

Wireless DeviceNet Leaps Material Handling Barriers

Turn a motorized conveyor system inside out and give the pallets the semi-autonomous capability to transport products from one station to the next for the type of product being carried. That level of flexible manufacturing, leaping over the barriers of wires and fixed traffic patterns, is up and working today.

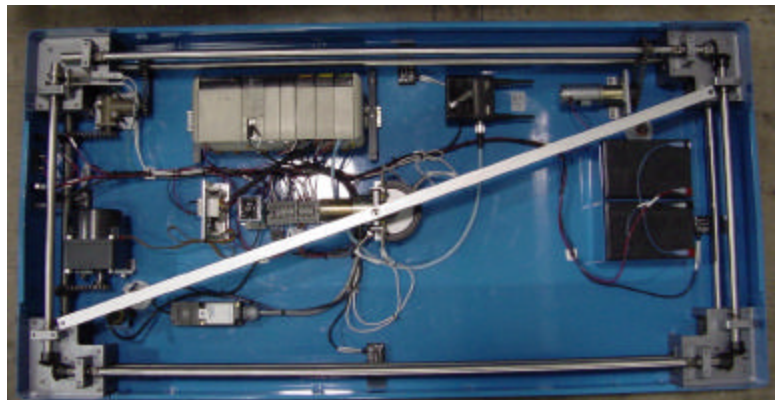
Glen Ward of Ward Systems Inc. (Grass Valley, Calif.) recognized that the convergence of technologies, including wireless DeviceNet communications, wireless RFID, compact DC-powered programmable controllers, and space-saving batteries would allow him develop a flexible material handling system that does not shut down for every minor repair.

Ward's PowerPallet-equipped production lines include carts with built-in controller, batteries, drive mechanism and wireless DeviceNet and RFID communications. Each PowerPallet moves back and forth along stock aluminum track without need for a fixed traffic flow pattern. A main controller approves routes, coordinates timing and settles traffic conflicts at track intersections. A small PLC on-board each cart communicates via wireless DeviceNet with the main controller and each other for independent movement along the track. The RFID-enabled pallets slow down from the 250 ft/min to 7 ft/min before reaching each station offering a stable platform similar to a miniature automated guided vehicle (AGV). Pallets can be switched off track for maintenance without shutting down the whole system, reducing downtime, component wear and power usage.

Bill Arnold, Omron's I/O and networks product manager says, "Wireless DeviceNet allows users to have a main trunk and traditional topology, and then supplement or replace it using wireless linkages to smart DeviceNet nodes that can perform intelligent processes. This kind of 'decentralized control' allows users to meet frequently changing production requirements, use existing space more effectively and react faster to customer orders. Reconfiguring this many wiring points would be cost prohibitive.



The PowerPallet-equipped production line at Hexcel Manufacturing features semi-autonomous carts exchanging data via wireless DeviceNet.



The underside of Ward System, Inc's *PowerPallet* shows Omron's WD30 wireless DeviceNet transmitter, CQM1 PLC, RFID data carrier and drive motor.

System capabilities: Wireless DeviceNet can transceive up to 34 channels on a 2.4 GHz band allowing 34 devices or wireless masters, each with 32 slaves. At Hexcel Manufacturing, Ward Systems, Inc. installed a system of 25 PowerPallets, moving at speeds up to 250 ft/min., each communicating with a single Wireless DeviceNet master station.

Controls:

Omron CS1 PLC for central controller

Omron CQM1H or CPM2C-S PLC on-board each pallet

Omron WD-30 Wireless DeviceNet transceiver and receiver

Omron RFID data carriers, read/write heads and controllers
(available but not selected for this application)