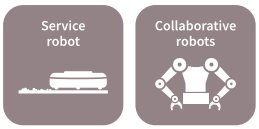
Robotics

Superior solutions for industrial and service robots

www.infineon.com



Robotics

Superior solutions for industrial and service robotics

Disruptive technologies have significantly changed our lifestyle in the past few decades. Now a new era is on the horizon – the age of robots. Robots are joining the ranks of innovative and disruptive technologies by revolutionizing traditional habits and processes. Today's robots can identify and navigate through surroundings, work alongside and even interact with humans. Moreover, they teach themselves the skills required to complete a new task.

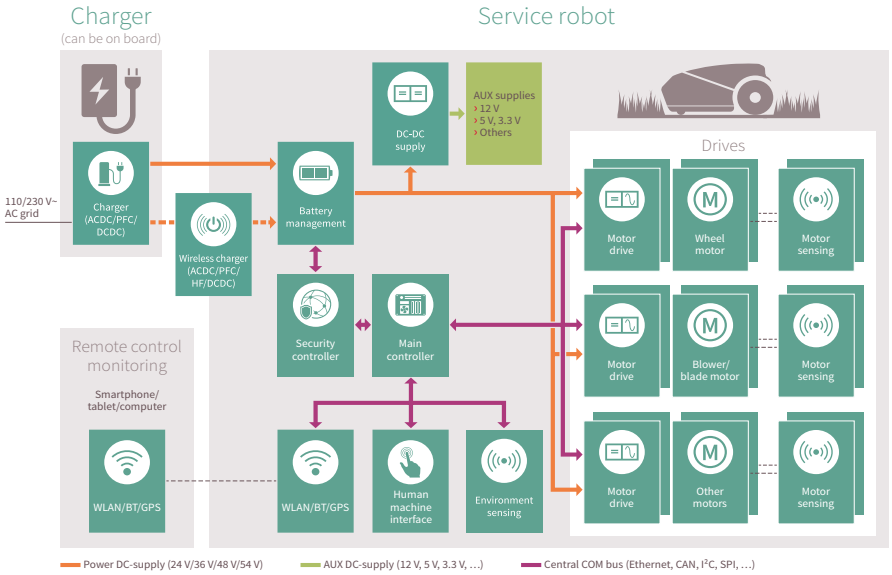
All this would not be possible without semiconductor solutions. Whether in an industrial robot, a collaborative robot (cobot), a mobile robot for warehouses, last-mile delivery (AGV & AMR) or a domestic robot, intelligent semiconductors are the key enablers for all major robotic functions. Drawing on our insight into all facets of the robotics field, and with a comprehensive portfolio of power products and sensors on offer, Infineon provides reliable system solutions that address the latest trends in robotics. Whether it is artificial intelligence, Internet of Things, smart home, cloud-based services, human-machine interface or any robotics-related field, Infineon has value to add to nearly all robot designs.

Features and benefits

Key features	Key benefits
› Fast time to market	› A complete eco-system of simulations, documentation, and demonstration boards enable a faster time to market
› Complete solutions – broad portfolio from power to connectivity (Wi-Fi & Bluetooth®) and Sensors	› Whatever design specification, Infineon has the answer thanks to its comprehensive portfolio of products and solutions which you can easily tailor to your needs
› Extended battery lifetime and product life spans	› High reliability of Infineon components results in prolonged product life spans
› Overall system size and cost reduction	› Reduction of overall system size and cost thanks to small form factor and compact design of components, both of which are required for highest power density › BOM savings thanks to lowest $R_{DS(on)}$
› Security, quality, and safety	› Trustworthy hardware-based security
› Authentication	› As a security market leader with a proven track record and outstanding partner network for embedded security, Infineon provides highest quality standards and a safety-certified development process
	› OPTIGA™ Trust enables authentication of components connected to the system (e.g., battery pack recognition to avoid second-party batteries)

Domestic robots - simplifying everyday life and work

Structural system overview: domestic robots

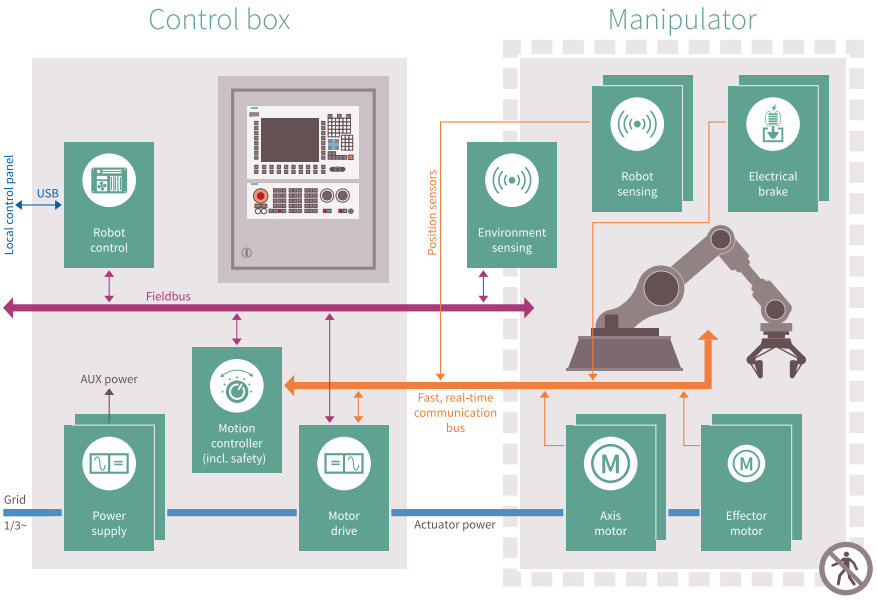


The latest generation of domestic robots has ushered in a new level of assistance and simplicity in homes and professional environments. They directly interact with humans, which introduces unique challenges from a design perspective, especially in domestic environments. Energy efficiency, long battery life as well as security aspects and sensing capabilities are key to user-friendly and safe designs. By choosing Infineon, you get a one-stop semiconductor shop for all your service-robot design needs.

www.infineon.com/robotics

Industrial robots and cobots – advance through collaboration

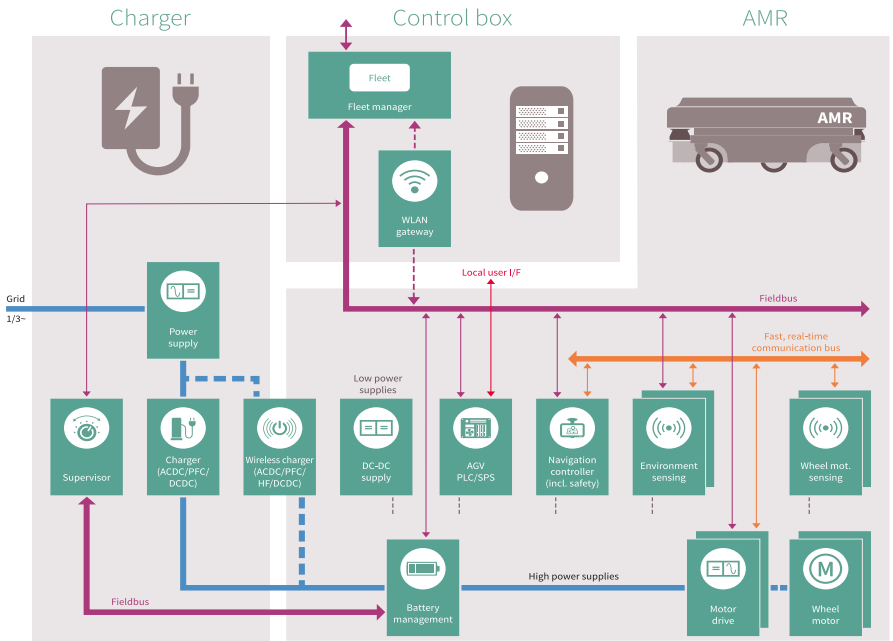
Structural system overview: industrial robots & cobots



Cobots, or collaborative robots, work outside the limitation of a safety cell, directly interacting with real people. This setup requires a precise set of design features, especially for the sake of workplace safety. With Infineon's semiconductors for cobot systems, you benefit from the expertise of an experienced and reliable partner. Our radar and sensor solutions, for example, provide the tools to uphold even the highest safety standards and allow the robots to leave their formerly fenced working environment.

Mobile robots – driving production and logistics forward

Structural system overview: battery-powered mobile robots



Autonomous mobile robots (AMRs) are a self-driving force behind automated manufacturing processes. Battery-powered systems offer the highest degree of flexibility within working environments. Covering the entire product portfolio for robotics applications – from the power supply to motor drives and sensors for navigation and environment scanning – Infineon is equipped to ensure AMRs can find their way through nearly all production environments.

www.infineon.com/robotics

Recommended products

		Industrial robots		Cobots	Mobile robots (AMR, AGV)	Domestic robots
Common system power		> 5 KW	< 5 KW	100 – 1000 W	200- 500 W	10 – 100 W
Common operating/battery voltage		3 V ~ 400V_{AC}	1 v~ 110 V-220 V_{AC}	1 V~ 110 V-220 V_{AC} / 48 V_{DC} Bus	24 V – 48 V_{DC}	12 V - 36 V_{DC}
Power supply and charger	**Power switch**	650 V and 1200 V CoolSiC™ MOSFET 600 V/650 V IGBT HighSpeed 5 650 V IGBT TRENCHSTOP™ 5 and IGBT 7 T7 650 V and 1200 V EasyPACK™ Module		600 V/650 V CoolMOS™ 650 V CoolSiC™ 20 V - 200 V OptiMOS™ and StrongIRFET™	600 V/650 V CoolMOS™ 650 V CoolSiC™ 20 V - 200 V OptiMOS™ and StrongIRFET™	600 V/650 V CoolMOS™ 650 V CoolSiC™ 20 V - 200 V OptiMOS™ and StrongIRFET™
	PFC power diodes	650 V CoolSiC™ Schottky diode				
	Gate driver EiceDRIVER™ family	low-side single-channel: 1EDN7550B, 1EDN8550B, 1ED44175N01B, 1ED44173N01B low-side dual-channel: 2ED24427N01F, 2EDN7523G				
		1200V single-channel isolated: 1ED3124MU12F, 1EDI60N12AF	650 V half-bridge: 2EDF9275F, 2EDF7175F, 2ED2304S06F, 2ED2182S06F 650 V high-side: 1EDB9275F, 1EDB6275F, 1EDB8275F			
	Microcontroller (MCU)	Arm® Cortex®-M0: XMC1100 or XMC1300 Arm® Cortex®-M4: XMC4200				
Motor control and drive	**Power Switch**	1200 V IGBT 7 S7 1200 V CoolSiC™ MOSFET 1200 V CoolSiC™ Easy1B Module	650 V and 1200 V CoolSiC™ CoolGaN™ 600 V 600 V /650 V/1200 V TRENCHSTOP™ 600 V EasyPIM™ and EasyPACK™ 600 V CIPOS™ (full integration)	60 – 100 V OptiMOS™ and StrongIRFET™ Recommended packages: PQFN 3 x 3 (space savings) Super SO8 (price/performance) TOLL (high current)	60 – 150 V OptiMOS™ and StrongIRFET™ Recommended packages: PQFN 3 x 3 (space savings) Super SO8 (price/performance) TOLL (high current)	25 – 60 V OptiMOS™ and StrongIRFET™ Single- and dual-channel MOSFETs Recommended packages: PQFN 3 x 3 (space savings) Super SO8 (price/performance) TOLL (high current)
	Gate driver EicEDRIVER™ family	1200V single-channel isolated Compact: 1ED31xx and 1ED-MF 1200V single-channel isolated Enhanced: 1ED34xx and 1ED-F2 1200 V half-bridge IR2214SS 1200 V three-phase: 6ED2230S12T	650 V half-bridge: 2EDF9275F, 2EDF7275F, 2EDF7175F, 2ED2304S06F, 2ED2182S06F, 650 V high-side: 1EDB8275F, 1EDB9275F, 1EDB6275F 650 V three-phase: 6EDL04N06PT	200 V half-bridge: IRS2005S, IRS2007S, IRS2008S, 2EDF7275K 200 V three-phase: 6EDL04N02 200 V high-side: 1EDN7550B & 1EDB8550B 160 V half-bridge: 2ED2748S01G, 2ED2738S01G 120 V half- bridge: 2EDL8124G 60 V three-phase programmable: 6EDL7141 25 V low-side: 1ED44173N01B, IRS44273L		
	Microcontroller (MCU)	PSoC: ARM® Cortex® M4F+M0 → CY8C61x8 XMC™: ARM® Cortex® M4F → XMC4800 TRAVEO II™: ARM® Cortex® M7 Dual Core + ARM® Cortex® M0+ → CYT4BF8CD AURIX™: TriCore → TC337				
	Hall switch	XENSIV™ TLx496x				
	Current sensor	XENSIV™ TLI4971				
	Angle sensor	XENSIV™ TLE/TLI5012B, TLE5014SP				
Battery management system (BMS)	**Microcontroller (MCU)**				XMC™: XMC4x00 (ARM® Cortex® - M4F) PSoC: PSoC 4 (ARM® Cortex®M4F+M0)	
	Protection switches				100 V – 150 V OptiMOS™ or StrongIRFET™ IPT015N10N5, IRFS4115	30 V – 80 V OptiMOS™ or StrongIRFET™ BSC007N04LS6, IRL40T209, IRFS7430
	Balancing switches (small signal)				20 V or 30 V N/P MOSFETS in SOT23, TSOP6 or SOT363 dual-channel	
	Monitoring and balancing IC				TLE9012AQU (sensing IC) TLE9015QU (transceiver IC)	
	Battery authentication				OPTIGA™ Trust Charge OPTIGATM Authenticate IDoT	
Sensing (e.g., room mapping, HMI, collision avoidance, air quality)	**Radar**	XENSIV™ 60 GHz: BGT60LTR11AIP XENSIV™ 24 GHz Radar: BGT24LTR11 or BGT24MTR11				
	ToF (Time-of-Flight) 3D image sensors	XENSIV™ REAL3™ 3D image sensor: IRS1645C				
		XENSIV™ REAL3™ 3D image sensor: IRS2381C				
	MEMS Microphones	XENSIV™ MEMS microphones, digital I/F: IM69D130 or IM69D120				
	Other sensors	Pressure sensor: XENSIV™ DPS368 (e.g., airflow control) CO_2 Sensor - XENSIV™ PAS CO_2				
Connectivity and human-machine interface (HMI)	**Wi-Fi**	CYW4373 (1x1 dual-band Wi-Fi 5) CYW43439 (1x1 2.4GHz Wi-Fi 4)				
	HMI	PSoC 4000 - entry-level PSoC 4100 - more touch buttons PSoC 4700 - inductive sensing				
Security	**Authentication and protection**	OPTIGA™ Trust B OPTIGA™ Trust M				
Memory	**NOR Flash**	S25FL-L serial NOR Flash memories Densities 64 MB to 256 MB				
Others	**Voltage regulator**	DC-DC voltage regulator 12 V/5 V or 3.3 V, watchdog, error monitoring, safe state control, BIST etc.				
	LED Driver	Driving currents from 10 mA to 250 mA – linear driver ICs: BCR3xx, BCR4xx Support currents from 150 mA to 3 A – DC-DC switch-mode: ILD4xxx, ILD6xxx				

For more details on the product, click on the part number or contact our product support.

Where to buy

Infineon distribution partners and sales offices:
www.infineon.com/wheretobuy

Service hotline

Infineon offers its toll-free 0800/4001 service hotline as one central number, available 24/7 in English, Mandarin and German.

- Germany ..... 0800 951 951 951 (German/English)
- China, mainland ..... 4001 200 951 (Mandarin/English)
- India ..... 000 800 4402 951 (English)
- USA ..... 1-866 951 9519 (English/German)
- Other countries ..... 00 * 800 951 951 951 (English/German)
- Direct access ..... +49 89 234-0 (interconnection fee, German/English)

* Please note: Some countries may require you to dial a code other than “00” to access this international number.
Please visit www.infineon.com/service for your country!

Mobile product catalog

Mobile app for iOS and Android.

www.infineon.com

Published by
Infineon Technologies Austria AG
9500 Villach, Austria

Document number: B151-I1203-V1-7600-EU-EC
Date: 11 / 2021