INDUSTRIAL EDUCATION SOLUTIONS

FANUC

APT MANUFACTURINGsolutions

"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

"At ITW Welding/Miller Electric we are proud to work with industry partners pairing industrial welding solutions in the educational arena to develop the workforce of tomorrow that is prepared to adapt to the demands of the marketplace."

- Dave Lambert
Group President - North American Sales & Marketing, ITW Welding

"At Fronius, we are proud to be recognized as a global technology leader in the field of welding. We believe that it is our responsibility to bring passion and education to students, as they are the future of the industry."

- Christoper Bliven
Head Of Sales – Partner Program, Fronius

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For most current information, see aptmfg.com/education

FANUC

APT MANUFACTURINGsolutions

CERTIFICATIONS, CURRICULUM, & SOFTWARE

FANUC America Corporation
3900 W. Hamlin Road
Rochester Hills, MI 48309-3253

Telephone: (248) 377-7000
Customer Service Center: (888)-FANUC-US
www.fanucamerica.com

FANUC EDUCATION GRANT

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 I/P Scanner, Advanced Dual Check Safety (DCS), 4D Graphics, Motion Package, PC Remote iPendant, Collision Guard Pack, Interface Panel, Maintenance Package, Menu Utility, Remote iPendant, ROBODRILL 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 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

Rockwell Automation EDU Toolkit Bundle
- **Studio 5000 Logix Designer®**
- **Studio 5000 View Designer,**
- **plus over 100 more pieces of Rockwell software**

Available through your local Rockwell distributor.

CURRICULUM

Learning+ course content

Available through your local Rockwell distributor.

OpenBook™
learning management software

Integration Project-Based Learning (PBL) Curriculum
- **Daily lesson plans**
- **Assessment and grade charts**

Use our online tool to navigate equipment and programs

Legend:
- FANUC Robotics Courses (F)
- FANUC CNC Courses (C)
- Rockwell Automation Courses (R)
- Miller Welding Courses (M)
- APT Integration Courses (A)
- Industry Recognized Certifications (I)

Level 1

Learning Level	Career Path		Description	Cert. Type	ROBO-DRILL	CERT Cart	MTEC-SIM	MTEC	Weld CERT Cart	iCC (PLC/HMI)	AM-CERT	CSM	iiM5.0	iLS
Level 1	FANUC Robot Operator - Material Handling	F	FANUC: HandlingTool Operation and Programming	[cert]		✓	✓	✓		✓*	✓	✓	✓	
		F	FANUC: HandlingPRO	[cert]		✓	✓	✓		✓*	✓	✓	✓	
		I	FANUC Certificaiton administered by NOCTI: FCR-01 - Written	[grad]		✓	✓	✓	✓		✓	✓	✓	
		I	FANUC Certificaiton administered by NOCTI: FCR-02 - Performance	[grad]		✓	✓	✓	✓		✓	✓	✓	
	FANUC Robot Operator - Arc Welding	F	FANUC: ArcTool Operation and Programming	[cert]					✓					
		F	FANUC: WeldPRO	[cert]					✓					
		M	Miller OpenBook: Robotic Welding Fundamentals	[cert]					✓					
		M	Miller OpenBook: Gas Metal Arc Weldig (MIG)	[cert]					✓					
	CNC Operator	C	FANUC CNC Concepts: Machining, Programming, Setup, and Operation	[cert]	✓		✓	✓				✓		
		C	FANUC CNC Concepts: Turning, Programming, Setup, and Operation	[cert]	✓		✓	✓				✓		
		I	NIMS Certification: CNC Mill Programming Setup, and Operation	[grad]	✓			✓				✓		
	PLC / Controls Operator	A	Schematic Reading Fundamentals							✓	✓	✓	✓	✓
		A	Panel Building Lab							✓				✓
		R	Rockwell CCP 183: Ethernet / IP Configuration and Troubleshooting	[cert]						✓	✓	✓	✓	
		R	Rockwell CCP 146: Logix 5000 System Fundamentals	[cert]						✓	✓	✓	✓	
		A	Introduction to Integration - Labs and Exercises							✓	✓	✓	✓	✓

Level 2 & Level 3

Learning Level	Career Path		Description	Cert. Type	ROBO-DRILL	CERT Cart	MTEC-SIM	MTEC	Weld CERT Cart	iCC (PLC/HMI)	AM-CERT	CSM	iiM5.0	iLS
Level 2	FANUC Robot Technician	F	FANUC: iRVision 2D	[cert]		✓**	✓**	✓**	✓**		✓	✓	✓	
		I	FANUC Certificaiton administered by NOCTI: FCR-T1	[grad]		✓	✓	✓	✓		✓	✓	✓	
	CNC Machine Technician	C	FANUC CNC Concepts: FANUC Simluator Exercises	[cert]			✓					✓		
		I	NIMS Certification: CNC Mill Operations	[grad]				✓				✓		
	Robotic Welding Technician	M	Miller OpenBook: Applied Knowledge - Robotic Welding Labs	[cert]					✓					
		I	American Welding Society: CRAW Certificaiton	[grad]					✓					
	Maintenance Technician	C	TRRBD40-501 - Understanding the FANUC ROBODRILL	[cert]	✓			✓				✓		
		C	TRCNC40-501 - FANUC ROBODRILL Usage & Maintenance	[cert]	✓			✓				✓		
		R	Rockwell CCP153: Maintenance and Troubleshooting	[cert]							✓	✓	✓	✓
		A	Intermediate Concepts: Maintenance and Troubleshooting of Industrial Equipment				✓	✓	✓	✓	✓	✓	✓	✓
	PLC / Controls Technician	A	Introduction to Industrial Automation and Integration				✓	✓			✓	✓	✓	✓
		R	Rockwell CCP 151: Basic Ladder Logic Programming	[cert]							✓	✓	✓	✓
		R	Rockwell CCP 143: Ladder Logic Project Development	[cert]							✓	✓	✓	✓
		R	Rockwell CCV 204-A: FactoryTalk View ME & PanelView Plus Programming	[cert]							✓	✓	✓	✓
		R	Rockwell INA 201: Industrial Network Architecture Foundation	[cert]							✓	✓	✓	✓
		R	Rockwell INA 202: Industrial Network Architecture Intermediate	[cert]							✓	✓	✓	✓
		R	Rockwell CCP 251: Advanced Logix 5000 Programmer	[cert]							✓	✓	✓	✓
		R	Rockwell CCP 154: Studio Logix Designer Level 4 ST & SFC	[cert]							✓	✓	✓	✓
		R	Rockwell SAF LOG 104: Guard Logix (and Banner) Application Development	[cert]						✓*	✓	✓	✓	✓
		A	Basic Integration Labs: PLC, HMI, Robot, Ancillary Components				✓	✓		✓*	✓	✓	✓	✓
		A	Introduction to Safety Systems							✓*	✓	✓	✓	✓
		R	Rockwell CCA 185: PowerFlex 525 Drive Startup and Configuration	[cert]						✓*		✓	✓	✓
Level 3	Robot Integration	A	Robot to CNC: Integration Fundamentals and Labs			✓		✓	✓			✓		
	Industrial Controls Integrator	R	Rockwell INA 203: Industrial Network Architecture Advanced Part 1	[cert]						✓*		✓		✓
		R	Rockwell INA 204: Industrial Network Architecture Advanced Part 2	[cert]						✓*		✓		✓
		R	Rockwell CCN 130: Motion Control Fund	[cert]						✓*		✓		✓
		R	Rockwell CCN 144: Studio 5000 Logix Designer Level 4: Kinetix 5500/6500 (CIP) Programming	[cert]						✓*		✓		✓
		A	Safety Systems, Standards Design, and Application				✓	✓	✓		✓	✓	✓	✓
	Applied Engineering of Robotics, Automation, and Industrial Systems	A	Integration: Part Traceability							✓*		✓		✓
		A	Integration: I/O Link Technology							✓*		✓		✓
		A	Integration: RFID Technology							✓*		✓		✓
		A	Integration: Advanced Integration of Industrial Equipment								✓	✓		✓
		A	Integration: Advanced Part Tracking and Messaging								✓	✓		✓
		A	Integration: Industrial 4.0 and IIoT								✓	✓		✓
		I	FANUC - Rockwell Level 3 Systems Integrator Certification	[grad]							✓			✓

Level 1
This coursework 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 coursework will train technician level employees with troubleshooting fundamentals.
This could be used in an advanced vocational school, but is best suited for a community college or school program that is trying to grow from the operator level training and begin teaching troubleshooting and integration.

Level 3
This coursework will train system integration in areas for robotics, PLC, process engineering, controls architecture, and machine design.
This is perfect for an advanced technical school training students to apply theoretical knowledge of industrial systems, or a university that is looking to teach engineering and integration of industrial components and equipment.

[cert icon] - Training Certificate upon successful completion of e-learning.

[grad icon] - Recognized industry certification issued by an independent credentialing authority.

*ICC must be integrated with CERT cart, MTEC, or MTEC-SIM to teach robotics courses

**Must purchase vision options in order to teach FANUC iRVision

FANUC

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Advantages of Our Industrial Training Equipment

	OUR TRAINERS	OTHER TRAINERS
Trainers built for manufacturing training	✓	✓
Equipment built with exact same standards as industrial equipment	✓	
Curriculum with labs to apply knowledge	✓	✓
Curriculum comes directly from manufacturer; not rewritten	✓	
Labs are derived from industry practices, like live panel building utilizing industry standard wiring practices	✓	
Certificates upon completion of classwork or modules	✓	✓
Certifications directly from industry leaders like FANUC, Rockwell, and Miller Welding that carry over to the first day on the job	✓	
Rockwell MicroLogix basic PLC	✓	✓
Rockwell CompactLogix advanced PLC integration with Studio 5000	✓	
Advanced courses in FANUC TPP, iRVision, Advanced TPP, DCS	✓	
Advanced courses in integration of area scan, RFID, wireless I/O	✓	
FANUC CRX 8 Years Zero Maintenance	✓	

FANUC
Recommended Training Curriculum Path

Programming

- HandlingTool Operations & Programming
- SpotTool Operations & Programming
- ArcTool Operations & Programming
- PaintTool Operations & Programming
- DispenseTool Operations & Programming
- Robot Operations

*Safety
- *Dual Check Safety

*Advanced Courses

*Vision
- *iRVision 2D Operation & Programming
- *iRPickTool Operation & Programming
- *Advanced iRVision 2D Operation & Programming
- *iRVision 3DL Operation & Programming
- *iRVision 3DMV Operation & Programming

*Programming
- *Advanced Teach Pendant Programming
- *PalletTool Setup & Programming
- *HandlingPRO ROBOGUIDE Simulation
- *PaintPRO ROBOGUIDE Simulation
- *KAREL Operation & Programming
- *Force Sensor Setup & Operation
- *Collaborative Robot Operation & Programming

Mechanical
- Robot Disassembly/ Reassembly

Electrical
- Controller Electrical Maintenance

*Communications
- *DeviceNet Setup & Functionality
- *Ethernet IP Setup & Functionality

ROBODRILL
- ROBODRILL Operation & Programming
- ROBODRILL Maintenance & Troubleshooting

Please note: **All courses marked * require completion of all prerequisites.**
Please view prerequisite requirements within individual course descriptions.

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Stand-Alone Products
for your Classroom

CRX-10*i*A / CRX-5*i*A

ER4iA

SCARA SR-3*i*A

M-1*i*A

Collaborative CR-7*i*A

***i*CC PLC/HMI**

ArcMate 50iD/7L

LR Mate 200*i*D/7L

ROBODRILL CNC

CNC Simulator Controller

All FANUC robots are available. Contact your education solutions provider.
Also see accessories on next pages.

CERT Cart

FANUC's CERT Cart is an entry level cart that teaches students basic tool handling skills as well as *i*RVision 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.
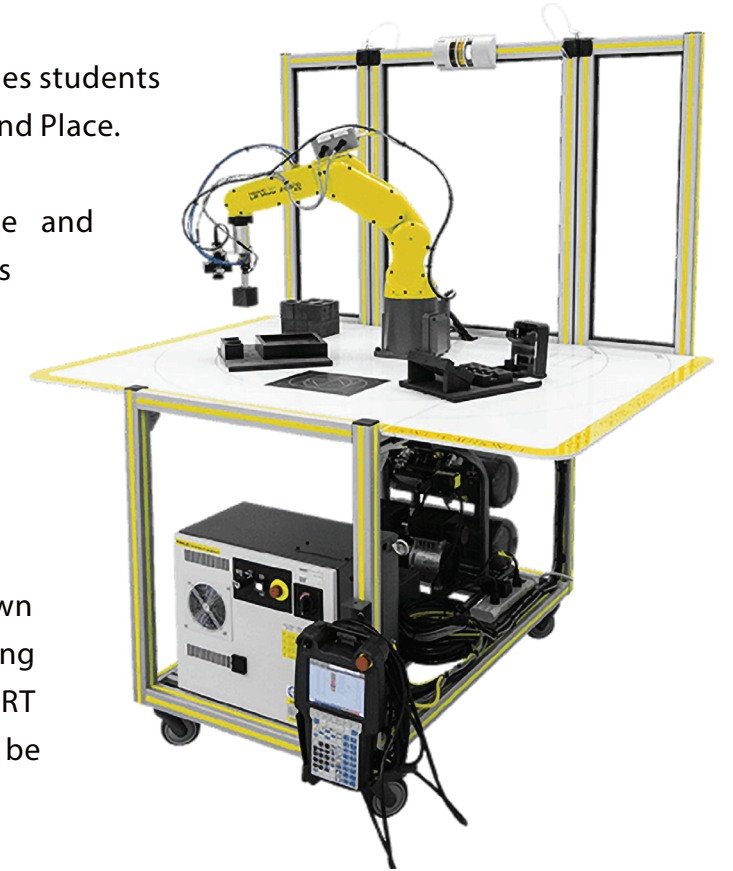
Project-Based Learning (PBL) Kits
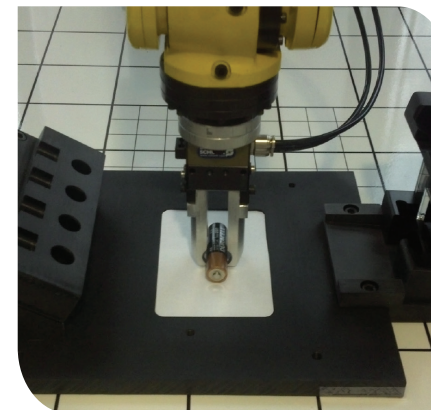
Battery Package

iRVision

Pill Kit

FANUC ROBODRILL CNC

Industry-Rated, Priced for Education

The FANUC ROBODRILL is a high-performance machining center, known worldwide as the most reliable machine manufactured today. The ROBODRILL makes quick work out of any milling, drilling, or tapping jobs. FANUC CNC controls are the most used CNC controls with over 5 million installed worldwide. FANUC is a leading supplier of CNC technology and factory automation systems, and their CNCs are used in many manufacturing applications. The ROBODRILL is the preferred machine in any manufacturing facility large or small.

ROBODRILL 3-axis
• FANUC ROBODRILL α-D14MiB series
• NRTL for ROBODRILL M*i*B5/L*i*B5 without breaker box (ONLY NRTL)
• 31*i*B/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 ECO 3-axis
• FANUC ROBODRILL α-D14M*i*B series
• NRTL for ROBODRILL M*i*B5/L*i*B5without 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)*

ROBODRILL 5-axis
• Available with custom order

FANUC CERTIFIED CNC TRAINING

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

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ROBOT MACHINE TENDER
MTEC - Machine Tending Educational Cell

LR Mate machine tender

Shown with FANUC ROBODRILL D14MiB5

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

FANUC
ROBOTICS

FANUC LR Mate 200iD/7L long-arm 6-axis robot

• R30iB Plus robot controller

OR FANUC CRX-10iA collaborative 6 Axis robot

• R30iB Mini Plus robot controller

Optional 2D iRVision Available

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

APT MANUFACTURINGsolutions

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

• Safety area scanner for fenceless operation of LR Mate 200iD/7L robot work area

• 3-color beacon operation indicator light

• FANUC CRX operates in collaborative mode without safety area scanner

• 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)

MTEC FEATURES	ROBODRILL CNC α-D14MiB5 FANUC 31i-B5	FANUC LR Mate Machine Tender	FANUC CRX Machine Tender
Pricing	$$$	$	$
Integrated industrial production line	✓	✓	✓
Industry 4.0	✓	✓	✓
FANUC Certification	✓	✓	✓
FANUC CNC controls	✓		
Machine actual parts	✓		
CNC tool holder type	BT-30		
Coolant	✓		
Spindle RPM	10000		
FANUC robot machine tender	✓		
FANUC iRVision for inspection and sort		✓	✓
Fenceless robot cells with safety area scan		✓	
Fluid power pneumatics		✓	✓
Portable (fits in classroom)		✓	✓
Fault insertion		✓	✓
Robot end-of-arm tool		gripper	gripper
APT integration curriculum	✓	✓	✓
120V 20 amp		✓	✓

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ROBOT WITH CNC SIMULATOR
MTEC-SIM - Machine Tending Educational Cell

- 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 *i*RVision 2D for error proofing and guidance

- Built-in toolbox for storage
- Students have the opportunity to learn real world advanced automation integration
- Preconfigured w/ load & unload program templates for simple build with no complex programming needed
- 3-axis mill and 2-axis lathe simulation

FANUC

CNC

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

ROBOTICS

FANUC ER4*i*A 6-axis robot
- R30iB Mate Plus controller

OR FANUC CRX-5*i*A collaborative 6 Axis robot
- R30*i*B Mini Plus robot controller

Optional 2D *i*RVision Available

FANUC's new R30*i*B Plus robot controllers feature the new *i*Pendant with enhanced screen resolution and processing capability.

The new user interface, *i*HMI, 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.

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- 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 operation of ER4iA robot work area
- FANUC CRX operates in collaborative mode without safety area scanner
- 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

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

iC *industrial* Controls Center **Features**

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

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
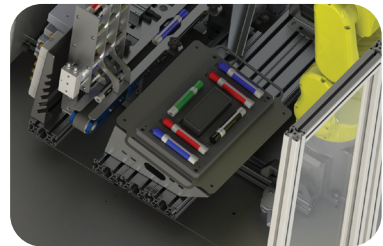» Replenishment parts kit
» Panel rebuild master kit

- Rockwell CompactLogix 5380 controller w/ Integrated Motion (5069-L306ERM) w/ 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 & Cable Glands for external device connections
- Pre-loaded with structured program template
- Endless possibilities - can connect to almost any device!
- PLC robot integration program template installed
- Also sold in kit form for student build-out

Ready to interface with your FANUC CERT robot over Ethernet IP protocol or optional discrete I/O

Ask about your custom needs. Prices may vary.

MECHATRONICS CERT CART
*i*IM5.0 - Industrial Integrated Mechatronics Trainer

- FANUC ER4*i*A 6-axis robot -or- FANUC CRX-5iA collaborative 6 Axis robot
- Brushless DC motor and drive
- Power transmisson 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*

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

*i*IM5.0 Features

FANUC

FANUC ER4*i*A 6-axis robot
- R30iB Mate Plus controller

OR FANUC CRX-5*i*A collaborative 6 Axis robot
- R30*i*B Mini Plus robot controller

Optional 2D *i*RVision Available

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APT MANUFACTURINGsolutions
- Fold-up work table for laptop, textbook, etc.
- Safety area scanner for fenceless operation of ER4iA robot work area
- FANUC CRX operates in collaborative mode without safety area scanner
- 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
- NEMA 12 steel industrial enclosure
- 120V, 24 VCD power supply
- 5 port ethernet switch
- Wireless ethernet bolt

Rockwell Automation
(Included with 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
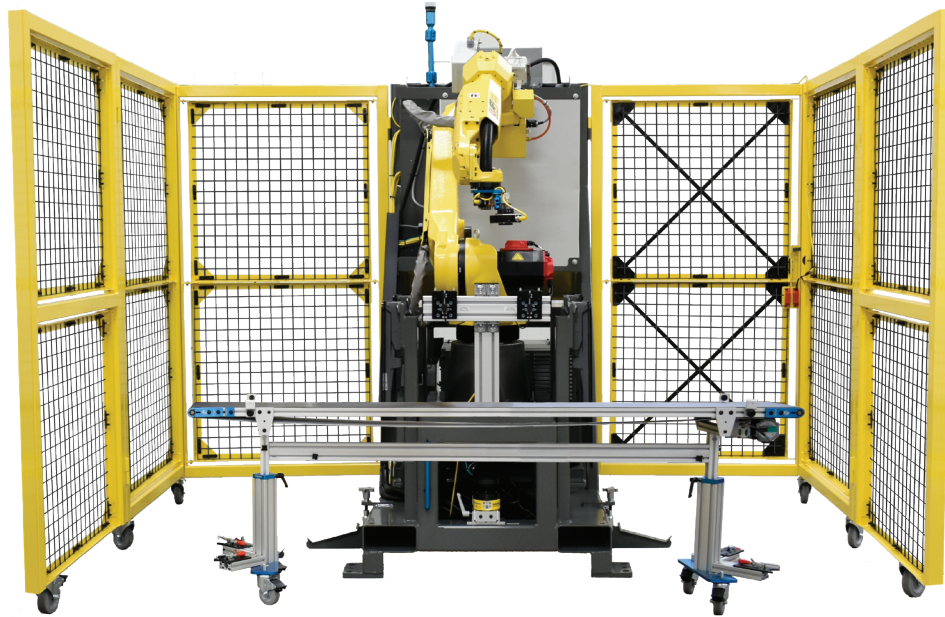- 8 local I/O Modules max

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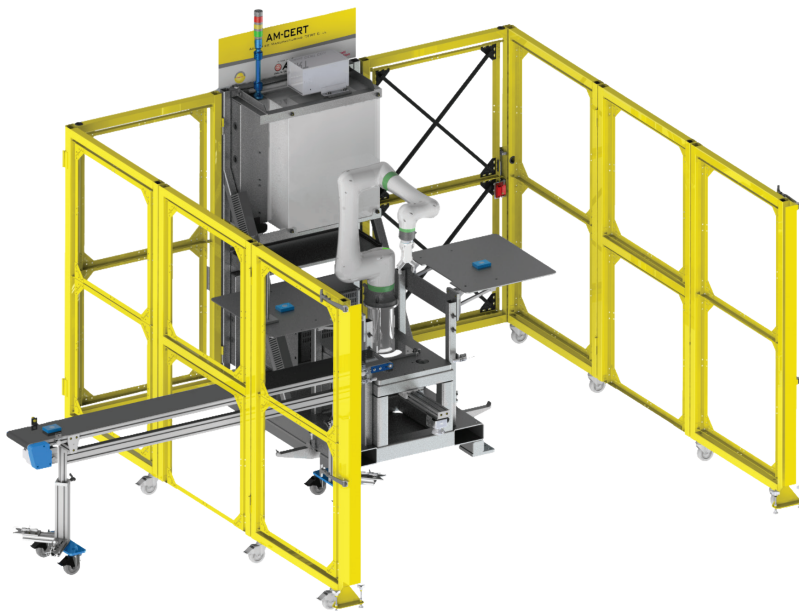- 10.4" SVGA TFT color touch display

INDUSTRIAL MATERIAL HANDLING TRAINER

AM-CERT - Advanced Manufacturing Cert Cell

AM-CERT Features

Open: 10' deep x 10' wide x 88" high

Folded: 72" deep x 54" wide x 88" high

Product Options

AM-CERT-10	Material Handling CERT Cell with M10 Robot
AM-CERT-20	Material Handling CERT Cell with M20 Robot
AM-CERT-CRX	Material Handling CERT Cell with CRX Robot
Option 1	Swivellink® Conveyor
Option 2	Area Scanner 270° Protection (Standard on CRX)
Option 3	Automatic Tool Change (M10iD/M20iD only)
Option 4	Safety PLC Option
Option 5	Transformer 208V, 220V, or 240V 3-Phase Power (for M10iD or M20iD, CRX standard 120 VAC)

Rockwell PLC • FANUC Robot • FANUC _i_RVision • Swivellink® Conveyor
Robotics • PLC • Safety • Pneumatics • I/O • Vision

FANUC

FANUC M10_i_D or M20_i_A 6-axis robot
- R30_i_B Plus robot controller

FANUC CRX-10_i_A 6 Axis robot
- R30_i_B Mini Plus robot controller

Optional 2D _i_RVision Available

FANUC's new R30_i_B Plus robot controllers feature the new _i_Pendant with enhanced screen resolution and processing capability.

The new user interface, _i_HMI, 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.
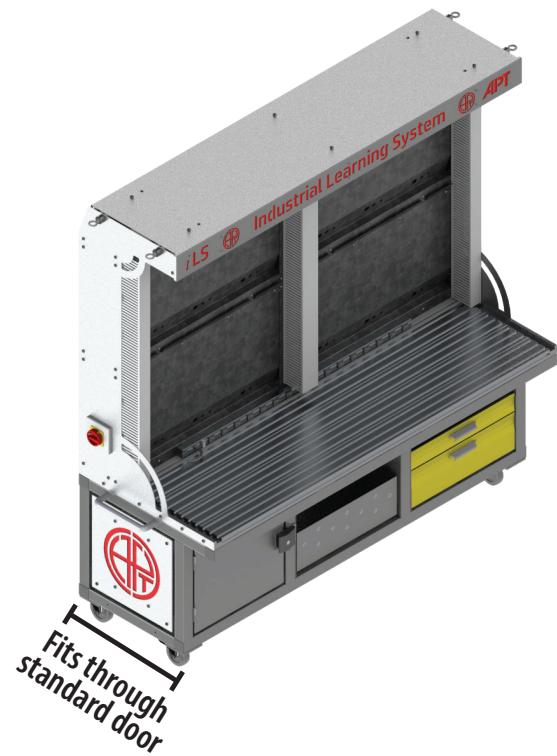
Rockwell Automation

- 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

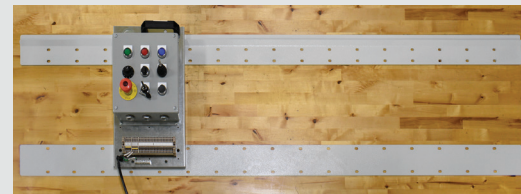- Rockwell PanelView™ 10" touch screen interface with cell function screens

APT MANUFACTURINGsolutions

- Folding perimeter fencing

- Access panel for conveyor through the perimeter fence

- Slide out programming laptop desk w/ 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 on M10iD, or M20iD robots, collaborative two jaw gripper on CRX robot

- Available ATI automatic tool change with separate gripper and vacuum tool on M10iD or M20iD robots

- Portable with pallet jack or forklift

- Safety interlocked entry door

- Light curtain or area scan safety for robot work area

- Area scan safety on CRX integrated for collaborative and non-collaborative robot operation

- Main power choice of 208 VAC 3 phase, 220 VAC 3 phase, or 480 VAC 3 phase

- 120 VAC 20 amp with CRX10iA

FANUC

Rockwell Automation

APT MANUFACTURINGsolutions

*i*LS - INDUSTRIAL LEARNING SYSTEM

- Overhead work light
- 110VAC 24v power strip
- On-board air compressor
- Ample storage space
- Quick disconnect plugs
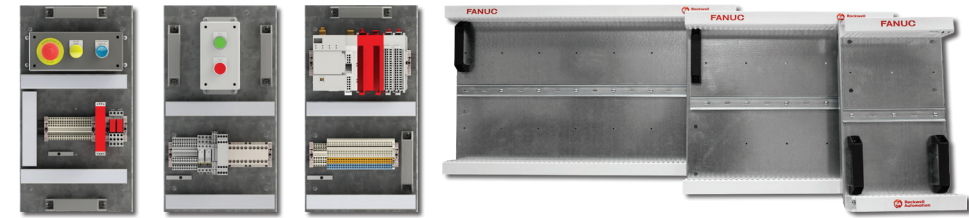- Welded cart w/ casters for mobility

Fits through standard door

Module Storage Options

**Wall Mount
or
Storage Rack**

iLS Modules

Module	Part #	Description
Electrical Controls	ILSM-W1-E-RAGLX	Safety PLC w/ RA Guardlogix 5069 safety PLC, 1 safety input & 1 safety output card, 1 standard input & 1 standard output card, size 1
	ILSM-W1-E-RARLY2B	Various relays and timers, 2 illuminated push buttons, size 1. *Conveyor Not Included*
Industrial	ILSM-W1-I-RAPB9	Push Button Interface Panel, 9 devices, pushbuttons, switches, potentiometer, tri-color bubble light, size 1
	ILSM-W2-I-RAPV10	Rockwell Automation Panelview 5000 HMI, 10" Screen, size 2
Safety	ILSM-W1-S-RAESTOP	E-stop safety panel, safety relays, reset button, and indicator light, size 1. *Conveyor Not Included*
Motor Drive	ILSM-W1-D-RAPFXVFD	RA Powerflex VFD, Variable Frequency Drive for 240VAC, 3 phase inverter-duty gearmotor, size 1. *Recommend with ILSM-T4-OR3PHGM*
Mechatronics	ILSM-W1-P-SMC4PV	SMC Pneumatic Valve Manifold, includes 4 controllable valves of various types, Ethernet IP comms, size 1. *Requires a PLC*
	ILSM-W1-P-SMCPNP4V	Fluid Power Automation, includes various pneumatic actuators, vacuum, and sensor technology. Requires form of logic control to perform a sequence of operation, size 1. *Recommend ILSM-W1-P-SMC4PV or ILSM-W2-P-SMC4VIND*
	ILSM-W2-P-SMC4VIND	SMC Pneumatic Individual Valves, includes 4 controllable valves of various types, hard-wired via cable to M12 connector, size 2
	ILSM-W2-M-SENSE	Sensor Sample, includes various types of devices common in industry. Includes, but not limited to, proximity, photoeye, ultrasonic, etc., size 2
Safety Device	ILSM-W2-S-INTLK	Common safety rated door interlocks, rectangular non-contact, solenoid locking, trapped key, size 2
Basic Circuitry	ILSM-W1-C-BBDC	Basic DC Circuits, w/solderless breadboard and DC-DC Converter (+24VDC, +12VDC, +5VDC, 0VDC, -12VDC) and various semiconductor components for fundamental circuit design principles, size 1
General Purpose	ILSM-W1-G-TSLOT	T-Slot mounting Board
	ILSM-W1-G-APTBLNK	Size 1 blank wall board for customizing
	ILSM-W2-G-APTBLNK	Size 2 Blank Wall Board for customizing
	ILSM-W3-G-APTBLNK	Size 3 Blank Wall Board for customizing

iLS Desktop Modules

- Holds up to two size 1 modules, or one size 2 module
- Built in 24VDC power supply (120VAC supply voltage utility)
- Non-skid feet
- Desktop use to test and learn on individual modules before integration onto the iLS Base unit
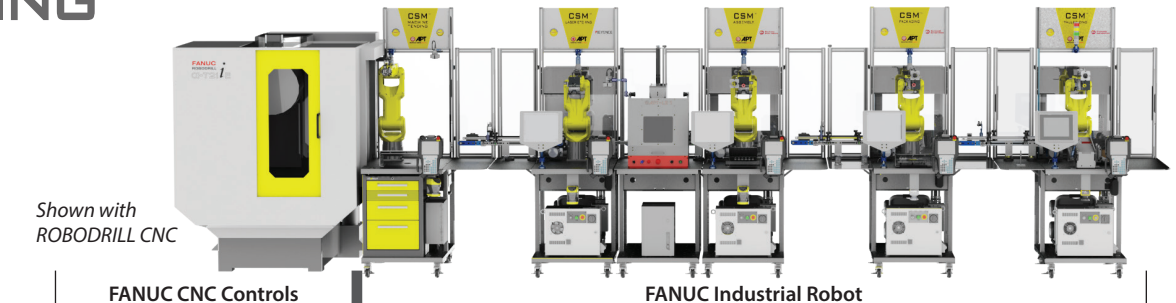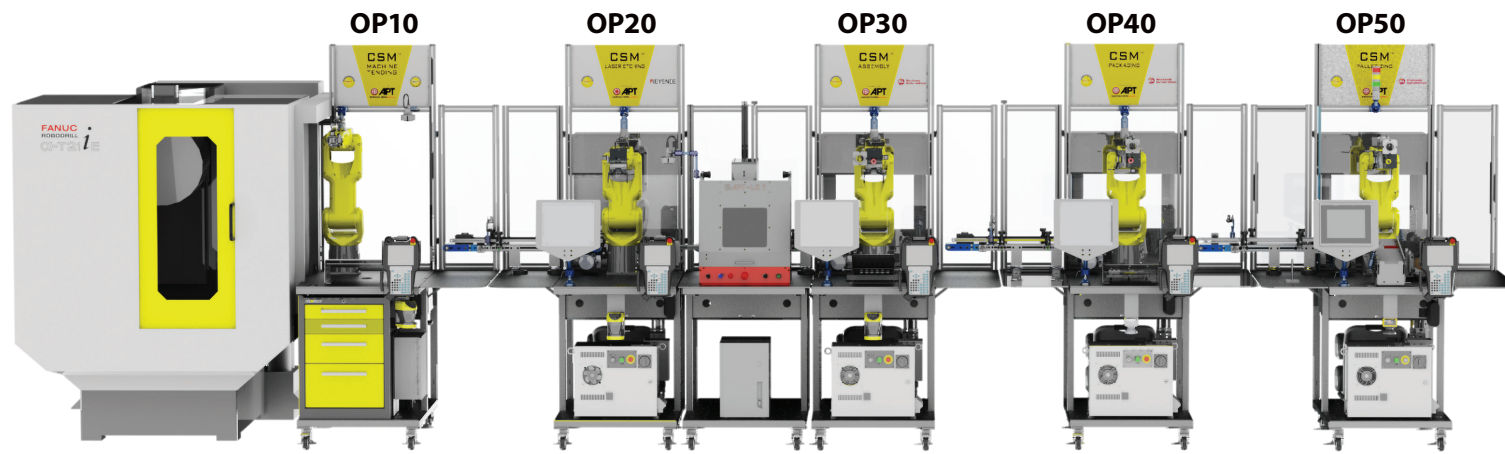

Module	Part #	Description
Motor Drive	ILSM-T4-M-OR3PHGM	Inverter-duty, 3 Phase Gearmotor, 240 VAC, rotating disk, proximity sensor. *Requires a VFD*
Safety Device	ILSM-T4-S-RALC300	Tabletop light curtain emitter and receiver, 300mm length
	ILSM-T4-S-HKSCAN	Tabletop area scanner, 270 degree sweep
Mechatronics	CON-4536TNM-BL-E	Tabletop conveyor, Variable Speed Control, Brushless DC gearmotor, Non-magnetic mounting, 4-1/2"W x 36"L, Photoeye each end, Ethernet IP capable (but not required)
General Purpose	iLSM-T4-G-TSLOT	9" x 18" Tabletop T-Slot mounting board

FANUC

RA Rockwell Automation

APT MANUFACTURINGsolutions

SMART MANUFACTURING TRAINING SYSTEM
CSM™ - Connected Smart Manufacturing

OP10   OP20   OP30   OP40   OP50

Individual OPs can be purchased with OP30

Shown with ROBODRILL CNC

CONNECTED SMART MANUFACTURING — CONNECT 4.0 — CERTIFIED EDUCATION

**The OP10 cannot be separated from the CNC once mated through the controls

CSM FEATURES	FANUC CNC Controls			FANUC Industrial Robot				
	CNC Simulator OiF Plus Controls	Levil CNC LMV-400 Oi-MF Controls	ROBODRILL CNC α-D14MiB5 FANUC 31i-B5	OP10 Machine Tender	OP20 Laser Part Marking	OP30 Assembly Station	OP40 Packaging Station	OP50 Palletizing Station
Pricing	$	$$	$$$	$	$$$	$$	$$	$$
Integrated industrial production line	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Production line flow	Right	Left	Right	Follows CNC flow				
Industry 4.0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Project-based mechatronics					Yes	Yes	Yes	Yes
FANUC Certification	Yes	Yes	Yes	Yes	Yes	Yes		**Yes**
FANUC CNC controls	Yes	Yes	Yes					
Machine actual parts		Yes	Yes					
CNC tool holder type		S20T ER-16	BT-30					
Coolant		Yes	Yes					
Spindle RPM		14000	10000					
FANUC robot machine tender	Yes	Yes	Yes					
FANUC iRVision	Yes			Yes	Yes	Yes	Yes	Yes
Vision-guided pick and sort						Yes	Yes	
Vision inspection				Yes	Yes	Yes	Yes	Yes
Fenceless robot cells with safety area scan				Yes	Yes	Yes	Yes	Yes
Rockwell Studio 5000 Logix PLC					Slave	Master	Slave	Slave
Rockwell Safety PLC				Yes	Yes	Yes	Yes	Yes
Rockwell HMI PanelView™ touchscreens					Yes	Yes	Yes	Yes
Rockwell e-learning subscription					Yes	Yes	Yes	Yes
Fluid power pneumatics				Yes	Yes	Yes	Yes	Yes
Part traceability and marking					Yes			**Yes**
Modular work cells (can be used independently)	Yes	Yes	Yes	**	Yes	Yes	Yes	Yes
Portable (fits in classroom)	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Wired or wireless between stations				Yes	Yes	Yes	Yes	Yes
Fault insertion				Yes	Yes	Yes	Yes	Yes
Smart sensor technology I/O link with diagnostics					Yes	Yes	Yes	Yes
Dual robot end-of-arm tool vacuum/mechanical grip					Yes	Yes	Yes	Yes
Conveyors with VFD (variable speed drives)					Yes	Yes	Yes	Yes
RFID manufacturing process tracking					Yes	Yes	Yes	Yes
APT integration curriculum	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
120V 20 amp	Yes	Yes		Yes	Yes	Yes	Yes	Yes

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APT MANUFACTURINGsolutions

FANUC

Robotics

Robot Options Include:
- FANUC LR Mate 200iD/7L
- LR Mate 200iD
- CRX-10iA
- SCARA SR-6iA

FANUC's new robot controllers feature the new *i*Pendant with enhanced screen resolution and processing capability. The new user interface, *i*HMI, 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.

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.

ROBODRILL - CNC

High-Performance Vertical Machining Center

α-D14M*i*B(5)

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

Rockwell Automation

Controls

- 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

APT MANUFACTURINGsolutions

Integration

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

OP10 Machine Tending the CNC

OP20 Laser Marking the product

OP30 Assembly of the product

OP40 Packaging the product in boxes

CONTROLS INTEGRATION

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 fenceless 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.
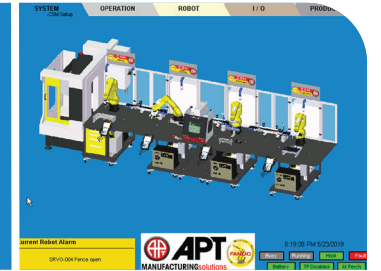
OPERATIONS - These screens are used for general machine operation and functionality. 3D model images are used to aid with the intuitiveness and ease of use. Status Indicators, Mode Control, and Manual Operations, along with Operational and Fault Messages are displayed on these screens.
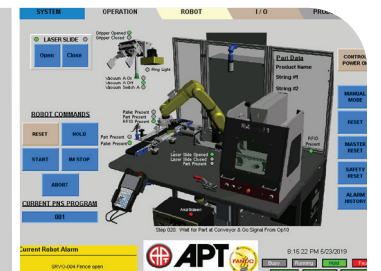
ROBOT - This screen displays all communication and I/O interface between the system PLC and robot. Users may also manually control the functions of the robot and call a specific robot program to run from this screen.
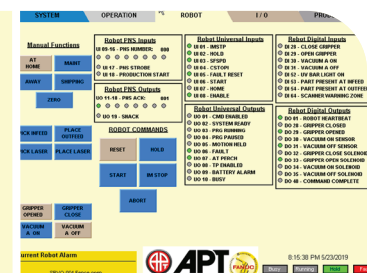
I/O - On this screen users can see all I/O within the system, its present status on/off to run diagnostics and aid in troubleshooting.
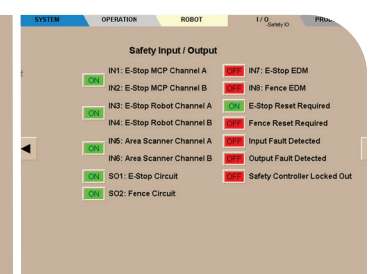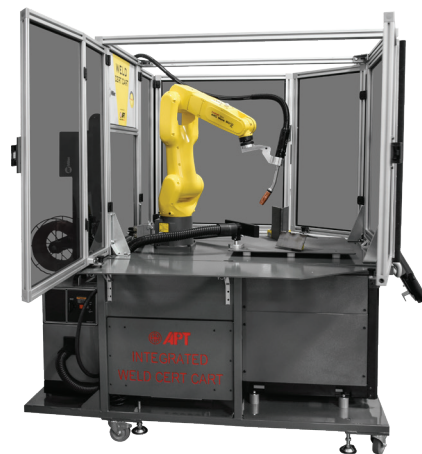
PRODUCTION - From these screens the user can view and capture production data to be used for business analytics. Recipe management and the production scheduler allow the users to edit the parameters and schedule all products the system can run.

FANUC

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MANUFACTURINGsolutions

ROBOTIC WELDING TRAINER

CHOOSE YOUR FANUC ROBOT

Products	Fenced Robot Cart	Fenceless Cobot Cart
Products	Fenced Robot Cart	Fenceless Cobot Cart
System Model	APT ARC50	CART 10S
6-Axis Robot	ARC Mate 50iD Traditional Robot	CRX-10S Collaborative Robot
Robot Reach	36"	49"
Robot Power	120v 20 amp	120v 20 amp
Robot Programming	Traditional Teach Pendant	FANUC Tablet
Robot Torch Guidance	Traditional Teach Pendant	Clever Torch Teach Guidance
Torch Roller Dress-out	Custom	MOD-WELD Rollers
Fume Extractor	Standard	Option
Cart Footprint	57-1/4"W x 73-1/4"D	40"W x 78"D
Cart Table Work Space	19-1/2" x 24"D fixture plate, 54"W x 51"D	40"W x 58-1/2"D
Cart Table Hole Size	16mm Dia, 2x2 Hole Pattern	16mm Dia, 2x2 Hole Pattern
Approx Weight w/ Welder	1,150 lbs	1,300 lbs
Torch	22.5 degree torch angle	22.5 degree torch angle
Grant	Both carts can qualify for FANUC $403,000 Grant, see Grant Specs	
FANUC Software	Both carts come with the FANUC ARC Tool EDU Software Bundle	
Tips & Tricks	FANUC CRX Welding Tips & Tricks	

Choose Your Options

Products	Fenced Robot Cart	Fenceless Cobot Cart
Vision	Yes	No
PHV Fume Extractor	Included	Optional with Fenceless Cart
Handheld Torch	All-in-one manual to robotic MIG wire weld gun. Remove the gun going to the robot and plug the optional 15' handgun into the existing power source to get 2 ways to weld. Robot welding will not work while handheld torch is being used.	
PPE	Weld Helmet Weld Gloves Safety Glasses	
Work Holding	(1) Pivot Angle 150 Mini – Included 6" x 15" x 6" (1) Mini Multi Angle – Included 3.6" x 1.7" x 3.4" (1) Mini Angle – Included 2.3" x 1.3" x 2.1"	

Choose Your Power Supply

	Fronius			Miller
400i	TPSi, air-cooled torch for welding steel. Comes with .035 wire feed rollers 3PH Power and PMC Software. Optional consumable or replacement parts up to 1/16		350D	Auto-Continuum 3PH or Auto-Deltaweld 1PH, air-cooled torch for welding steel. Comes with .035 wire feed rollers. Optional consumable or replacement parts up to 1/16
400i-C-S	TPSi, cooler, water-cooled torch, push/pull CMT ready package (CMT Software not included) for both steel (hard wire) & aluminum (soft wire) Equipped with 3/64 start-up consumables & drive wheels for aluminum welding. 3PH Power. PMC Software included.			
Fronius Options			**Miller Options**	
CMT	Fronius Cold Metal Transfer (CMT) welding, only available in CMT ready machines. Ideal for high performance welding in the areas of thin materials, brazing, visual aesthetics, cladding & WAAM welding consisting of all ranges of materials from Aluminums, Steels, Coppers, Titanium, & Nickel alloys		Available Training	Miller OpenBook
LSC	Fronius Low Spatter Control, achieves high-quality weld seams with minimal spattering and increased deposition rate, as the LSC principle is based on the short circuit occurring at a low current level. This leads to soft reignition and a stable welding process.			

Fronius TPS/i

The Ultimate in Flexibility

The TPS/i can be equipped with different software packages, known as Welding Packages—from the introductory package to the high-end solution. The modular structure and regular software updates expand the system's range of functions, providing the user with the perfect configuration to suit every challenge. The standard or pulse processes are available as basic packages. The advanced Welding Packages LSC, PMC, or CMT, are available for particularly demanding welding tasks.

Customizable
• All required welding parameters are directly accessible

At a glance
• All work parameters can be accessed via the first menu level

Immediate access to 5 EasyJobs and more
• Recurring welding tasks can be set quickly & easily

Just 2 clicks
• Quick change between characteristics/process parameters

7" color display
• With plain text display and touchscreen

Practical
• Can be easily operated with welding gloves

Languages
• Over 30 languages can be selected for operation

Auto-Continuum™ Systems

Take your welding to the next level.

The adaptive arcs of Versa-Pulse™ and Accu-Pulse® instantly make adjustments to handle weld tacks, large gaps and inconsistent parts. The result is higher quality welds and fewer weld defects.

Versa-Pulse™
• Fast, low-heat, low-spatterprocess
• Great for gap filling
• Shortest arc length/lowest pulse voltage

Accu-Pulse®
• The most popular process for majority of industrial welding applications
• Most adaptive arc on 16+ gauge
• Designed for all weld positions

RMD®
• Lowest heat process, best for gap handling
• Limited travel speed

OpenBook™

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

Cobot Cart Accessories

Patents Pending

(B) (A) (C) (D) (F) (B) (E) (B)
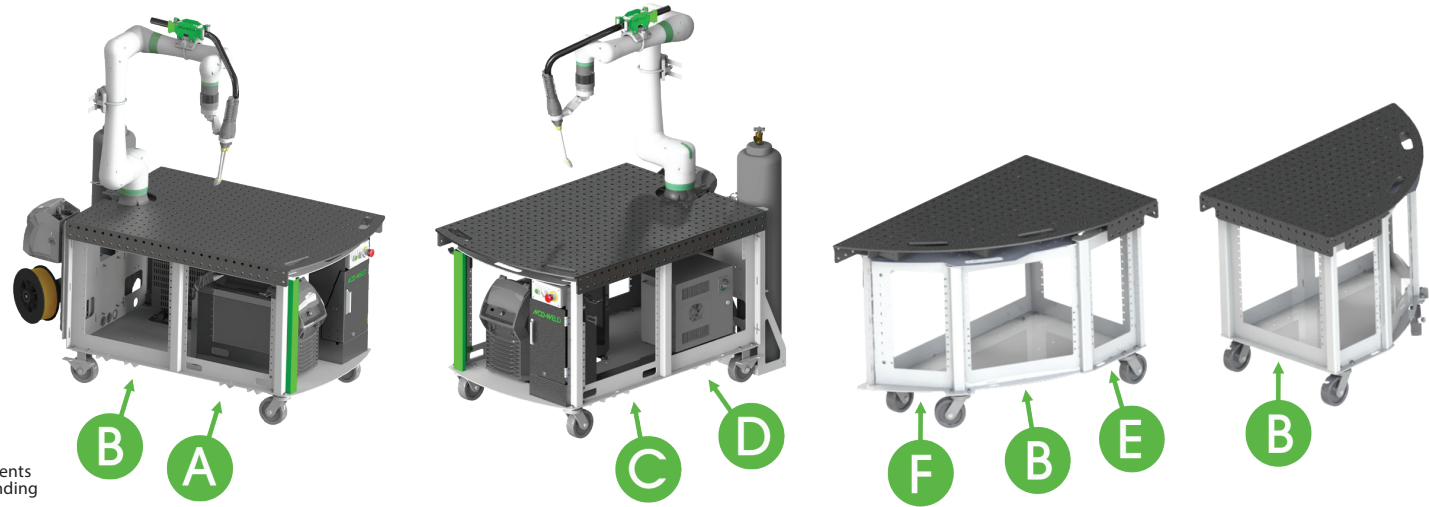
Side carts have locations for "wide" and "narrow" accessories
Accessories are built with 14 ga steel, powder coated for durability.

Drawers and Shelves

All drawers have ball bearing slides for smooth function.

DW1025			DW2025	
	Shallow drawer - Narrow Inner Dimensions: 8.8"W x 14.8"L x 2.4"H	E	Shallow drawer - Wide Inner Dimensions: 18.8"W x 14.8"L x 2.4"H	B D
DW1040			**DW2040**	
	Medium drawer - Narrow Inner Dimensions: 8.8"W x 14.8"L x 3.9"H	E	Medium drawer - Wide Inner Dimensions: 18.8"W x 14.8"L x 3.9"H	B D
DIVS10			**DIVS20**	
	Drawer divider set for narrow drawers Fits in: DW1025, DW1040		Drawer divider set for wide drawers Fits in: DW2025, DW2040	
SH1025			**SH2025**	
	Storage shelf - Narrow 10"W x 15.75"L x 2.5"H	E	Storage shelf - Wide 20"W x 15.75"L x 2.5"H	E
SCSH10			**SCSH20**	
	Spray can storage shelf - Narrow 12"W x 3.625"D	E F	Spray can storage shelf - Wide 22"W x 3.625"D	A B C D

Collaborative Positioners

Collaborative Manual Index Positioner for Collaborative Robot Welding

MIT40

Shown with WS 1826 Weld Screen	Shown on Mod-Weld Cart	Heavy Duty locking w/ hardened blocks

- Manual index positioning table with locking slide in 4 locations.
- Built with a 5/8 steel plate with fixture holes on 2" centers.
- Industrial heavy duty bearing for ease of rotation with a load.
- Grounding block engaged at all time includes a 6' grounding cable.

Storage, Bin, Clamps and Pins

BINP10			BINP20	
	Bin box panel - Narrow, Includes 2 bins Bin size: 4 1/8"W x 5 3/8" L x 3" H	E F	Bin box panel - Wide, Includes 4 bins Bin size: 4 1/8"W x 5 3/8" L x 3" H	A B C D
CR1007			**CR2013**	
	Clamp Hanger - Narrow 7 clamp notches	E F	Clamp Hanger - Wide 13 clamp notches	A B C D
PB1006			**PB2006**	
	Pegboard Panel - Narrow Ø.25 holes, 1" spacing, Hole array 10 x 6	E F	Pegboard Panel - Wide Ø.25 holes, 1" spacing, Hole array 20 x 6	A B C D

Safety

PCMC-8	WS1826
Pull curtain - #8 plastic curtain Magnets secure curtain seam together for added arc flash safety. This is not a safety shield from the robot	Tabletop Magnet Screen - #8 Dark Shield Mounts in 2 directions, 18" x 26"

Blank Covers

BP1045			BP2045	
	Blank plate - Narrow 10" x 4-1/2" Tall	E F	Blank plate - Wide 20" x 4-1/2" Tall	A B C D

Holder

AGHG45	
	Angle Grinder Holder with Cord Wrap Fits 4-1/2" Grinder

FANUC CERTIFIED EDUCATION

APT MANUFACTURINGsolutions

Miller

Fronius

ROBOT ACCESSORIES

Pedestals

We stock pedestals for the CRX and LR Mate robots.

- Holes for leveling and anchoring
- Steel welded construction
- Powder coat finish

- LR Mate sizes from 24" to 48" tall in 6" increments
- CRX-10iA sizes from 12" to 48" tall in 6" increments
- CRX-20iA sizes from 18" to 30" tall in 6" increments

When mounting the LR Mate we recommend guarding (see page 42).
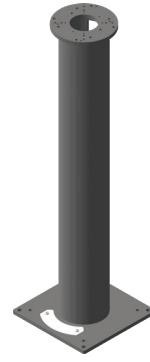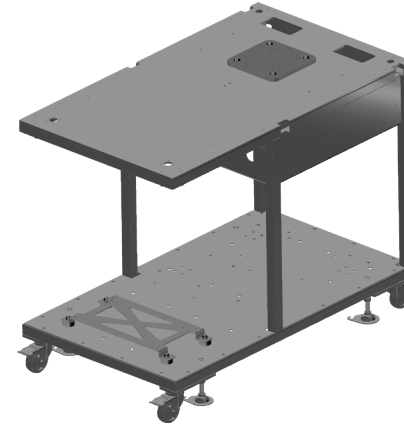
Always be safe when operating a robot.
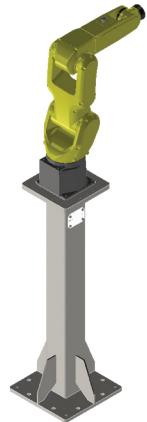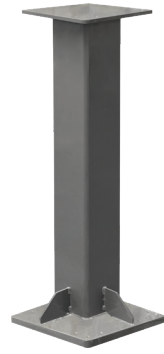
LR Mate

CRX

CRX-25iA   **CRX-10iA**

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.

Add wings to expand work area to 57" wide x 47 1/4" long

Mobile Pedestal

Kit includes:
- CRX pedestal (see above for pedestal sizes)
- 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
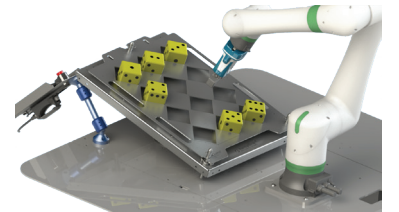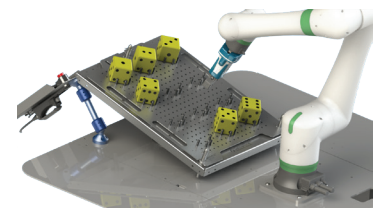- Large footprint for stability

Parts Feeder Kit sold separately   **CRX-10iA Kit**

CRX-25iA Kit

Mobile Cart Optional Add-ons

Robot End-of-Arm Tool
- Schunk CoAct collaborative EOAT
- Parallel gripper kit with 2 jaws for 3" blocks
- Ready to connect to FANUC CRX

Parts Feeder Kit with 3" Foam Dice Blocks

- Fixed grid, 12 location diamond template with six (6) 3" foam dice cubes
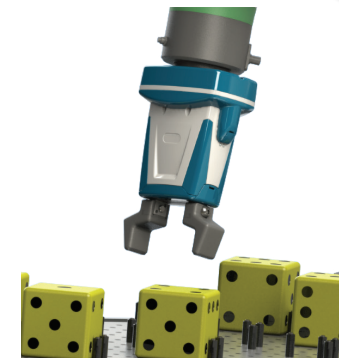- Pegboard reconfigurable template with 50 locator pegs and six (6) 3" foam dice cubes

ROBOT ACCESSORIES

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
- 120 VAC Power cable

Free Standing Conveyor

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

Magnetically Mounted Tabletop Conveyor

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

Safety Fencing

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.
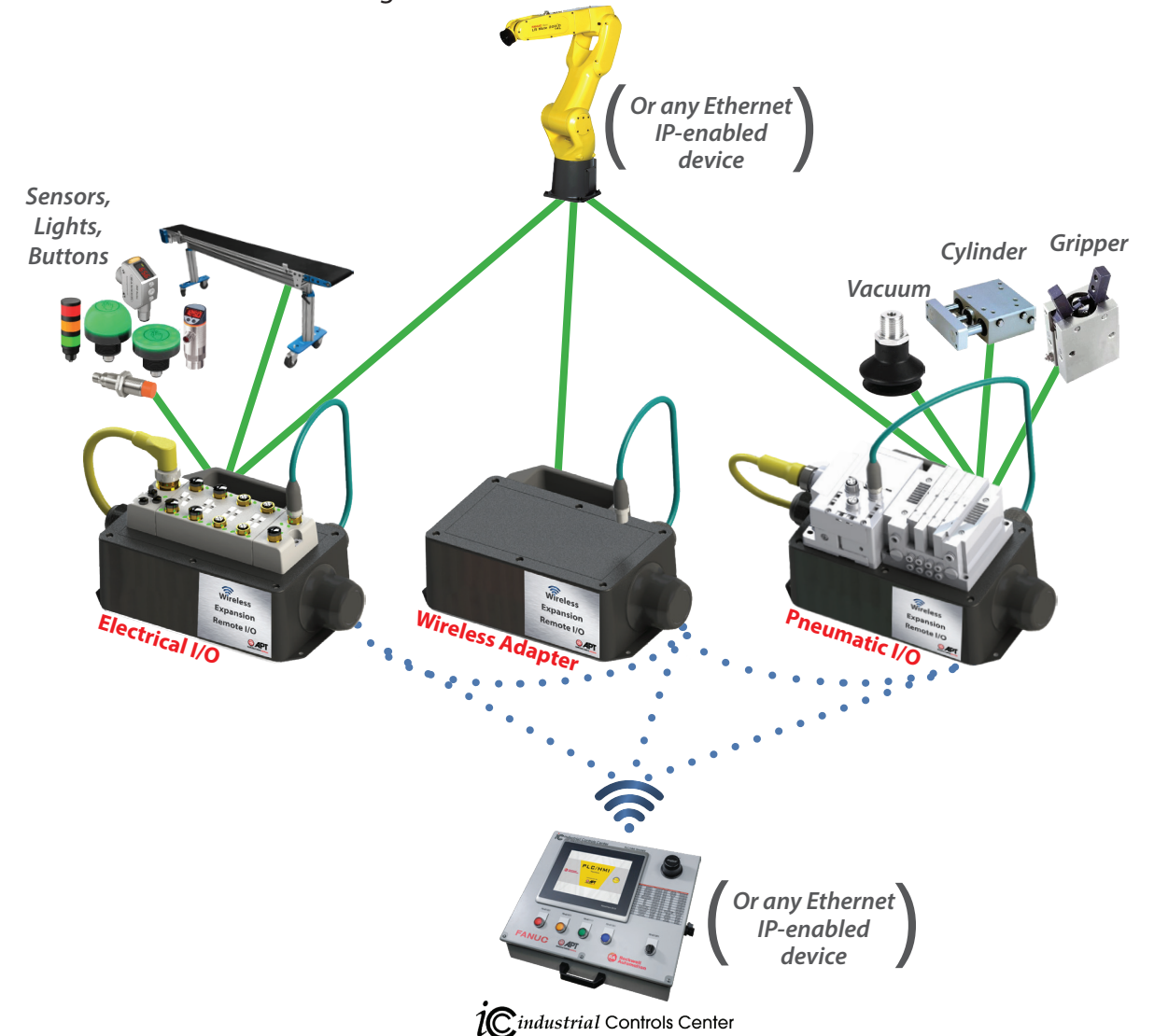- Area scanner kit with narrower side panels.

Ask about your custom needs. Prices may vary.

Wireless Expansion Remote I/O

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

Configure with remote modules and untether!

(Or any Ethernet IP-enabled device)

Sensors, Lights, Buttons

Cylinder   Gripper

Vacuum

Electrical I/O   **Wireless Adapter**   **Pneumatic I/O**

(Or any Ethernet IP-enabled device)

iC *industrial* Controls Center

Wireless
- » WEP, WPA, and WPA2 security protocols
- » Anybus wireless bolt
- » Add network communicatoin to your FANUC robot

Electrical
- » Configurable 16 points of input/output (using splitters on 8 access ports)
- » Industry standard M12 5-pin port

Pneumatic
- » Four individually controllable valves
  - ◆ Double solenoid, 2 position, blocked center ports
  - ◆ Double solenoid, 2 position, open center ports
  - ◆ Double solenoid, 2 position, detent
  - ◆ Single solenoid, 2 position, spring return
- » Great for testing and understanding fluid power
- » Use for temporary setups and testing or permanent installation
- » Valves are triggered over Ethernet

FANUC

Swivellink® INTELLIGENTLY DESIGNED

RA Rockwell Automation

APT MANUFACTURINGsolutions

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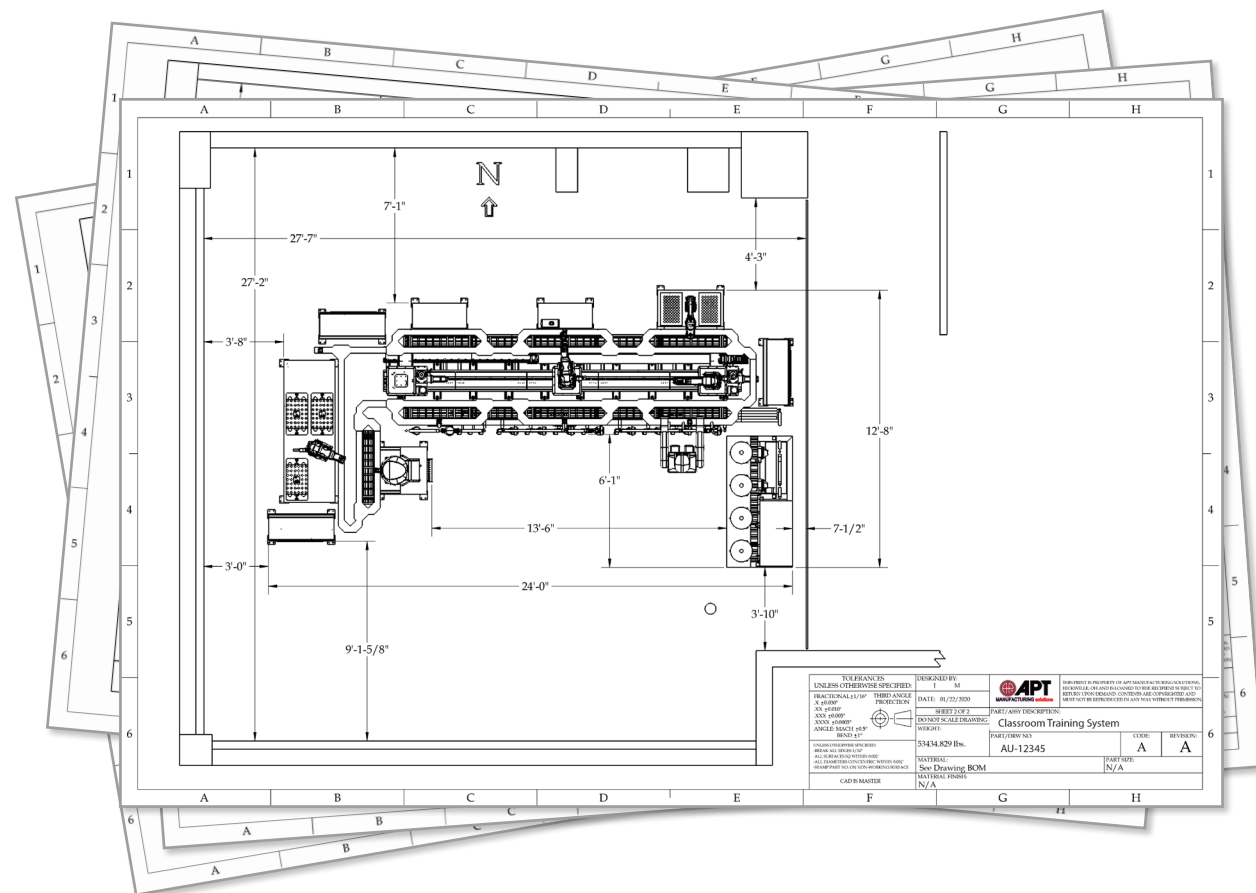
Our design team will talk to you to get an understanding of your initiatives and goals.

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.
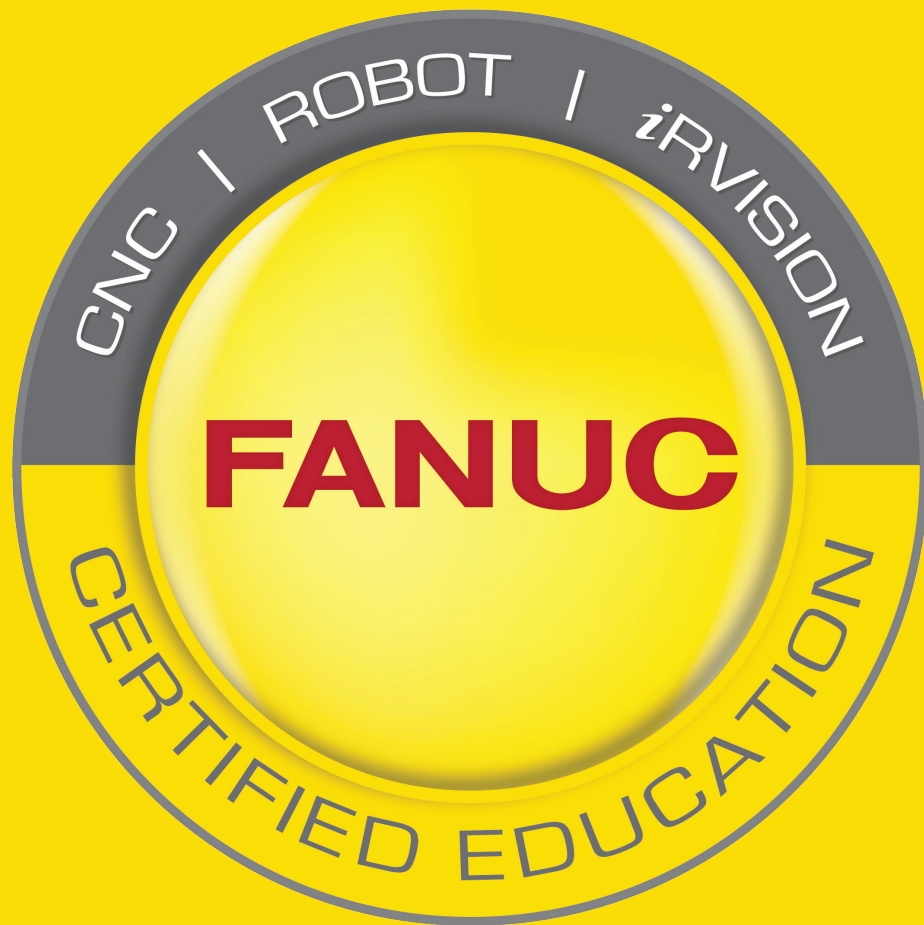
Considerations

- *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*

FANUC

MANUFACTURINGsolutions

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