



Smart Manoeuvre:



Integrating an *Intelligent* AGV into Your Facility

Today's industrial production environments are highly dynamic and often congested. To address this reality, RMT created a robust materials transportation solution that *intelligently* adapts to changes in its working environment, for efficient, uninterrupted transfer of materials.

All AGVs Are Not Created Equal

While AGVs serve their purpose in reducing damage, increasing efficiency and decreasing downtime, not all AGVs are created equal.

Traditional AGV systems are fixed in their environment and rely on wires or tape markers to guide them through the plant – just as a streetcar relies on wire infrastructure to guide it through a city.

The analogy of the present-day manufacturing facility as a city is a reasonable one, according to Bill Torrens, Director Sales and Marketing at RMT Robotics. “To maximize the use of space, today’s warehouses and manufacturing facilities have become like congested cities, with little expansion room left for additional infrastructure like conveyors, electrified monorail systems or AGVs,” Torrens explains.

And just like a streetcar must grind to a halt if another vehicle should block its path, most early generation AGVs have no choice but to stop dead if obstacles block their path. Moving or re-routing a traditional AGV requires a re-programming of its path, which can be time consuming and costly.

These limiting capabilities are increasingly problematic. As facilities become more and more congested, the traditional AGV’s performance in an organization’s manufacturing process becomes more prone to interruption. And so the time has come for the traditional AGV to smarten up! Fortunately for manufacturers, it already has.



How AGVs are Used

Traditional AGV devices are used in manufacturing environments, primarily for delivery of work-in-process (WIP) materials. They move from a loading area to a destination area where they’re unloaded, and the pathway they take in between is limited by the capabilities of their navigation system.

Among the drawbacks to most early generation AGVs is their inability to move outside their pre-determined track. Once programmed, these AGVs perform specific sequential manoeuvres only, and must stop should an obstruction block their path.

If a traditional AGV fails, the entire system comes to a halt, until the particular failed vehicle is removed from the circuit. With a fleet of ADAM vehicles however, if one breaks down or becomes damaged, the others continue working and navigate around the damaged unit.



The Next Generation *Intelligent* AGV

RMT Robotics first introduced ADAM™, a new breed of AGV, to the tire industry in 2003, to automate the movement of work-in-process inventory from storage to production machinery. ADAM (Autonomous Delivery and Manipulation) requires no wires, markers or tape for navigation, and can be easily re-tasks.

“We understood that our AGV had to allow for a high level of flexibility, and be nimble enough to dynamically navigate around obstacles, while getting the job done. ADAM has been doing this for some of our customers for the past few years with much success,” says Torrens.

ADAM is the first-ever *intelligent* AGV (*i*-AGV) that can manoeuvre independently, plotting the best path to its assigned destination while steering clear of unexpected obstacles – in much the same way that a taxi driver can manoeuvre down a side street to reach his passenger’s destination, no matter how many accidents, roadblocks or traffic jams he may encounter!

ADAM Learns the Landscape

And just as a seasoned taxi driver knows the city like the back of his hand, ADAM learns the ins and outs of its operating environment. Not over the course of several years, but within hours.

“Initially, an operator will manually guide a single ADAM around its working environment to allow it to build a map of walls, fixed equipment, pathways and other areas using its onboard range-sensing laser,” says Pierre Pinet, ADAM Product Manager, Global Operations. “Once complete, the map can be enhanced by the operator through the addition of features such as one-way lanes and restricted areas. The map is then shared with all of the vehicles in the fleet so that they all work off of one reference. This makes it easy to integrate additional ADAM units into the facility.”

Mission-Based Dispatching

A taxi driver is told by dispatch where the next fare is waiting for pickup, and is entrusted to transfer the passenger to his or her destination, thinking on the fly about the optimal route.

With ADAM, the operator can use mission-based dispatching to assign tasks to ADAM and, just like a taxi, ADAM can be relied upon to find the best path to the destination.

In contrast, a traditional AGV is akin to a streetcar. Destinations are limited by a pre-determined track, and to add new stops requires the installation of new track. ADAM has no such limitations, and is free to simply drive across the floor, using any aisle or pathway that exists.

Self-Navigation

If a taxi meets a car accident en route, the driver will consider ways to move around the blockage. He'll pick up side streets here and there, taking the shortest available route toward the destination. A streetcar would be forced to stop, however, and wait until any cars and debris are moved from its path before proceeding.

Likewise, ADAM is constantly making choices. If someone walks across ADAM's path, ADAM sees (via an on-board laser range-finding system) and moves accordingly. If a forklift drops a load and blocks the route, ADAM safely moves around the obstruction and carries on. In contrast, a traditional AGV, like a streetcar, is forced to wait until the problem is solved by some other party.

Opportunity Charging

A taxi will stop for gas when breaks in the day allow, but will always respond to requests from dispatch.

ADAM seizes moments throughout the day when not in use to go park, recharge its battery, and await further instruction. Charging takes place seamlessly, and with no interruption to production. Constantly on, ADAM remains available to respond instantly to orders.

"ADAM is truly a best-of-industry automation solution, with great potential for manufacturing and warehousing operations," says Pinet. "Its adaptive and scalable characteristics contribute to solving the dilemma of how to drive greater efficiency and profitability from space-restricted facilities."

As plants continue to become congested, ADAM is the adaptive and scalable *i*-AGV that provides manufacturers with a practical and effective tool to use in achieving their lean manufacturing ideals.

To find out how ADAM can integrate into your manufacturing operation, please contact Pierre Pinet, RMT Robotics at +1 905.643.9700 ext. 271 or e-mail pierrepinet@rmtrobotics.com.

Visit ADAM on the web at www.adam-i-agv.com.



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