



SCS[®] SMART CONTROL SYSTEMS

Intelligent CAN solutions for utility vehicles

CAN BUS TECHNOLOGY

Intelligent and complex systems made easy

New technologies and future oriented systems are crucial for the design of on-board electrical systems. The growing number of electrical vehicle components and the need for data transmission between individual devices quickly leads to heavy cable harnesses and higher wiring complexity. The CAN bus as standard field bus is the ideal technology in the automotive industry to facilitate fast and simple

data transmission and to reduce wiring. The installation of intelligent systems of centralised or decentralised design is possible without any problems. A simple extension of the CAN network through standardised components is possible at any time. Different protocols such as J1939 and CANopen are based on the CAN 2.0 standard and implement further layers of the OSI model.

ISOBus

SAE J1939

CANopen

CAN 2.0



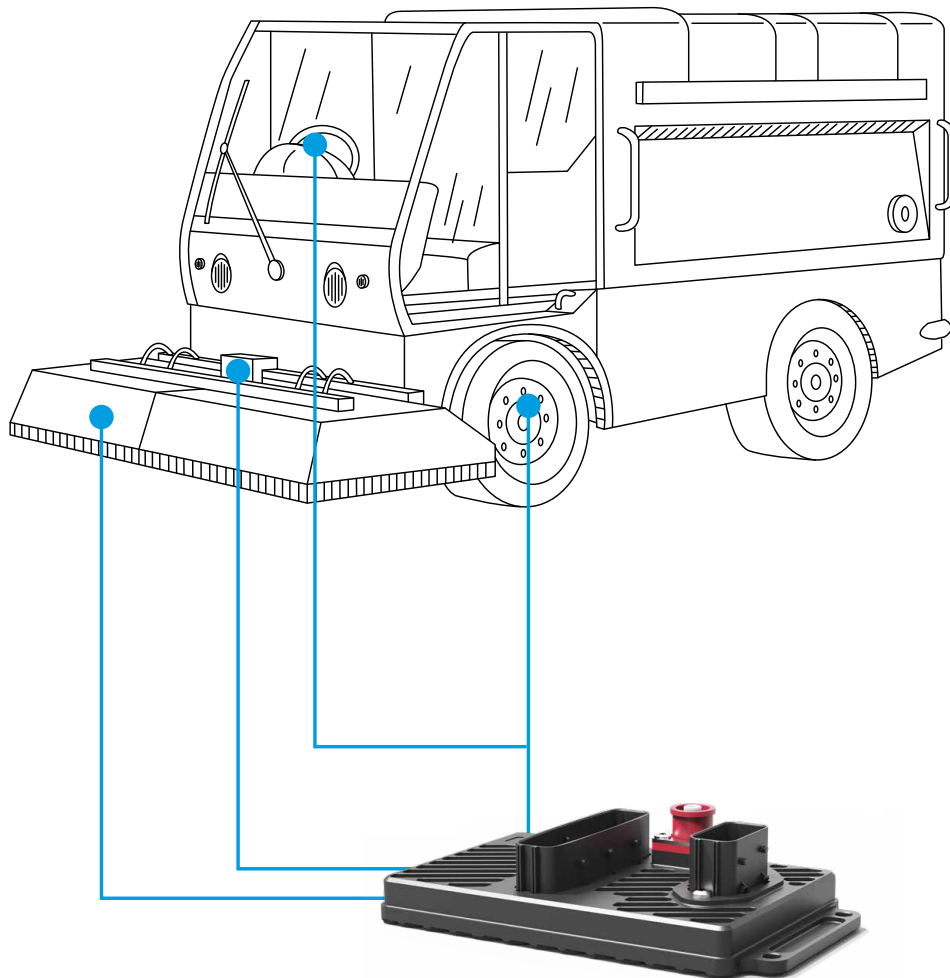
E-T-A offers a suitable CAN solution with numerous intelligent products, that support the CAN 2.0 standard and are compatible with J1939 and CANopen.



YOUR BENEFIT

- Reduced wiring effort and costs
- Easy upgradeability
- Decentralisation and modularity
- Robust and easy data transmission

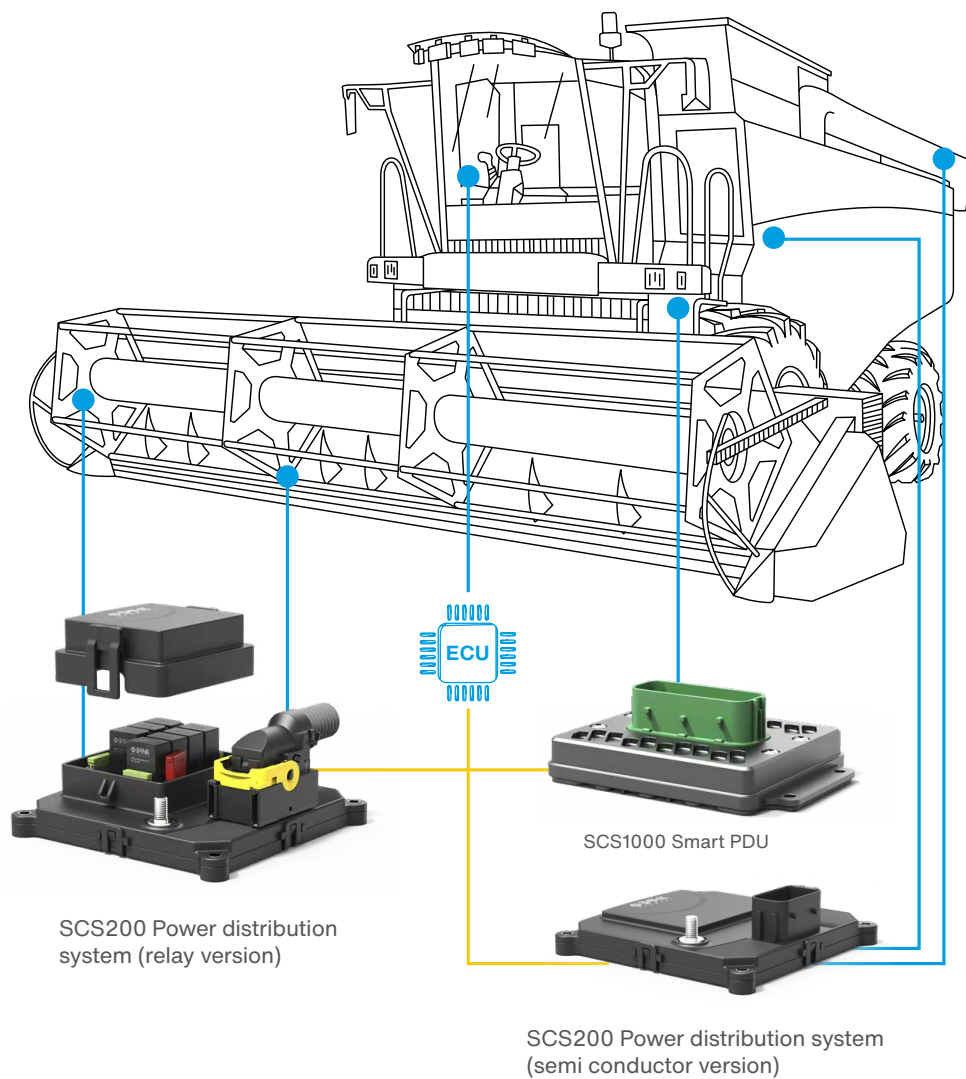




All-in-one Modul SCS3000-64

CENTRALIZED System architecture

In the centralised system architecture the complete machine is operated by a single, central high-performance controller. Normally, this architecture is found in smaller machines. Sensors and actuators are connected either directly or via CAN bus to the centralised controller. It controls and monitors all machine functions.



SCS200 Power distribution system (relay version)

SCS1000 Smart PDU

SCS200 Power distribution system (semi conductor version)

DECENTRALISED Control architecture

With the increasing intelligence and flexibility required of a machine, the design of the electronic control unit is becoming correspondingly complex. High load currents and bulky cable harnesses within the machine are challenging results of this. This is the reason why a modular and “decentralised” control architecture is preferred in large and complex vehicles. Smaller function units are optimally placed in the machine and connected via the standardised CAN bus, which drastically reduces wiring complexity. Additional components can easily be integrated into existing systems during later retrofits.

SCS® SMART CONTROL SYSTEMS

CAN components and system solutions

E-T-A's smart Control Systems product group combines intelligent systems, power distribution and components with communication capabilities via CAN. Our products help digitise the on-board electrical system and the installation of an intelligent power distribution. The **SCS®** portfolio comprises standardised hardware in combination with a flexibly adjustable software for easy vehicle modernisation and system integration. Condition monitoring

and availability of diagnostic data allow predictive maintenance. Both centralised and decentralised system architectures, as well as I/O extensions, can be realised with **SCS®** products. For all requirements that are not covered by the **SCS®** product group, E-T-A offers customised system solutions, tailor-made for your application.



CAN-capable power distribution system with diagnostic functions

- CAN controlled PDUs for decentralised distribution of higher currents downstream of the ECU
- Current and voltage measurement and electronic load protection per channel



Logic and distribution of high currents in one module

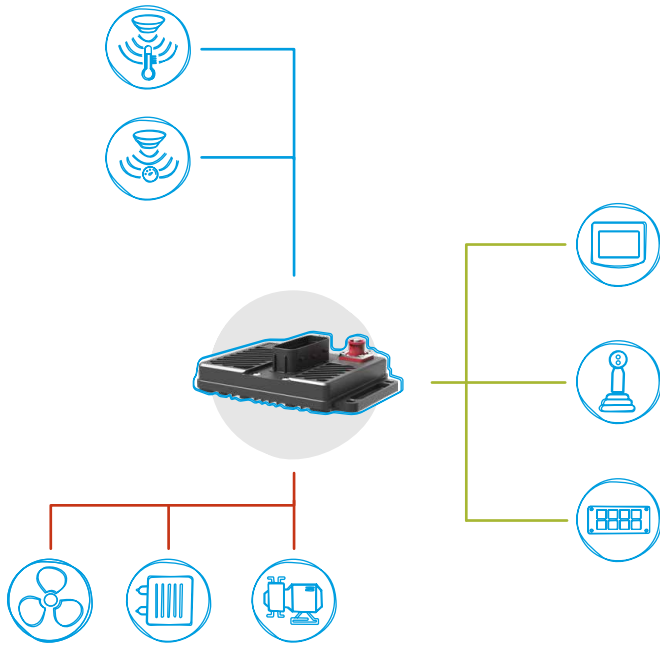
- Up to 64 channels, 280 A total current for a centralised system approach
- PWM, Soft Start and H-bridges functionality
- CAN and Ethernet connection

EXAMPLES FOR POSSIBLE APPLICATIONS

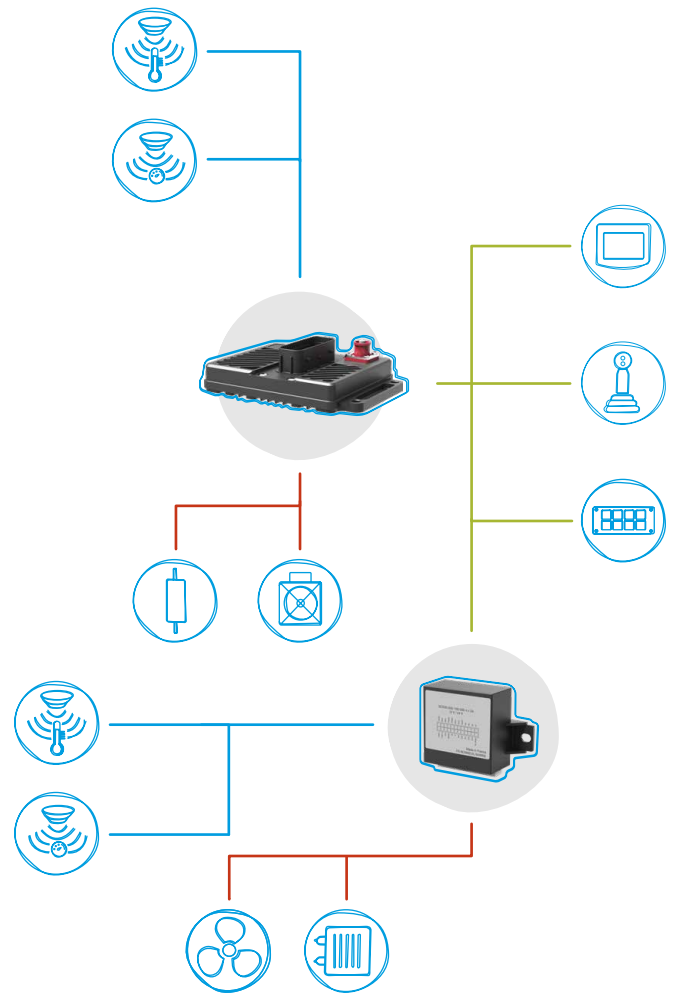
LEGEND LINE COLOURS:

- CAN-Bus: green
- Inputs: blue
- Outputs: red

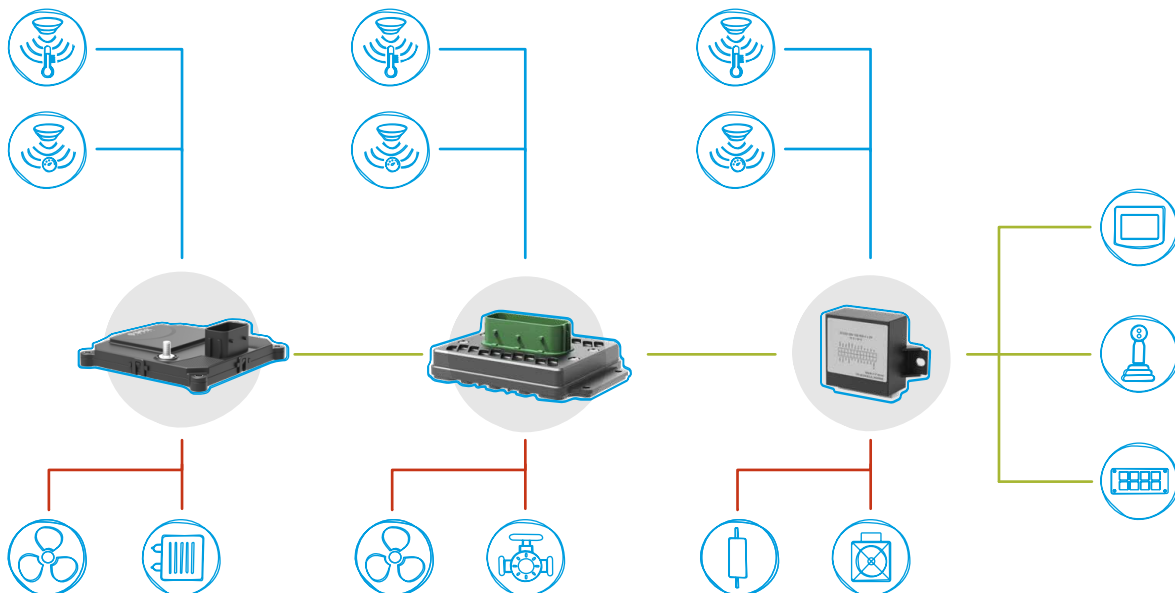
Centralised system
with SCS3000



I/O extension
with optional extension



Decentralised system
with SCS200 und SCS1000



INTELLIGENT SCS200 POWER DISTRIBUTION SYSTEM

Diagnostic data for load management and predictive maintenance

Intelligent and complex systems as well as the electrification of loads play a decisive role in the development of on-board electrical systems. The **SCS200** is the right answer to these requirements. It is an intelligent power distribution system, allowing decentralised control and monitoring of loads via CAN bus. The design features PCB-based power distribution in a compact IP67 enclosure.

The **SCS200** modules are plug & play solutions which help you reduce space and wiring complexity. Its major application is the decentralised power distribution for higher loads downstream of the ECU. The **SCS200** enables load management and predictive maintenance by providing comprehensive diagnostics (load current and voltage measurement, output status) and making

this data available on the CAN bus. This avoids consequential damages, vehicle breakdowns and downtimes and increases vehicle availability and productivity. In addition, the information received allows fast and efficient troubleshooting during service and maintenance.

YOUR BENEFIT

- **Predictive maintenance and load management** through comprehensive diagnostic functions (current, voltage, status)
- **Reduced wiring effort** through plug-and-play solution with CAN connection
- **Space-saving and flexible installation** through compact IP66/67 enclosure
- **Increased safety** through integral electronic load protection





OVERVIEW:

- Up to 150 A total current
- Up to 30 A per channel
- CAN SAE J1939 / CANopen compatible
- IP67 enclosure
- Current and voltage measurement, electronic load protection, status information





SCS1000/3000 HIGH-END MODULES

Logic combined with power distribution

Especially the system size and high current loads are important within an ever more demanding vehicle architecture, where space in the vehicle is at a premium. The **SCS3000** and **SCS1000** series are extremely compact power distribution systems with integral logic. The modules provide considerable functionality combined with high efficiency in a highly compact form factor. The **SCS3000/1000** are ideal in terms of their upgradeability for fleet modernisation and projects where space-savings are of the utmost importance.

The **SCS3000** modules are the perfect solution for a centralised system approach. Power distribution and control functions, as well as logic links, PWM and soft start

functionality are combined in a single module. Multiple individual components can be replaced by a single one. The **SCS1000-16** is a low cost entry-level solution with a total of 16 load outputs, four of which are PWM capable with a fixed frequency. Communication is provided via one CAN channel. This makes it the ideal solution for smaller or decentralised system architectures, retrofit solutions and for the first steps towards vehicle digitalisation.

The **SCS3000** and the **SCS1000** modules can easily be configured via a graphical user interface - including the definition of the associated CAN messages.



Reduced system costs and flexibly configurable – SCS1000/3000 High-End-Modules

YOUR BENEFIT

- **Forward-looking load management** through inrush handling and soft start functions
- **A wealth of functions in a very small form factor** - Logic and power distribution combined in one module
- **Reliability** through compact IP67 enclosure
- **Designed to your requirements** through configuration via graphical user interface

OVERVIEW:

- Up to 280 A total current
- Up to 35 A per channel
- Up to 3 CAN channels, 2 Ethernet ports, RS232 interface
- Up to 5 H-bridges
- High-side and Low-side switching
- IP67 enclosure

APPLICATION-SPECIFIC SYSTEM SOLUTIONS

Optimised electrical system and integral communication

E-T-A System Solutions is a team of experts to design electrical systems and CAN solutions for various vehicle types according to your needs, ideas and technical requirements. Working with our customers to find reliable solutions that are easy to install and maintain is our motivation for every project.

Technologies

We offer systems for voltage ratings from DC 12 V up to 1250 V with a current rating up to 500 A. In order to optimise space requirements and wiring complexity and to reach

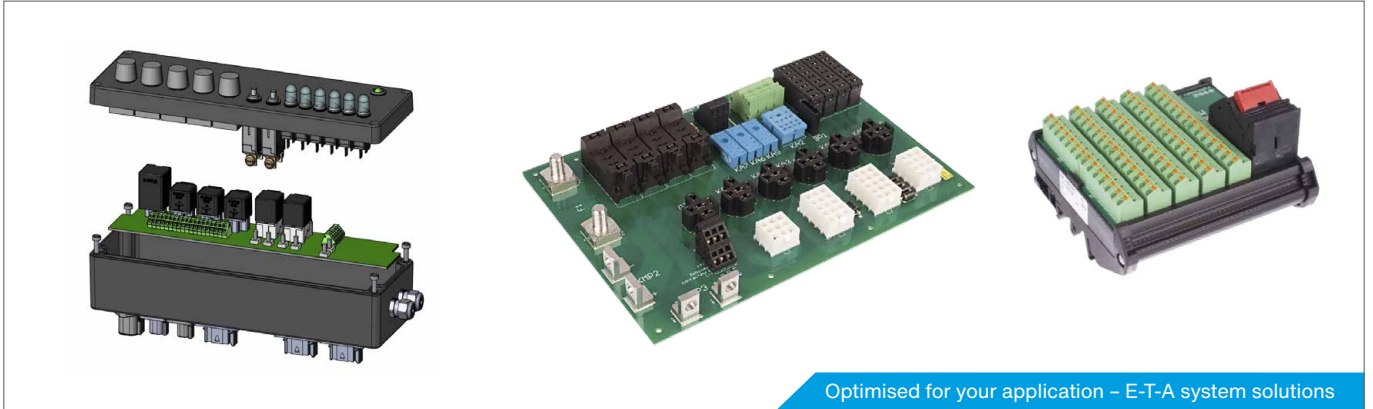
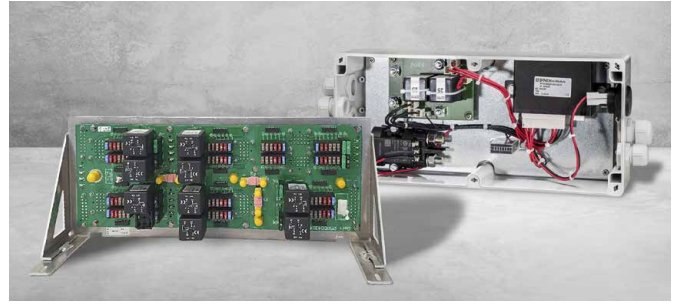
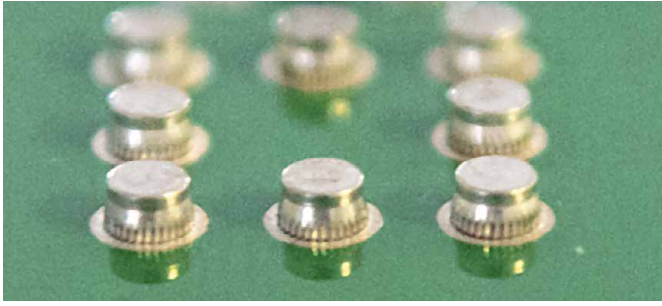
highest possible flexibility, we integrate most components on PCBs with up to 8 layers, connected with sockets, bolts and plug-in connectors. We use Softpress technology for the power distribution on PCBs. This innovative technology allows efficient and compact power distribution with extremely low specific resistance, low heat development and high shock and vibration resistance. Our PCBs are populated with components by selective soldering to optimise the contact resistance and guarantee low heat development.

For example we integrate the following products in our systems:

- Circuit breakers
- Electro-mechanical relays
- Solid state relays
- Timer relays
- Flashing relays
- CAN modules
- HV relays

- **System optimisation adapted to the application:** Solutions are developed together with our customers adapted to the application
- **Plug-and-Play:** with up to IP6k9k: A variety of plug-in connector options with high IP rating simplifies integration into the vehicle
- **Easy maintenance and aftersales:** Easy replacement through plug-in type components
- **Cost savings and risk minimisation:** Extremely short mounting time and risk minimisation by way of pre-wired plug-in connectors





Optimised for your application – E-T-A system solutions

SOFTPRESS TECHNOLOGY

- Press-fit technology without soldering
- Low thermal stress to the PCB during the production process
- High ampacity resulting from low contact resistance
- Extremely resistant against vibration and shock



SCS® SMART CONTROL SYSTEMS

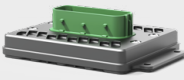


Technical data

Type	SCS3000-64	SCS3000-48	SCS3000-34	SCS3000-16
				
Load outputs	64	48	34	16
Nominal voltage	12/24 V	12/24 V	12/24 V	12/24 V
Total current	280 A	280 A	280 A	200 A
Max. current/channel	35 A (10x)	35 A (10x)	35 A (10x)	35 A (4x)
Physical inputs	16	16	16	12
Communication	CAN 2.0, Ethernet	CAN 2.0, Ethernet	CAN 2.0, Ethernet	CAN 2.0, Ethernet
IP-Rating	IP67	IP67	IP67	IP67
H-Bridges	5	5	5	2
Configuration	Graphical programming environment			
Typical applications	All-in-one module for large, centralised system architectures, performance and logic combined in one module			Centralised/decentralised intelligent power distribution for small system architectures, performance and logic combined in a single module

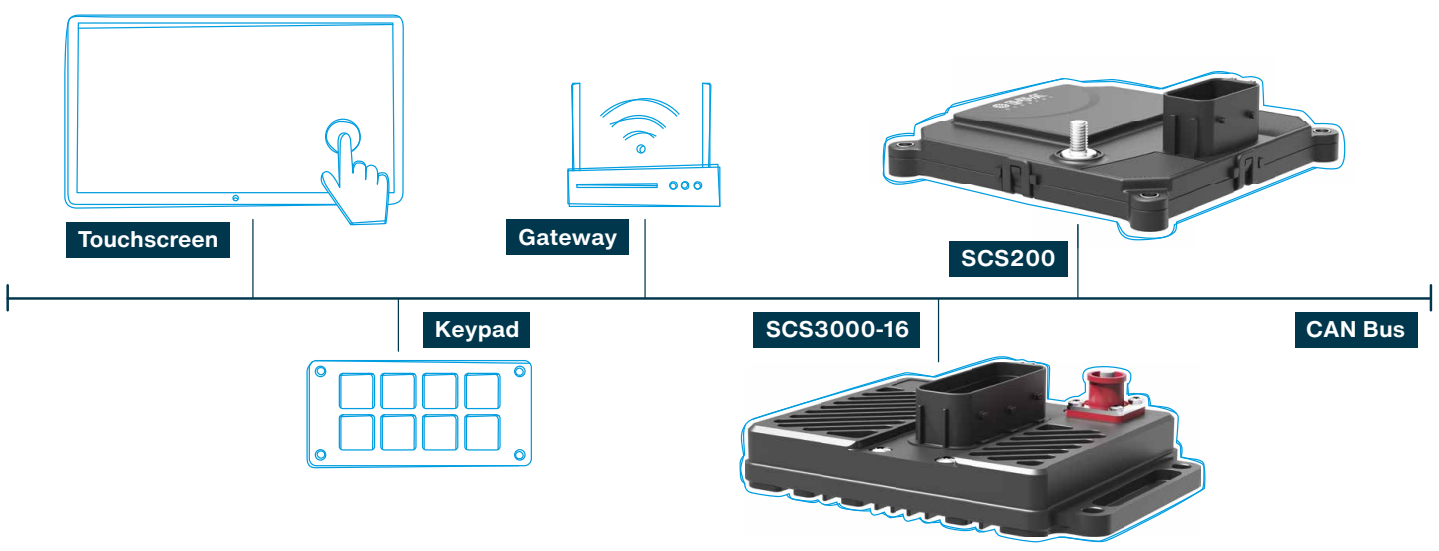
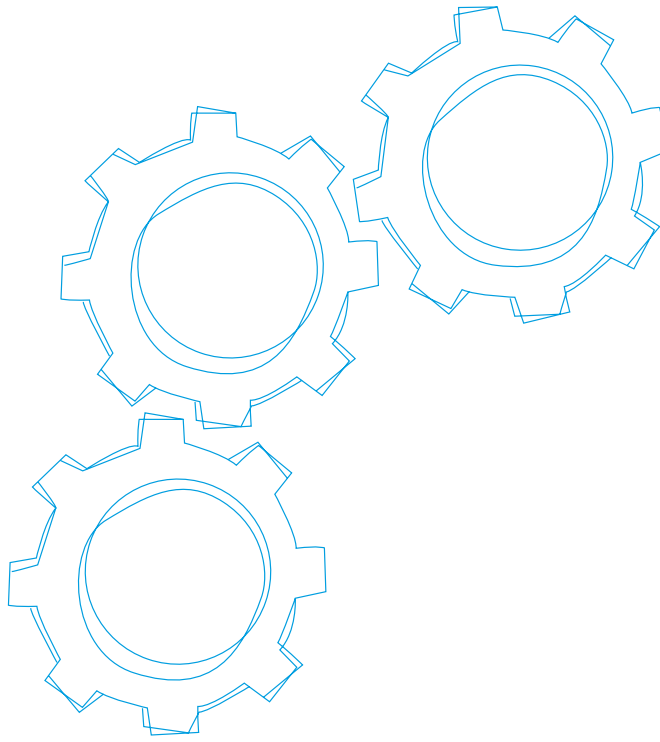
COMPATIBLE ACCESSORIES

Accessories, such as touch screens, keypads or gateways complete the vehicle system and allow user-intuitive visualisation and control of all **SCS®** modules and loads. If you need further information on additional CAN-capable components, just get in touch

with us. We recommend you accessories perfectly matching our **SCS®** modules and support you with the design of your entire system, relying on generally available standard components.

SCS1000-16	SCS200-SC	SCS200-RC
		
16	12	8
12/24 V	12 V, 24 V, 48 V	12/24 V
160 A	up to 150 A	120 A
32,5 A (4x)	30 A (4x)	30 A (4x)
12	up to 6	6
CAN 2.0, SAE J1939	CAN 2.0, SAE J1939, CANopen	CAN 2.0, SAE J1939, CANopen
IP67	IP67	IP67
-	-	-
	Without config environment (defined CAN frames)	
Entry-level solution for small system architectures, performance and logic combined in one module	CAN-controlled, decentralised power distribution with comprehensive diagnostic functions (current, voltage, status)	

We will be pleased to answer your questions about **SCS®** compatible accessories, such as screens, keypads or gateways.



E-T-A Elektrotechnische Apparate GmbH

Industriestraße 2-8

90518 Altdorf

Tel. 09187 10-0

Fax 09187 10-397

E-Mail: info@e-t-a.de