F Smart Handling AGV Solutions



The Model M100-ST is part of the topselling family of AGVs, offering ultimate flexibility, reliability and scalability at an affordable price.

FEATURES

Low Profile: Designed to "tunnel" under mobile racks and trailers to tow them from underneath. This keeps the footprint of the AGV with trailer to a minimum.

Safe: The M100-ST offers a 16-pattern laser to detect obstructions and personnel.

Affordable: Many applications can demonstrate Return on Investment in three months or less.

Simple: CartTools[™] and AGV Tools software provide a user-friendly interface to implement/make changes.

Industrial: Steel construction with powder coat and industrial enamel paint.

Integration: Can integrate with Plant Control Systems via Wi-fi communications and our System Automation Manager[™] (SAM) software providing traffic control. Automatic Guided Vehicles

36AH Battery Pack

Tow Pin – Max Towing 1,950 lbs

Operator HMI

Pendant

Control Plug



NAVIGATION AND GUIDANCE OPTIONS

Natural Feature Navigation (NFN): Environmental feature data is collected by on-vehicle sensors and used by the vehicle computer to determine location. **Inertial Navigation:** Odometry data and in-floor waypoints are used by the vehicle computer to determine location.

Magnetic Tape/Bar Guidance: Magnetic path is followed using sensors.

NAVIGATION ENHANCEMENTS

Enhanced Navigation: Additional sensors can be added to augment the vehicle's navigation technology.

Co-Navigation Technology: Multiple navigation packages may be used on a vehicle in challenging environments.

FEATURES AND OPTIONS

- Wi-fi Communications 802.11 a/b/g/n/ac Wheel Brushes
- Automatic Shut Off
- Sleep/Auto-wake
- Automatic Charging
- Side Swipe Optics
- Warning Light/Horn
- Cab Side Covers

This product is available with Magnetic Guidance Technology



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SMART HANDLING AGV SOLUTIONS

General Specifications	
Weight / with batteries	270 lbs (122 kg) / 325 lbs (147 kg)
Dimensions	W: 20.13" (510 mm) L: 39" (990 mm) H: 11.5" (290 mm)
Traction Power	40 lbs constant, 80+ lbs starting
Safety – Front/rear	ANSI B56.5 compliant bumper
Speed – Laser Bumper	15 to 160 FPM, - 6 speeds, 1 FPM increments
Rear Paddle Bumper	Maximum 30 FPM (if equipped)
Rated Trailer	1,950 lbs (885 kg) @ 100 FPM
	1,050 lbs (476 kg) @ 160 FPM
	With 2% friction factor trailer wheels
	Capacity reduced by 10% when reversing
	1% Incline/Decline 830 lbs @ 100 FPM
	AGM/TPPL 36AH 24VDC battery pack
Automatic Battery Charge	48 amp charge rate (if equipped)
Manual Charge	Up to 25 amp charge rate, via manual plug
Environment	op to 25 amp charge rate, via manual plug
	$0 \pm 40\%$ C $250/\pm 0.050/$ non-condensing hypridity
Environment – Atmosphere	0 to 40° C, 25% to 95% non-condensing humidity
Dust/Water-proof	No
Floor Specs – Edges/Debris	¼" abrupt elevation change maximum, smoothed
Expansion Joints	¼" maximum
Grade Rating	0%
Flatness	1% and ¼" variation in 5' or less
Floor Conductivity	0.6 coefficient of friction between wheels and floor, minimum
Static Dissipative	Less than 3.5 x $10^7 \Omega$
Radio Communication	IEEE 802.11a/b/g/n/ac, plus security encryption (if equipped)
Detailed Specifications	
Available Wheel Loading	Front add'l – 200 lbs, Rear add'l – 230 lbs each
	Weight added to module is subtracted from rated trailer
	Ferrierd and Devence (if any inned)
Drive Direction – Automatic	Forward and Reverse (if equipped)
Drive Direction – Automatic Duty Cycle	100% @ 20 lbs drawbar (1,000 lbs)
Duty Cycle	100% @ 20 lbs drawbar (1,000 lbs) Vulkolan 150 mm diameter x 50 mm wide Gear driven steerable turntable
Duty Cycle Drive Unit – Wheel	100% @ 20 lbs drawbar (1,000 lbs) Vulkolan 150 mm diameter x 50 mm wide
Duty Cycle Drive Unit – Wheel Drive Type	100% @ 20 lbs drawbar (1,000 lbs) Vulkolan 150 mm diameter x 50 mm wide Gear driven steerable turntable
Duty Cycle Drive Unit – Wheel Drive Type Motor	100% @ 20 lbs drawbar (1,000 lbs) Vulkolan 150 mm diameter x 50 mm wide Gear driven steerable turntable 130 watts 24VDC permanent magnet
Duty Cycle Drive Unit – Wheel Drive Type Motor Steering	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor
Duty Cycle Drive Unit – Wheel Drive Type Motor Steering Brake	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor3Nm, spring actuated (fail-safe)
Duty Cycle Drive Unit – Wheel Drive Type Motor Steering Brake Caster Wheels	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor3Nm, spring actuated (fail-safe)Solid elastomer 5" diameter x 1-3/8" wide
Duty Cycle Drive Unit – Wheel Drive Type Motor Steering Brake Caster Wheels Guidance – Magnetic Tape/Bar	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor3Nm, spring actuated (fail-safe)Solid elastomer 5" diameter x 1-3/8" wideSmartCart AGV
Duty Cycle Drive Unit – Wheel Drive Type Motor Steering Brake Caster Wheels Guidance – Magnetic Tape/Bar Steer Angle Sensor	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor3Nm, spring actuated (fail-safe)Solid elastomer 5" diameter x 1-3/8" wideSmartCart AGVAnalog 10 turn potentiometer+/- 1" from physical path
Duty Cycle Drive Unit – Wheel Drive Type Motor Steering Brake Caster Wheels Guidance – Magnetic Tape/Bar Steer Angle Sensor Steering Accuracy	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor3Nm, spring actuated (fail-safe)Solid elastomer 5" diameter x 1-3/8" wideSmartCart AGVAnalog 10 turn potentiometer+/- 1" from physical pathError generated within 6" of path loss
Duty Cycle Drive Unit – Wheel Drive Type Motor Steering Brake Caster Wheels Guidance – Magnetic Tape/Bar Steer Angle Sensor Steering Accuracy Guide Loss Error	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor3Nm, spring actuated (fail-safe)Solid elastomer 5" diameter x 1-3/8" wideSmartCart AGVAnalog 10 turn potentiometer+/- 1" from physical pathError generated within 6" of path lossNot offered, violates ANSI B56.5
Duty Cycle Drive Unit – Wheel Drive Type Motor Steering Brake Caster Wheels Guidance – Magnetic Tape/Bar Steer Angle Sensor Steering Accuracy Guide Loss Error Hunt for Path Sensor	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor3Nm, spring actuated (fail-safe)Solid elastomer 5" diameter x 1-3/8" wideSmartCart AGVAnalog 10 turn potentiometer+/- 1" from physical pathError generated within 6" of path loss
Duty Cycle Drive Unit – Wheel Drive Type Motor Steering Brake Caster Wheels Guidance – Magnetic Tape/Bar Guidance – Magnetic Tape/Bar Steer Angle Sensor Steering Accuracy Guide Loss Error Hunt for Path Sensor SmartSteer Accuracy	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor3Nm, spring actuated (fail-safe)Solid elastomer 5" diameter x 1-3/8" wideSmartCart AGVAnalog 10 turn potentiometer+/- 1" from physical pathError generated within 6" of path lossNot offered, violates ANSI B56.516 millisecond data rate, 50 updates per second+/- 3" @ 10'
Duty Cycle Drive Unit – Wheel Drive Type Motor Steering Brake Caster Wheels Guidance – Magnetic Tape/Bar Guidance – Magnetic Tape/Bar Steer Angle Sensor Steering Accuracy Guide Loss Error Hunt for Path Sensor SmartSteer Accuracy Stopping Accuracy	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor3Nm, spring actuated (fail-safe)Solid elastomer 5" diameter x 1-3/8" wideSmartCart AGVAnalog 10 turn potentiometer+/- 1" from physical pathError generated within 6" of path lossNot offered, violates ANSI B56.516 millisecond data rate, 50 updates per second+/- 3" @ 10'½" proximity sensor, 1-½" transponder reader @ 30 fpm
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Duty Cycle Drive Unit – Wheel Drive Type Motor Steering Brake Caster Wheels Guidance – Magnetic Tape/Bar Steer Angle Sensor Steer Angle Sensor Guide Loss Error Hunt for Path Sensor Sensor SmartSteer Accuracy Stopping Accuracy Location Method	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor3Nm, spring actuated (fail-safe)Solid elastomer 5" diameter x 1-3/8" wideSmartCart AGVAnalog 10 turn potentiometer+/- 1" from physical pathError generated within 6" of path lossNot offered, violates ANSI B56.516 millisecond data rate, 50 updates per second+/- 3" @ 10'½" proximity sensor, 1-½" transponder reader @ 30 fpmTransponder tags, 5 data bytes including checksumVirtual Locations via distance initiated functions
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Duty Cycle Drive Unit – Wheel Drive Type Motor Steering Brake Caster Wheels Guidance – Magnetic Tape/Bar Steer Angle Sensor Guide Loss Error Guide Loss Error Hunt for Path Sensor Guide Loss Error Hunt for Path Sensor Steering Accuracy Stopping Accuracy Location Method Program Capacity Navigation Steer Angle Encoder Steering/Stopping Accuracy HMI Display Manual Movement	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor3Nm, spring actuated (fail-safe)Solid elastomer 5" diameter x 1-3/8" wideSmartCart AGVAnalog 10 turn potentiometer+/- 1" from physical pathError generated within 6" of path lossNot offered, violates ANSI B56.516 millisecond data rate, 50 updates per second+/- 3" @ 10'½" proximity sensor, 1-½" transponder reader @ 30 fpmTransponder tags, 5 data bytes including checksumVirtual Locations via distance initiated functions5000 program stepsDaifuku AGV - Natural Feature Navigation and InertialYes+/- 1/2" from physical path3.5" color touch screen – errors & destinationsPendant – via pendant plug receptacle, Rescue dolly
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Duty Cycle Drive Unit – Wheel Drive Type Motor Steering Brake Caster Wheels Guidance – Magnetic Tape/Bar Guidance – Magnetic Tape/Bar Steer Angle Sensor Steering Accuracy Guide Loss Error Hunt for Path Sensor Hunt for Path Sensor Stopping Accuracy Location Method Program Capacity Navigation Steer Angle Encoder Steering/Stopping Accuracy HMI Display Manual Movement Minimum Path Radius Drive Stalled Detection	100% @ 20 lbs drawbar (1,000 lbs)Vulkolan 150 mm diameter x 50 mm wideGear driven steerable turntable130 watts 24VDC permanent magnet24 VDC motor3Nm, spring actuated (fail-safe)Solid elastomer 5" diameter x 1-3/8" wideSmartCart AGVAnalog 10 turn potentiometer+/- 1" from physical pathError generated within 6" of path lossNot offered, violates ANSI B56.516 millisecond data rate, 50 updates per second+/- 3" @ 10'½" proximity sensor, 1-½" transponder reader @ 30 fpmTransponder tags, 5 data bytes including checksumVirtual Locations via distance initiated functions5000 program stepsDaifuku AGV - Natural Feature Navigation and InertialYes+/- 1/2" from physical path3.5" color touch screen - errors & destinationsPendant - via pendant plug receptacle, Rescue dolly24" - 90° turn, 30" - 180° turnYes - in 1" increments

CARTTOOLS SOFTWARE

Simple, standardized toolbox of commands that make configuration a snap.

Cartfords

Pendant Control – When manual movement is required, it's as simple as driving the AGV where it needs to go.



Reverse Magnetic Tape Guidance – By just adding another guidance sensor and laser bumper, the M100-ST can act as

a shuttle cart.

SmartSteer – CartTools directing the AGV to intentionally leave the magnetic tape path. It allows maneuvers like pivot turns and ignoring floor problems when in full automatic operation.

DAIFUKU

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Per NEC ampacity guidelines

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Wiring