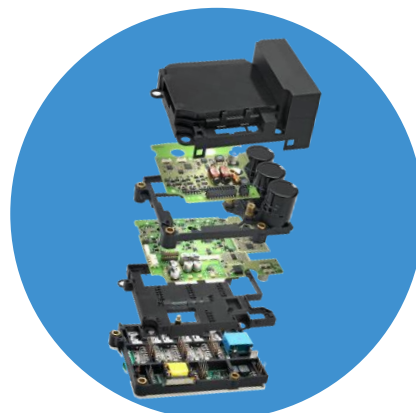


# Fast Facts

## ECU - Electronic Control Unit

The customer specific inverter for E-drives contains the required hard and software components for controlling the synchronous engine as well as the control of the complete vehicle.

An integrated DC/DC converter supplies the 12 V vehicle system voltage for light, water pump, E-Gas reporting, dashboard etc.. The heat reduction of the power stage is done via water cooling system.



## System Control Unit

Since 2009 AB Mikroelektronik offers complex control units for operating electrical three-phase machines (10 kW nominal performance, 30 kW peak load) .

The ECU controls the driving operation of PM synchronous machines via IGBT B6 bridge inverter in electric and hybrid vehicles.

Torque/speed control algorithms and protective mechanisms (short circuit, overcurrent, low/over voltage, over temperature) are implemented as well as the drive control of the power electronics and a high voltage/low voltage power converter for the supply of the vehicle contacts (horn, light, water pump, speed sensor, display, e-gas, etc.).

All functions have been developed under consideration of the valid safety standards (ISO 26262) and both, software and hardware have been realised in the control unit. Motor inverter functions (motor control, data acquisition for operating the synchronous machine) are designed suitable for high voltage, vehicle control functions are triggered galvanically insulated via low voltage potential.

The particular modules (MCU, DC/DC inverter, vehicle control) are packed on different substrates (power electronics on AlN substrates, DC link capacitors in lead frames, sensor analysis and vehicle control on organic materials).

## Special Features

<b>High Voltage MCU:</b> <ul style="list-style-type: none"> <li>• Inverter: IGBT switch: 400 A, 650 V</li> <li>• Inductive current transformer: LEM HC6F300-5</li> <li>• Insulation voltage control: given</li> <li>• Temperature control: max=105 °C (shutdown temperature)</li> <li>• Galvanic isolation voltage: via 2 highspeed optoelectronic couplers in the UART communication between MCU and security control</li> <li>• Quick discharge of the DC-link capacitor: &lt;60 V within 2 sec.</li> </ul>	<b>Cooling:</b> <ul style="list-style-type: none"> <li>• Water cooling: Tcooling water, max=100 °C</li> </ul>
<b>High Voltage-Low Voltage DC/DC Converter:</b> <ul style="list-style-type: none"> <li>• Unidirectional down converter: 400 V → 12 V, 6 A cont. current</li> </ul>	<b>Electrical I/O:</b> <ul style="list-style-type: none"> <li>• HV supply: 400 V screwed connections</li> <li>• LV supply: 12 V plug connection</li> <li>• Screwed motor phase connections</li> <li>• Communication: multipin plug connection               <ul style="list-style-type: none"> <li>- CAN</li> <li>- PWM</li> </ul> </li> <li>• LV contacts: multipin plug connection</li> <li>• Motor/temperature sensors: 2-pin plug connection</li> <li>• Speed sensor: 8-pin plug connection</li> </ul>
<b>Low Voltage Vehicle Control:</b> <ul style="list-style-type: none"> <li>• 6 individual 12 V contacts</li> </ul>	