



**SHU COURSES WILL ENABLE YOU TO CONFIDENTLY:**

**CONTROL AND MANAGE  
YOUR AGV/AGC SYSTEM**

**MAKE PATH CHANGES  
TO ANY SYSTEM**

**DIAGNOSE YOUR  
VEHICLE AND SYSTEM**

**PROGRAM AND CONFIGURE  
YOUR VEHICLES**

**MONITOR AND CONTROL  
VEHICLES AND SYSTEM**

**GENERATE VEHICLE  
AND SYSTEM REPORTS**

**DAIFUKU**





Smart Handling University will allow Automatic Guided Vehicle (AGV) and Automatic Guided Cart (AGC) users to take control and maintain their systems. Our hands-on classes will engage students with the intuitive features of each software tool available. The course exercises promote the ability to program, modify paths, and to monitor system/vehicle performance.

Software Tools include:

- CartTools
- AGV Tools
- SAM
- SmartView
- SAM Assembly Manager
- SAM Auto Transport

All Daifuku site classes are held in our new training center in Novi, MI. We have 23,000 square feet dedicated to AGC/AGV training, both classroom and “hands-on” interaction with vehicles and path.





# Course Options



The following classes are offered to enhance your knowledge of the features and controls systems for the AGV/AGC product lines. After completing these classes, technicians; maintenance people; and engineers will be able to take care of an AGV/AGC system.

Daifuku Site Class	Length	Price <sup>‡</sup>	Class Size Max/Min	Prerequisite	Additional Information
• CartTools Programming	2 days	\$3000	6/3	None	By special request
• CartTools Programming & SAM Operators Training	3 days	\$4000	6/3	None	Scheduled class
• SAM Transport Management Certification	3 days	\$4500	6/3	CartTools/SAM	By special request
• SAM – Assembly Manager Training	2 days	\$3500	6/3	CartTools/SAM	By special request
• Advanced AGV Programming and System Configuration (Two class options available)	5 days	\$7200	6/3	Proficient with AutoCAD	By special request

Customer Site Class	Length	Price <sup>†</sup>	Class Size	Additional Costs
• Basic Maintenance and Troubleshooting	2 days	\$8000	8	Fixed-price travel and living expense is \$1,900 for base 2 day trip.
• AGV/AGC Awareness Training	1 day	\$5400	12	
• For additional days**	1 day	\$1800	12	Fixed-price travel and living expense is \$1,600 for base 1 day trip and \$300.00 for each additional day.

Fixed price travel available for most US locations, please consult our training coordinator for verification.

\*\* Additional days for customer site classes can only be added when a base class is ordered. Additional days must immediately follow the base day(s) with no gaps.



# Here's What Customers & Industry Experts are Saying about AGVs & AGCs Smart Handling University

“With little previous experience with the AGC system, I was very pleased with the information covered in this course. The 3 days I've spent here has saved me months of stumbling around trying to learn the system on my own and still would not have all the knowledge obtained. I feel better going back to my plant with being able to watch our system and mentally understand what is going on with the software in the background.



It is also very helpful to learn the terminology to be able to discuss the system intelligently with Tech Support if problems would arise. *Just an excellent, must-have first class.*”

Carl G. Blaylock | Project Engineer | Southeastern Container



“The advantage of being able to just pick up the magnetic tape and change the layout in a matter of minutes allows us to change an entire line over a weekend. When you look at the bang for the buck, you can't beat these SmartCarts.”

Dave Werkheiser | Manufacturing Engineer | John Deere

“The carts are safe, simple and easy to set up. They have a lot of potential for almost every industry, and they're relatively inexpensive.”

Nidamaluri Nagesh | Advanced Manufacturing Engineer | General Motors\*

“With the carts, all we have to do is prep the floor and put down some magnetic tape to reconfigure the path. We can do that over a weekend or a holiday shut down.”

Larry MacAdam | Materials Industrial Engineer | CAMI

\* "Automatic Cart Makes it Easier to Handle Parts" *The Detroit News*, January 11, 2005



# CartTools Programming



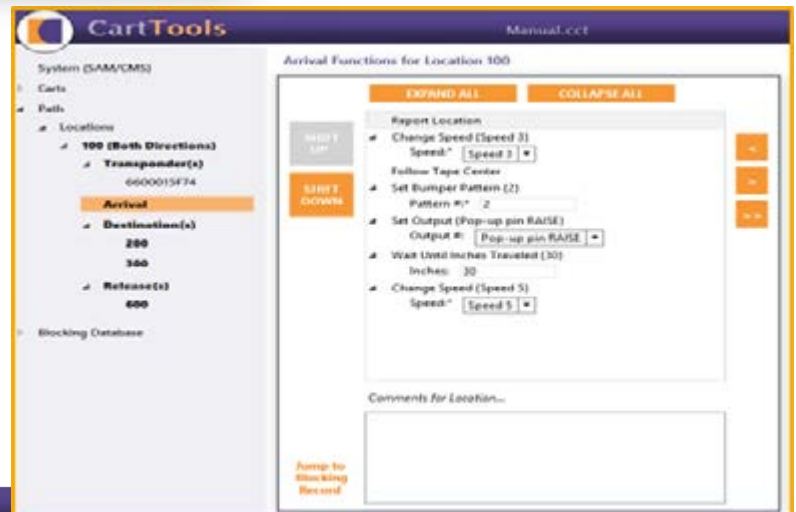
## Overview

This course provides the knowledge base for utilizing CartTools to program simple or complex reliable systems, providing an in depth discussion of CartTools commands and programming best practices.

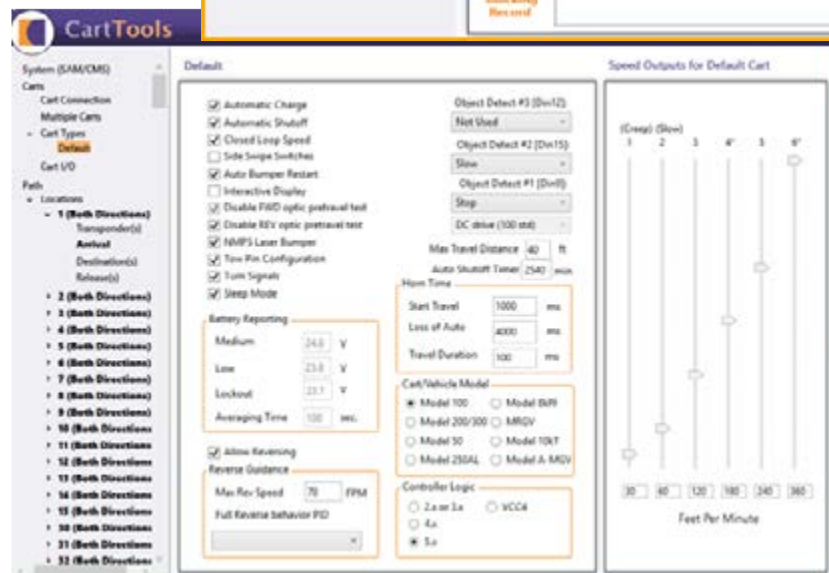


## Programming Functions

- Review functionality and best practices of each command.
- Incorporate exercises and actual programming of AGVs/ AGCs on site
- Program a charging station
- Program a pick or a drop station
- Program an assembly line location
- Review files generated by CartTools



Students completing this course will leave with full working knowledge on how to efficiently and effectively program any type of AGV/AGC product and system and will be able to make changes at any time by themselves.





# CartTools Programming and System Automation Manager (SAM) Operators Training



## Overview

This course combines CartTools Programming with System Automation Manager (SAM) Operators training. CartTools programming provides the knowledge base to program simple or complex systems, providing an in depth discussion of CartTools commands and programming best practices. SAM is a robust control system of Automatic Guided Vehicles (AGVs) and Automatic Guided Carts (AGCs).

Included in this class are hands-on programming exercises of AGVs/AGCs along with an explanation of how traffic management is achieved through both programs. Operators learn how to monitor and interact with a system's vehicle fleet through SAM's SmartView Interface and how to make modifications to a system through both CartTools and SAM programs.

## All CartTools Programming Material Covered (see previous page)

## Blocking Database

- Normal release
- PLC destination
- PLC release
- Alternate routing
- Negative claimed/required blocks.

## SAM Topics Covered Include

- System Architecture
- Startup/Shutdown
- SmartView Operator Screens
- Hot Backup
- Centralized Vehicle Management
  - Traffic management
  - Dynamic routing
  - Continuous communication
  - Alarming
  - Vehicle management

## Introduction to SAM System Applications

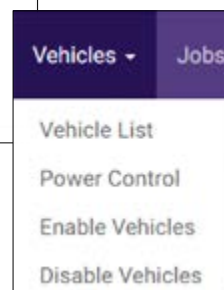
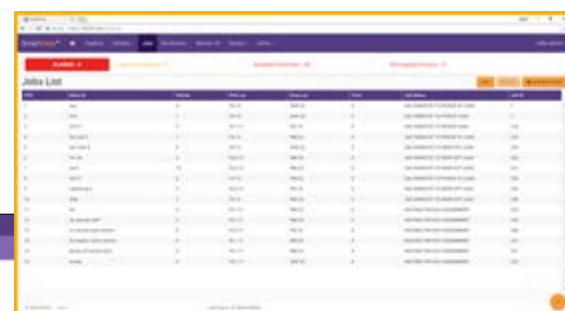
- Transport management
- Assembly management
- Remote dispatching management

## Graphical User Interface

- Monitoring system & vehicle status
- Operator interaction with vehicle fleet

## Comprehensive Reports

- How to generate and read
- Setting reporting parameters





# Advanced AGV Programming and System Configuration

Two class options are available based on guidance system type.



## Overview

### Programming and Operations

- CartTools Programming Best Practices
- Traffic Management Techniques
- SAM SmartView Operations

### Path Design with AGV Tools Program

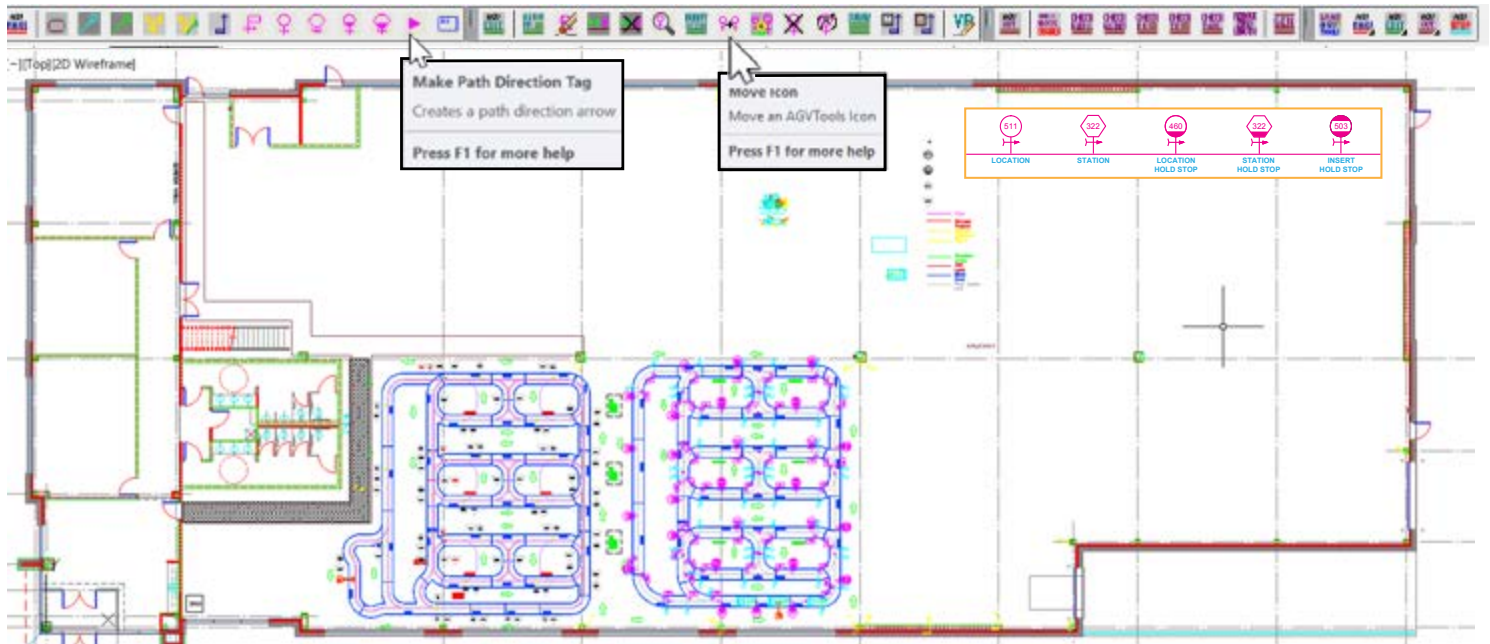
- Utilizing AutoCAD and AGV Tools Software
  - Create and modify AGV Paths
  - Review of Tracking and Generate Database Tool
- Review of Tracking and Generate Database Tool

### File Management

- File Management including Vehicle Setup Utility and Downloading Files

### Prerequisite Class

- Proficient with AutoCAD





# Basic Maintenance and Troubleshooting - On site



## Overview

This on-site course promotes preventative maintenance procedures to increase the performance and longevity of Automatic Guided Vehicles (AGVs) and Automatic Guided Carts (AGCs). Basic mechanical/electrical functions will be reviewed with recommended guideway installation and proper care. Class exercises and reference materials will be covered to assist users with troubleshooting techniques.

## Electrical Functions and Maintenance Topics Include

- Vehicle power controls and safety relay
- CCU Board
- Radios
- Drive motor controller
- Ethernet communications with vehicle and SAM.
- Sensors
- Battery charging
- Steering components
- Speed Control components

## Recommended Preventative Maintenance Schedules

- Weekly, monthly, and annual procedures

## Guide Path Installation and Maintenance

### Topics Include (For tape guidance systems only)

- Recommended installation and maintenance of magnetic paths, transponder reader antennas, transponders, and mag sensor calibration.
- (weekly, monthly, and annual).



## Basic Troubleshooting Techniques Include

- Input/Output Sensors and switches
- Communication issues
  - Guidance problems with tag reader antenna, steering, speed control, and brake operation
- Error recovery procedures





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# AGV/AGC Awareness Training



## Overview

This class is useful for both operators and managers. It includes an introduction to AGCs and system overview. Safe operating principles are covered in detail with basic operator appropriate troubleshooting procedures.

## Introduction to AGC Technology

- General Overview of all safety components
- Safe Operating Practices
- Manual and Automatic Operation
- Operator Controls
- Human Machine Interface (HMI)

## SAM Overview and Basic Troubleshooting

- Introduction to SmartView Interface
- Proper Way to Remove and Insert Cart into the System
- Review Common Conditions and Faults
- SAM Reports





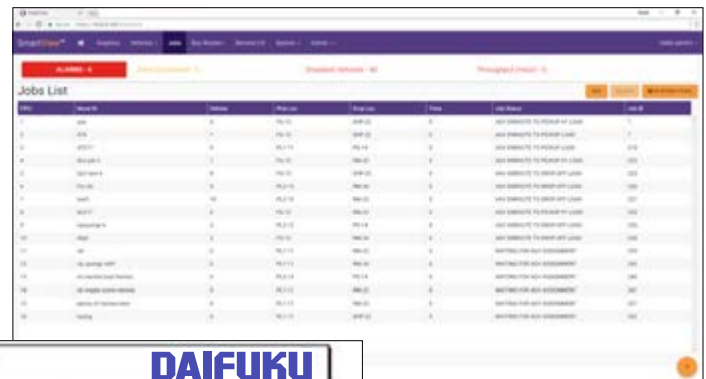
# SAM Transport Management Certification



## Overview

This class teaches the configuration of the following SAM options.

- Remote Dispatching
- Bus Routes
- Transport Management
- Transport Types
  - Manual - SmartView is used by an operator to request a transport by specifying the pick and drop locations.
  - Semi-Automatic – Operator pushbuttons for users to trigger transports
  - Automatic – Signal Triggers and acknowledges via a PLC interface utilizing photo eyes to automatically detect a load to be picked up and space available for delivery



Vehicle Activity Report									
DAIFUKU									
Start: 11/15/14 10:00:00 End: 11/15/14 11:15:00									
Vehicle List: All									
Station	Time	Job	Task	Job ID	Priority	Location	Job Name	Job ID	Job Name
11/15/14 11:40:44	1	10000	10000	10000	1	10000	10000	10000	10000
11/15/14 11:40:44	2	10001	10001	10001	1	10001	10001	10001	10001
11/15/14 11:40:44	3	10002	10002	10002	1	10002	10002	10002	10002
11/15/14 11:40:44	4	10003	10003	10003	1	10003	10003	10003	10003
11/15/14 11:40:44	5	10004	10004	10004	1	10004	10004	10004	10004
11/15/14 11:40:44	6	10005	10005	10005	1	10005	10005	10005	10005
11/15/14 11:40:44	7	10006	10006	10006	1	10006	10006	10006	10006
11/15/14 11:40:44	8	10007	10007	10007	1	10007	10007	10007	10007
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11/15/14 11:40:44	99	10098	10098	10098	1	10098	10098	10098	10098
11/15/14 11:40:44	100	10099	10099	10099	1	10099	10099	10099	10099

## Certification in this class is required to:

- Sell SAM Transport Functionality
- Configure, Install, and Modify a SAM Transport Management System
- Request Technical Support for SAM Transport Manager from JBW Engineer Groups.

## Prerequisites

- CartTools Programming and System Automation Manager (SAM) Operators Training

# PckLst.dat  
 # This file defines the locations vehicle can be when they look for new jobs  
 # The first number is the vehicle location  
 # The next numbers are either a list of locations where we look for the starting location  
 # of a job or a range of locations. The range of locations exists as a positive number followed  
 # by a



# SAM Assembly Manager Training



## Overview

This class teaches the configuration for assembly line applications.

## Assembly Line Concepts

- Workcells
- Stations
- Queue Counts
- Lift Heights

## Sleep Mode and Assembly Systems

## Assembly Systems Subsystems

- SAM
- SmartView
- PLC
- AGVs/AGCs

## Assembly PLC Interface

## SAM Configuration

- PNDDEF.dat (Defining Workcells and Stations)
- OPCMgr.xml (Defining OPC tags)
- AssemblyMgr.ini (Configuring the Assembly Line)

## CartTools for Assembly Lines Review

- Workcell Conventions

## Test Track Layout and Testing

- Identify Workcells
- Configure PNDDEF.dat
- Configure OPCMgr.xml
- Configure AssemblyMgr.ini

## Making Changes and Troubleshooting Techniques

- Adding a Workcell
- Adding a Queue Station

## Prerequisites

- CartTools Programming and System Automation Manager (SAM) Operators Training







## TO SCHEDULE CLASSES

Check online for class schedule. <http://daifukuna.com/About-Us/SHU>

Credit card payment or purchase order accepted.

Contact Customer Service for reservation requests.

Phone: 1-877-529-3221

Email: [webbservice@jerviswebb.com](mailto:webbservice@jerviswebb.com)

# DAIFUKU

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NOTICE: \* Smart Handling University is the name of our SmartCart AGC training program. No course credits nor degree will be earned with the completion of these courses.

‡ Price per person

† Price per class