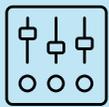molex

Solutions for Autonomous Mobile Robots

Autonomous Mobile Robots (AMRs) are transforming logistics and manufacturing by streamlining material transport with flexibility and efficiency. To operate effectively in warehouses and factory floors, AMRs must maintain continuous operation, withstand demanding environmental conditions and maximize battery life while maintaining robust wireless and data connectivity. This requires interconnect solutions that secure power distribution, preserve signal integrity and ensure communication modules perform without interruption.

Molex supports these demands with wire-to-board connectors that feature color-coded options, positive-locking mechanisms, enhanced contact protection and resin enhancements for long-lasting durability in mobile applications. These are complemented by signal and low-power cables engineered with discrete wiring options, rugged overmold designs, pre-crimped leads and customizable configurations. Together, these solutions provide AMRs with reliable power management and secure data transmission, enabling safe, efficient and scalable operation across industrial environments.
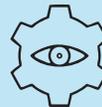

Autonomous Mobile Robot

Main Controller	Battery Management	Navigation Sensors	Vision Systems	Motor Controller	Communication Module

MOLEX SOLUTIONS FOR THE AUTONOMOUS MOBILE ROBOT MARKET

Board-to-Board Connectors	Circular Connectors	Signal and Low-Power Cables	Wire-to-Board Connectors
Key Features			
Low profile	Sealed designs	Discrete wiring options	Color-coded options
Superior mating guidance	Locking mechanisms	Durable overmold design	Positive-locking mechanism
Dual contact design	Rugged construction	Pre-crimped leads	Enhanced contact protection
High mating retention	Many sizes and form factors	Customizable cable solutions	Resin enhancements

Autonomous Mobile Robots

molex

Main Controller

Circular connectors (Nano-Change M8, M12)

I/O connectors (USB connectors, Micro SD)

Cable assemblies (Signal/low-power cables)

Wire-to-board connectors (Micro-Fit, Nano-Fit)

Wire-to-wire connectors

(MXP120)

Navigation Sensors

Cable assemblies

(Signal/low-power cables)

Wire-to-board connectors (Nano-Fit)

Battery Management

I/O connectors

(USB Type-C, USB Type-A)

Cable assemblies

(Signal/low-power cables)

Wire-to-board connectors

(DuraClik, Nano-Fit,

Mini-Fit Sr., Micro-Fit)

Vision Systems

Board-to-board (SlimStack, Quad-Row)

I/O connectors (USB)

Cable assemblies

(Signal/low-power cables,

High-Speed FAKRA-Mini)

Wire-to-board connectors

(HSAutoLink II)

Communication Module

I/O connectors, RJ45 jacks

(HDMI, USB Type-C, USB Type-A)

Cable assemblies

(Signal/low-power cables)

Wire-to-board connectors

(HSAutoLink II)

Nano-Fit Connectors

M12 Connectors

Power and Signal Cable Assemblies

SlimStack Connectors

REFERENCES

Wire-to-Board Connectors
UL-approved
Signal options
Glow Wire offerings
Fit families

Cables
Power and signal
Pre-crimped leads
Custom cable creator

Board-to-Board Connectors
UL-approved
Micro product reference guide

Circular Connectors
Nano-Change M8
M12
M23

SUBASSEMBLY BREAKDOWN

Main Controller – Processes data and manages overall operations

Battery Management – Regulates charging and controls power flow

Navigation Sensors – Uses LiDAR, IMU and GPS to enable mapping and localization

Vision Systems – Detect obstacles using cameras and depth sensors

Motor Controller – Controls wheel speed and movement

Communication Module – Provides connectivity via Wi-Fi, Bluetooth and 5G