OPS „Onshore Power Supply“
SAMPS „Stemmann Alternative Maritime Power System“
Onshore Power Supply & Charging Systems

Various Solutions for...

- Container Vessels: Onshore Power Supply via Cable Reel Container System
- Cruise Liner: Onshore Power Supply via Cable Reel / Mobile Carrier System
- Electrical Ferries: Quick Charging Connection via Pantograph System
- Yachts: Special Applications via Cable Reel System
### Average Power Requirements

...for Various Type of Vessels

<table>
<thead>
<tr>
<th>Type of Vessel</th>
<th>Average Power Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Container Ship</td>
<td>up to 7 MW</td>
</tr>
<tr>
<td>Cruise Ship</td>
<td>up to 20 MW</td>
</tr>
<tr>
<td>Reefer</td>
<td>up to 8 MW</td>
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<tr>
<td>Ro-Ro</td>
<td>up to 8 MW</td>
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<tr>
<td>Tanker</td>
<td>up to 6 MW</td>
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<tr>
<td>Bulk general cargo ship</td>
<td>up to 4 MW</td>
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</tbody>
</table>
Onshore Power Supply for Cruise Liner

History of the "SAMP Hamburg Altona Project"

Terminal Situation

Ship’s hatch / Control Cabinet
Onshore Power Supply for Cruise Liner

Onshore Power Supply via Mobile Carrier Systems SAMPS Hamburg

- High tide, height difference hatch/quay: 3.5 m
- Low tide, height difference hatch/quay: 6.5 m
- Travel distance parallel to quay wall: 300 m
- Distance between ship and quay wall: 4 m
- Distance between SAMP-System and quay wall: approx. 2.5 m
- Distance between hatch and socket: approx. 3.5 m
- Hatch dimensions (h x w): 1.2 x 0.8 m
- Transmittable voltage: 12 MVA
Onshore Power Supply for Cruise Liner

Port Side / Cable Duct
Onshore Power Supply for Cruise Liner
Port Side / Cable Duct / Energy Chain
Onshore Power Supply for Cruise Liner

Control Panel
Onshore Power Supply for Cruise Liner

Transfer Vehicle / Cover Lifting Device with Cable Guideway
Onshore Power Supply for Cruise Liner

Solution with cable channel

- Vehicle can be driven by only one person
- Safe plug delivery by means of telescopic arm and plug carrier
- Safe from flooding up to 1.3 m above quay edge (IP 67)
- Tidal range compensation up to 9 m
- 20 MVA at 11 kV or 6.6 kV, 50/60 Hz
- Individually modifiable to each port situation
- ICE/ISO/IEEE80005-1
Onshore Power Supply for Cruise Liner

Vehicle in Action
Onshore Power Supply for Cruise Liner

Vehicle in Action
Onshore Power Supply for Cruise Liner

Telescopic Plug Holder System
Onshore Power Supply for Cruise Liner

Vehicle in Action
Onshore Power Supply for Cruise Liner

Story of the "SAMPS Shanghai Project"

Terminal Situation

Ship’s hatch / Control Cabinet
Onshore Power Supply for Cruise Liner

Story of the "SAMPS Shanghai Project"
Onshore Power Supply for Cruise Liner

Story of the "SAMPS Shanghai Project"
Onshore Power Supply for Cruise Liner

High Tide

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Diagram showing the onshore power supply for a cruise liner, with dimensions for various parts of the structure.
Onshore Power Supply for Cruise Liner

Normal Tide

Diagram showing the onshore power supply system for a cruise liner, with dimensions and labels indicating the ship, pier, and sea level.
Onshore Power Supply for Cruise Liner

Low Tide

Diagram showing the onshore power supply system for a cruise liner at low tide. The diagram includes measurements such as 2900, 1200, 6400, 2700, and 2700. The labels 'Ship', 'Sea level', and 'Pier' are also present.
In the port of Shanghai, at the cruise terminal Wusongkou, we have realized an onshore power supply system which is customized especially to the local conditions.

Our onshore power supply-vehicle is moved to the pier by a battery-operated drive and there it is coupled with our underfloor connection system. From this supply point on a flexible travel distance of up to 70 m is possible.

This system also has a tidal range compensation and can, corresponding to the requirements of the particular ship, supply different frequencies and voltages. In accordance with the standard our onshore power supply-vehicles offer pilot-/ground check- as well as cable tension monitoring.
Onshore Power Supply for Cruise Liner

Solution with cable reel

- Vehicle can be driven by only one person
- Safe plug delivery by means of articulated arm and plug carrier
- Battery operation for self-sustained travel movements
- Tidal range compensation up to 6 m
- 20 MVA at 11 kV or 6.6 kV, 50/60 Hz
- Individually modifiable to each port situation
- ICE/ISO/IEEE80005-1
Onshore Power Supply for Cruise Liner

Story of the "SAMPS Shanghai Project"
Onshore Power Supply for Cruise Liner

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Story of the "SAMPS Shanghai Project"
Onshore Power Supply for Cruise Liner

Story of the "SAMPS Shanghai Project"
This standard describes the data interface of shore and ship as well as step-by-step the procedures for the onshore power supply communication.

All arguments, which are written in italics in this standard, are signals of the telegrams. In the interface descriptions the address and data type are specified.
### High Voltage Shore Connection (HVSC)

Communication Interface Description for Various Type of Vessels

1. **POWER PLUG FACE (SHORE SIDE PLUG)**
2. **SOCKET OUTLET FACE (SHIP SIDE SOCKET)**
   - **E.** EARTH
   - **P1.** PILOT LINE 1 (USED FOR GROUND CHECK)
   - **L1.** PHASE A - PHASE R
   - **L2.** PHASE B - PHASE S
   - **L3.** PHASE C - PHASE T

1. **FAIL-SAFE LIMIT SWITCH**
Onshore Power Supply

Customized to the local conditions

Gear your port up for the future by using our individual Onshore Power Supply Systems
Stemmann CMS complies with the standard IEC/IEEE/ISO 80005-3 by the following point:

- Establishing of „equipotential bonding“ between ship and shore
- IP rating 55 and heating in the housing to avoid moisture and condensation
- Emergency stop for cable reel and power connection
- Suitable for all voltages and frequencies
- Complies with annexes B and D (Offshore supply-, service-, working ships, tankers; every application where the cable management system is installed on shore)
- Cable length will be surveyed
- Cable tension will be observed by survey of cable length
- The cable reel is fully moveable and can be placed everywhere. So there is no interference with other quay side operations
- Suitable for all tidal ranges and all load conditions of the vessel
- Cable can be stored on the cable reel if the system is not in operation
- Plugs are according to standard
- Cables are according to standard
- With 3 cables the reel is suitable for the following combinations of power and voltage according to standard: 690V with 1000kVA, 440V with 750kVA, 400V with 500kVA
Compatibility of cable reel with IEC/IEEE/ISO 80005-3

IEC/ISO/IEEE 80005-3

The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees.

The purpose of IEC/IEEE 80005-3 is to define requirements that allow compliant ship to connect to compliant low-voltage shore power supplies through standardized shore to ship connections accessories.

To comply with the standard will the cable reel approved by a third party – DNV-GL
Onshore Power Supply for Container Vessels

Onshore Power Supply via Cable Reel Container Systems

Onboard System
The feed of the onshore power supply for container vessels is realized for example by the installation of a 40 ft. HC-container in the bottom storage row.

The system consists of a spiral cable reel with slip ring assembly and fibre optic rotary connector incl. the drives for the reel and the extension system of the roller conveyer.
### Onshore Power Supply for Container Vessels

#### Container System Advantages

<table>
<thead>
<tr>
<th>Advantage</th>
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<tbody>
<tr>
<td>HC-container installation in the bottom storage row requires no special housing installation on board.</td>
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<tr>
<td>Installation/cable pay-off on port- or starboard side possible.</td>
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<tr>
<td>Constant tension on cable by torque motor.</td>
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<tr>
<td>Excess tension-coupling for protection from damage to the mechanical parts.</td>
</tr>
<tr>
<td>The operation is effected by means of a radio remote control.</td>
</tr>
<tr>
<td>Decades of experience in the construction and manufacturing of cable reels.</td>
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</table>
Onshore Power Supply for Container Vessels

Onshore Power Supply via Mobile Socket Systems

Onshore System
Onshore Power Supply for Container Vessels

Onshore Power Supply via Cable Reel / Mobile Socket System

Onshore System

Combination of HC-container installation on board and mobile socket installation onshore.

Flexible mounting heights depending on the local conditions.

Flexible traveling lengths depending on the local conditions.
Our Location

Head Office · Production Area · Testing Range
Founded: 1912 in Luxembourg
since 1950 in Schüttorf · Germany

Legal form: Limited Liability Company [GmbH]
Owner: Wabtec Corporation since 2014

Employees: about 480 [Schüttorf · Germany]
about 110 [France · Netherlands · Poland]

Areal: 56.000 m²
Workshop: 15.000 m²
Office: 2.700 m²
INDUSTRY PRODUCTS

Quality Made in Germany

Cable Reels
Cable Festoon Systems
Slip Ring Assemblies
Conductor Lines
Thank you for your attention.