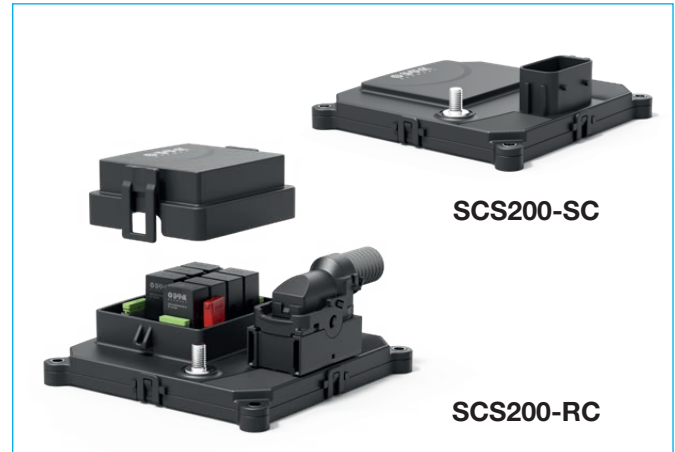


## Description

Intelligent and complex systems as well as the electrification of loads currently 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 the CAN bus. The design features a pcb-based power distribution in a compact IP66/67 enclosure.

The SCS200 modules are plug & play solutions that allow you to reduce wiring time and save space. Comprehensive diagnostic capabilities (integral load protection, load current and voltage measurement, output status) and the integrated CAN connection of the SCS200 allow predictive maintenance and the implementation of load management.



## Applications

### Scope of applications:

- Agricultural machinery, construction machinery, special vehicles, trucks and buses
- Decentralised power distribution below the ECU
- Vehicle modernisation and easy system extension through a standard CAN component

## Benefits

- Predictive maintenance and load management through comprehensive diagnostic functions (current, voltage, status)
- Reduction of wiring time through plug-and-play design with CAN connection
- Space-saving and flexible installation through a compact IP66/67-rated enclosure
- Enhanced safety through integral electronic load protection

## Approvals

Approval authority	Logo	Directive	Approval logos
KBA	E1 10R-059019	ECE-R10	

## Compliance



## Variant examples

Part numbers	Short description
SCS200-SC08-00-01-C1-01	8 load outputs, fully electronic, DC 12 V, J1939
SCS200-SC12-00-01-C1-01	12 load outputs, fully electronic, DC 12 V, J1939
SCS200-SC12-00-02-C4-01	12 load outputs, fully electronic, DC 24 V, CANopen
SCS200-SC12-00-04-C4-01	12 load outputs, fully electronic, DC 48 V, CANopen
SCS200-RC08-00-01-C1-01	8 load outputs relays and fuses, DC 12/24V (unpopulated), J1939

## Technical data SCS200-SC... (T<sub>AMB</sub> = 25 °C at U<sub>N</sub> = 12 V)

Rated voltage	DC 12 V
Operating voltage range	9 V ... 16 V
Rated current per channel	8-channel version: 4 x 30 A, 4 x 10 A 12-channel version: 4 x 30 A, 8 x 10 A
Total current	8-channel version: 120 A 12-channel version: 150 A
Analog inputs	6 analog inputs (0 – 10 V) <sup>3)</sup>
Temperature range <sup>1)</sup>	-40 ... +85 °C
Closed current	< 0.5 mA
Electronic load protection	trip current 1: 1.3 x I <sub>N</sub> trip delay 1: 200 ms  trip current 2: 3 x I <sub>N</sub> (channels 1-4: max. 60 A, channels 5-12: max. 22.5 A) trip delay 2: 30 ms (can be deactivated via software)
Bus communication	CAN 2.0B / SAE J1939 250 kBits/s (CANopen and 500 kBits/s available soon)
Degree of protection	IP66, IP67 to ISO 20653
Environmental tests	to ISO 16750
EMC	to ECE-R10 (E1)
Reverse polarity protection	supply terminals (reverse polarity non-conductive) and load outputs (reverse polarity conductive)
Short circuit resistance	30 A channel > 100 A at 16 V 10 A channel > 60 A at 16 V
Voltage drop <sup>2)</sup>	channel 1-4 (at 24 A): max. 50 mV channel 5-12 (at 8 A): max. 75 mV
Vibration	RMS acceleration 57.9 m/s <sup>2</sup>
Shock resistance	50 g/6 ms half-sine
Housing material	PA66-GF25FR V-0
Mass	410 g
Dimensions	159 x 159 x 44 mm

<sup>1)</sup> Ampacity see derating (user manual SCS200)

<sup>2)</sup> Cannot be ensured over the entire life span

<sup>3)</sup> Input 1 to 3 can be used for physical module addressing (PMA)

**Technical data SCS200-SC... (T<sub>U</sub> = 25 °C at U<sub>N</sub> = 24 V)**

Rated voltage	DC 24 V
Operating voltage range	9 V ... 32 V
Rated current per channel	2 x 25 A, 10 x 10 A Parallel connection of the 10 A load outputs possible (3 x 25 A, 9 x 10 A possible at 100 A total current)
Total current	120 A
Analog inputs	5 analog inputs (0 – 10 V) <sup>3)</sup>
Temperature range <sup>1)</sup>	-40 ... +85 °C
Closed current	< 1 mA
Electronic load protection <sup>4)</sup>	Trip current 1: 1,3 x I <sub>N</sub> Trip delay 1: 200 ms  Trip 2: 3 x I <sub>N</sub> (channels 1-3: max. 75 A, channels 4-12: max. 30 A) Trip delay 2: 30 ms (can be deactivated via software)
Bus communication	CAN 2.0B / SAE J1939 / CANopen 250 kBits/s (500 kBits/s available soon)
Degree of protection	IP66, IP67 to ISO 20653
Environmental tests	to ISO 16750
EMC	to ECE-R10 (E1)
Reverse polarity protection	Supply terminals (reverse polarity non-conductive) and load outputs (reverse polarity conductive for 60s to ISO16750-2)
Short circuit resistance	25 A channel: > 100 A at 32 V 10 A channel: > 60 A at 32 V
Voltage drop <sup>2)</sup>	Channel 1-3 (at 20 A): max. 60 mV Channel 4-12 (at 8 A): max. 60 mV
Vibration	RMS acceleration 57.9 m/s <sup>2</sup>
Shock resistance	50 g/6 ms half-sine
Housing material	PA66-GF25FR V-0
Mass	410 g
Dimensions	159 x 159 x 44 mm

<sup>1)</sup> Ampacity see derating (user manual SCS200)

<sup>2)</sup> Can't be ensured over the entire life span.

<sup>3)</sup> Input 1 to 3 can be used for physical module addressing (PMA)

<sup>4)</sup> Differentiation of CAN diagnostic information between trip current 1 & 2

**Technical data SCS200-SC... (T<sub>U</sub> = 25 °C at U<sub>N</sub> = 48 V)**

Rated voltage	DC 48 V (Load) DC 12/24 V (Control)
Operating voltage range	9 V ... 60 V (Load) <sup>5)</sup> 9 V ... 32 V (Control)
Rated current per channel	3 x 15 A, 9 x 10 A Parallel connection of the 10 A load outputs possible
Total current	90 A
Analog inputs	5 analog inputs (0 – 10 V) <sup>3)</sup>
Temperature range <sup>1)</sup>	-40 ... +85 °C
Closed current	< 1 mA
Electronic load protection <sup>4)</sup>	Trip current 1: 1,3 x I <sub>N</sub> Trip delay 1: 200 ms  Trip 2: 3 x I <sub>N</sub> (channels 1-3: max. 45 A, channels 4-12: max. 30 A) Trip delay 2: 30 ms (can be deactivated via software)
Bus communication	CAN 2.0B / SAE J1939 / CANopen 250 kBits/s (500 kBits/s available soon)
Degree of protection	IP66, IP67 to ISO 20653
Environmental tests	to ISO 16750
EMC	to ECE-R10 (E1)
Reverse polarity protection	Supply terminals (reverse polarity non-conductive) and load outputs (reverse polarity conductive)
Short circuit resistance	15 A channel: > 90 A at 32 V 10 A channel: > 60 A at 32 V
Voltage drop <sup>2)</sup>	Channel 1-3 (at 12 A): max. 60 mV Channel 4-12 (at 8 A): max. 75 mV
Vibration	RMS acceleration 57.9 m/s <sup>2</sup>
Shock resistance	50 g/6 ms half-sine
Housing material	PA66-GF25FR V-0
Mass	410 g
Dimensions	159 x 159 x 44 mm

<sup>1)</sup> Ampacity see derating (user manual SCS200)

<sup>2)</sup> Can't be ensured over the entire life span.

<sup>3)</sup> Input 1 to 3 can be used for physical module addressing (PMA)

<sup>4)</sup> Differentiation of CAN diagnostic information between trip current 1 & 2

<sup>5)</sup> According to ISO21780, the nominal voltage range goes up to 52 V; at 54 V the transient voltage limit is defined and from 54V the overvoltage range begins, which causes the SCS200 to switch off the load outputs for self-protection when detected.

**Technical data SCS200-RC... (T<sub>AMB</sub> = 25 °C at U<sub>N</sub> = 12 V/24 V)**

Rated voltage	DC 12 V/24 V
Operating voltage range	9 V ... 32 V
Rated current per channel	4 x 30 A, 4 x 10 A
Total current	120 A
Analog inputs	6 analog inputs (0 – 10 V) <sup>3)</sup>
Temperature range <sup>1)</sup>	-40 ... +85 °C
Closed current	12 V < 1.2 mA 24 V < 2.4 mA
Electronic load protection	trip current 1: 1.3 x I <sub>N</sub> trip delay 1: 200 ms  trip current 2: 3 x I <sub>N</sub> (channels 1-4: max. 60 A, channels 5-8: max. 22.5 A) trip delay 2: 30 ms (can be deactivated via software)
Fail-safe	ATO fuses as back-up elements (not included in the delivery)
Bus communication	CAN 2.0B / SAE J1939 250 kBits/s (CANopen and 500 kBits/s available soon)
Degree of protection	IP66, IP67 to ISO 20653
Environmental tests	to ISO 16750
EMC	to ECE-R10 (E1)
Reverse polarity protection	Supply (reverse polarity non-conductive)
Short circuit resistance	depending on the relays fitted. Example:  TE V23074-A2002-A403 (30A channel): > 100 A at 24 V  E-T-A ESR10-NC2A4HB-00-D2-10A (10 A channel) > 60 A at 24 V
Voltage drop <sup>2)</sup>	channel 1-4 (at 24 A): max. 50 mV channel 5-12 (at 8 A): max. 75 mV
Vibration	RMS acceleration 57.9 m/s <sup>2</sup>
Shock resistance	50 g/6 ms half-sine
Housing material	PA66-GF25FR V-0
Mass	630 g (fully populated)
Dimensions	159 x 159 x 62 mm

<sup>1)</sup> Ampacity see derating (user manual SCS200)

<sup>2)</sup> Cannot be ensured over the entire life span

<sup>3)</sup> Input 1 to 3 can be used for physical module addressing (PMA)

## Ordering information

<b>Type</b>	
<b>SCS200</b>	Intelligent power distribution board - Smart Control Systems
<b>Load outputs</b>	
<b>SC</b>	Semiconductors
<b>RC</b>	Relay sockets and ATO circuit breaker sockets
<b>Number of channels</b>	
<b>08</b>	8 load outputs
<b>12</b>	12 load outputs (only with SC version)
<b>Assembly</b>	
<b>00</b>	standard (with RC version without relays and fuses)
<b>Supply voltage</b>	
<b>01</b>	12 VDC (SC version only)
<b>02</b>	24 VDC (SC version only)
<b>03</b>	12/24 VDC (RC version only)
<b>04</b>	48 VDC (SC version only)
<b>CAN standard</b>	
<b>C1</b>	SAE J1939 compatible
<b>C2</b>	SAE J1939 compatible, without integrated CAN termination
<b>C3</b>	CANopen compatible
<b>C4</b>	CANopen compatible, without integrated CAN termination
<b>Software configuration</b>	
<b>01</b>	standard configuration, locally configurable via CAN

**SCS200-SC 08 - 00 - 01 - C1 - 01** ordering example

The versions SC for 12V and RC for 12/24V are currently not available as CANopen version. In addition, the functionality of these versions is limited to the existing functionality and will be updated to the new features soon.

## CAN communication CAN 2.0B/SAE J1939 / CANopen

### Receive (Rx)

- Switch load outputs ON and OFF
- Query of measured values per load output
  - current and voltage
- Query of analog outputs
- Query of total current and  $U_{Bat}$
- Query of load output status
  - switching status and error diagnosis (ON, OFF, overload, open load)
- Activate sleep mode
- Initialise module
  - ON and OFF delay per channel (0.5 s ... 2.7 hrs)
  - Module ID
  - Rated current per channel
    - 10 A channels: 1 A ... 10 A
    - 30 A channels: 5 A ... 30 A
  - Paralell connection of load outputs
  - PMA state
  - Safe states

### Send (Tx)

- Total current and  $U_{Bat}$  (accuracy:  $\pm 3$  A or  $\pm 3\%$  at  $U_N$ )
- Load current per channel (accuracy:  $\pm 0.5$  A)
- Voltage applied per channel (accuracy:  $\pm 3\%$  at  $U_N$ )
- Voltage values of analog inputs (0 – 10 V, accuracy:  $\pm 200$  mV)
- Error diagnosis per channel (normal, trip 1 (overload), trip 2 (short circuit), open load)
- Switching conditions of load outputs
- Information regarding the module configuration
- Heart beat according to CANopen
- Diagnosis information can be send cyclically or up on request

The SCS200 supports address claiming to SAE J1939-81.  
The SCS200 supports LSS according to CiA 305.

No special configuration software required for initialising/configuring the module.

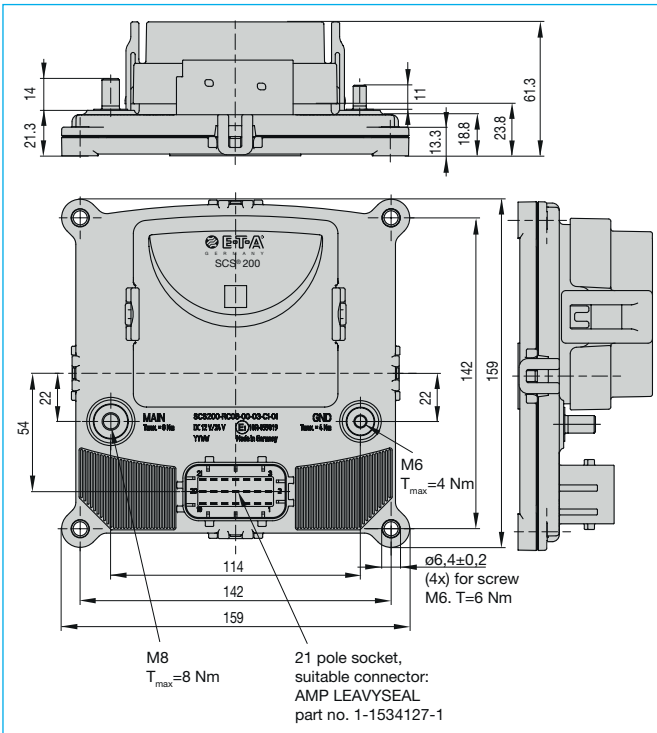
For listing all pertinent CAN frames (DBC, SYM and EDS files available) and other information, please observe the separate user manual:



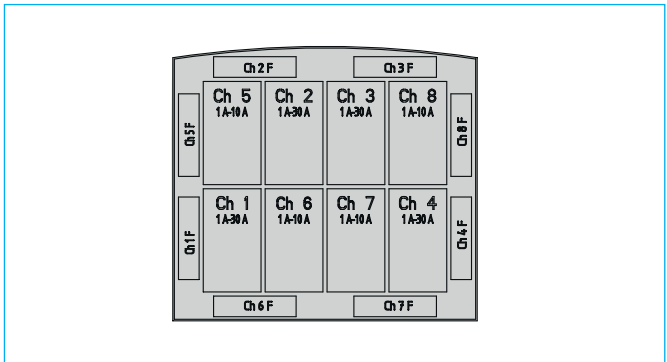
SCS®200  
<https://www.e-t-a.de/qr1042/>



## Dimensions SCS200-RC...



## Channel assignment SCS200-RC08-...



## Cable cross sections and mounting method

### Cross section of main terminal:

≥ 50 mm<sup>2</sup> (for positive supply voltage, GND terminal only for logic supply)

The cross section needs to be adjusted to the actual current and the operating temperature conditions. The temperature behaviour of the device improves with larger cross sections.

### Cross section of load terminal:

30 A channels: AWG12 or 4 mm<sup>2</sup>

10 A channels: AWG12 or ≥ 2.5 mm<sup>2</sup>

The cross section needs to be adjusted to the actual current and the operating temperature conditions. The temperature behaviour of the device improves with larger cross sections.

### Mounting screws:

M6, max. tightening torque 6 Nm  
(not included in the scope of delivery)

## Pin assignment SCS200- RC08-...

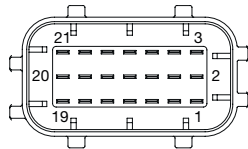
### Main terminals

U<sub>Bat</sub>: M8 screw terminal (marking: MAIN)

GND: M6 screw terminal (marking: GND)

### 21-pole connector

Mating plug: Tyco AMP LEAVYSEAL  
1-1534127-1



Pin	Name	Description
1	n.c.	not connected
2	LOAD_8	10 A load
3	LOAD_4	30 A load
4	n.c.	not connected
5	IN_A_1	Analogue input 1 / PMA 1
6	LOAD_7	10 A load
7	n.c.	not connected
8	IN_A_3	Analogue input 3 / PMA 3
9	LOAD_3	30 A load
10	n.c.	not connected
11	IN_A_4	Analogue input 4
12	LOAD_6	10 A load
13	IN_A_2	Analogue input 2 / PMA 2
14	IN_A_5	Analogue input 5
15	LOAD_2	30 A load
16	IN_A_6	Analogue input 6
17	WAKE_SIGNAL_IN	CAN wake up input
18	LOAD_5	10 A load
19	CAN_H_OUT	CAN high
20	CAN_L_OUT	CAN low
21	LOAD_1	30 A load

**Accessories: Population for SCS200-RC08-...**

Note: The SCS200-RC08-00-03-xx-01 product version is delivered unpopulated. Accessories can be ordered additionally and are enclosed with the delivery.

**Relays and fuses for 12 V DC: X22392701**

**Contents:**

- 4 x 10 A micro-relay E-T-A ESR10-NC3A4HB-00-D1-10A
- 4 x 30 A micro-relay E-T-A ESR10-NC3A4HB-00-D1-30A
- 4 x 15 A blade-type fuse MTA 380029 blue
- 4 x 40 A blade-type fuse MTA 380035 orange

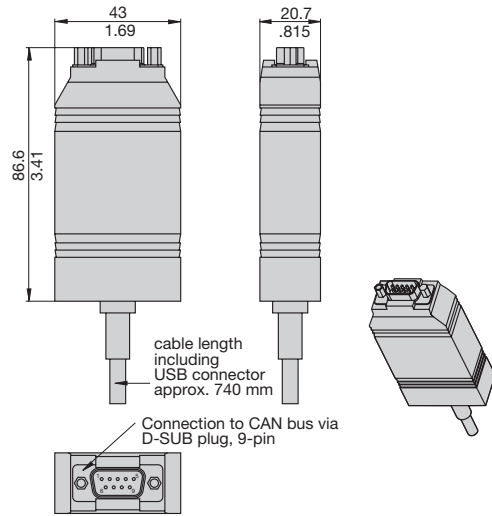
**Relays and fuses for 24 V DC: X22392702**

**Contents:**

- 4 x 10 A micro-relay E-T-A ESR10-NC3A4HB-00-D2-10A
- 4 x 30 A micro-relay Tyco V23074-A2002-A403
- 4 x 15 A blade-type fuse MTA 380029 blue
- 4 x 40 A blade-type fuse MTA 380035 orange

**Accessories: USB/CAN converter**

**USB/CAN converter:** XPP-USBC0  
XPP-USBC1 (opto-decoupled)



**Pin assignment D-SUB output plug**

PIN	assignment
2	CAN-L
7	CAN-H

This is a metric design and millimeter dimensions take precedence. Applicable for nominal dimensions without direct tolerance indication: DIN ISO 286 ± IT 13. Refer to product datasheet for installation and safety instructions.

All information and data given on our products are accurate and reliable to the best of our knowledge, but E-T-A does not accept any responsibility for the use in applications which are not in accordance with the present specification. E-T-A reserves the right to change specifications at any time in the interest of improved design, performance and cost effectiveness. Dimensions are subject to change without notice. Please enquire for the latest dimensional drawing with tolerances if required. All dimensions, data, pictures and descriptions are for information only and are not binding. Amendments, errors and omissions excepted. Ordering codes of the products may differ from their marking.