**Smart Handling
Education**

AGV Training Classes

Learn how to operate, program, make path changes, and maintain your Automatic Guided Vehicle (AGV) Systems
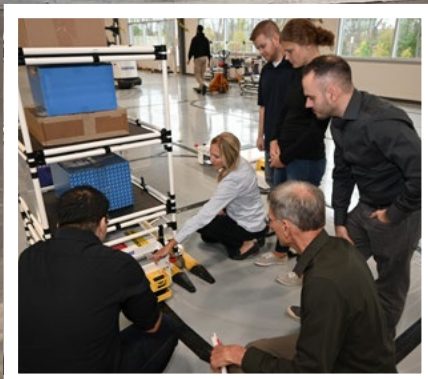

DAIFUKU

Smart Handling Education

Automatic Guided Vehicle (AGV) Training Classes allow users to take control and maintain their systems. Our hands-on classes will teach students about the features of each software tool available. Course exercises allow for practice programming, modifying paths, and monitoring system/vehicle performance.

Classes are available at our Daifuku Airport & AGV Innovation Center in Novi, Michigan. This modern facility has been specially designed for AGV training, with classroom and a variety of on-site AGVs for student hands-on exercises. Students run the equipment on test tracks and are instructed by experienced educators with in-depth knowledge of AGVs.

Selected courses are also offered at customer sites. See the course descriptions for availability.

AGV Training Classes

The following classes enhance knowledge of the features and controls systems for the AGV product lines. Technicians, maintenance people, and engineers will be able to manage and maintain an AGV system after completing these classes.

Training Classes	Length	Price	Class Size Min/Max	Prerequisite
• Basic Maintenance and Troubleshooting	2 days	$8,000‡	Up to 8	None
• AGV Awareness Training Multiple Sessions per day	1 day	$5,400‡	Up to 12	None
• For additional days**	1 day	$1,800‡		
• CartTools Programming	2 days	$3,000†	3/6	None
• CartTools Programming & SAM Operators Training	3 days	$4,000†	3/6	None
• Advanced AGV Programming and System Configuration	5 days	$7,200†	3/6	Proficient with AutoCAD
• SAM Transport Management Certification	3 days	$4,500†	Max 6	CartTools/SAM
• SAM – Assembly Manager Training	2 days	$3,500†	Max 6	CartTools/SAM

Travel expenses will be quoted for customer site training

‡ Price per class

† Price per person

** 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.

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Here's What Customers & Industry Experts are Saying about Daifuku's AGV Training Classes

"With little previous experience with the AGV 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

Basic Maintenance and Troubleshooting

Course Description

This course teaches preventative maintenance procedures to enhance the performance and longevity of AGV systems and vehicles. Included in this training are: basic mechanical/electrical functions, component review and configuration, vehicle manuals, and troubleshooting techniques.

Overview

- AGV Introduction
  - o Automatic/manual movement
- Operator Controls
  - o Safety components
- Component Overview
  - o Vehicle power controls and safety mechanisms
  - o CCU/VCC4 board
  - o Radio
  - o Drive motor controller
  - o Sensors
  - o Steering components
  - o Speed control components
- Electrical Prints
  - o Review the user friendly AGV electrical schematics
- Recommended Preventative Maintenance Schedules
  - o Weekly, monthly, and annual procedures
- Basic Troubleshooting and Error Recovery Techniques
  - o Input/output sensor and switch issues
  - o System and AGV communication problems
  - o Guidance errors

Who Should Attend

Mechanical/Electrical Technicians/ Engineers and Maintenance Personnel

Prerequisites

None

AGV Guidance Types

All Types

Location

At your company site

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AGV Awareness Training

Course Description

This course is for employees who work near or interact with your AGVs. This training includes safety and basic operations. If needed, we encourage you to hold multiple sessions to cover all shifts. Many customers purchase this class with Basic Maintenance and Troubleshooting Training.

Overview

- Introduction to AGV Technology
- General overview of all safety components and safe operating practices
- Automatic/Manual operation
- Operator Controls
- HMI (Human Machine Interface) Screen

Who Should Attend

Personnel who work near or interact with the AGVs

Prerequisites

None

AGV Guidance Types

All Types

Location

At your company site or our Daifuku Airport & AGV Innovation Center – Novi, Michigan

CartTools Programming

Course Description

This course teaches you to use Daifuku's CartTools software, which directs the movement of your AGVs. The class covers functionality and best practices to help achieve a safe and efficient automated environment. Students will be given hands-on exercises, which allow them to create, change, and troubleshoot CartTools commands.

Overview

- How each command works, and best practices
- Program commands and test on onsite AGVs that have the same navigation type as your system
- Exercises - how to program:
  - o A pick or a drop station
  - o A charging station
  - o Turns/ Forks in the path
  - o Special Options
  - o Destinations
- Files generated by CartTools
- Troubleshooting

Who Should Attend

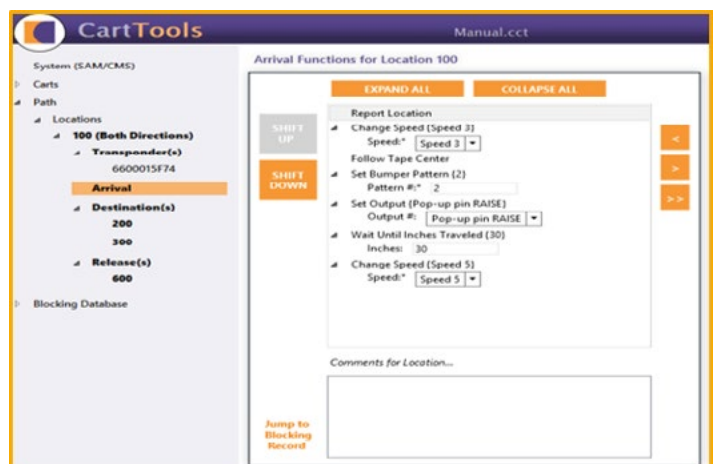Personnel who make simple changes to an AGV system

Prerequisites

None

AGV Guidance Types

All Types (with CartTools Only Systems)

Location

Daifuku Airport & AGV Innovation Center – Novi, Michigan

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CartTools Programming and System Automation Manager (SAM) Operators Training

Course Description

This course combines operator training for CartTools Programming and SAM (System Automation Manager). CartTools software is used to program the AGV's commands at a given location. SAM is a robust traffic control system that manages the AGV's movement. Hands-on exercises allow students to create, change, and troubleshoot a system.

CartTools Programming Functions

- How each command works and best practices
- Blocking/traffic management concepts
- SAM controlled release types

SAM System Review

- System architecture
- Hot Backup
- Continuous communication
- System startup/shutdown
- Graphical User Interface - SmartView
    - Monitoring system & vehicle status
    - Operator interaction with vehicle fleet
- Alarms and Reports
- File Management – CartTools and SAM
- Introduction to SAM System Applications
    - Transport management
    - Assembly management

Program a System

- Students will program a system using both CartTools and SAM. They will test their program on on-site AGVs that have the same navigation type as their system.
- Exercises include how to program:
    - A pick or a drop station
    - A charging station
    - Turns/ Forks in the path
    - Special options
    - Destinations
    - Blocking
    - Releases
    - Troubleshooting

Who Should Attend

Personnel who interact with CartTools/SAM and make changes to an AGV system.

Prerequisites

None

AGV Guidance Types

All Types (with systems that use both CartTools and SAM)

Location

Daifuku Airport & AGV Innovation Center – Novi, Michigan

Advanced AGV Programming and System Configuration

Course Description

This class combines advanced programming, operations, SAM review, and configuration of an AGV system. Students will create path designs utilizing AutoCAD, Daifuku's CartTools, and AGVTools. Hands-on exercises will allow students to create, test, and troubleshoot their path design.

Includes CartTools programming and SAM operators training

Overview

- Programming and Operations
    - o CartTools programming best practices
    - o Traffic management techniques
    - o SAM SmartView operations
- Path Design
    - o Utilizing AutoCAD and AGV tools software
    - o Create and modify AGV paths
    - o Review tracking and generate database tool
- File Management
    - o File Management including vehicle setup utility and downloading files

Who Should Attend

System Designers/Maintainers of AGV systems

Prerequisites

None

AGV Guidance Types

Inertial, Laser, and Natural Feature Navigation

Location

Daifuku Airport & AGV Innovation Center – Novi, Michigan

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SAM Transport Management Certification

Course Description
This class teaches the concepts of the SAM Transport Management features and its configurations. To receive certification you must pass a final exam at the end of the training. Daifuku engineer support is available to students who achieve certification.

SAM Configuration
This class teaches the configuration of the following SAM features:
- Remote Dispatching
- Bus Routes
- Manual Transport:
  Operator requests a transport operation through SmartView
- Semi-Automatic Movement:
  The operator pushes a button to create a job to pick and drop and the vehicle performs a job.
- Automatic Movement:
  A PLC can interface with SAM to trigger a signal to create a job. For example, a PLC interface utilizing photo eyes to automatically detect a load to be picked up and determine space available for delivery can be used to create a transport operation automatically.

Certification Test
- Students are tested on the following SAM transport management concepts:
  - o SAM transport functionality
  - o Configuration of transport systems
  - o Modification of transport systems

Who Should Attend
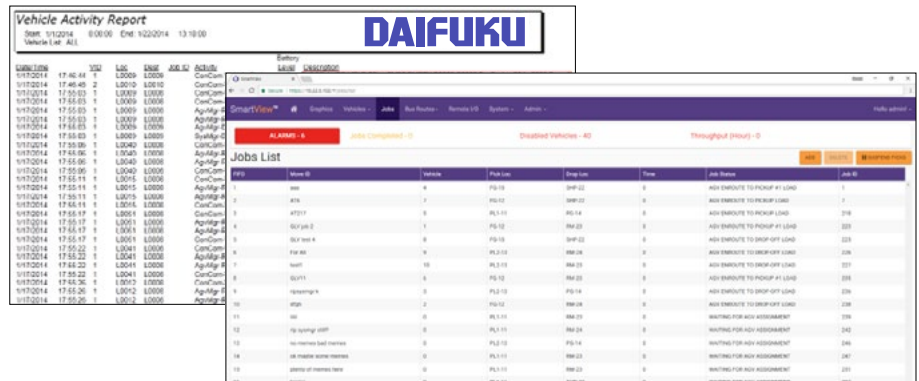System Designers/Maintainers of Transport AGV systems

Prerequisites
CartTools Programming and SAM Operators Training
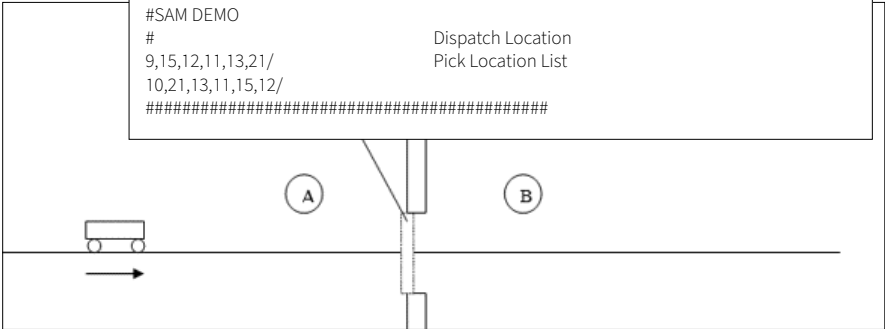
AGV Guidance Types
Tape guidance

Location
Daifuku Airport & AGV Innovation Center – Novi, Michigan


```
# 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 negative number, i.e. 1, -10 would include locations 1 - 10
#
#########################################
#SAM DEMO
#                                    Dispatch Location
9,15,12,11,13,21/                    Pick Location List
10,21,13,11,15,12/
#########################################
```

SAM Assembly Manager Training

Course Description

This class teaches students how to configure assembly line applications. Assembly line concepts include: assembly advancement, workcells, assembly segments, takt time, subsystems, PLC interface, programming, testing, and troubleshooting are reviewed through hands-on exercises.

CartTools and SAM SmartView

- Programming workcells with Cart-Tools program review
  - o SAM Release Types
- SAM SmartView operator overview - Assembly Screens, Takt time options, and reports

Configuration, Programming, and Testing

- Identify Workcells, stations, queue locations in specified SAM files
- Review different assembly modes of operations, such as asynchronous and synchronous advancement of vehicles through an assembly line
- Learn to interface with a PLC to provide operation complete and tooling clear signals to SAM assembly system
- Identify Takt time parameters in SAM SmartView
- Test work utilizing SAM SmartView

Who Should Attend

System Designers/Maintainers of Assembly AGV systems

Prerequisites

CartTools Programming and SAM Operators Training

AGV Guidance Types

Tape guidance

Location

Daifuku Airport & AGV Innovation Center – Novi, Michigan

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TO SCHEDULE CLASSES

Contact Customer Service for more information or to schedule a class.
Phone: 1-877-529-3221
Email: training@daifukuna.com

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