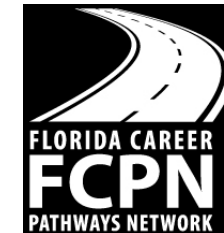


# MANUFACTURING & SUPPLY CHAIN CREDENTIALS AND APPRENTICESHIP UPDATES FOR REMOTE LEARNING

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November 19, 2020 FCPN at FACTE



Marilyn Barger, Ph.D., P.E.

Director, FLATE

Part of the FloridaMakes Network

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[www.flate.org](http://www.flate.org)

[www.floridamakes.com](http://www.floridamakes.com)



WHO WE ARE

**FLATE**

Florida Advanced Technological Education Center



Strengthening Career & Technical Education for the  
21st Century Act (Perkins V), State Leadership

## Mission

Improve the productivity and technological performance of Florida's manufacturing sector.



[www.floridamakes.com](http://www.floridamakes.com)



NEWS

EVENTS

FLORIDA MANUFACTURES



WHAT WE DO

WHO WE ARE

RESULTS

CONTACT US

CALL US 407.450.7206

## WHAT WE DO

FloridaMakes is a service designed to strengthen Florida's manufacturing companies. We're created BY manufacturers, FOR manufacturers, so we understand the unique needs facing manufacturing firms.



# BACKGROUND: ENTRY LEVEL REGISTERED APPRENTICE MODEL

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## Industrial Manufacturing Technician (IMT)

ONet Code 17-3029.09

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In November 2014, US Department of Labor Office of Apprenticeship (DOL/OA) officially registered the IMT occupation. It is used by companies as the foundation for a U.S. DoL Registered Apprenticeship (RA). It is available only to full-time incumbent workers.

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RA program is divided into two segments, Certified Production Technician 4.0 online curriculum Related Training (RT) and company location-based On-the-Job Learning (OJL).

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MSSC partnered with educators, workforce agencies, and the manufacturing industry to create the Certified Production Technician 4.0 courses that serves as the related training for the Industrial Manufacturing Technician program



# WHAT IS THE IMT?

## The Industrial Manufacturing Technician Apprenticeship:

- Is competency-based
- Is delivered in a hybrid mode
- Is a Florida registered apprenticeship
- Provides production workers with the knowledge and competencies
- Uses MSSC Certified Production Technician (CPT) e-learning courses

**200 online curriculum hours; 2,000-hour apprenticeship on-the-job training** provides a guided training program for workers in their work environment to:


- Set up, operate, monitor and control production equipment
- Help improve manufacturing processes
- Understand manufacturing as an integrated business system
- Efficiently and safely manage raw materials/consumables

For more information: [FloridaMakes.com/apprenticeships](https://FloridaMakes.com/apprenticeships)



# THE FIVE KEY COMPONENTS

**To ensure Registered Apprenticeships are high-quality and meet the needs of both employers and apprentices, programs must have these elements:**

1. Employers are the foundation of every apprenticeship program.
2. Apprentices receive training from an experienced mentor on the job.
-  3. **Technical Instruction:** Online or classroom based or a combination.
  - 4 Assessments (Quality, Maintenance, Safety and Manufacturing Processes)
4. Apprentices (as employees) receive increases in wages with demonstrated gains in skills and knowledge.
5. Certificate of Apprenticeship Completion: Industry-recognized credential certifying apprentices are qualified for the job.



# CERTIFIED PRODUCTION TECHNICIAN (CPT 4.0)

## I 4.0 technologies added to MSSC CPT Standards and Assessments

1. Industry 4.0 including 5G
2. Artificial Intelligence (AI)
3. Autonomous Robots
4. Additive (3D) Manufacturing
5. Data Analytics
6. Industrial Internet of Things (IIOT)
7. Augmented Reality (AR)
8. Nanomanufacturing
9. Advanced Materials

### LINKS and RESOURCES

- [Recorded Webinar 1- Introduction to MSSC Instructor Resources](#)
- [Recorded Webinar 2- MSSC CPT Production Standards 2020 Industry 4.0 Edition](#)
- [Recorded Webinar 3- Best Practices for Online Traini](#)
- <https://www.msscusa.org/certification/production-certification-cpt/>



# CERTIFIED PRODUCTION TECHNICIAN (CPT 4.0)

- **152** FL Authorized CPT Testing sites (~ 10% of sites in the USA (1,774)).
- Florida has approximately **7,000** earned CPT credentials, about 10% of the USA total.

Type of Testing Center	
Career/Work Ready Centers	6
Community College	46
Companies	8
Federal Prisons/Correctional Facilities	5
High Schools	44
Job Corps Centers	1
Military Bases	2
Private Training Centers	14
Secondary School Districts	13
Technical College	8
Vocational School/Technical HS	3
Workforce Investment Boards	2
	152



# IMT PROGRAM ADVANTAGES

Online and on-demand

No travel to a college or vocational school

Apprentices proceed at their own pace

Learning applied skills on the equipment at their place of employment

National Certified Production Technician Certification

Articulates to more skill's specific RA programs

CPT certification articulates to 15 college credits if they continue towards a degree

Attractive to women and underrepresented populations

[www.FloridaMakes.com/apprenticeships](http://www.FloridaMakes.com/apprenticeships)

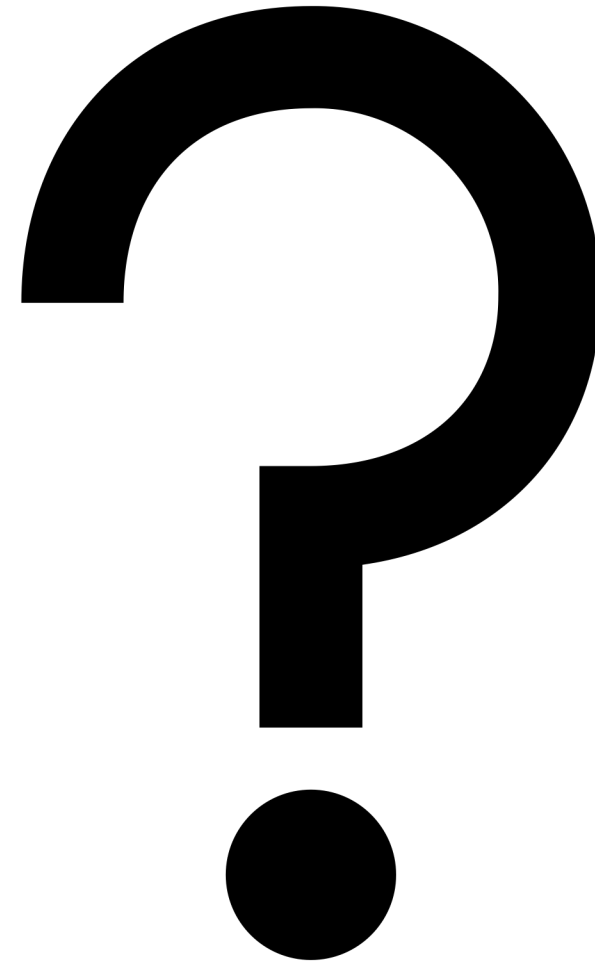


## Questions

FloridaMakes  
407-450-7206

[www.floridamakes.com/ap  
prenticeships](http://www.floridamakes.com/ap-prenticeships)

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US-based developer, manufacturer and integrator of industry-certification-aligned automation training systems for over 30 years



## Value of Industrial Certifications & Apprenticeships

- Reduces hiring costs
- Ensures alignment skills to industry need
- Promotes workplace safety and increase product quality
- Federal, State, Local, Industry funding available
- Provide employers with the assurance the worker has met the standard for employment (or promotion)
- Increases the marketability of the prospective employee

**CERTIFIED**

## MSSC: Certified Technician-Supply Chain Automation Certification

As skill sets change, so does the need for training: Focused on training skilled technicians in Supply Chain Automation.

### NEW Certification Launched in 2020

Collaboration between NCSCA, MHI, MHEDA, MSSC, Amatrol: Develop a certification focused at the automated warehouse distribution center and the supply chain.



National Center for Supply Chain Automation





**Supply Chain Automation**

**Industrial Technology Maintenance & Mechatronics for Advanced Manufacturing**

**Industry 4.0 Smart/Connected Automation**

SACA – Professional

Higher Level Skills



**MSSC: CT-SCA**

NR – Network Repair  
ER – Equipment Repair  
EM – Equipment Maint.



**PMMI**

**LEVEL 2**

Motors and Controls  
Industrial Electricity 2  
Mechanical Compts. 2  
PLC's 2

**LEVEL 1**

Fluid Power 1  
Industrial Electricity 1  
Mechanical Compts. 1  
PLC's 1



**NIMS**

**ITM DUTY AREAS 1-9**

Maintenance Operations  
Mechanical Systems  
Hydraulic Systems  
Pneumatic Systems  
Electrical Systems  
Electronic Systems  
Process Control Systems  
Welding  
Piping

**Machine Operator**

Benchwork and Layout  
Measurement, Materials, Safety  
Operator Train. – HAAS/Fanuc

**SACA - Specialist**

Electrical Systems 1	Smart Factory 1
Electric Motor Cntrl. 1	Robot Systems 1
VFD Systems 1	Robot Integration 1
Motor Control TS 1	Mechanical TS
Sensor Logic 1	Laser Alignment
Electrical Sys. Install.	Electric Motor TS
PLC's 1	Hydraulic 1
PLC's TS 1	Hydraulic Maint. 1
Pneumatic Systems 1	Process Control 1
Mechanical Power 1	Process Control TS
Ind. 4.0 TPM	Rigging 1
Ethernet Com. 1	Rigging 2
Smart Sensor 1	More to come...

Middle Level Skills



MSSC: CFT  
MSSC: CLT  
MSSC: CLA

MSSC: **CPT**  
MSSC: **CPT+**

**SACA – Associate**

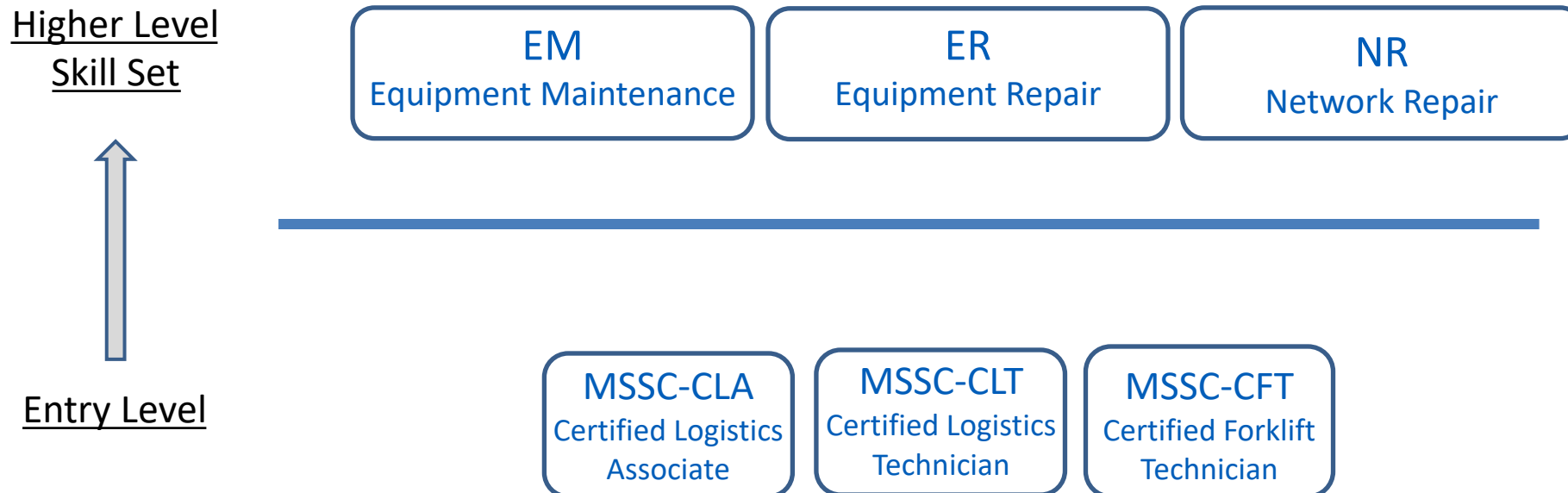
Basic Operations  
Advanced Operations  
Robot Operations  
IIoT, Networking & Analytics

Entry Level Skills

# MSSC: CT-SCA Certification

New Occupation developed by NCSCA

**Supply Chain Technician:** *A person who installs, operates, supports, upgrades or maintains the automated material handling equipment that supports the supply chain*

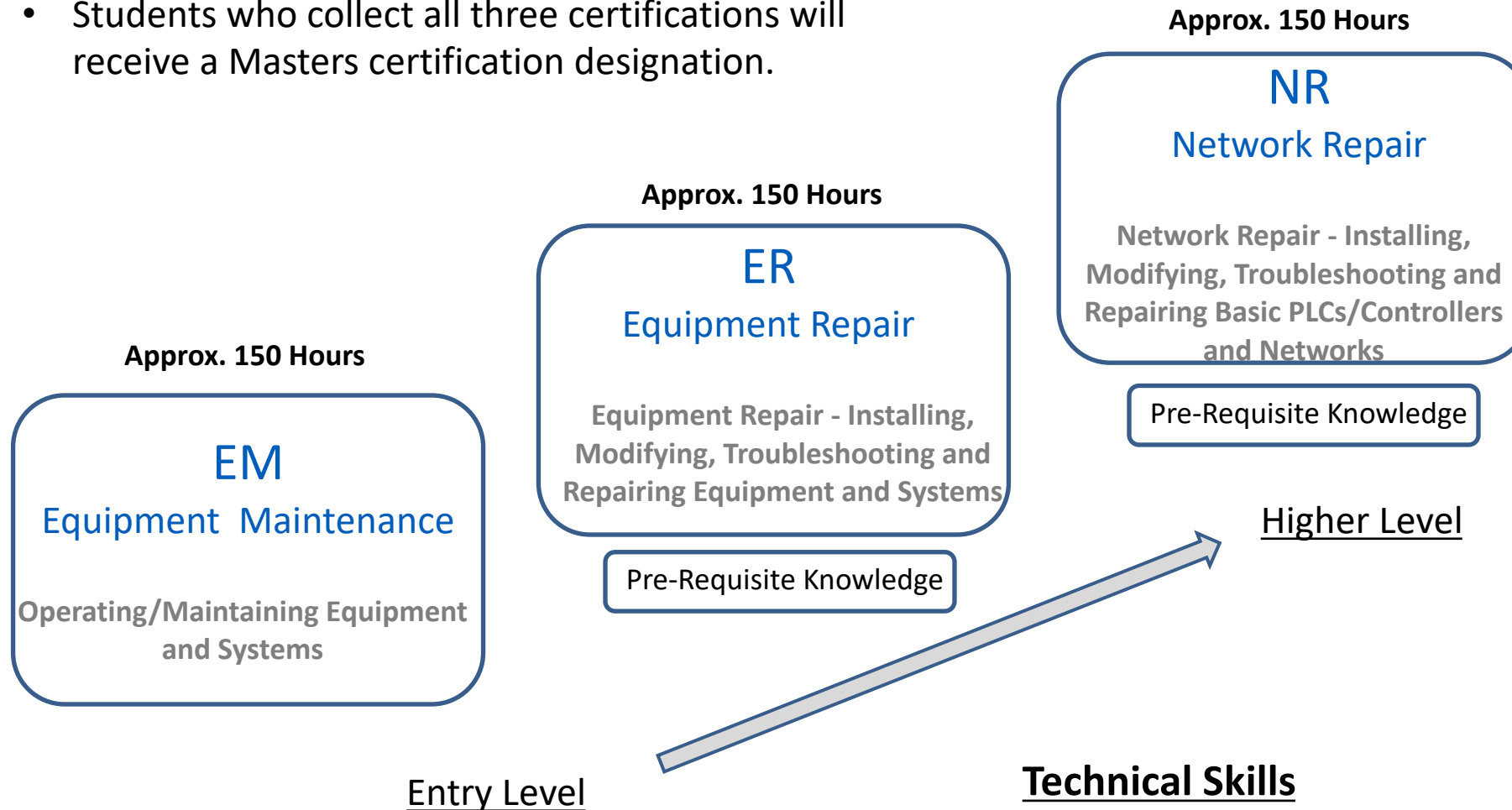


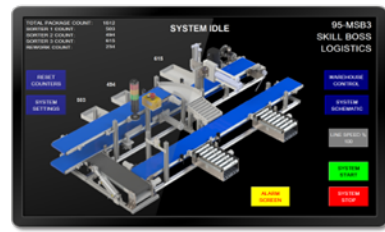
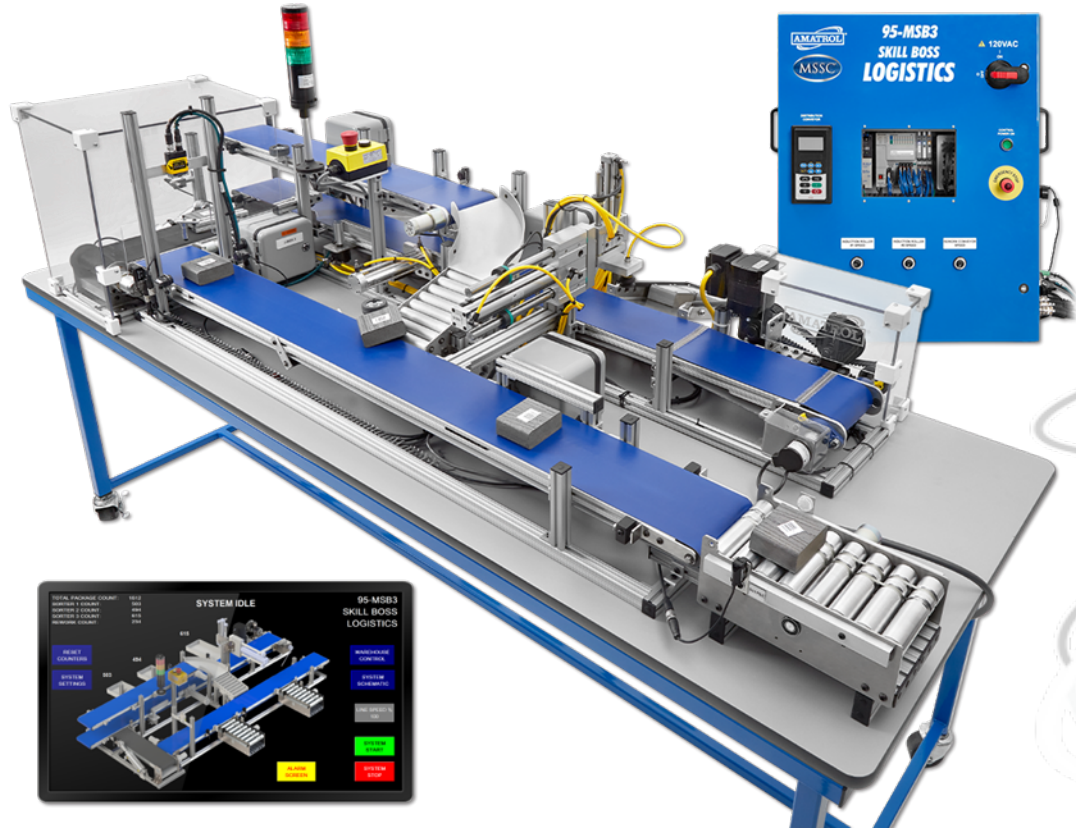
# MSSC: CT-SCA Certification



## 3 Unique Industry Recognized Certifications

- Prerequisite knowledge with Individual Pathways
- Pathways Increase in Technical Skills
- Students who collect all three certifications will receive a Masters certification designation.





# CT-SCA Certification & Skill Boss-Logistics

Why...?

# Early Days in a Distribution Center

In 1997, Amazon launched its distribution network with two distribution centers in Seattle and Delaware. The original 93,000-square-foot Seattle facility was "*repetitively manual*" picking, packing, sorting and routing.



# Modern Distribution Center

As of June 2020, estimated that Amazon operates 559 active facilities @ 183m SF of Distribution space; Walmart @ 783m SF. Utilizing: ASRS, Autonomous-Robots/AGVs, Connected Conveyor Systems: RFID, Barcodes, Sensors

[https://www.mwpl.com/html/amazon\\_com](https://www.mwpl.com/html/amazon_com)



# Supply Chain Predictions

## Top 10 Predictions for Worldwide Supply Chains in 2020

*The supply chain has become a competitive weapon in the modern, digital economy. - TECHNOLOGY & AUTOMATION 11/24/19 Ellis*

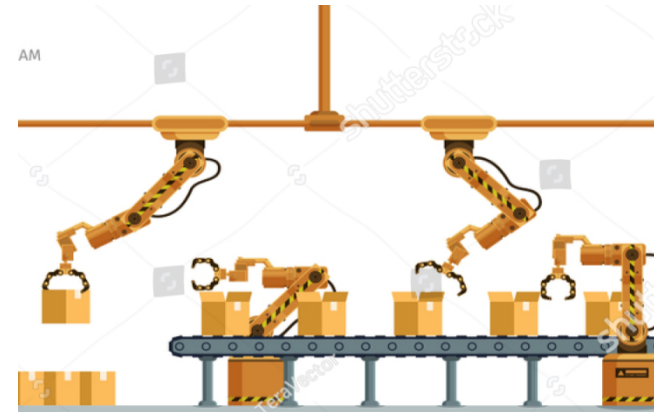
**Prediction 2:** By 2022, firms will dedicate 35% of their logistics business and budget to process automation...

**Prediction 5:** By 2023, 65% of warehousing activities will use robots and situational data analytics...

**Prediction 7:** By 2023, 60% of G2000 manufacturers will invest in AI-infused robotic process automation...

**Prediction 9:** By 2022, the number of companies offering flexible warehousing options will have increased by 50%...

# CT-SCA Certification and Skill Boss Logistics



## Supply Chain's Shift: Connected Automation Systems and Industry 4.0 Technologies

- Trend toward Regionalization of the Supply Chain
- Enable organizations to remain nimble and react quickly
- Increased usage of robotics, automation and intelligent software
- "...Vocational training in automation taking on greater significance for {*non-repetitive*} maintenance, repair, troubleshooting and dexterity skills that cannot be programmed into a robot..." *BottomLine - October 2020*

**2020: "75 percent of American companies have suffered pandemic-related supply chain disruptions" – Institute of Supply Chain Management**



# MSSC: CT-SCA Certification

These organizations recognized the industry shift to connected-automation and developed a competency-based certification aimed at the automated warehouse and its supply chain

Collaboration between NCSCA, MHI, MHEDA, MSSC, Amatrol



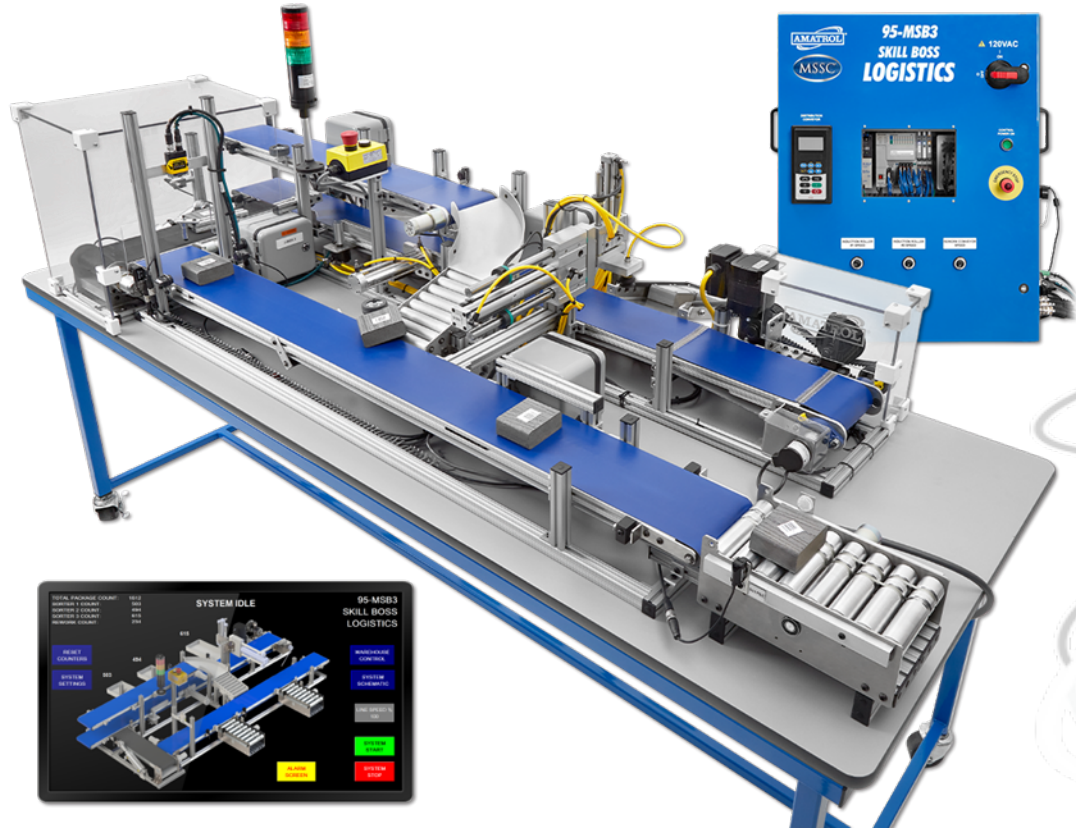
National Center for Supply Chain Automation



# Skill Boss-Logistics

Industry-Partners led and advised in the development of the CT-SCA Certification Framework and the Skill-Boss Logistics Technical Design Process





# Skill Boss-Logistics

Provides Hands-On Authenticated Skills-Assessment for the CT-SCA Certification

# Skill Boss - Logistics

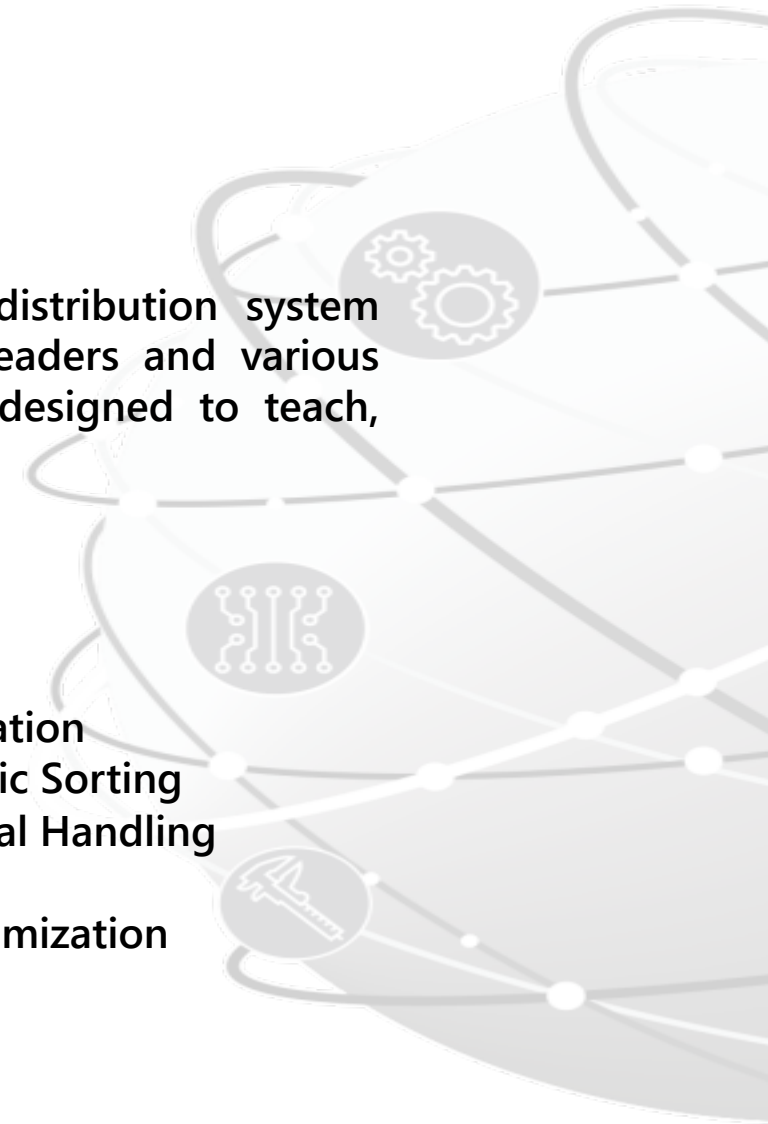
## How can SBL help?

### Hands-On Technical Skills for the CT-SCA

Skill Boss Logistics is a, consolidated, real working automated distribution system consisting of conveyors, sensors, vision systems, RFID, barcode readers and various industrial warehousing components and control systems: It was designed to teach, competency-based, supply chain automation skills.

#### System Functions:

- Distribution of packages to 3 destinations
- 2D barcode package tracking
- Automatic package queuing & priority release
- Package data tracking & control
- Package rework
- Package recirculation
- Electro-pneumatic Sorting
- Conveyor material Handling
- Jam sensing
- Product gap optimization

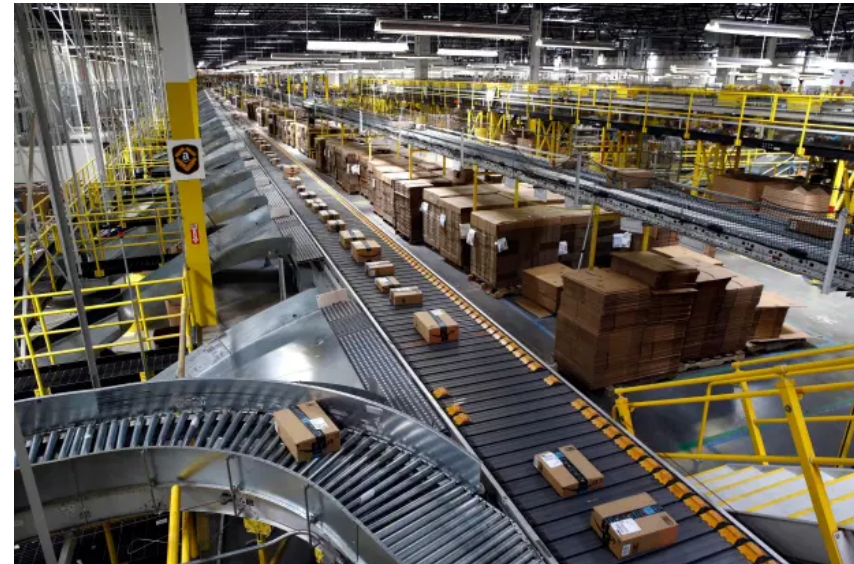
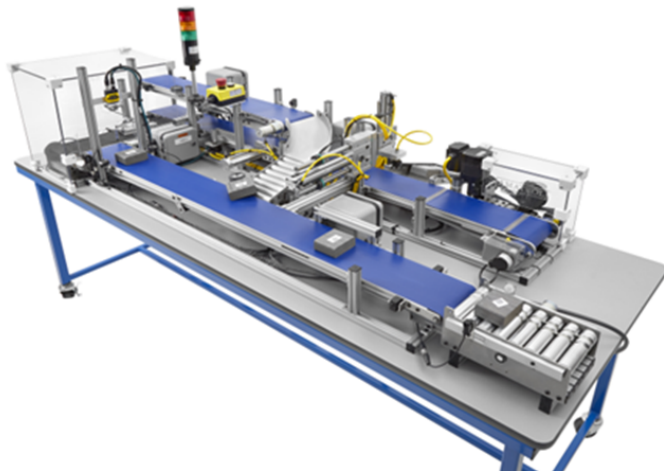
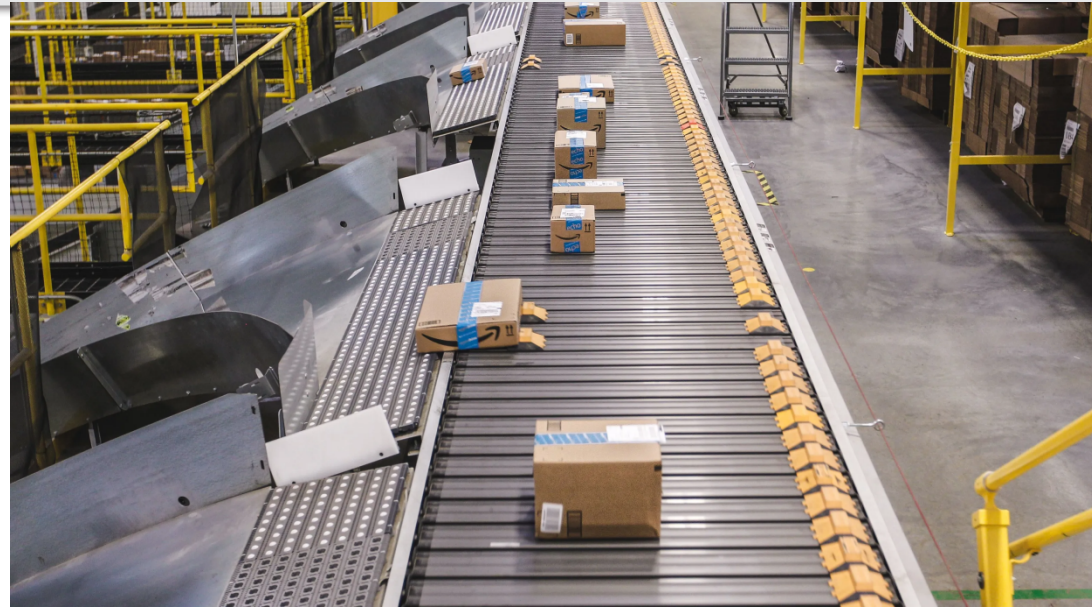


## Skill Boss Logistics

- Designed to simulate a modern Distribution Center
- Packages are loaded/scanned/routed and re-routed through an automated process

### [Skill Boss Logistic Video](https://www.youtube.com/watch?v=PxYVSrtbO_w)

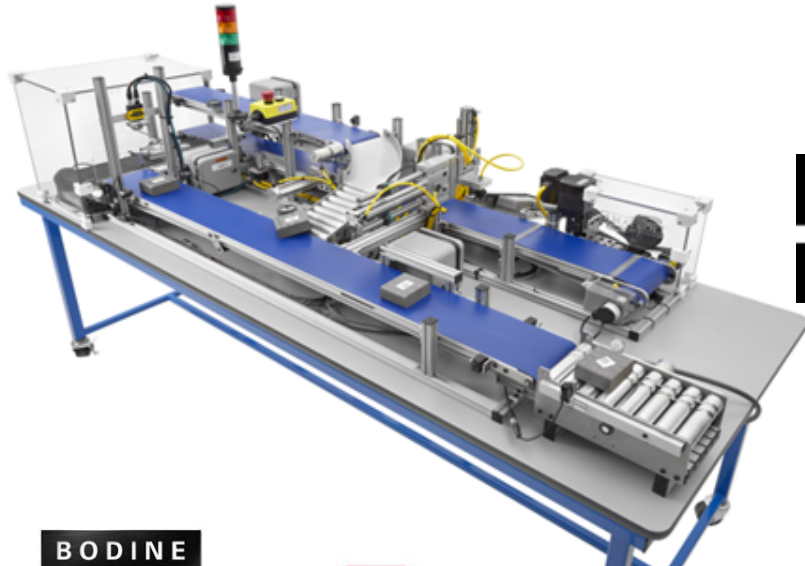
[https://www.youtube.com/watch?v=PxYVSrtbO\\_w](https://www.youtube.com/watch?v=PxYVSrtbO_w)



# Skill Boss-Logistics

How is Skill Boss Logistics designed?

With a Wide Variety of Industrial-Standard  
Components used in Automated  
Distribution Centers.



# Skill Boss - Logistics

Skills performed on SBL

## 100+ Hands On Skills

### EM Equipment Maint.

- Safety
- Measurement
- Nomenclature
- Hand Tools
- System Operation
- Adjust Electrical/Pneumatic
- Maintain Machines
- Adjust Scanners
- Adjust Automation Equipment

Preventative Maintenance

### ER Equipment Repair

- Install Mechanical Systems
- Interpret Specifications
- Troubleshoot Machines
- Install Electrical Systems
- Install Fluid Power Systems
- Interpret Blueprints

Equipment Repair

Entry Level

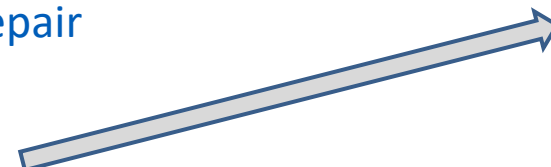
### NR Network Repair

- Check indicators Operation
- Adjust Electrical/Pneumatic Systems
- Edit a PLC Program
- Operate a PLC
- Troubleshoot a PLC
- Install Networks/Scanners
- Administer a Network

Network Repair

Higher Level

Technical Skills

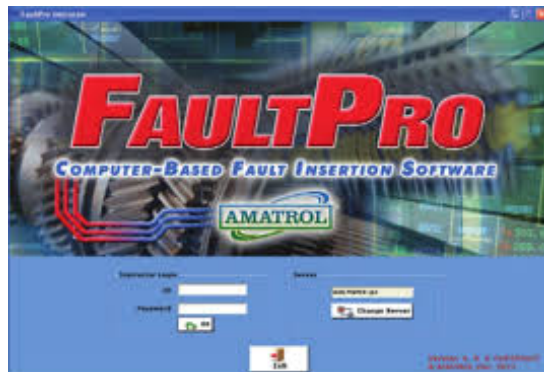


# Skill Boss – Logistics

## Computer Based Fault Insertion

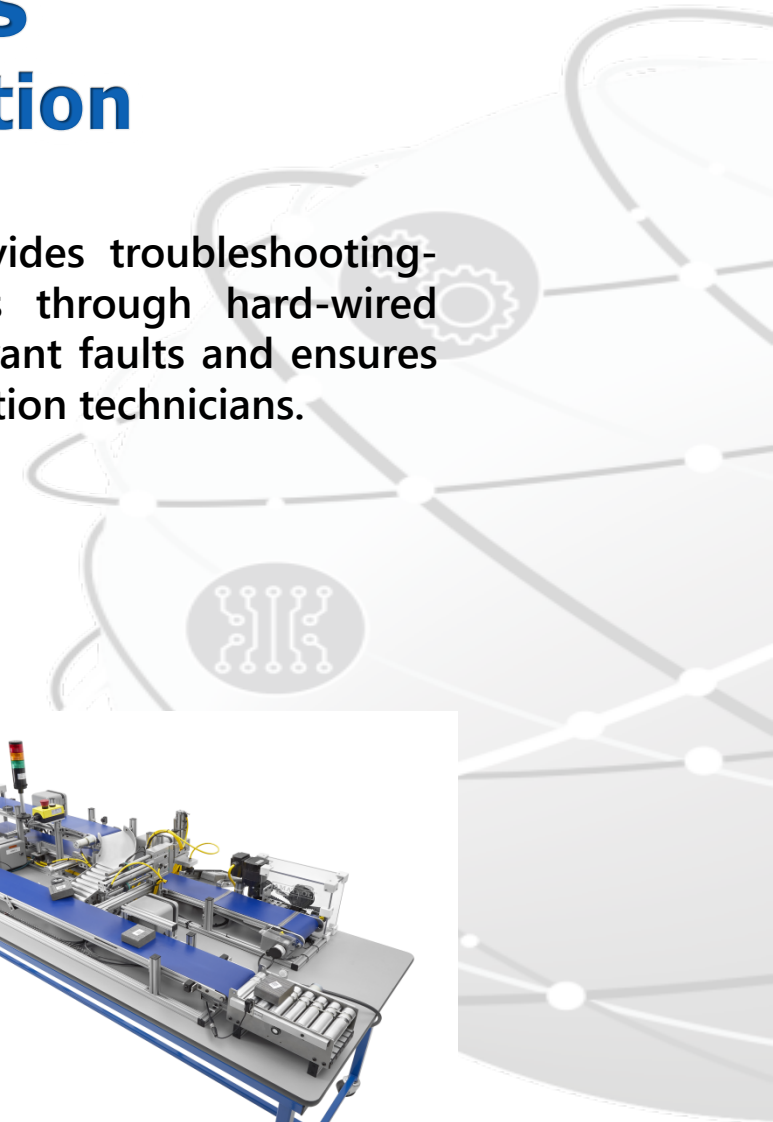
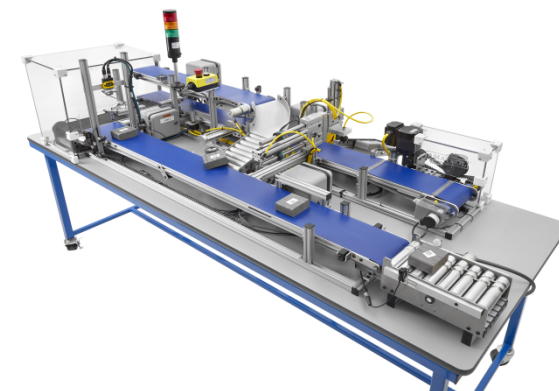
### FaultPro Included:

Amatrol's FaultPro computer-based fault insertion software provides troubleshooting-training by inserting individual "authentically-industrial" faults through hard-wired diagnostic software. FaultPro safely inserts over 50 industrial-relevant faults and ensures the most realistic troubleshooting environment for training automation technicians.



50+ Faults

Includes:  
Diagnostics Software  
In-Cabinet / Control Panel  
Troubleshooting





# Troubleshooting - FaultPRO Software and Skill Boss Logistics

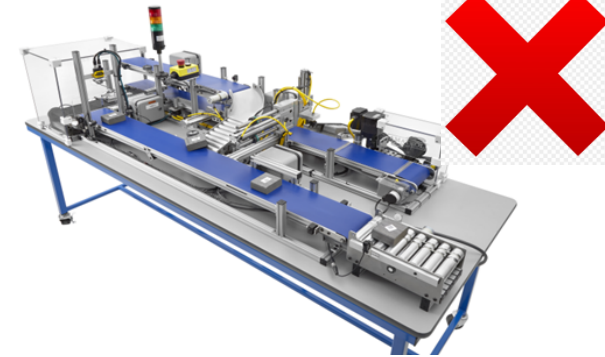
*Troubleshooting Software - How it works...*



Instructor



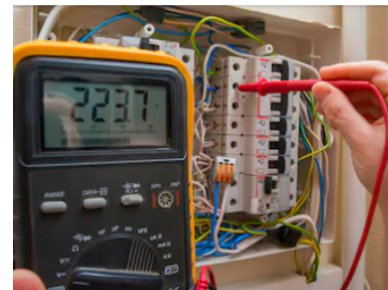
50+ Electronic Faults



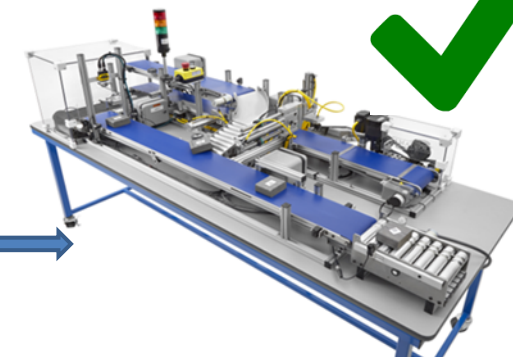
Student



SBL Diagnostic Software (HMI)



Test Equipment / DMM



Identify Fault

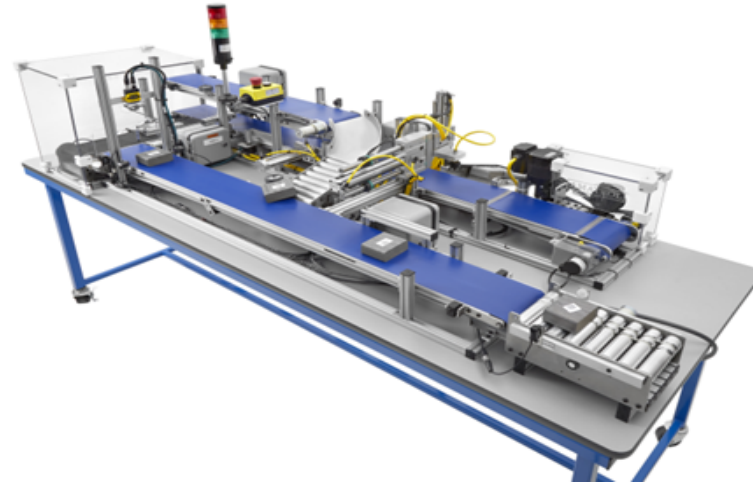
# FAULTPRO

COMPUTER-BASED FAULT INSERTION SOFTWARE

## Examples of 50+ Faults:

- Faulted e-Stop Push Buttons (Open / Short)
- Faulted Induction Sensor (Several Locations)
- Barcode Scanner (Failed Trigger / Output)
- Faulted Proximity Switches (Several Locations)
- Faulted Magnetic Reed Switches (Several Locations)
- Faulted Solenoids (Several Locations)
- Master Control Relay – Failed Contacts / Coil
- AB Compact Logix PLC – Failed Power Supply / Counter Module
- AB Compact Logix PLC – Failed Inputs / Outputs /Analog Outputs
- Power Flex 525 VFD Faulted Power In/Out
- DCV – Blockage / Bad Seals
- Induction Conveyor – failed DC Motor (Several locations)
- Encoder Failure (Several Locations)
- Main Power Breaker
- Failed Ethernet Switch

## Skill Boss - Logistics



- *Promotes Critical Thinking*
- *Solve Real World Problems*
- *Safe Fault Insertion*
- *Troubleshooting training in a controlled environment*
- *Teaches Troubleshooting techniques*
- *Practice / Testing Mode*

# MSSC: CT-SCA & Skill Boss-Logistics

## Benefits

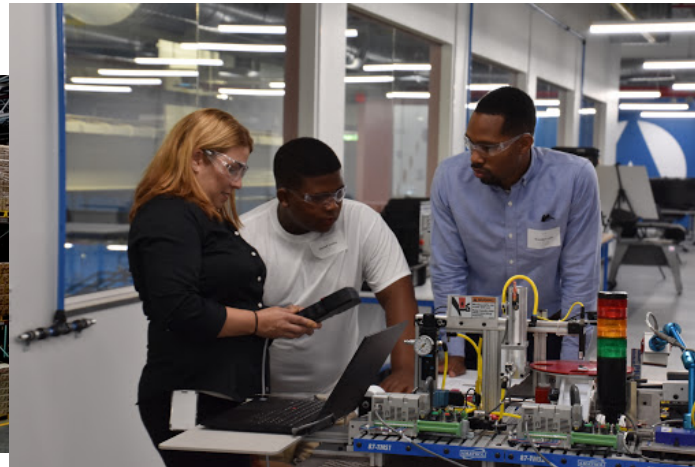
- Nationally-portable, Competency-based, Industry-led training certification program for Supply Chain Automation
- Fits well into any training program for logistics and supply chain automation: Academic / Industrial Training Programs
- Real World Training and Troubleshooting Automated Systems with SBL and FaultPRO Electronic Fault Insertion Software
- Hands-on experience to excite students to pursue a career in logistics and supply chain automation
- Can be Integrated into Pre-Apprenticeships and Apprenticeships
- Customizable to fit the skill level of a wide variety of skill sets: EM / ER / NR

## Supply Chain Automation & Advanced Manufacturing

CT-SCA & Skill Boss Logistics create training opportunities in the field of Supply Chain Automation and many areas of Advanced Manufacturing.



Industrial Training



Educational Programs

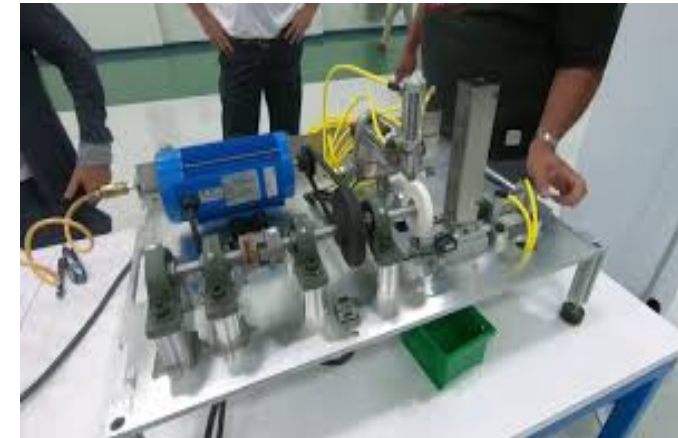


Workforce Training

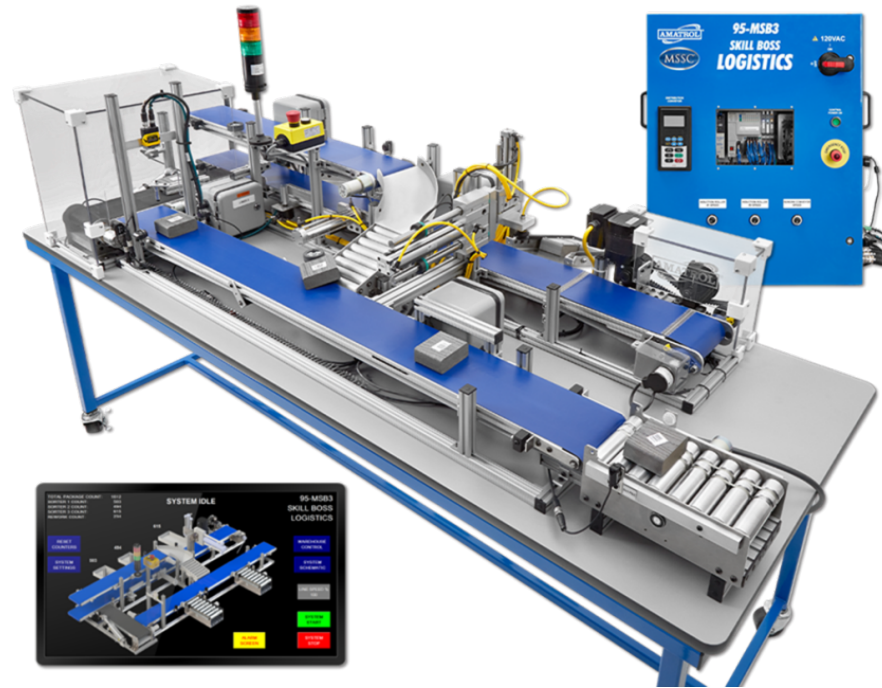


# CT-SCA & SBL Training @ Amatrol

Tying it all Together: Master Instructor  
Training: 1<sup>st</sup> - 2<sup>nd</sup> Q 2021



# MSSC: CT-SCA Certification & Skill Boss-Logistics



**QUESTIONS: Mark Gaudio**  
**Cell: 813-789-2461**

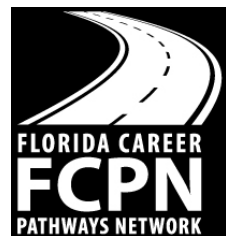
**Email: [mgaudio@jaegereducation.com](mailto:mgaudio@jaegereducation.com)**



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