

E-Mobility



COMES
ELECTRONIC CLIMATE CONTROL

E-Mobility

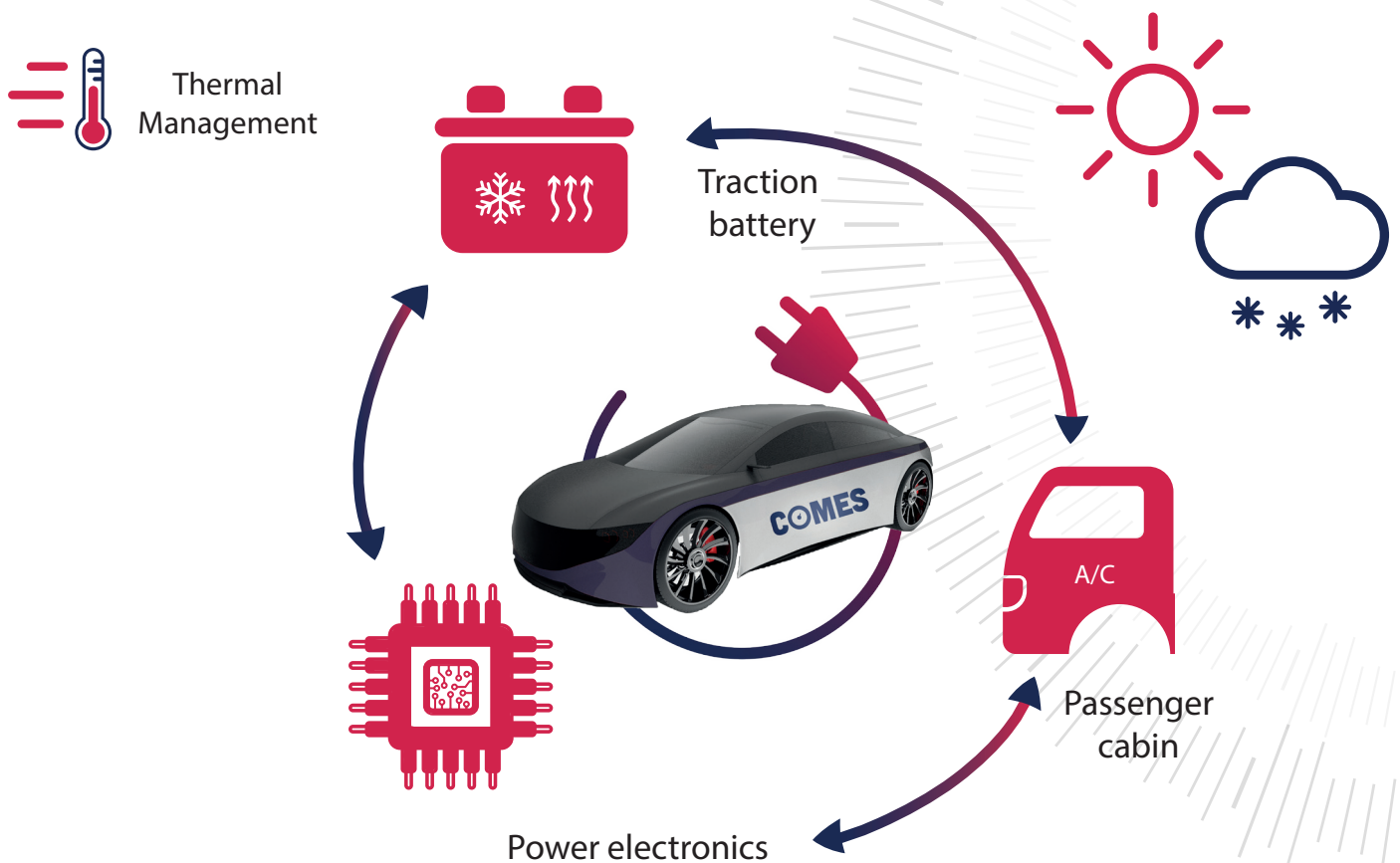
Thermal management in electric and hybrid vehicles is becoming more and more important, because of the need of controlling the climatization of the cabin, as well as the temperature of traction batteries and power electronics.

The main challenges imposed by power devices in electric and hybrid vehicles concern the high operating temperatures reached within the engine compartment, the environmental conditions and the strict requirements of the standards applicable to the automotive sector.

COMES has been working on this topic for years and its product portfolio includes now Control Units specifically tailored for Thermal Management applications.

We are also proud to have been chosen as development partner for e-mobility project by majors Automotive OEM and Tier1.

...because the future of Mobility is now and COMES is part of it!



COMES has also developed Control Panels specifically for the regulation of the PTC (Positive temperature coefficient) heaters in EV applications, such as DKL PLUS and DDL.

Upon request, other Control Units lines can be adapted to PTC heaters.

CCM

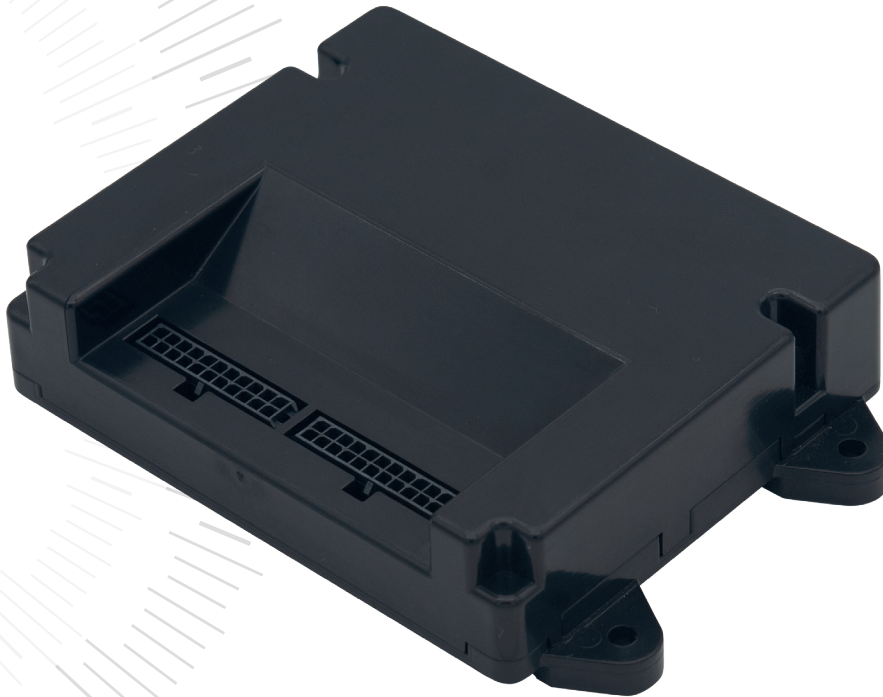
COMES Control Module for BTMS / Thermal Management

The CCM is a product tailored for thermal management in e-mobility applications.

This device could control either the HVAC system or the complete thermal management system, including batteries and electrical engine.

This device allows you to:

- Control the HVAC/ Thermal Management systems with fully customizable strategies and algorithms;
- Control customer specific systems, upon request;
- Control loads in high/low side up to 500mA, with diagnostics on each output;
- Communicate via CAN-Bus (J1939 full stack available upon request, other protocols upon request with configurable baud rate, UDS supported upon request, Network Management supported upon request, sleep function available/ wake up via CAN capable);
- Communicate via LIN, master or slave adaptable;
- Connect multiple ECUs to allow input/output extensions upon request;
- Generate multiple PWM signals to drive specific equipment as electronic blower controller, electric compressors, condenser fans, electric heaters etc.



GENERAL PERFORMANCE, ELECTRONICAL AND ENVIRONMENTAL TESTS

Operating Voltage Range:	9÷32VDC
Operating Temperature Range:	from -40°C to 85°C
Storage Temperature Range:	from -40°C to 90°C
Dust/Water Resistance:	IP4X
Electromagnetic Compatibility according to UNECE Regulation No.10	
Low power consumption available, up to 100uA at 24V during sleep mode	
Automotive-certified active components (optional: all electronical components automotive-certified)	

STANDARD INPUTS/OUTPUTS

- 12 Digital outputs with diagnostics for underload/overload
- 12 Analog inputs 10bit
- 3 Digital inputs
- 2 Linear outputs or PWM with Feedback, up to 3 capable
- 1 CAN BUS up to 1Mbit/s
- 1 LIN BUS Master or slave

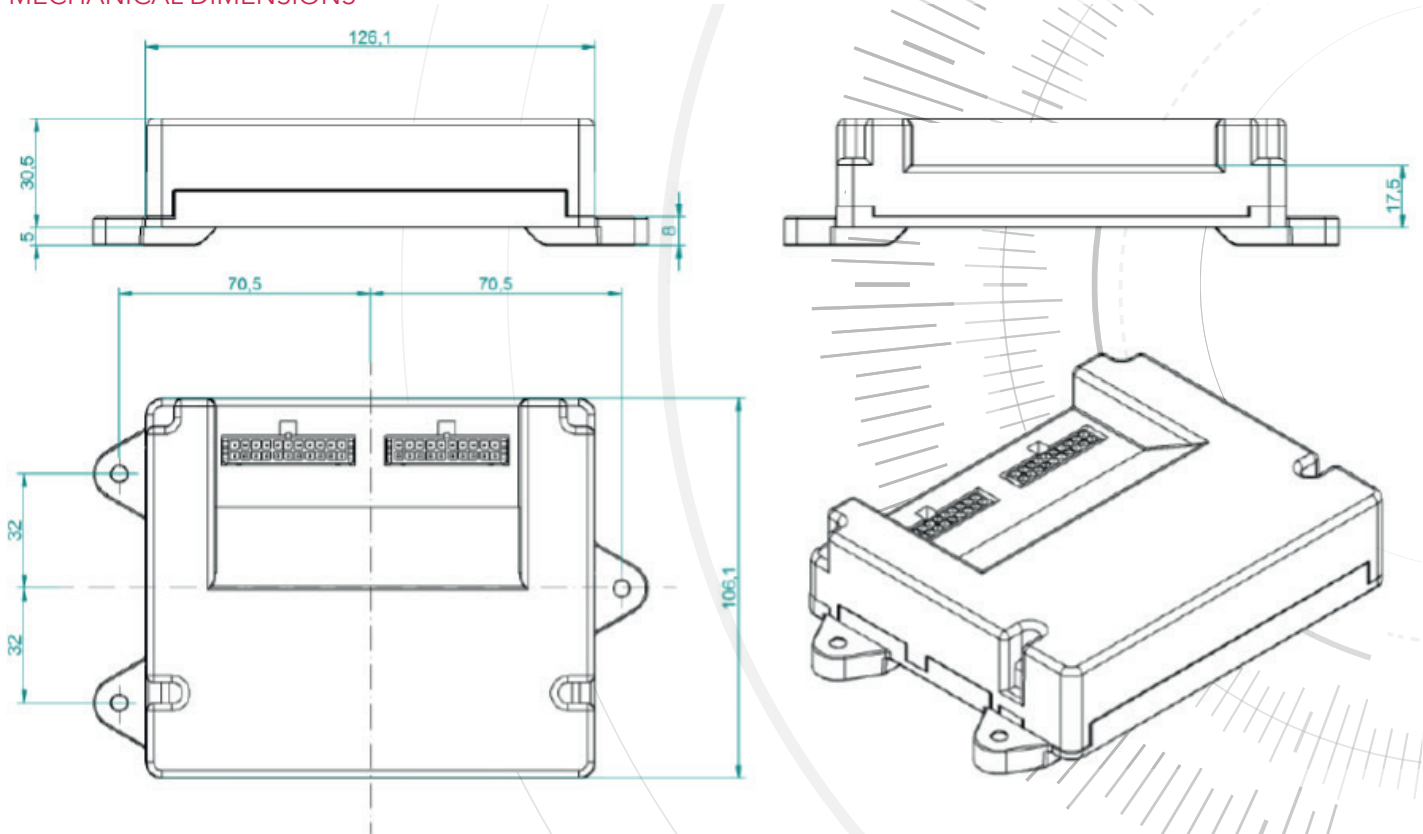
INPUTS/OUTPUTS UPON REQUEST

- 1 additional CAN BUS
- 1 additional LIN BUS
- 3 additional digital inputs
- 1 additional PWM

ADDITIONAL FEATURES:

- Application FW adaptable to different systems, fully parametrized and customizable for HVAC or customer equipment;
- UDS-compliant bootloader if required, adaptations on protocol if required;
- Based on the 32-bit Arm® Cortex®-M4F S32K14 MCU 512KB Program Flash Memory;
- Security options available as seed/key authentication, upon request;
- Customized COMES tooling for flashing application FW onto ECU via CAN BUS and USB-CAN BUS adaptor;
- Specific customer interface with security access available upon request;
- Customized and adaptable diagnostic CAN BUS interface, graphics and log capable to fully monitor ECU behavior, parameters, faults etc.;
- Optional: AUTOSAR BSW (with or without RTE), XCP protocol compliant.

MECHANICAL DIMENSIONS



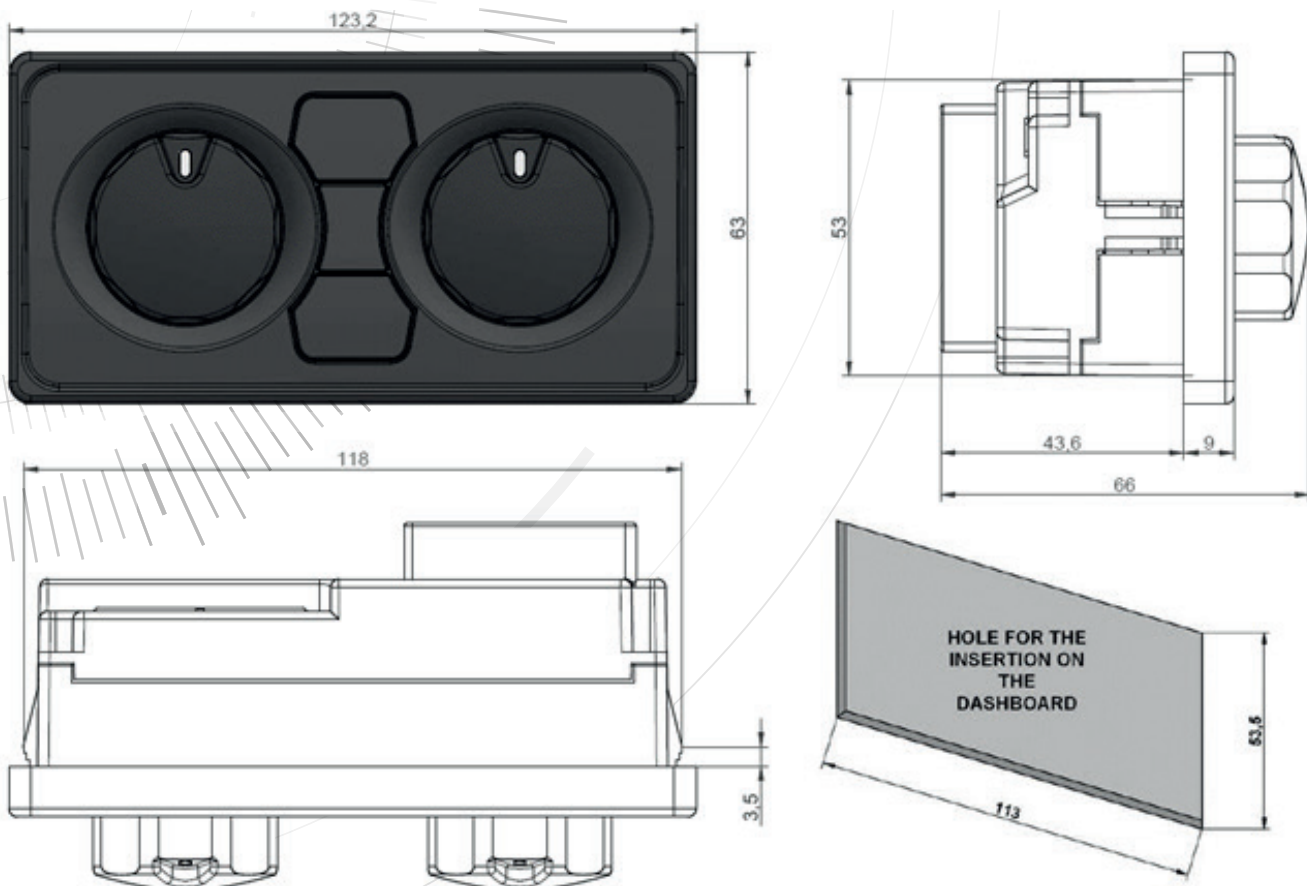
DKL PLUS for PTC Heater



GENERAL PERFORMANCE, ELECTRICAL AND ENVIRONMENTAL TESTS

Operating Voltage Range:	10.5÷16V / 18÷32V
Nominal Power Supply Voltage:	12V or 24V
Output Rated Current, each pin:	max 400mA
Operating Temperature Range:	from -40°C to 85°C
Storage Temperature Range:	from -40°C to 90°C
Dust/Water Resistance on the Front Panel:	IP43
Over Voltage Protection	
Reverse Polarity Protection	
Short-Circuit Protection	
Electromagnetic Compatibility according to UNECE Regulation No.10	

MECHANICAL DIMENSIONS



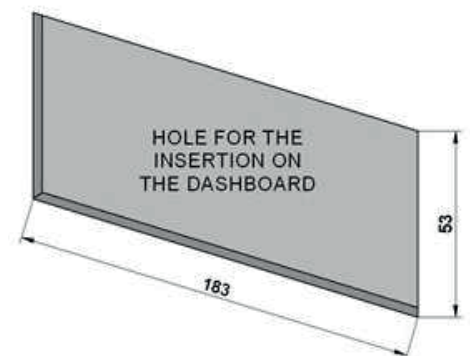
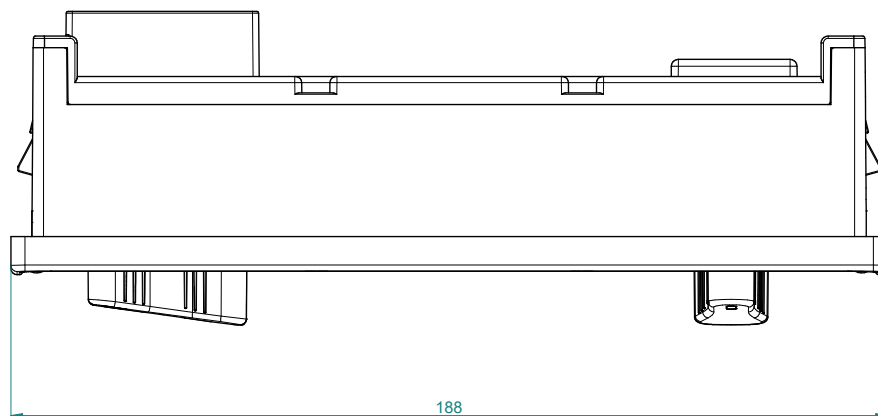
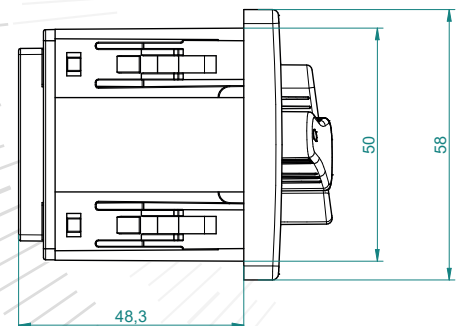
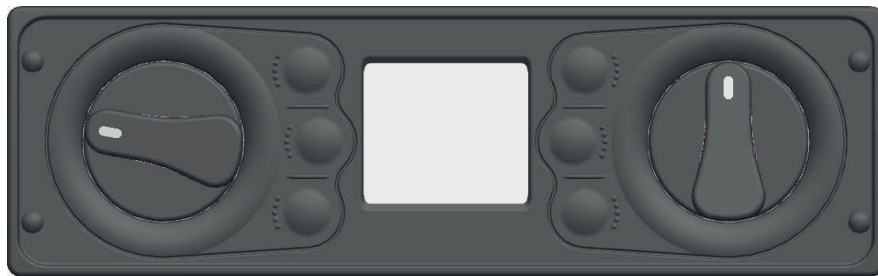
DDL for PTC Heater



GENERAL PERFORMANCE, ELECTRICAL AND ENVIRONMENTAL TESTS

Operating Voltage Range:	10.5÷16V / 18÷32V
Nominal Power Supply Voltage:	12V or 24V
Output Rated Current, each pin:	max 400mA
Operating Temperature Range:	from -40°C to 85°C
Storage Temperature Range:	from -40°C to 90°C
Water/Dust Resistance on the Front Panel:	IP54
Over Voltage Protection	
Reverse Polarity Protection	
Short-Circuit Protection	
Electromagnetic Compatibility according to UNECE Regulation No.10	

MECHANICAL DIMENSIONS



For insertion in the dashboard it is possible to choose between a DIN-format metal frame and metal fixing clips.

Examples of Customized Solutions



**Battery Cooling Control
Module for e-Buses**



**Battery Cooling Control
Module for e-Trucks**



**Battery Cooling Control
Module for e-Forklifts**



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