

THE POWER BEHIND ARTICULATED ROBOTS

Driving Advanced Performance and
Safety in Industrial Robotic Systems



Articulated robot arms are the workhorses of modern manufacturing, performing essential high-speed, high-precision tasks. As automation evolves, the demand for more powerful, faster robots is driving a shift toward higher voltage architectures. For engineers, this transition introduces significant challenges in designing efficient power conversion stages, ensuring precise motor control for complex movements, and robust safety systems to protect both the equipment and personnel.

Allegro provides a portfolio of high-performance solutions for the unique demands of articulated robot arms. Innovative isolated gate drivers with Power-Thru technology simplify the use of wide-bandgap SiC/GaN FETs, enabling higher power density and efficiency from traditional IGBT solutions. Combined with our accurate in-phase current sensors and motor commutation position sensors, Allegro's solutions provide the feedback and control needed for performance in servo motors, encoders, and power conversion systems.

What you can achieve with Allegro solutions

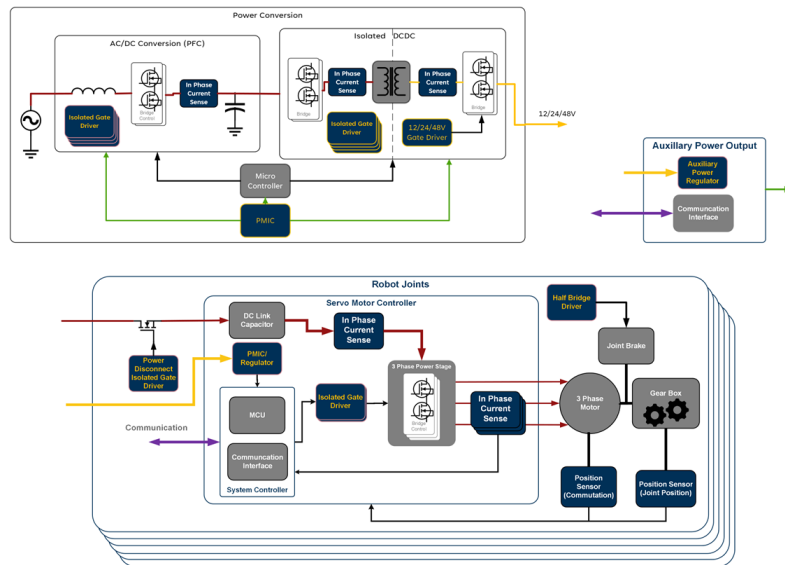
- **Higher Power & Efficiency:** Allegro's isolated GaN and SiC gate drivers with integrated Power-Thru technology reduce BOM, simplify design, and enable higher power density and switching efficiency in compact power conversion stages.
- **Superior Motor Control:** Achieve accurate, real-time feedback in your control loop with our compact, high-performance in-phase current sensors, enabling the superior motor control required for precise and fluid robotic arm movements.
- **Enhanced Safety & Reliability:** Ensure operational safety with dependable joint braking and control solutions, including robust gate drivers and ASIL-compliant components to prevent arm collapse and secure loads in higher voltage systems.



As industrial automation pushes the boundaries of performance, the underlying electronics must deliver uncompromising power, precision, and safety.

Allegro Microsystems' advanced power and sensing technologies provide the robust, highly integrated solutions required to build the next generation of industrial robots.

Block Diagram



Key Products and Solutions

Subsystem	Component	Allegro Parts	Key Differentiator
Servo Motor Controller	Servo Motor PMIC/Regulator	APM81815	Highest performance 48V pre-regulator
		A81411	Fully integrated PMIC, less external components
	Servo Motor Isolated Gate Driver	AHV85110/1 (GaN)	1 kV (8kV Abs Max), >2x PCB reduction vs comp
		AHV85311 (SiC)	1.5 kV (8kV Abs Max), >2x PCB reduction vs comp
	Servo Motor In Phase Current Sensor	ACS37220 (Integrated)	±1.4%, ±50 to ±200A, 4x4 mm package
		ACS37610 (Field)	±1.2%, ±50 to >10000A, 4-pin SIP package
Encoder	Half Bridge Driver	A89500 (48V)	100V absolute max, 3x3 mm DFN package
		A4950 (12V)	For 12V brake system, individual control of FETs
		A3942/4 (HS/LS)	High Side/Low Side for holding brake systems
	Motor Commutation	A33023 (Hall, SFI)	12-bit resolution, stray field immune
	Joint Position Sensor	A17803 (Inductive)	>18-bit resolution (with 2x), Ideal to replace higher cost optical encoder solutions
Power Supply	Isolated Gate Driver	AHV85110/1 (GaN)	1 kV (8kV Abs Max), >2x PCB reduction vs comp
		AHV85311 (SiC)	1.5 kV (8kV Abs Max), >2x PCB reduction vs comp
	In Phase Current Sensor	ACS37220 (Integrated)	±1.4%, ±50 to ±200A, 4x4 mm package
		ACS37610 (Field)	±1.2%, ±50 to >10000A, 4-pin SIP package
	Gate Driver	A89500 (48V)	100V absolute max, 3x3 mm DFN package
Auxiliary Power Output	Auxiliary Power Regulator	APM81815	Highest performance 48V pre-regulator



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