INNOVATION WITH PURPOSE
ALLEGRO microsystems

PRECISION IN MOTION

Powering the future of collaborative robotics

Collaborative robots (cobots) are revolutionizing manufacturing by working safely alongside human operators. These sophisticated 6-degree-of-freedom systems require precise motor control, reliable sensing, and robust power management to deliver the accuracy and safety that modern automation demands.

From automotive assembly lines to electronics manufacturing, cobots are transforming how we approach precision tasks. The key to their success lies in advanced semiconductor solutions that enable seamless human-robot collaboration while maintaining the highest standards of performance and safety. Modern cobots must balance multiple competing requirements: they need the precision and repeatability of traditional industrial robots while incorporating the safety features and intuitive operation necessary for human collaboration. This requires sophisticated control algorithms and advanced sensing capabilities that can adapt to dynamic operating conditions while ensuring consistent, reliable performance across diverse manufacturing environments.

What you can achieve with Allegro solutions

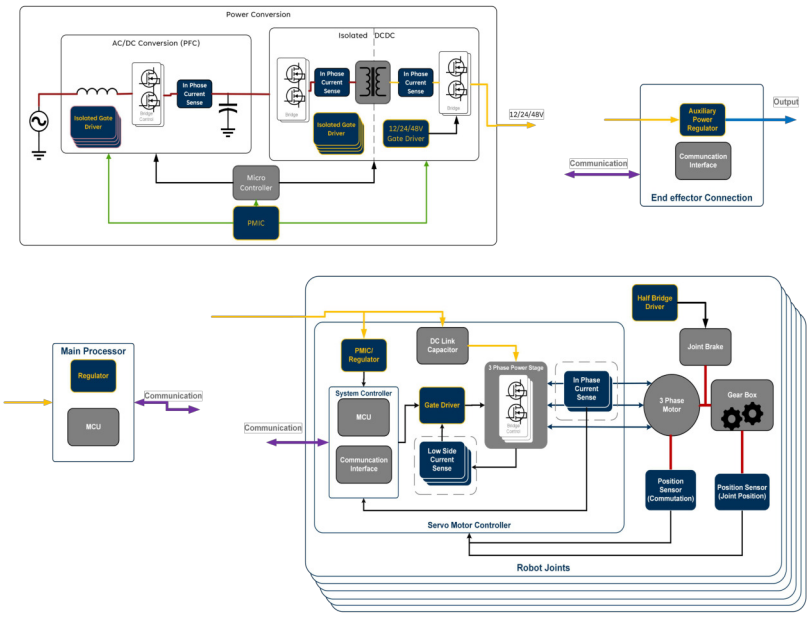
- **Precision Control:** Advanced magnetic current sensing and position feedback enable precise motor control for smooth, accurate movements in collaborative environments.
- **Enhanced Safety:** Robust current sensing and motor protection ensure safe operation when working alongside human operators, with real-time monitoring and fault detection.
- **System Integration:** Highly integrated solutions reduce PCB footprint and simplify design, enabling more compact and cost-effective cobot systems without compromising performance.
- **Reliability:** Magnetic sensing technology provides contactless operation resistant to dust, debris, and mechanical wear, ensuring consistent performance in demanding industrial environments.

Start enhancing your cobot with Allegro's comprehensive portfolio of sensors and drivers to ensure it has the precision and safety features needed to effectively collaborate with human operators.

Design robust systems that enable your cobot to operate reliably in demanding manufacturing environments, with safe human interaction supported by advanced magnetic sensing technologies.

Market-Leading Portfolios that Sense, Regulate and Drive

Block Diagram



Key Products and Solutions

Subsystem	Component	Allegro Parts	Key Differentiator
Servo Motor Controller	PMIC/Regulator	A81815	Ultra-compact solution, optimized to power directly from a 48V battery pack, quality-managed
		A81411	Fully integrated PMIC, reduces external components
	Gate Driver	AMT49100	3x Integrated Low-side CSAs, true 48V capability, ASIL-D Compliance
		A89500	True 48V capability (100V max), small form factor, half-bridge driver ideal for robotic applications
		A89503	Integrated Low-Side Current Sensor, true 48V capability, ASIL-B Compliance
	In Phase Current Sensor	ACS37041	Inherent galvanic isolation, Reduced losses with low conductor resistance
Robot Joint	Half Bridge Driver	A89500	True 48V capability (100V max), small form factor, half-bridge driver ideal for robotic applications
		A4950	For 12V Holding brake system, allows for individual control of FETs
	Motor Commutation	CT310	13-14 Bit Effective Resolution, Analog Output, End of Shaft
		A33023	11 Bit Effective Resolution, Stray Field Immune Angle Sensor
	Joint Position Sensor	A17802/3	16 Bit Effective Resolution, Differential analog SIN/COS output/High-Speed Digital Output
Power Supply	Isolated Gate Driver	AHV85110/1	Simplified System Design, reduced BOM, optimized for GaN FETs
		AHV85311	Integrated isolated bias supply, optimized for SiC FETs
	In Phase Current Sensor	ACS37041	Inherent galvanic isolation, Reduced losses with low conductor resistance
	Gate Driver	AMT49100	3x Integrated Low-side CSAs, true 48V capability, ASIL-D Compliance

To learn more about the Allegro family of products and to explore available design resources, visit allegromicro.com