

# LIFT DESIGNS TO THE NEXT LEVEL

Drive mobile robots with unmatched precision and control



The increasing demands on Autonomous Mobile Robots (AMRs) and Autonomous Guided Vehicles (AGVs) across diverse sectors like warehouse automation, healthcare and manufacturing necessitate robust and reliable hardware. Consistent performance, comprehensive diagnostics and efficient power management are crucial for ensuring peak productivity throughout operational cycles.

These industrial mobile robots are used to haul items and packages, and in some cases, lift them to and from elevated places. This is why it's important to use efficient motor drivers to power the wheels, enabling precise speed and position control for navigation and material transport. The push towards 48V systems aligns perfectly with Allegro's high-voltage capabilities, enabling higher payloads and longer operating times. Additionally, accurate current and position sensing are crucial for ensuring smooth and efficient motor operation. Current sensors can also be used for optimizing battery life by accurately measuring power flowing in and out of the battery.

## What you can achieve with Allegro solutions

- **Speed and efficiency:** Achieve optimal motor performance and minimize power consumption by reducing downtime and maximizing operational efficiency.
- **Compact design:** Allegro's highly integrated and small solutions allow for improved maneuverability, maximized payload capacity and optimized workspace utilization by decreasing PCB footprint.
- **Safety and reliability:** Protect against overcurrent, voltage spikes and other fault conditions with advanced circuit protection. Eliminate mechanical wear and enhance reliability with magnetic sensing technology.

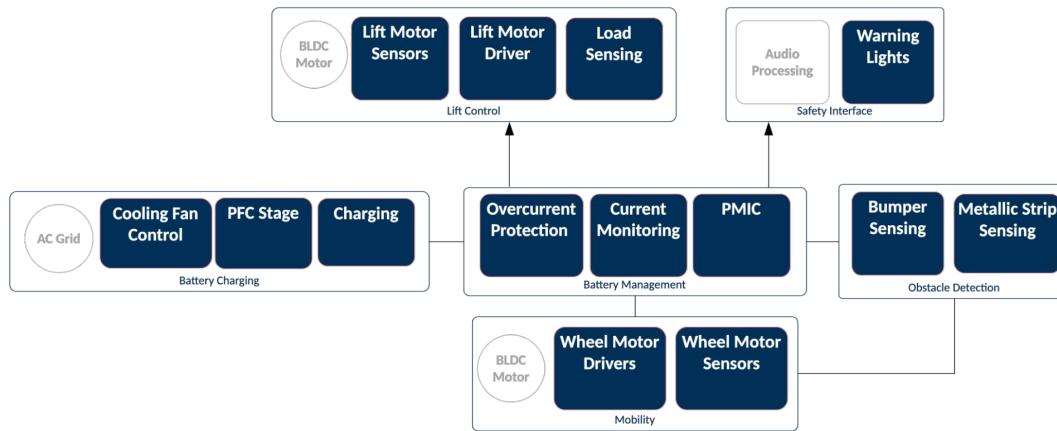


**Invest in quality solutions to enhance efficiency, productivity and safety in any dynamic environment.**

Allegro's robust selection of motor drivers and sensors enables AMRs to achieve exceptional performance in operation time and motor control.

# Market-Leading Portfolios that Sense, Regulate and Drive

## Block Diagram



## Key Products and Solutions

| Subsystem                       | Component                 | Allegro Parts      | Key Differentiator   |
|---------------------------------|---------------------------|--------------------|--|
| Wheel and Lift Motor Sensors    | 2D Position Sensor        | AAS33001           | Easy to integrate via multiple output formats, and on-chip linearization to calibrate out errors due to misalignment                         |
|                                 | Hall Latch                | APS12200           | Safety ready with integrated features such as overvoltage protection maximize robustness, up to 175°C junction temperature                   |
|                                 | Current Sensor            | ACS71240           | Small 3mm x 3mm package saves space on board and operates with low ohmic losses for efficient battery life                                   |
| Load and Magnetic Strip Sensing | 1D Position Sensor        | ALS31000           | Non-volatile memory to optimize device sensitivity for higher accuracy and optimized performance across temperature                          |
| Bumper Sensor                   | 1D Position Sensor        | A1308/9            | Non-volatile memory for enhanced accuracy, temperature stability and flexible packaging  |
|                                 | Hall Switch               | APS11753           | Ultra low power consumption with sleep time options  |
| Wheel Motor Drivers             | Brush DC Driver           | A4955, A4952       | Capable of 50 V operation as well as low power dissipation during PWM control  |
| Lift Motor Driver               | BLDC Driver               | AMT49413           | BLDC motor driver with integrated Hall-effect sensing and PWM control  |
| PFC Stage                       | Buck/Boost Current Sensor | ACS37002, ACS37010 | Optimized for DC/DC switching with wide bandwidth, high isolation voltages of up to 5 kVrms, and a low internal resistance option of 0.28 mΩ |
|                                 | Buck/Boost Gate Driver    | AHV85110, AHV85111 | Integrated components simplifies design and reduces common-mode capacitance for increased efficiency   |
| Charging                        | DC/DC Current Feedback    | CT433              | Low total output error and fast response time enables precise control over current feedback  |
|                                 | Fan Control               | A5931, A5932       | Does not need external sensors for monitoring, to reduce PCB footprint   |
| Battery Monitoring              | PMIC                      | APM81815           | Small 4mm x 4mm x 2mm size with integrated components takes up less space on PCB   |
|                                 | Current Sensor            | ACS37800           | Integrated voltage and current sensor with battery charge monitoring to optimize battery life  |
| Illumination                    | Warning Lights            | A6263              | Simplify control over multiple light modules with 4 outputs and fewer components   |



To learn more about the Allegro family of products and to explore available design resources, visit [allegromicro.com](http://allegromicro.com)