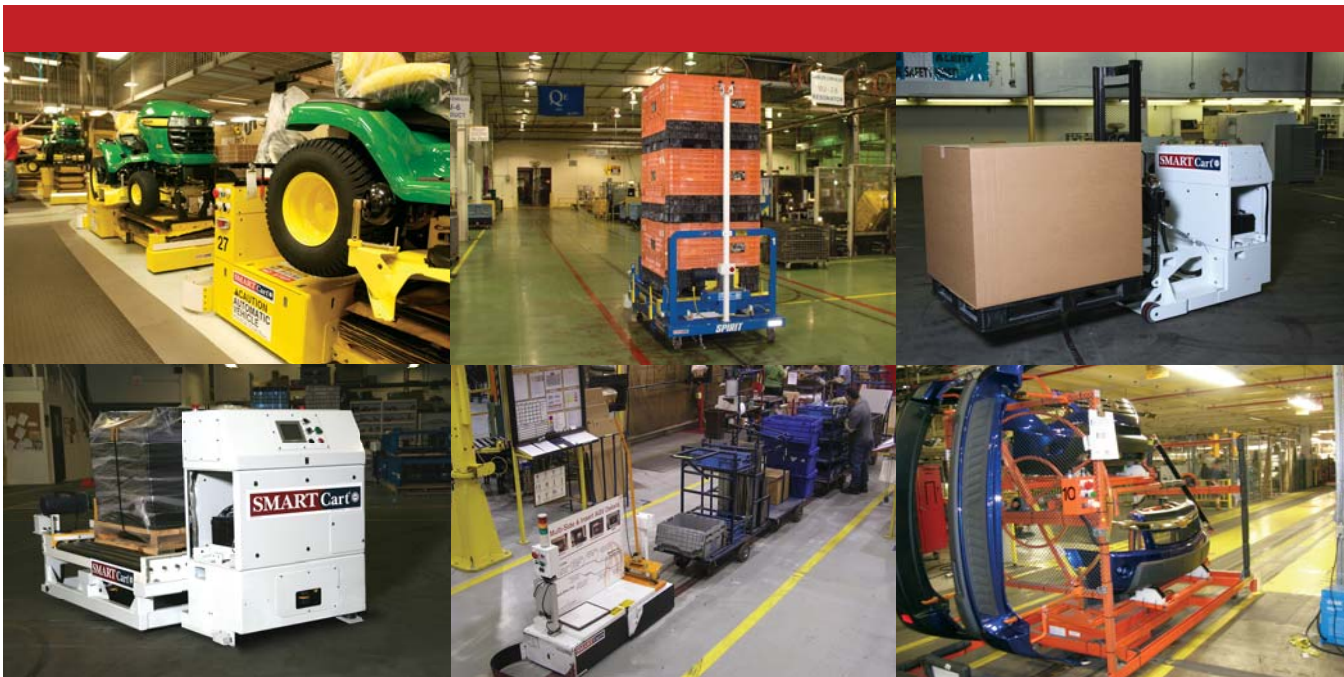


SMART CART®

**Flexible & Cost-Effective
Automatic Guided Carts**



DAIFUKU WEBB



JERVIS B. WEBB COMPANY

A Smart Move with Fast Payback

The SmartCart® Automatic Guided Cart (AGC™) is a flexible and cost-effective material handling solution from Jervis B. Webb Company. It is ideal for moving products on an assembly line or transporting goods throughout a plant or warehouse. Because it's automatic and durable, SmartCart provides reliable and consistent point-to-point movement of everything from small parts to heavy pallets.

What makes SmartCart AGCs so flexible and cost-effective?

SmartCart AGCs are guided by magnetic tape, which allows you to quickly install or modify the guideway in as little as a few hours. In addition, SmartCart has numerous load handling options to meet your specific needs. Over time, the load handling carrier can be replaced to accommodate different products, protecting your initial investment.

Furthermore, SmartCart is much cleaner and quieter than traditional conveyors. With a SmartCart AGC system, you have the ability to add SmartCarts if you need to increase capacity or remove them if you want to reduce capacity.

Best of all, the affordability and flexibility of SmartCart allows you to reap immediate benefits by delivering a fast and impressive payback in as little as three months.



Increase Productivity, while Reducing Costs

A prime area for cost savings in manufacturing plants is through in-process inventory reduction. Simply by adding or removing SmartCart AGCs from the line, assembly production rates can be increased or decreased on demand. This is a substantial benefit over conventional conveyor methods, which require the assembly line to be designed and installed up front for the maximum potential production rate. And, because of their flexibility, SmartCart AGCs are an excellent choice for companies adhering to continuous improvement initiatives.

To fully automate a warehouse, SmartCart AGCs can be integrated with our Automatic Trailer Loading vehicle, SmartLoader[®], and/or an Automated Storage and Retrieval System (AS/RS). This adds reliability, dependability and predictability to day-to-day processes. SmartCart AGCs can also dramatically improve warehouse and plant safety.

The Old Way



The SmartCart Way



SmartCart AGC Strengths **VS.** Conventional Conveyor Systems

- Scalable Material Handling: SmartCart allows you to increase throughput by simply adding AGCs.
- Easy Installation: SmartCarts can be installed in as little as a few hours; conveyor system installations can take weeks or months to complete.
- Easy Modification: Changes to the SmartCart AGC guidepath can be made in as little as a few hours, while conveyor system modifications can be very costly and take weeks or months to complete.
- No building modifications are required with SmartCarts.

SmartCart AGC Strengths **VS.** Manual Transport

- Reducing Costs: In cases where transportation of products is repetitive, SmartCart AGCs can dramatically reduce operational expenses such as labor, benefits and lost time.
- Continuous Operation: In most applications, SmartCarts operate two shifts a day without charging. Opportunity charging allows SmartCart systems to operate 24/7.
- Improved Safety/Damage Reduction: SmartCart AGCs remain on a designated path at a predictable speed and use a safety bumper, reducing the likelihood of injury or damage.

Endless Industries, Applications & Customers

SmartCart® AGCs are improving productivity in almost every industry including automotive, agricultural equipment, furniture, healthcare, food and beverage, as well as in numerous warehouses and distribution centers.

SmartCart AGC customers include:

Chrysler



General Motors



Johnson Controls



Harley-Davidson



Ethan Allen



John Deere



Yamaha



Nissan



Types of applications for SmartCart AGCs include:

Assembly

moving products through production processes

Kitting

collecting parts for assembly

Transportation

loading pallets and loose parts

Staging

delivering pallets for production processes

Warehousing

moving products from stretch wrappers to docks or storage

Order Picking

moving ordered products to trailer-loading area for distribution

Parts/Just-In-Time (JIT) Delivery

towing trailers of parts/materials to consumption points

Transfer/Shuttle

transfers loads across high traffic aisles

Here's What Customers & Industry Experts are Saying about SmartCart AGCs

“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



“SmartCart is an excellent example of standardizing the (automatic guided vehicles) and employing new technology to make them more cost-effective.”

Richard E. Ward | Executive Vice President
Material Handling Industry of America*



“The SmartCarts 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

Intuitive Navigation

Webb's SmartCart® AGC provides multiple navigation options to meet the specific needs of your environment. The most widely used option is magnetic tape, which is installed by merely cleaning the floor and applying the tape. Transponder tags can be placed on the floor to indicate locations where SmartCarts are to perform assigned tasks. Various tasks such as stopping, increasing/decreasing speed, lifting and lowering can be performed at different locations. To modify the guidepath, you can simply pull up the magnetic tape and reapply it in another location (along with any transponder tags).

In high-traffic areas where magnetic tape could be damaged, a bar magnet strip can be embedded into the floor in place of the magnetic tape. Another alternative, Webb's new SmartSteer™ technology allows you to program a SmartCart AGC to intentionally leave the navigation path and perform functions such as:

- crossing an aisle
- completing a three-point turn
- full reversing
- returning to the guidepath.

Best of all, SmartSteer functionality is now standard on most SmartCart AGC models.

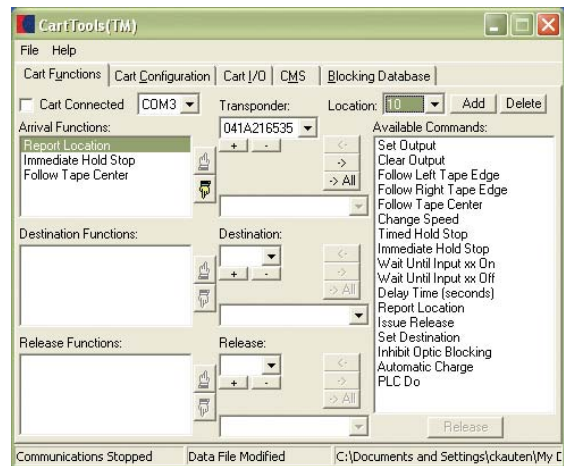


Simple Configuration

Setting up your SmartCart AGC system is simple with CartTools®, Webb's easy-to-use software configuration tool. CartTools lets you specify the tasks you want a SmartCart AGC to perform at various locations in your system. These functions include stopping, changing speed, triggering outputs, checking inputs, lifting, lowering and diverging from the guideway.

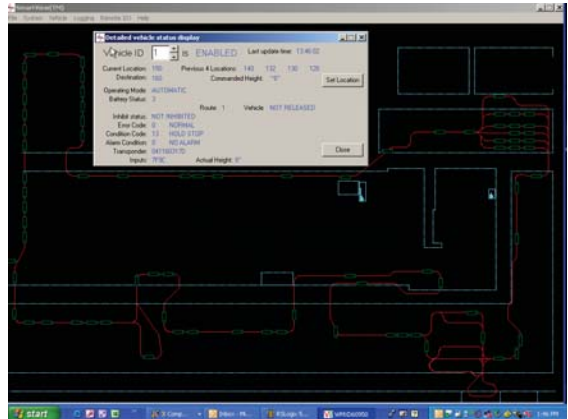
Real-Time Traffic Control

For real-time control and monitoring of multiple SmartCart AGCs within a system, you have the option to add Cart Management System (CMS) software. The CMS uses a wireless Ethernet LAN (802.11a/b/g) connection to collect data from all SmartCart AGCs in the system. The CMS also interfaces with upper level PLC systems or TCP/IP software for destination and routing logic. Additionally, the CMS provides status reporting and special functions, including the option to integrate with Warehouse Management Systems.



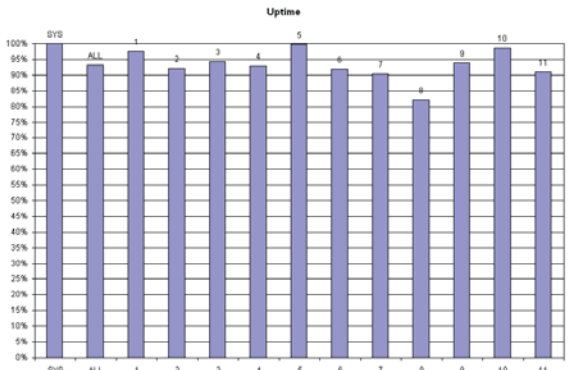
User-Friendly Interface

With the CMS, you can load a bitmap (.BMP) image of your entire SmartCart AGC system into Smart-View™, a standard program that allows you to add new SmartCart locations anywhere on the bitmap. As a result, you can easily visualize changes to the guideway before making them. Each SmartCart AGC also features color graphic displays that show vehicle status and allow you to change the destination and manually control the vehicle (manual control on Model 300 vehicles only).



Effective Data Collection

SmartCart AGC systems that utilize a CMS come with a standard feature that constantly collects and retains system data via .CSV (Comma Separated Values) files. The .CSV files can be imported into a Microsoft Excel® spreadsheet that is pre-equipped with macros that allow you to examine the system for trends that might indicate service is needed on the guideway or SmartCarts.



Designed for the Way You Do Business

Webb offers numerous SmartCart® AGC models and options, allowing you to find the SmartCart that best fits your needs.



Model CE

This SmartCart is CE certified, which means it has met all European Union (EU) consumer safety, health, or environmental requirements. The CE SmartCart includes a redundant circuit on the laser bumper, turn signals, and metal skirts. The CE certification can be available on all SmartCart models.

Model 100

The Model 100 SmartCart AGC is available in two options for towing and assembly applications. The standard 100 Tugger is capable of towing up to 2,000 lb (907 kg), based on a trailer friction factor of two percent. It is perfect for parts delivery, parts kitting, order picking and pallet delivery. The 100 Tugger/Tunnel (TT) is lower to the ground than the standard 100 Tugger, allowing it to “tunnel” under a customized carrier and tow it to another location. The Model 100 TT is available with an auto hitch, which allows for automatic coupling and decoupling with trailers and customized carriers.

The 100 Load Handling Frame (LHF) SmartCart AGC is ideal for assembly applications. All the primary components – drive,

controls, batteries and tag reader – are located in one place, which isolates the outer frame from the drive module. The 100 LHF comes equipped with a customized load handling carrier designed to meet your unique needs, including load handling frames supported by swivel casters for added stability in narrow aisles. Depending on the type of carrier, the Model 100 LHF can handle live loads up to 1,700 lb (771kg).



Model 300

The Model 300 SmartCart AGC is available in numerous options. The standard Model 300 Tugger has a 6,000 lb (2,722 kg) towing capacity based on a trailer friction factor of two percent. The Tugger is available with an auto hitch, which allows for automatic coupling and decoupling with trailers.

The Model 300 Load Handling Frame (LHF) can handle live loads up to 6,000 lb (2,722 kg) depending on the type of carrier. The 300 LHF option comes equipped with a customized load handling carrier designed to meet your unique needs. Carrier options include a scissor lift, which lifts and lowers products to improve ergonomics for assembly operations.

The Model 300 also includes options for a Single or Dual Roller

Conveyor, which is useful for delivering pallets, as large as 48" (1218 mm), to and from roller conveyor systems. The Model 300 Single Conveyor AGC can transport a load up to 3,200 lb (1,451 kg), while the Model 300 Dual Conveyor AGC can transport two 1,900 lb (862 kg) loads at a time.

Conversely, the Model 300 Counterbalanced Fork AGC features a 1,400 lb (635 kg) load capacity, which is perfect for picking up and dropping off pallets, as large as 48" (1218 mm), from conveyors, stretch wrappers or the floor.

Features and options include:

- CartTools® software for SmartCart configuration
- Magnetic tape or bar magnet guidepath
- SmartSteer™ technology
- Transponder location sensing
- Precision stopping proximity sensor
- Four selectable speeds from 15 (4.5) to 160 fpm (49 mpm)
- Automatic restart front bumper
- Laser bumper
- Pendant control
- Color HMI display
- Opportunity charging
- Fast charging
- Battery level monitoring
- Stopping - with pushbutton release, timed release or remote release
- Automatic load transfer controls

SmartCart® AGC Model Specifications

Specifications	Model 100	Model 300 Tugger LHF ¹	Model 300 Single Conveyor	Model 300 Dual Conveyor	Model 300 Counter-Balanced Fork
Load capacity ²	2,000 lbs 907 kg	6,000 lbs 2,722 kg	3,200 lbs 1,451 kg	1,900 lbs ea. 862 kg	1,400 lbs 635 kg
Max travel speed	160 fpm 49 mpm	160 fpm 49 mpm	160 fpm 49 mpm	160 fpm 49 mpm	160 fpm 49 mpm
Transfer speed	N/A	N/A	Up to 45 fpm 14 mpm	Up to 45 fpm 14 mpm	20 fpm 6 mpm
Transfer height	N/A	N/A	18" to 31" ³ 457 to 787 mm	18" to 31" ³ 457 to 787 mm	48" ⁴ 1219 mm ⁴
Stopping accuracy ⁵	+/- 1/2" 13 mm	+/- 1/2" 13 mm	+/- 1/2" 13 mm	+/- 1/2" 13 mm	+/- 1/2" 13 mm

All SmartCart AGCs have 24 VDC drive motors and battery packs.

In addition to AGCs, Webb offers a wide variety of Automatic Guided Vehicles (AGVs) that can handle loads up to 130,000 lb (58,900 kg). Our wide selection enables us to provide you with the most cost-effective and efficient solution that meets your needs. Webb was also the first to develop an Automatic Trailer Loading vehicle, SmartLoader®, which loads trailers and stacks pallets automatically with no trailer modifications needed. For more information on our AGVs and/or SmartLoader, contact a Webb sales engineer.

¹ Load handling frame

² Load capacity is directly affected by size and weight of material handling structure or automation. All stated capacities are based on a maximum of 50% duty cycle. For higher duty cycles, consult a Webb sales engineer.

³ Top of Roll

⁴ Top of Fork

⁵ Best stopping accuracy is achieved by stopping on a proximity sensor from 30 fpm (9 mpm) or less, with closed loop speed control. Model 50 is not equipped with closed loop speed control.

SmartCart AGC

Advantages:

- Affordability with a fast payback
- Flexibility with numerous models and options to meet your specific needs
- Magnetic tape navigation
- No building modifications required
- Easy to install
- Easy to configure
- Easy to modify
- Real-time traffic control
- SmartSteer provides the ability to leave guidepath to perform tasks





Established in 1919, Jervis B. Webb Company specializes in the design, engineering, installation and support of innovative material handling systems used in the automotive, airport, beverage, warehousing and manufacturing industries. As a subsidiary of Daifuku Co., Ltd., we form one of the largest automated material handling companies in the world, providing the widest range of solutions in the industry for companies around the globe.

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