

ROBOTICS

Cobots & AGVs



ELEKTRONIK SERVICE GMBH

mev-elektronik.com

Actuators: Motors

Actuators:
Motor Controllers

Wired and Optical
Communication

Wireless
Communication

Storage /
Memory



Sensors

Power Management/Supply

Actuators: Motor Controllers

Type	Form	Motor Type	Voltage	Current	Interfaces	Modes	Company
Motor Controller & Driver	Board	DC, BLDC, PMSM, EC coreless,	8...60V DC	1...120 A	USB, UART, CANopen, Analog, PWM	sensorless & sensor FOC, SVPWM, block	SOLO Motor Controllers
Motor Controller	SOM Module	DC, BLDC, PMSM, EC coreless,	5V DC	-	USB, CANopen, EtherCAT, Analog, PWM	sensorless & sensor FOC, SVPWM, block	SOLO Motor Controllers
MCU + Motor Controller	IC	BLDC, PMSM	5...24 V DC	-	SPI, I ² C, LIN, UART, CAN	sensorless & sensor FOC, SVPWM, block	Fortior
MCU + Motor Controller + Gatedriver	IC	BLDC, PMSM	36 / 180 / 600 V DC	100 mA to 1,1 A	SPI, I ² C, LIN, UART, CAN	sensorless & sensor FOC, SVPWM, block	Fortior
MCU + Motor Controller + Gatedriver + Powerstage	IC	BLDC, PMSM	20 V DC 600 V DC	1 A 1...6 A	SPI, I ² C, LIN, UART, CAN	sensorless & sensor FOC, SVPWM, block	Fortior
Motor Controller	IC	BLDC, PMSM	2...28 V DC	-	I ² C, PWM, Analog	sensorless & sensor FOC, SVPWM, block	Fortior
Motor Controller + Gatedriver	IC	BLDC, PMSM	6...28 V DC 600 V DC	100...800 mA	I ² C, PWM, Analog	sensorless & sensor FOC, SVPWM, block	Fortior
Motor Controller + Gatedriver + Powerstage	IC	BLDC, PMSM	6...28 V DC 600 V DC	0,5...2 A 2...12 A	I ² C, PWM, Analog	sensorless & sensor FOC, SVPWM, block	Fortior
Motor Controller + Driver	Board	Stepper	12...48 V DC	up o 2,2 A	CANopen, USB, RS485	sensorless load detection	Mo-Inno Controls
Motor + Motor Controller + Driver	Mechatronic Solution	Stepper	12...48 V DC	up o 2,2 A	CANopen, USB, RS485	sensorless load detection	Mo-Inno Controls

BLDC Motor Controller Modules

- 12 – 60 V, up to 6000 W
- Easy to use
- Drives and controls DC brushed, BLDC, PMSM and EC coreless motors
- Field Oriented Control with Nested Position-Speed-Torque loops
- Advanced algorithms (140 kHz loop rate)
- Torque, Speed and Position controlling
- Four quadrant regenerative operation
- Automatic parameter identification and self-tuning
- Safe Torque Off (STO) input



Actuators: Motor Controllers

BLDC / PMSM-Motor Control ICs



MCU

Motion Engine
ME

Gate-Driver

Power Stage

- High integration, high reliability and cost efficiency
- Dual-core products with Motion Engine in hardware
- Fully and partially integrated solutions from 6 to 600V
- Solutions with and without integrated MCU
- Very compact design with low production costs
- Sensorless FOC with full torque from standstill (HFI)
- FOC cycle of 5,6 μ s
- Speeds of up to 300.000 rpm
- High efficiency



Stepper Motor Controller Modules



- Single- and multiaxis solutions
- 12 to 48V, up to 4 A
- CANopen control
- Smooth operation
- Load dependent current control
- 24V I/Os



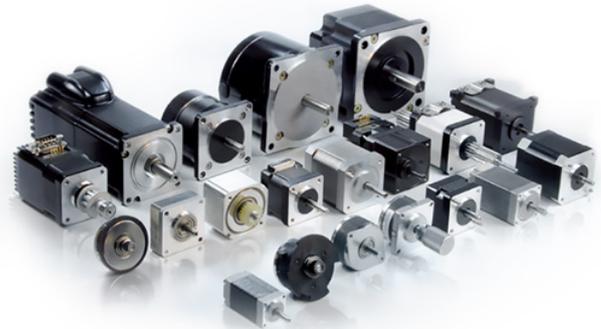
Actuators: Motors

Motor Type	Type	Voltage	Phase current	Power	Torque / Force	Size	Company
BLDC / PMSM	rotative	12...48 V DC 155...310 V AC	-	3...400 W 100...700 W	2... 960 mNm	16...80 mm 70...100 mm	MOONS
BLDC slotless	rotative	6...48 V DC	-	3...150 W	16... 218 mNm	8...90 mm	MOONS
Stepper	rotative	-	0,25...12 A	-	0,0058... 12 Nm	14 mm NEMA6 ... 110 mm NEMA42	MOONS
Stepper	linear	-	0,25...3 A	-	15...267 N	20 mm NEMA8 ... 57 mm NEMA23	MOONS
Piezo	rotative	5...7,5 V DC	-	-	4 mNm	11,4 mm	Piezo Motor Company
Piezo	linear	5...12 V DC	-	-	0,2...8 N	9...150 mm	Piezo Motor Company

BLDC and Stepper Motors

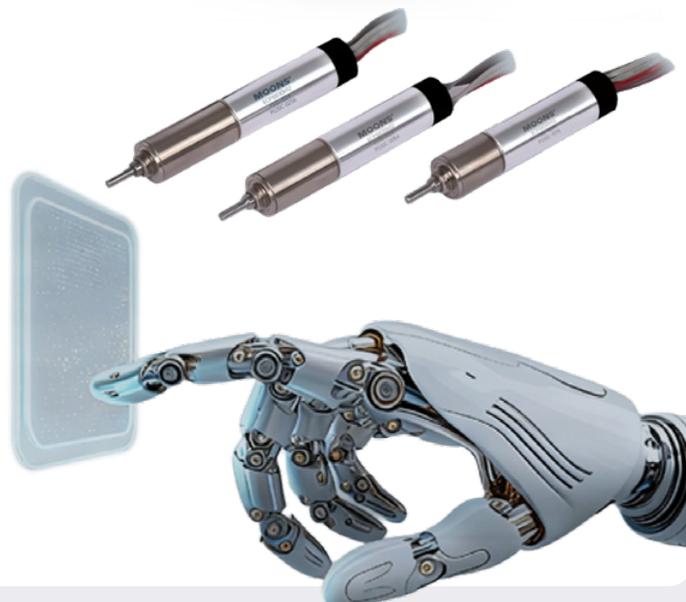
MOONS' is a global Top 3 stepper motor manufacturer with the yearly shipment of more than 10 million hybrid stepper motors in the world, using internationally proven scientific management tools along with the pursuit for professional applied technologies.

MOONS'
moving in better ways



BLDC Slotless Motors with optional gear and encoder

- Ironless winding
- Compact design
- Long operational lifetime
- No cogging
- No sparking
- Small size: Ø 10 mm
- High torque: 9,6 mNm
- High speed: 35.000 rpm



Sensors

Sensor Type	Form	Description	Technology	Measuring Type	Resolution	Accuracy	Interfaces	Features	Company
Position, Angle	Board / Module	High resolution hollow shaft kit encoder	Capacitive	Abs. angle	18 to 26 Bits	±3 ArcSec	BiSS, SSI	MIL & Space versions available	Netzer
Position, Angle	IC	Inductive position sensor controller	Resonant inductive	Abs. angle Rel. angle Abs. linear pos. Rel. linear pos.	15 to 18 Bits	± 0,02° 0,02 mm	SPI, ABN, BiSS, SENT	Sensor & target made of PCB	Cambridge IC
Position, Angle	IC	TMR magnetic encoder	TMR magnetic	Abs. angle Rel. angle	up to 24 Bits	± 0,025°	SPI, ABZ, UVW, PWM	Auto Calibration	Conntek
Position, Angle	IC	HALL magnetic encoder	HALL magnetic	Abs. angle Rel. angle	up to 16 Bits	± 0,1°	SPI, SSI, I ² C, ABZ, UVW, PWM	Auto Calibration	Conntek
Distance	IC	Ultrasonic Time-of-Flight	MEMS	Abs. position	4 mm	down to 1 cm	I2C, SPI	10 cm to 10 m	TDK Invensense
Multi Axis Motion	IC	Inertial Measurement Unit (IMU)	MEMS	Angular velocity Acceleration Magnetic field	20 Bits	typ. ±0,15 mg	I2C, I3C, SPI	3- to 9-axis	TDK Invensense
Force	Module	Load cell module	Strain gauge based	Force, contact, tension detection	up to 14 Bits	±1%FS typ.	I2C, Analog	compact design	TE Connectivity
Torque	Module	Safety torque monitoring	Strain gauge based	Static and dynamic torque measurement	0.025 % FS max.	±1.5 %FS typ.	I2C	customized products	TE Connectivity

High Resolution Absolute Rotary Encoders

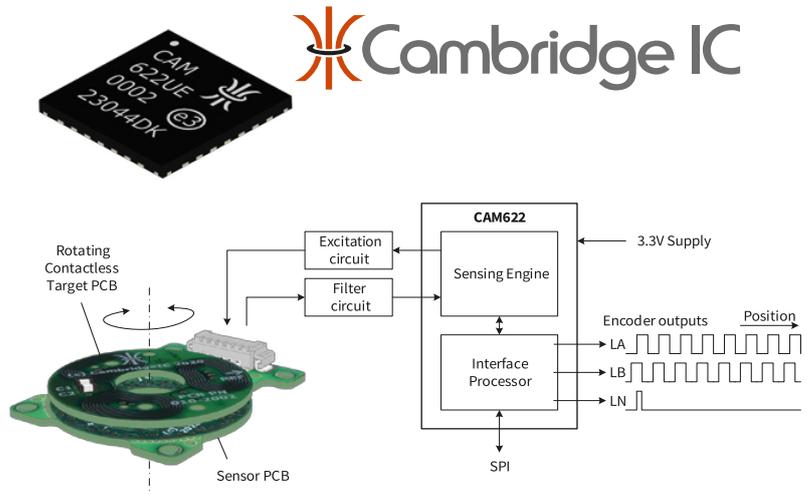
- High resolution, up to 26 Bits
- High accuracy, up to ± 0,0008°
- High repeatability up to ± 1 ArcSec / ± 0,0003°
- Small size, flat design, hollow shaft
- Suitable for harsh environments
- SSI, BiSS, ABZ, SPI, RS485



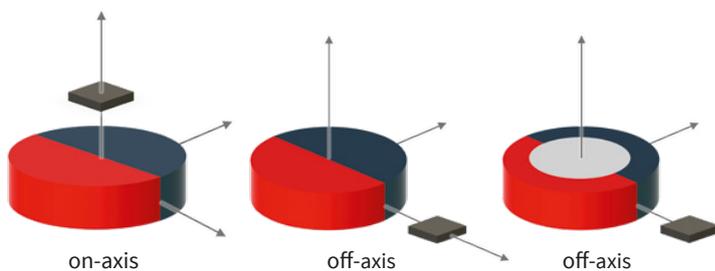
Sensors

High Resolution Resonant Inductive Encoder ICs

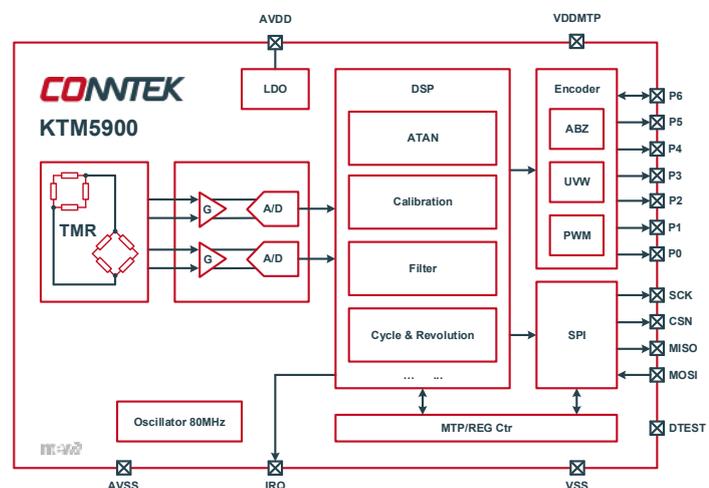
- Linear or rotary sensors
- Inductive resonant (833 kHz)
- PCB sensor & target
- Incremental ABZ output
- 4-65536 edges / 1-16384 cycles
- Latch-point compensation
- SPI host interface
- BiSS or SENT output
- 33.000 samples/s
- up to 60.000 rpm or 100 m/s
- Latency < 2 μ s for SPI & BiSS



Magnetic Encoder ICs with Auto-Calibration



- Max. 24-Bit of one pole pair
- Supports 1-4096 pole pairs
- Dual 16-Bit 2 MHz SAR ADC
- Max. 36 MHz SPI
- ABZ (4-65536 edges)
- Auto linear & non-linear calibration
- Post calibration INL $\leq \pm 0,0025^\circ$
- Off axis application INL $\leq \pm 0,06^\circ$
- Integrated prog. op-amp
- High bandwidth input 80 MHz
- Ultra low latency 3 μ s
- up to 60.000 rpm or 100 m/s



Sensors

Ultrasonic Time-of-Flight Sensing for Warehouse Automation



		Distance Measuring Range			
		Close Range 10 cm – 1,2 m	Mid Range 20 cm – 5 m	Longe Range up to 10 m	
Output	SPI	ICU-10201 	ICU-20201 	ICU-30201 	NEWEST GENERATION
	I2C	CH101 	CH201 	/	

- Reliable performance across different floor materials and textures
- Accurate short- and mid-range distance measurement
- Compact design for easy integration into mobile platforms
- Stable operation under varying lighting and environmental conditions
- Energy-efficient sensing for battery-powered robots

MEMS Motion Tracking with Integrated IMUs

ICM-45686 6-Axis Motion Sensor

- 3-axis Gyroscope from 15 to $\pm 4000^\circ/s$
- 3-axis Accelerometer up to $\pm 32g$
- Low noise performance
- Ultra-low power consumption
- Flexible interfaces (I3C/I²C/SPI)
- Available with software platform for indoor positioning



Precision Force Sensors

FS20, FX29 and FC22 Series

- Compact designs for easy integration
- High measurement accuracy and repeatability
- Robust construction for industrial environments
- Fast response times for dynamic applications
- Flexible use across a wide range of robotic concepts



Safety Torque Sensors

- 20 Nm to 900 Nm
- Outer diameter from 65 mm to 140 mm
- Overall height 20 mm typ.
- High strength stainless steel (17-4PH) or Titanium (Ti-6Al-4V) housing and FR4 PCB
- 0°C to +85°C compensated range
- -40°C to +105°C operating range



Communication / Control: Wired and Optical Communication

Type	Form	Features	Company
Industrial Ethernet PHYs and NICs	IC	FE, 1G, 2.5G, 5G, 10G low latency	Realtek
Industrial Ethernet Switches	IC	4port to 48port FE, 1G, 2.5G, 5G, 10G	Realtek
Single Pair Ethernet	IC	FE, 1G, 2.5G	Realtek
Fast & Gbit Ethernet Switches	Device	Managed & Unmanaged 4 to 24 ports SFP	Teltonika
Optical Transceivers for Multi Mode and Single Mode Fiber	Module	SFP... and solderable Packages up to 25G	Apac Opto
Optical Transceivers for POF and HCS	Module	50/100/250 Mbps Gigabit	Firecomms
Connectors & Cables	M8, M9, M12, 7/8", M23, special connectors	Focus on customization	HTP

Managed PoE+ Ethernet Switch



TSW202

- 8 x RJ45 ports, 10/100/1000 Mbps
- 2 x SFP ports
- Profinet Class B conformance
- PoE+ Support
- -40°C – +75°C



Flexible Cables & Industrial Connectors

- Pre-assembled moulded cables
- Field-attachable solutions
- Industrial connectors such as M8/M12 circular connectors



Communication / Control: Wireless Communication

Type	Form	Interface	Features	Company
WiFi 4, 5, 6/6e, 7	IC	UART, I2C, SPI, SDIO, PCIe, USB	Integrated MCU	Realtek
WiFi 4, 5, 6, 7	Module	UART, I2C, SPI, SDIO	Integrated MCU	Feasycom
WiFi 5, 6/6e, 7	Module	PCIe, M.2, USB, SDIO	Bluetooth	Sparklan
WiFi 5, 6/6e, 7	Module	PCIe, M.2, USB	Bluetooth	Emwicon
Bluetooth / BLE	IC	UART, I2C, SPI	Integrated MCU	Realtek
Bluetooth / BLE	Module	UART, I2C, SPI	Integrated MCU	Feasycom
LTE/4G, 5G	Module	USB, PCIE, UART, I2C, SPI	Optional integrated MCU or CPU	Cavli
LTE/4G, 5G WiFi 4, 5, 6, 7 Router	Device	I/Os optional RS232 and RS485	up to 5 Ethernet ports	Teltonika

WiFi 7 Modules

WNFQ-293BE(BT) / WNSQ-293BE(BT)

- WiFi 7 + Bluetooth 5.4
- Tri-Band 2,4GHz, 5GHz and 6GHz
- Dual Band Dual Concurrent
- M.2 2230 Key E or M.2 1620 LGA
- PCIe interface for WiFi, USB interface for Bluetooth
- -30°C – +85°C

SPARKLAN



Communication / Control: Storage / Memory

Type	Form	Capacity	Series	Flash Type	Company
SATA SSDs	Module M.2	up to 2TB	X-75m2	3D NAND TLC	Swissbit
SATA SSDs	Module 2,5"	up to 2TB	X-75P	3D NAND TLC	Swissbit
SD Cards	Card	up to 128GB	S-56	3D NAND pSLC	Swissbit
uSD Cards	Card	up to 2GB	S-600u	SLC	Swissbit
eMMC	IC	up to 256GB	EM-30	3D NAND TLC	Swissbit
eMMC	IC	up to 80GB	EM-36	3D NAND pSLC	Swissbit
PCIe BGA	IC	up to 480GB	E2000	3D NAND TLC	Swissbit

Industrial Storage for Robotics

Industrial Storage plays a critical role in robotics, influencing performance, reliability, and efficiency. Whether in autonomous vehicles, industrial automation, or AI-driven robotics, choosing the right storage solution is key to overcoming challenges in latency, endurance, energy consumption, and security.

swissbit®



Made for Robotics

BGA PCIe - E2000 Series

- PCIe 3.1 / NVMe 1.3 compliant with HMB support
- 5 GB – 480 GB, 3D NAND Flash technology
- PCIe M.2 1620 BGA (16x20 mm)
- Industrial operational temperature -40 to 85°C (up to 95°C Tcase)
- Data Care Management
- Power fail protected firmware - thermal management
- AES 128/256 encryption (on request)
- End to End data path protection
- Diagnostic and lifetime monitoring support
- In-field firmware update

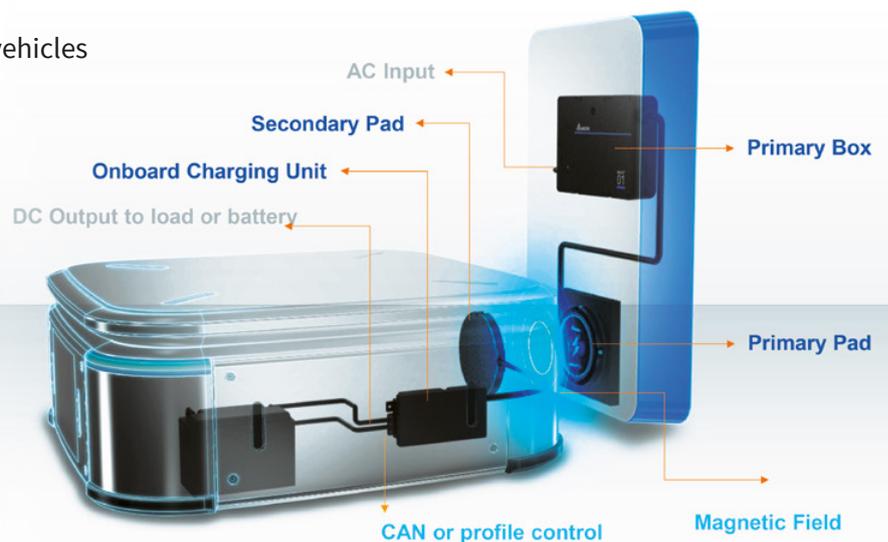


Power Management / Supply

Type	Form	Power	Charging possible	Company
DIN Rail AC/DC	Device	15 W - 960 W	X	Delta
				Aipu Power
Conduction Cooled AC/DC	Device, Module	200 W - 600 W		Cincon
				VOX Power
Desk Top Adapter	Device	15 W - 300 W	X	Delta
				Cincon
Configurable PSU	Module	600 W - 3000 W	X	VOX
				Delta
Panel Mount PSU	Module	40 W - 3000 W	X	Delta
				P-Duke
				Cincon
DC/DC Converter	Device, Module	1W - 1000W	X	Delta
				Cincon
				P-Duke
				Aipu Power

MOOVE^{AIR} Wireless Charging (1 kW – 30 kW)

- >93% Efficiency
- No maintenance
- No worn-out charging contacts
- No Arcing
- One charging point for multiple vehicles
- CE, UL, FCC certified



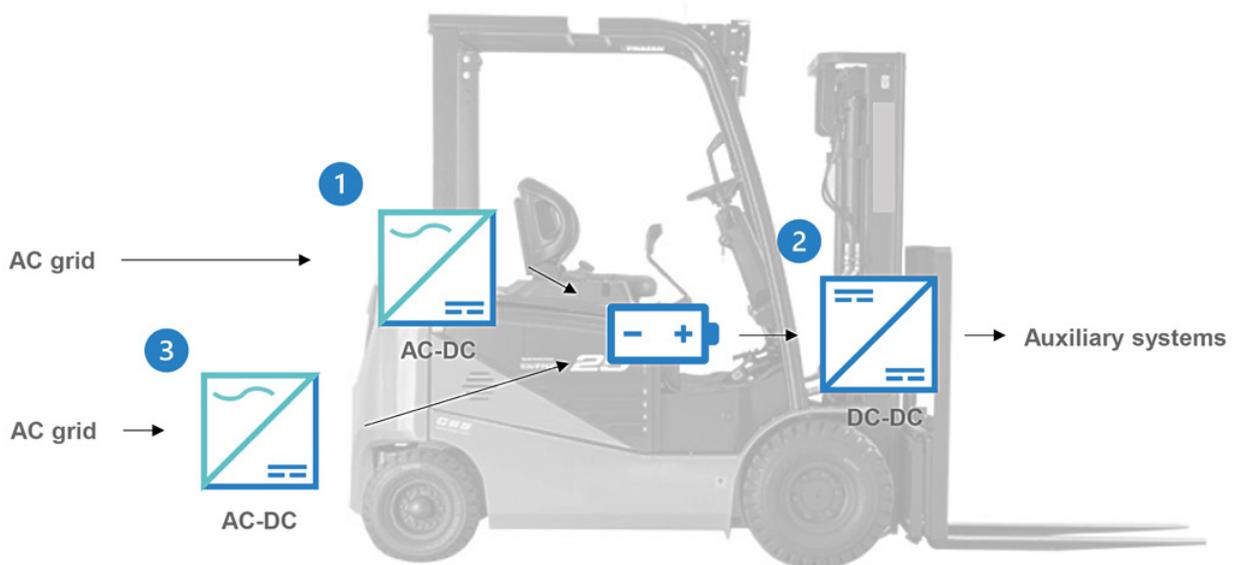
MOOV^{air} Topology

Power Management / Supply

MOOVEON Wired Charging
(720 W – 32 kW)



IEV Product Portfolio



1 MOOV^{on} Onboard Chargers



OBC 720	
AC in	110-240V
DC out	24V/36V/48V
	720W

2 MOOV^{on} DCDC Converters



For 13V systems		
DC in	24V-36V	48V-100V
DC out	400W	400W / 600W

3 MOOV^{base} Modular Chargers & Charging Modules



1PH & 3PH	
AC in	1AC 230V / 3AC 400V
DC out	24V~80V
	1.35kW-32kW



PM1350 & PM3000	
AC in	100-240V
DC out	24V~80V
	1350W-3000W



LOGISTICS

Customized Concepts
C-Parts-Management
KANBAN, POD, STL
Logistics Concepts
EDI

QUALITY MANAGEMENT-SYSTEM

Qualified supplier to well-known customers
in the field of industry, medical technology,
communication technology, aerospace and
defense industry.

ISO 9001 : 2015 certified

EN 9120 : 2018 certified



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