning gap. We piece parts together into one great learning system where students can not only learn the technology, but can also understand how to apply it as a system and understand the steps. That’s what our customers really want!”

- Michael Cook
Director
University Partnership Rockwell Automation

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For most current information, see aptmfg.com/education
CERTIFICATIONS, CURRICULUM, & SOFTWARE

The FANUC America Corporation Certified Education Training (CERT) Program certifies instructors at educational institutions to train their students to program FANUC robots. To accompany the FANUC CERT Program, new school locations receive (1) CERT Instructor Training and Tool Kit and (1) CERT School Comprehensive Educational Package.

All CERT Program Robots include the Advanced CERT Software Configuration for education, which includes: MH - Advanced Ethernet IP Scanner, Advanced Dual Check Safety (DCS), 4D Graphics, Motion Package, PC Remote Pendant, Collision Guard Pack, Interface Panel, Maintenance Package, Menu Utility, Remote Pendant, ROBOCRILL Interface. AT – Torch Guard, Torch Mate, Collision Guard, 4D Graphics, Payload ID, Touch Sensing and TAST (Through Arm Seam Tracking), Auto Error Recovery, Bump Box, Constant Path, Password Protection, Panel Wizard, KAREL, Menu Utility, Lincoln or Miller Weld Library.

The Industry Value of the Advanced CERT Software Configuration is $15,240

The (MH or AT) CERT Instructor Training and Tool Kit provides your designated instructor training materials and includes the following deliverables:
- (1) online seat to take CERT Cart Safety Features web course
- (1) online seat to take Robot Operations web course
- (1) online seat to take HandlingTool or ArcTool Operation and Programming web course
- (1) online seat to take HandlingPRO or WeldPRO web course
- (1) seat to take a live HandlingTool or ArcTool Operation and Programming class at a FANUC facility
- (1) ROBOGUIDE Simulation Software license
- (1) FANUC Robot Operations Manual
- (1) FANUC HandlingTool or ArcTool Operations and Programming Manual
- (1) FANUC HandlingPRO (ROBOGUIDE Simulation) Manual

The Industry Value of the CERT Instructor Training and Tool Kit is $15,500.

The (MH or AT) CERT School Comprehensive Educational Package provides students training tools and ensures your instructor has the necessary tools to effectively teach their students. This package includes the following deliverables:
- (25) concurrent-user seat to take Robot Operations web course
- (25) concurrent-user seat to take HandlingTool or ArcTool Operation and Programming web course
- (25) concurrent-user seat to take HandlingPRO or WeldPRO web course
- (25) ROBOGUIDE Simulation Software license

Industry Value of the CERT School Comprehensive Educational Package is $290,610(MH) / $403,240(AT)

To become a certified (MH or AT) CERT instructor, the designated instructor must:
1. Successfully complete the CERT Cart Safety Features web course
2. Successfully complete the Robot Operations web course
3. Successfully complete the HandlingTool or ArcTool Operation and Programming web course
4. Successfully complete the HandlingPRO or WeldPRO web course
5. Attend the live HandlingTool or ArcTool Operation and Programming class at a FANUC facility
6. Pass the online Certified Education Robot Training Test via FANUC eLearn
7. PASS the NOCTI CERT FANUC (FCR-01) EXAM - Test Fee required through NOCTI (MH only)
8. Provide an outline of their robotic syllabus/curriculum
9. Provide a video to FANUC of a module/chapter being presented to an audience or faculty staff

SOFTWARE

INCLUDED
- 1 year subscription of Rockwell Automation EDU Toolkit Bundle
  - Studio 5000 Logix Designer®
  - Studio 5000 View Designer,
  - plus over 100 more pieces of Rockwell software
  Renewable each year through your local distributor.

OPTIONAL
- (10) seats of Learning+ course content
  Renewable each year through your local distributor.

CURRICULUM

Integration Project-Based Learning (PBL) Curriculum
- Daily lesson plans
- Assessment and grade charts
### Use our online tool to navigate equipment and programs

https://aptmfq.com/products/program-overview/

<table>
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<th>Learning Level</th>
<th>Career Path</th>
<th>Description</th>
<th>Certification Type</th>
<th>ROBO-DRILL</th>
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<th>MTEC-SIM</th>
<th>I/O Link Technology</th>
<th>RVision 2D</th>
<th>RVision 3D</th>
<th>JiMMS B</th>
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</tbody>
</table>

**Notes:**
- **Level 1:** This course will train entry level operators and provide a basic understanding of industrial equipment. This is perfect for a high school, vocational school, or school starting up industrial training.
- **Level 2:** This course will train technician level employees with troubleshooting fundamentals. This could be used in an advanced vocational school or a community college on a school program that is training to grow from the operator level into a more formal teaching troubleshooting and integration.
- **Level 3:** This course will train system integration in areas for robotics, PLC, process engineering, controls, automation, and machine integration. This is perfect for an advanced technical school training students to apply theoretical knowledge of industrial systems or an university that is looking to teach engineering and integration of industrial components and equipment.

**Approved Industry Certification Issued by an independent certifying authority:**
- **FANUC:** Rockwell CCA 185: PowerFlex 525 Drive Startup and Integration: Industrial 4.0 and IIOT
- **FANUC:** Rockwell INA 204: Industrial Network Architecture
- **FANUC:** Rockwell CCP 146: Logix 5000 System Fundamentals
- **FANUC:** Advanced TPP
- **FANUC:** Robotic Handling
- **FANUC:** Advanced Integration of Industrial Equipment
- **FANUC:** Advanced TPP
- **FANUC:** Robotic Handling
- **FANUC:** Advanced Integration of Industrial Equipment
- **FANUC:** Advanced TPP
- **FANUC:** Robotic Handling
- **FANUC:** Advanced Integration of Industrial Equipment

**Certification Requirements:**
- **FANUC:** Rockwell CCA 185: PowerFlex 525 Drive Startup and Integration: Industrial 4.0 and IIOT
- **FANUC:** Rockwell INA 204: Industrial Network Architecture
- **FANUC:** Rockwell CCP 146: Logix 5000 System Fundamentals
- **FANUC:** Advanced TPP
- **FANUC:** Robotic Handling
- **FANUC:** Advanced Integration of Industrial Equipment

**Prerequisites:**
- **ROBO-DRILL:** Certification administered by NOCTI: FCR-T1
- **CERT:** Certification administered by NOCTI: FCR-01
- **MTEC:** Certification administered by NOCTI: FCR-01
- **I/O Link Technology:** Certification administered by NOCTI: FCR-01
- **RVision 2D:** Certification administered by NOCTI: FCR-01
- **RVision 3D:** Certification administered by NOCTI: FCR-01
- **JiMMS B:** Certification administered by NOCTI: FCR-01

**Materials:**
- **FANUC Robotics Courses:** FANUC Robotics Courses
- **FANUC CNC Courses:** FANUC CNC Courses
- **Rockwell Automation Course:** Rockwell Automation Course
- **MTEC:** MTEC
- **AM-CERT:** AM-CERT
- **CSM:** CSM

**Description:**
- **Introduction to Safety Systems**
- **Robotics CERT Carts and MTECs with CRX robots are eligible for marked certificates only.**
- **American Welding Society: CRAW Certification**
- **FANUC Robotics Courses:** FANUC Robotics Courses
- **FANUC CNC Courses:** FANUC CNC Courses
### Advantages of Our Industrial Training Equipment

<table>
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<tr>
<th>Advantage</th>
<th>OUR TRAINERS</th>
<th>OTHER TRAINERS</th>
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<tr>
<td>Trainers built for manufacturing training</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Equipment built with exact same standards as industrial equipment</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Curriculum with labs to apply knowledge</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Curriculum comes directly from manufacturer; not rewritten</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Labs are derived from industry practices, like live panel building utilizing industry standard wiring practices</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Certificates upon completion of classwork or modules</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Certifications directly from industry leaders like FANUC, Rockwell, and Miller Welding that carry over to the first day on the job</td>
<td>✔</td>
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<tr>
<td>Rockwell MicroLogix basic PLC</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Rockwell CompactLogix advanced PLC integration with Studio 5000</td>
<td>✔</td>
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<tr>
<td>Advanced courses in FANUC TPP, iRVision, Advanced TPP, DCS</td>
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<td></td>
</tr>
<tr>
<td>Advanced courses in integration of area scan, RFID, wireless I/O</td>
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</table>
WE BELIEVE IN EDUCATION....

APT Manufacturing Solutions is an automated equipment builder and precision machine shop equipped with over 30 manual and CNC machines, laser cutting and fabrication equipment, mechanical engineering with 3D solid modeling, and controls engineering with PLC and robot programming. At APT, education and training is woven into the core of our every move. We recognized years ago that educating the next generation is vital to our success, and the success of manufacturing in America, we have made it one of our primary strategic objectives.

“Our passion is to equip and teach the next generation of workforce to advance manufacturing, technology, innovation, and leadership.”

High School Training: Years ago, we founded a state-of-the-art high school training center where we opened our doors to high school students from surrounding schools to learn the nuts and bolts of manufacturing. We lead them through coursework and hands-on learning designed to open their eyes to the opportunities they have in industry after school. Courses include:

- OSHA safety 10 hour
- Tools of the trade
- Drafting and 3D Modeling
- Machining
- Welding and Fabrication
- Industrial Wiring and Panel Building
- Basic PLC logic and Control Systems
- Robot handling and programming

Apprenticeship Program: Students who graduate from these programs must enroll in apprenticeship program to continue employment, where they go through a two- or four-year program, fully paid, working during the day and continuing school at a community college at night. This has proven to be a phenomenal approach to education, developed over time based on need for workforce development. The key to this is the partnership that has come between industry and education. We believe this partnership is vital to changing industry and solving the workforce development problem as America moves forward.

“We don’t build education trainers…we build industrial equipment with industrial curriculum for the education market.”

It was through our passion for education that APT became a FANUC Education Solutions Provider, and this equipment is sold exclusively through the FANUC Education Solutions Provider Network. They carry the industry training curriculum of key manufacturers like FANUC America, Rockwell Automation, and Miller Welding. These partnerships are critical to maintaining high-caliber trainers that model industry standards.
FANUC’s CERT Cart is an entry level cart that teaches students basic tool handling skills as well as iRVision Pick and Place. Instructors benefit from both FANUC’s online and instructor led training, which are the same skills taught at the FANUC Robotics training facility. As an educator attending training, you’ll be sitting beside industry programmers and learning the same course material that is being used in industry to apply in your classroom. This is real world equipment, not a watered-down version. FANUC America provides this training opportunity to instructors as part of its CERT program allowing the industrial certification to be passed on to students.

**CERT CART**

**Project-Based Learning (PBL) Kits**

All FANUC robots are available. Contact your education solutions provider. Also see accessories on next pages.
The Fanuc ROBODRILL is a high-performance machining center, known worldwide as the most reliable machine manufactured today. ROBODRILLS make quick work out of any milling, drilling or tapping jobs. Reliability has also been addressed in all areas of the machine design. Coupled with the latest Fanuc 31i-B control, the ROBODRILL is the preferred machine in any manufacturing facility large or small.

**ROBODRILL 3-axis**
- FANUC ROBODRILL α-D14MiB series
- NRTL for ROBODRILL MiBS/LiBS without breaker box (ONLY NRTL)
- 31i/B5 - Additional 1 slot board
- Touch panel screen
- Right side auto pneumatic door
- Robot interface 2 for side door (CNC with built-in multi-function Ethernet type) or without hub (with robot interface creen), includes 3-76 FL-net, robot connection function and safety function by FL-net
- Side window and basic top cover of splashguard
- Automatic oil lubricating (standard)
- Illumination (standard)
- Coolant unit with chip flush - tank capacity 100L
- Outer coolant piping
- Fast data server (with compact flash memory 4GB)

**ROBODRILL 5-axis**
- Available with custom order

**ROBODRILL ECO 3-axis**
- FANUC ROBODRILL α-D14MiB series
- NRTL for ROBODRILL MiBS/LiBS without breaker box (ONLY NRTL)
- No coolant tank included
- Part program storage size 2Mbyte
- Ethernet function

Add an optional Industrial or Cobot robot tender to ROBODRILL 3-axis or 5-axis (Not available for ECO 3-axis)

**FANUC**

**ROBODRILL CNC**

*Industry-Rated, Priced for Education*

**ROBODRILL Accessories**

**Tooling Package**
- BT30 tool holder tightening fixture
- ER20 wrench
- (10) retention knobs
- (10) BT30 ER20 collet holders
- ER20 15-piece collet set 1/16” - 1/2”
- 1/2” carbide endmill
- 3/8” carbide endmill
- 1/4” carbide endmill
- 1/8” chamfer mill
- Edge finder

**Vise Kit**
- 4” Vise
- 4” Handle
- 4” Aluminum jaws
- (2) 3/8 tee nuts
- (2) Hold down bolts

**Other Accessories**
- 5 gallon TRIM MicroSol 585XT coolant
- Brix refractometer coolant testing
- Vactra No. 2 way oil, 5 gallon pail
- 0.25 GPH 8” reach belt oil skimmer
- 4” aluminum jaws

**Project-Based Learning (PBL)**

- Clock
- Business Card Holder
ROBOT MACHINE TENDER
MTEC - Machine Tending Educational Cell

- Students familiar with CNC and/or robots have the opportunity to learn real world advanced automation integration
- FANUC CNC controller Interface between robot and CNC for seamless integration
- Preconfigured with load and unload program templates for simple build with no complex programming needed

MTEC FEATURES

<table>
<thead>
<tr>
<th>Feature</th>
<th>Levil CNC</th>
<th>LR Mate 200iD/7L</th>
<th>ROBOTICS</th>
<th>MTEC LR Mate Machine Tender</th>
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<td>Fault insertion</td>
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<tr>
<td>120V 20 amp</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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</tbody>
</table>

CNC
- Smart Trouble Shooting Function
- Memory card slot plus USB port
- Built-in interlock function for safety
- Enables robot operation and system status display on the robot operation screen
- Custom PMC to create, read, and write ladder programs

FANUC ROBOTICS
FANUC LR Mate 200iD/7L long-arm 6-axis robot
- R30iB Plus robot controller
- 2D iRVision optional

CNC
- Tabletop machine
- 120V power
- FANUC robot load/unload
- Qualifies for FANUC CNC Cert
- Qualifies for FANUC Robot Cert

- Fold-up work table for laptop, textbook, etc.
- Safety area scanner for fenceless robot operation or safety interlocked access door to robot work area
- 3-color beacon operation indicator light
- Swivel casters with brakes and rotation lock
- Part locating template for NIMS mill block or dual conveyor in/out for parts blanks
- Single 2-jaw EOAT for NIMS mill block (3/4” x 2 1/2” x 3 1/2” aluminum, 50 pcs included)
Students have the opportunity to learn real world advanced automation integration

Preconfigured with load and unload program templates for simple build with no complex programming needed

3-axis mill and 2-axis lathe simulation

FANUC ROBODRILL Interface between robot and CNC simulator for integration training

120 VAC power connection to MTEC-SIM with on-board air compressor for self-contained cell operation

Fits through 36” door

Optional iRVision 2D for error proofing and guidance

Built-in toolbox for storage

FANUC's CNC simulator is designed specifically for educational purposes, ensuring affordable access to the latest FANUC CNC platform in a compact and portable package, easily integrated into any classroom.

Switchable mill and lathe system in one simulator

3-axis milling / 2-axis turning system + 1 spindle

Conversational programming and 3D simulation (MGi)

Inch / metric switchable

32 tool offset pairs

Work piece coordinators G52-G59 + 48 additional on mill

FANUC LRMate ER4iA 6-axis robot

R30iB Plus robot controller

2D iRVision optional

FANUC's new R30iB Plus robot controllers feature the new iPendant with enhanced screen resolution and processing capability.

The new user interface, iHMI, can display guides for setup and programming, as well as tutorials from the main home page which as a design common to FANUC CNCs, enabling easier use of robots.

Modular robot cart

Welded steel construction

Fits through standard doorway

Single 2-jaw EOAT for mill blank and lathe blank

Fold-up work table for laptop, textbook, etc.

Safety area scanner for fenceless robot operation or safety interlocked guarding around robot work area

3-color beacon operation indicator light

Swivel casters with brakes and rotation lock
PLC/HMI Trainer

Rockwell Automation (Allen Bradley) CompactLogix control panel electrical project kit

• Rockwell CompactLogix 5380 controller with Integrated Motion (5069-L306ERM) with 16 24VDC digital inputs & 16 24VDC digital outputs
• Rockwell AB 10” PanelView 5000 Graphic Terminal (PanelView 5310)
• 5 Port Stratix Ethernet Switch
• Dual Ethernet Access Ports and Cable Glands for external device connections
• Pre-loaded with structured program template
• Also sold in kit form along with Rockwell curriculum
• Endless possibilities - can connect to almost any device!
• PLC robot integration program template installed

PLC/HMI Trainer ready to use as standalone OR integrate to any FANUC robot

Includes:
• NEMA 12 steel industrial enclosure
• 120V, 24 VCD power supply
• 120V 10’ power cord
• 5 port ethernet switch
• Wireless ethernet bolt
• 4 pushbuttons
• 1 selector switch

PLC: Compact Logix 5000 Series
• 32 task
• Dual IP mode (2 diff network connections)
• DLR, start and linear topologies supported
• 16 ethernet node connections max
• 32 socket connections max
• 2 CIP drive axis connections (position loop/servo control)
• Ladder structured text, function block diagram
• Sequential function chart programming interfaces
• 0.6 MB user memory
• 8 local I/O Modules max

HMI: Panelview 5000
• 10.4” SVGA TFT color touch display
• 4:3 aspect ratio
• 800 x 600 pixel resolution
• 1GB RAM / 1 GB user memory

Ask about your custom needs.
Prices may vary.

Options:
» Student build kit
» Discrete I/O kit to FANUC LR Mate peripheral I/O board for robots without ethernet
» Mobile workbench - adjustable height with power
» Replenishment parts kit
» Panel rebuild master kit

Includes:
• 1-year subscription to Rockwell software
Industry 5.0 is the next step in the industrial revolution: People, robots, and smart machines working together.

**FEATURES:**
- FANUC LRMate ER4iA 6-axis robot
- Brushless DC motor and drive
- Power transmission via belt drive
- Conveyor part transport
- Fluid power (pneumatics)
  - Direction control valves
- Rotary actuator
- Escapement actuator
- Guided linear actuator
- Sensor technology
  - Optic
  - Laser
  - Solid state hall effect
  - Proximity
  - Inspection
- Optional iCC PLC/HMI trainer

**PLC: Compact Logix 5000 Series**
- Dual IP mode (2 diff network connections)
- DLR, start and linear topologies supported
- 16 ethernet node connections max
- 32 socket connections max
- 2 CIP drive axis connections
- Ladder structured text, function block diagram
- Sequential function chart programming interfaces
- 8 local I/O Modules max

**HMI: Panelview 5000**
- 10.4" SVGA TFT color touch display

**FANUC**
- FANUC LR Mate ER4iA 6-axis robot
- FANUC R30iB Plus robot controller
- 2D iRVision optional

FANUC’s new R30iB Plus robot controllers feature the new iPendant with enhanced screen resolution and processing capability.

The new user interface, iHMI, can display guides for setup and programming, as well as tutorials from the main home page which as a design common to FANUC CNCs, enabling easier use of robots.

**iIM5.0 Features**
- Fold-up work table for laptop, textbook, etc.
- Safety area scanner for fenceless robot operation
- 3-color beacon operation indicator light
- Swivel casters with brakes and rotation lock
- Dry-erase marker PBL
- On-board air compressor
- Plugs into 20 amp 120vac power

**PBL (Project-based Learning)**
- Product manufacturing with sortation and package assembly
- Bulk material infeed
- Color Sortation
- Robotic packaging/assembly
**AM-CERT Features**

- Safety interlocked entry door
- 16 remote accessible configurable I/O points
- PLC control panel with viewing window, main power disconnect, program access port on outside of panel
- Rockwell CompactLogix™ or Compact GuardLogix® PLC cell control
- Rockwell PanelView™ 10” touch screen interface with cell function screens
- Light curtain or area scan safety for robot work area
- Main power choice of 208 VAC 3 phase, 220 VAC 3 phase, or 480 VAC 3 phase
- Folding perimeter fencing
- Access panel for conveyor through the perimeter fence
- Slide out programming laptop desk with 110 VAC power supply
- Fold down pick and place tables
- SMC pneumatics, filter/regulator
- SMC valve bank wired to robot I/O
- SMC two-jaw robot gripper with open/close sensors and Piab vacuum with vacuum switch
- Available ATI automatic tool change with separate gripper and vacuum tool
- Portable with pallet jack or forklift

**Product Options:**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
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<tbody>
<tr>
<td>AM-CERT-10</td>
<td>Material Handling CERT Cell with M10 Robot</td>
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<td>Material Handling CERT Cell with M20 Robot</td>
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<td>Swivellink® Conveyor</td>
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<td>Option 2</td>
<td>Area Scanner 270° Protection</td>
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<td>Option 3</td>
<td>Automatic Tool Change</td>
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<td>Safety PLC Option</td>
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<tr>
<td>Option 5</td>
<td>Transformer 208V, 220V, or 240V 3-Phase Power</td>
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</table>

**Industrial Material Handling Trainer**

**AM-CERT - Advanced Manufacturing Cert Cell**

Train on Industrial Equipment for Advanced Manufacturing
Take your training to the next level!

Fully integrated Rockwell PLC with FANUC robot for advanced material handling

![FANUC](image)

**FANUC**

- FANUC M10i/D or M20iA 6-axis robot
- FANUC R30iB Plus robot controller
- 2D iRVision

FANUC’s new R30iB Plus robot controllers feature the new iPendant with enhanced screen resolution and processing capability. The new user interface, iHMI, can display guides for setup and programming, as well as tutorials from the main home page which is a design common to FANUC CNCs, enabling easier use of robots.

**Product Dimensions:**

Open: 10’ deep x 10’ wide x 88” high
Folded: 72” deep x 54” Wide x 88” high

**Rockwell PLC • FANUC Robot • FANUC iRVision • Swivellink® Conveyor**

Robotics • PLC • Safety • Pneumatics • I/O • Vision

**Shown collapsed**
**SMART MANUFACTURING TRAINING SYSTEM**

**CSM™ - Connected Smart Manufacturing**

**BUY INDIVIDUALLY OR AS A COMPLETE SYSTEM**

---

### CSM FEATURES

<table>
<thead>
<tr>
<th>Feature</th>
<th>OP10</th>
<th>OP20</th>
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</tbody>
</table>

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**FANUC CNC Controls**

- FANUC Industrial Robot
- Rockwell Studio 5000 Logix PLC
- Rockwell Safety PLC
- Rockwell HMI PanelView™ touchscreens
- Rockwell e-learning subscription
- Fluid power pneumatics
- Part traceability and marking

**FANUC Industrial Robot Features**

- Vision-guided pick and sort
- Vision inspection
- Fenceless robot cells with safety area scan
- Rockwell Studio 5000 Logix PLC
- Rockwell Safety PLC
- Rockwell HMI PanelView™ touchscreens
- Rockwell e-learning subscription
- Fluid power pneumatics
- Part traceability and marking
- Modular work cells (can be used independently)
- Portable (fits in classroom)
- Wired or wireless between stations
- Fault insertion
- Smart sensor technology I/O link with diagnostics
- Dual robot end of arm tool vacuum/mechanical grip
- Conveyors with VFD (variable speed drives)
- RFID manufacturing process tracking
- APT integration curriculum

---

**Showed with FANUC CNC Controls**

**Showed with Levl CNC**

---

*The OP10 cannot be separated from the CNC once mated through the controls.*
This system is truly like no other Industrial System for Education Institutions. Your students will use FANUC/Rockwell products on a factory system to understand a fully integrated line. Each cart can also be detached for individual learning.

Integration from:
FANUC CNC Machine Making Product
OP 10 Machine Tending the CNC
OP 20 Laser Marking the product
OP 30 Assembly of the product
OP 40 Packaging the product in boxes

• Rockwell CompactLogix or GuardLogix PLC cell control
• Rockwell PanelView 10” touch screen interface with cell function screens
• Safety interlocked entry door
• 16 remote accessible configurable I/O points
• 3 color beacon light
• Main power disconnects
• Program access port on outside of panel
• Area scan safety for robot work area

Using the programming guide, even first-time robot users can create a program for a simple handling task and execute it in just 30 minutes! Easier usage also improves efficiency by facilitating system setup and maintenance.

CONNECTIONS SMART MANUFACTURING
High-Performance Vertical Machining Center α-D14MiB(S)
The ultimate all-round vertical machining center Model M, perfect for milling and drilling tasks requiring maximum precision, versatility and reliability.
• Optimal acceleration and deceleration control
• Rigid Design
• Easy maintenance and operation
• Extremely fast 9 second tool change
• High precision control
• Designed for easy automation

• FANUC LR Mate 200iD 4S 6-axis robot
• 2D iRVision Optional
FANUC’s new robot controllers feature the new iPendant with enhanced screen resolution and processing capability. The new user interface, iHMI, can display guides for setup and programming, as well as tutorials from the main home page which has a design common to FANUC CNCs, enabling easier use of robots.

CONNECTING SMART MANUFACTURING
ROBODRILL - CNC

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Using the programming guide, even first-time robot users can create a program for a simple handling task and execute it in just 30 minutes! Easier usage also improves efficiency by facilitating system setup and maintenance.
Controls integration is the key to connected systems, IIoT, and industry 4.0. In order to continue to advance in manufacturing technology, we must continue to train connected systems, hardware and software, and integration of control systems.

APT equipment is designed specifically to teach advanced electrical hardware, software development, and integration of control systems. We are using the same equipment and software that is being used in the majority of industrial equipment; not what is cheapest or has free software. We are using the latest technology and hardware.

We have partnered with FANUC America to offer EDU grants and Rockwell Automation to provide Learning+, where applicable, to schools who want to get involved on this advanced manufacturing training.

APT provides all programs, drawings, templates, and design documentation unlocked and free of charge. The school has access to every part of the controls system and access to any passwords and security setup within the equipment to develop and teach curriculum that best suits the industry in their region. Our sample programs and templates have been developed by observing and taking the best programming methods observed over 25 years of industry practice. The HMI interface and PLC code and structure focus on simple core programming methods that make operating, maintaining, and troubleshooting easy to perform. Our hope is that this focus on ease of use and simple programming gets distributed through all students that learn on our equipment.

Our design allows for students and instructors to have fully functional industrial grade safety systems that allow the system to run at greater speeds than typical education system should be allowed to run. The safety systems also allow for students and instructors to work closely with the equipment and remain safe. Our fanceless versions of equipment allow personnel to approach the equipment and the equipment will slow down or stop accordingly and then resume once it is safe.

### AN IN-DEPTH LOOK AT THE OPERATOR INTERFACE

The HMI is broken into 5 color coded tabs with enhanced diagnostics on the system. 3D graphics are put on the different screens just as we would in the industry.

**SYSTEM** - These screens are used for general machine setup. A majority of the functions available on the systems require security requirements to access them. Several functions on the System HMI screens include: VFD frequency setup; Recipe Management System, Inspection Limits, I/O Link Setup, Login, and System Security Settings.

**OPERATIONS** - These screens are used for general machine operation and functionality. 3D model images are used to aid with the intuitiveness and ease of use. Status Indicators, Mode Control, and Manual Operations, along with Operational and Fault Messages are displayed on these screens.

**ROBOT** - This screen displays all communication and I/O interface between the system PLC and robot. Users may also manually control the functions of the robot and call a specific robot program to run from this screen.

**I/O** - On this screen users can see all I/O within the system, its present status on/off to run diagnostics and aid in troubleshooting.

**PRODUCTION** - From these screens the user can view and capture production data to be used for business analytics. Recipe management and the production scheduler allow the users to edit the parameters and schedule all products the system can run.
Features

- **OpenBook™**
  - Miller’s learning management software.
  - Helps plan, offer, and assess student learning.
  - Provides welding instructors, learners, and management with an easy tool to teach welding concepts and techniques to a variety of students.
  - Helps those just starting out to professionals in the field who’d like to learn new skills or refresh their current techniques.

**Auto-Continuum™ Systems**

*Take your welding to the next level.*

- Versa-Pulse™
  - Fast, low-heat, low-spatter process
  - Great for gap filling
  - Shortest arc length/lowest pulse voltage
- Accu-Pulse®
  - Most popular process for majority of industrial welding applications
  - Most adaptive arc on 1/8" gauge
  - Designed for all weld positions
- RMD®
  - Lowest heat process, best for gap bridging
  - Limited travel speed

**Integrated Weld Educational Cart**

**Education & Software**

- **OpenBook™**

**Auto-Continuum™ Systems**

*Take your welding to the next level.*

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  - Designed for all weld positions
- RMD®
  - Lowest heat process, best for gap bridging
  - Limited travel speed

**Manufacturing Equipment**

- **FILTRAIR® 130**
  - High-efficiency filter designed to capture weld fume
  - FILTek™ HEPA cleanable filters last longer
  - Lightweight and portable
  - Quiter for a safer, more productive work area

**Included:**
- Work Holding Kit (APT88001132)
- Pivot Angle 150 Mini
- Mini Angle
- Mini Multi Angle

**Optional:**
- PPE Kit (APTWELDPPE)
- 15' Industrial MIG Gun with 15' ground cable

**FANUC ARC CERT:**

(No eligible for CERT program)

- **Versa-Pulse™**
  - Fast, low-heat, low-spatter process
  - Great for gap filling
  - Shortest arc length/lowest pulse voltage
- **Accu-Pulse®**
  - Most popular process for majority of industrial welding applications
  - Most adaptive arc on 1/8" gauge
  - Designed for all weld positions
- **RMD®**
  - Lowest heat process, best for gap bridging
  - Limited travel speed

**Plug the optional 15' handgun into the existing Miller power source to get 2 ways to weld!**

**10% Graduate Discount at Mag Tools**

Use APTWELDCELL at mag-tools.com
ROBOT ACCESSORIES

**Mobile Cart**
- 27 1/2" wide x 47 1/4" long
- Optional wings fold to fit through standard 36" door
- Out-of-the-box solution for FANUC CRX as a mobile training system.

**Mobile Pedestal**
- Kit includes:
  - 24" CRX pedestal
  - Mobile base
  - Controller bracket
  - Teach tablet holder.
  - Heavy duty welded steel construction
  - Standard gray powder coated finish
  - Total locking swivel and wheel brakes
  - Industrial swivel leveling feet for stability
  - Non-slip pads on each leveling foot
  - Large footprint for stability

**Parts Presentation Kit with 3” Foam Dice Blocks**
- Fixed grid, 12 location diamond template with six (6) 3” foam dice cubes
- Pegboard reconfigurable template with 50 locator pegs and six(6) 3” foam dice cubes

**Mobile Cart Optional Add-ons**

**Pedestals**
We stock pedestals for the CRX and LR Mate robots.
- Range from 24” to 48” tall in 6” increments
- Holes for leveling and anchoring
- Steel welded construction
- Powder coat finish

When mounting these robots we recommend guarding (see next page).
*Always be safe when operating a robot.*
Create a “Lab Environment Work Cell” for Robots

This is industrial guarding “STRONGUARD™” used in industry for perimeter guarding around robot cells. We offer this to education for students to safely run the robot and additional students see over the top of the guarding for instructional purposes. All the standard guarding is 53” tall for visibility, we offer a few kits that we feel would be best used for these robots:

- 5’ x 5’ for SCARA or FANUC LR Mate
- 7’ x 7’ for FANUC M10
- 10’ x 10’ for FANUC M20
- Additional sizes also available

The safety mesh is 2” x 2” black coated, the post and frames are made of steel and are powder coated Safety Yellow. We offer several safety options that include:

- Gated entry with latch and interlock switch.
- Light curtain, three-sided guarding with one open side.
- Area scanner kit with narrower side panels.

Swivellink® 4-1/2”W X 36”L Variable Speed Conveyor

- Swivellink® belt conveyor with variable speed capability (conveyor mounted speed control)
- 4-1/2” wide bed, 4-1/4” wide belt, 36” overall length conveyor
- Hard stop each end of conveyor
- Optical sensor at idle end of conveyor on adjustable mount
- Optical sensor at drive end of conveyor on adjustable mount
- Sensor cables and motor control forward / reverse terminated in small junction box
- 120VAC Power cable

Free Standing Conveyor
- Free standing conveyor base with adjustable height stands
- Locking swivel casters for portability
- Adjustable side rails

Magentically Mounted Tabletop Conveyor
- Conveyor base with switchable magnetic mounts
- Side rails, one side fixed, opposite side adjustable

Wireless Expansion Remote I/O

Add a wireless network to your robot or other training equipment.

Configure with remote modules and untether!
CLASSROOM DESIGN SERVICES

Let us design your classroom with industry-recognized equipment and curriculum

APT’s Design Team is comprised of field experts with years of experience. Engineering • Automation • Management • Material Handling • Mechanical • Design

Our design team will talk to you to get an understanding of your initiatives and goals.

We will then design a classroom with automation and robotics equipment and curriculum to make your students a valuable candidate to employers.

We will align education solutions with your budget requirements, with consideration for local industry relatability, software licensing requirements and maintenance costs.

Considerations

• Long-term plan
• Variety of learning options
• Environmental and lighting requirements
• Utility requirements and locations
• Enough space for equipment and collaboration
• Plan for future growth
• Understanding local industry needs
Contact your authorized FANUC education solutions provider for more information.