

# ONBOARD CHARGER

OBC\_22kW-450-70

OBC\_22kW-800-40

OBC\_22kW-850-32

**Stercom Power Solutions GmbH**

Ziegelstraße 1  
D-83629 Weyarn  
Germany

Tel. +49 8020 33996-0  
E-Mail: [info@stercom.de](mailto:info@stercom.de)  
Internet: [www.stercom.de](http://www.stercom.de)

OBC  
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## HIGHLIGHTS

- Ultra compact 22 kW OBC with the output versions 450V/70A, 800V/40A, or 850V/32A
- Very efficient switching technology using Silicon Carbide Technology
- Identical outline dimensions and plugs of all versions
- Suitable for 12V/24V electronic supply
- AC input power factor > 99 %, very low THD
- Very flexible AC input configuration compatible with all major types of CCS/Type2 inlets
- Supports AC charging via AC Wallbox according to EC 61851 as well as Direct AC supply
- Integrated DC charging with EPLC- (Embedded Power Line Communication) charge controller fully compatible with DIN SPEC 70121 and ISO15118
- Very low power consumption in "Sleep Mode"





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## CAN COMMUNICATION

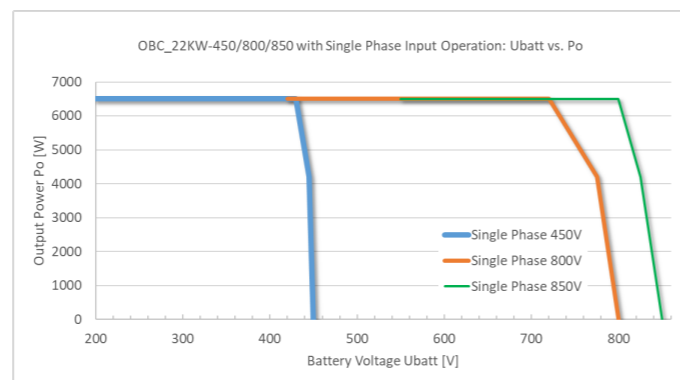
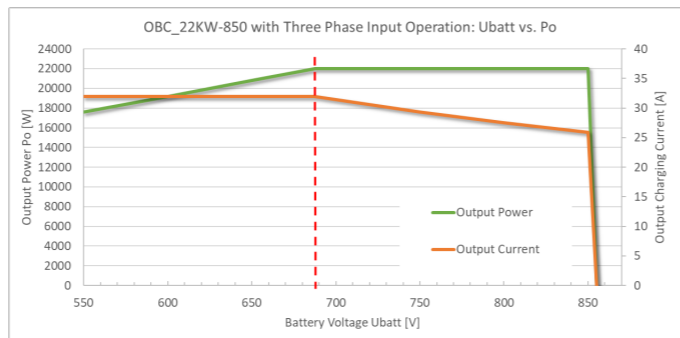
- Physical CAN layer using CAN 2.0B with 29-bit identifier
- CAN identifier structure compliant with SAE J 1939 protocol
- Internal Cluster Communication via internal "Bridge CAN" 2.0B
- CAN Matrix and CAN DBC File available on request

## AC INPUT CONFIGURATION

- AC Wallbox Charging according to 61851-1
- Compatible with all kinds of CCS/Type 2 inlets
- Supports all inlet features like PP/CP communication, 12V/24V actuators, lock pilot contacts, temperature sensors
- Direct AC input mode
- 32A single phase operation

## APPLICATIONS

- High voltage, high energy and power for on and off charging
- Public transportation (e-buses)
- Construction machinery
- Municipal vehicles
- Marine eDrives



## INTELLIGENT CHARGING FOR BATTERY CONSERVATION

- CCCV charging optimized for all types of Li-batteries
- 450V/70A , 800V/40A or 850V/32A versions to perfectly suit high- or medium-voltage battery arrangements
- Compatible with all major BMS systems
- Parallel operation
- Direct DC charging control using EPLC option
- Control outputs for direct DC-charging

# Embedded Power Line Communication (EPLC)

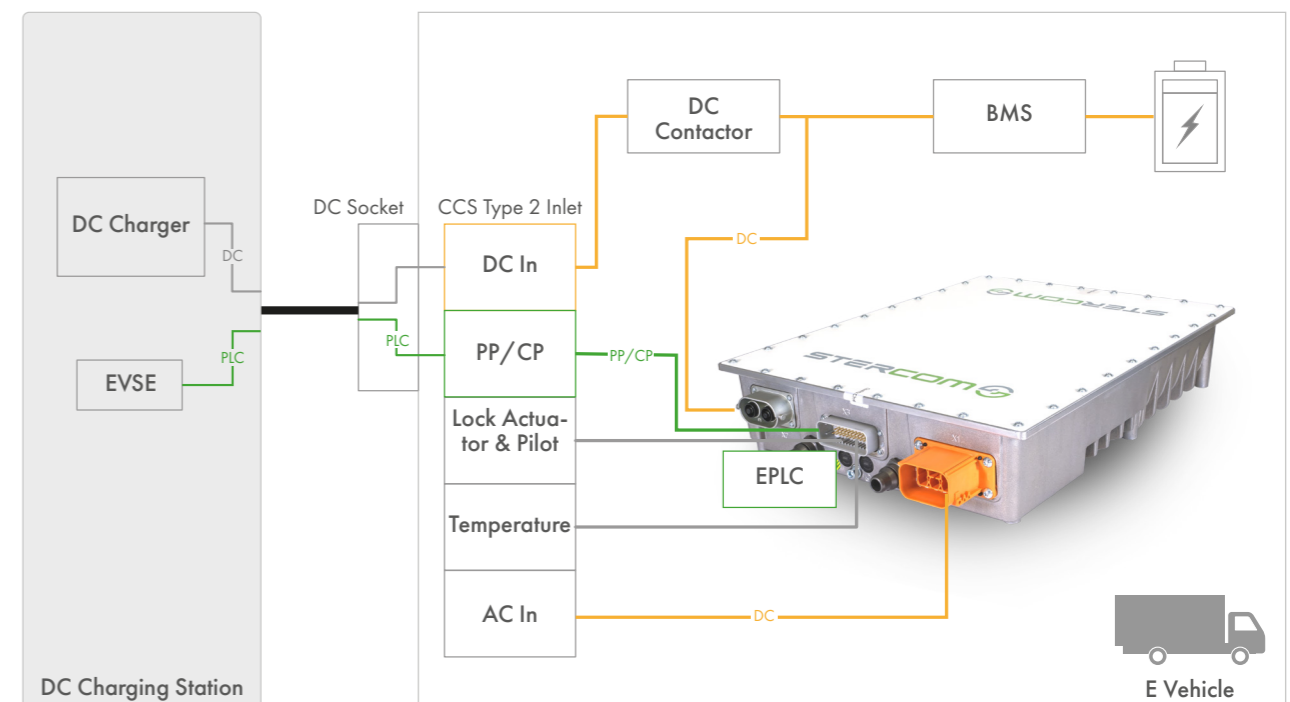
The Embedded Powerline Communication (EPLC) module is an integrated option to enable DC charging. This EPLC enables power line charge control communication of one or multiple OBCs via a CCS plug to the DC Charging station (EVSE).

## CLUSTER OPERATION

- In "Paired Operation" always two OBCs share one 63A AC inlet
- Cluster communication via an independent "CAN Bridge"
- Cluster configuration with 3-bit jumpers in the signal plug

## EPLC DC CHARGE CONTROLLER

- DC charging via CCS Type2 using the EPLC charge controller
- Fully integrated "Embedded PowerLine Communication"
- EPLC handles communication between the EV-BMS and the charging station
- Autonomous control of the vehicle's DC Actuators in DC charging mode
- ISO 15118 supports "plug and charge" as well as certification exchange
- OBC acts as a "gateway" between the DC charging station and the Battery Management System
- No further EVSE or EVCC module necessary in the vehicle
- OBC controls HV components (DC contactors) and BMS in direct DC charge mode
- DC charging according to DIN Spec 70121 and enhanced protocol according to DIN Iso 15118



## TECHNICAL DATA

AC input	Value	Units
Voltage range three-phase (phase – phase L1 → L2 → L3)	(EU) 346 – 440 (US) 190 - 504	Vrms
Voltage range single-phase (L1 – N)	(EU) 200 – 250 (US) 95-135	Vrms
Max. input current @ 3~ input ( per phase)	32	Arms
Max. input current @ 1~ input	32	Arms
Input frequency	45 – 65	Hz
Power factor (at three – phase)	> 99	%
Starting inrush current	< 50	A
Leakage Current @ 3~ input	< 3.5	mA

DC Output	OBC_22KW-450	OBC_22KW-800	OBC_22KW-850
Voltage range	200-450 V <sub>DC</sub>	420-800 V <sub>DC</sub>	550-850 V <sub>DC</sub>
Max Charging Current @ 3~ input	70 A	40 A	32 A
Max Charging Power @ 3~ input	22 kW	22 kW	22 kW
Max Charging Current @ 1~ input	32 A	32 A	32 A
Max Charging Power @ 1~ input	6.5 kW	6.5 kW	6.5 kW
Output Voltage ripple @ 3~ input	±2 %	±2 %	±2 %
Switch ON time	5 s	5 s	5 s
Output Voltage tolerance @ 3~ input	±1 %	±1 %	±1 %
Charging Mode	CCCV ---	CCCV ---	CCCV ---
Output current tolerance @ 3~ input	±5 %	±5 %	±5 %
Output current ripple @ 3~ input	±2 %	±2 %	±2 %

### Mechanical data/cooling

Housing	Aluminum	---
Weight	18	kg
Outline dimensions of Die Casted Enclosure	491.8 x 347.9 x 95.2	mm
Outline Dimensions of CNC Machined Enclosure	488.4 x 347.8 x 95.2	mm
IP protection	IP6k9k	---
Nom. liquid volume flow recommended	8	ltr/min
Min. liquid volume flow	6	ltr/min
Nom. liquid pressure drop (Tests done a Die Casting OBC Enclosure)	113	mbar@ 8 ltr/min see table below
Max. liquid pressure	2	bar
Cooling Liquid Specification	min. 50% water → max. 50% antifrogen	Example Gylsantin G48 Ready Mix
Liquid Temperature Range without power derating	-40 to +50	°C
DC Current derating start at	+50	°C
Protection of Over Liquid Temperature	+70	°C
Liquid Output Temperature rise	< 5	°C

Safety		
Isolation input/output	DIN EN 61851-1:2012-01	---
Functional safety	Quality Management Level	---
AC overvoltage protection	✓	---
AC undervoltage protection	✓	---
AC overcurrent protection	✓	---
Open circuit protection	✓	---
Output overcurrent protection	✓	---
Overtemperature	✓	---
Insulation resistance	>5	MΩ
+24 V /+ 12 V reverse polarity protect	✓	---
Communication failure protection	CAN timeout protection	---

Interfaces at X3	Description
2x CAN Communication Interface IN and OUT	Vehicle CAN-BUS: SAE J1939 Internal CAN-BUS: CAN2.0B (Service/Diagnostic CAN)
Type 2 / CCS Inlet interface	DIN EN 61851-1:2012-01, Type2 and CCS charging Paired operation mode with 63 A Type 2 inlet  Cluster Operation in Direct AC Mode
Embedded PLC Interface Optional	Communication according to DIN SPEC 70121:2012-08  Communication according to DIN ISO 15118 in preparation
Inlet Lock Mechanism Control	Digital Inputs and Outputs to control and monitor Inlet Lock mechanism switchable to 12V and 24V (by SW parameter)
Electronic Supply voltage	9-30 V @ 20 W max. power consumption
LED supply	3xOutput for 3 LED's (Green, Blue, RED) 5 V/5 mA
HVIL Loop	HVIL at control connector X3 Current capability up to max. 20mA Internal 22 Ohm resistor in series connected
DC Charge Inter-Connection	Control signals of DC Charge Relays(+/-) are ready for customer to be used. Furthermore, the Feed-back Interface Pins are also ready for customer to be used in DC Charging mode.



Standards	Description	Remark
DIN EN 61851-1:2012-01	Electric vehicle conductive charging system	EMI, isolation requirements
DIN EN 61851-21-1:2018-04	EMI requirements	
ECE R10 V6 20 November 2019	Uniform provisions concerning the approval of vehicles with regard to electromagnetic compatibility	Performed with single OBC, not applied for OBC $\geq 2$
IEC 62196-2	Type 2 AC inlet	
IEC 62196-3	CCS2 AC/DC inlet	
SAE J1939	Car vehicle CAN Bus standard	Optional
LV123	Electrical safety requirements	Optional
DIN SPEC 70121:2012-08	CCS DC charging	PLC communication, optional
DIN ISO 15118	CCS DC charging	Optional
IEC 60068-2-6: 2007-1	Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)	
IEC 60068-2-27: 2008-02	Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock	
IEC 60068-2-64: 2019-10	Environmental testing – Part 2-64: Tests – Test Fh: Vibration, broad-band random and guidance	
MBN LV 124-2: 2013-08	Electric and Electronic Components in Motor Vehicles up to 3,5t General Requirements, Test Conditions and Tests Part 2: Environmental Requirements	
ISO 16750-4: 2010-04-15	Road vehicles-Environmental conditions and testing for electrical and electronic equipment: Part 4: Climatic Loads	Test of the resistance to climatic and thermal stress, the functionality, the degree of protection according to the standards.

Stercom follows the policy of permanent product improvements. Therefore we reserve the right to make changes and improvements without prior notice.

Stercom Power Solutions GmbH

Ziegelstraße 1

D-83629 Weyarn

Tel.: +49 (0) 8020 33996 0

Fax: +49 (0) 8020 33996 99

Email: [info@stercom.de](mailto:info@stercom.de)

Website: [www.stercom.de](http://www.stercom.de)

