

Godkjent av		Ansvarlig	Lars Tore Sjøstad
Dato		Versjon	1

This user guide applies to Plug's shore power facilities in Larsneset, Harstad.

Content of the Procedure

- 1. General procedure for connecting and disconnecting ships in accordance with IEC 80005-3.**
- 2. Larsneset LV Shore Power Facility.**
- 3. User guide of Zinus cable management system, ZPP115.**
- 4. How to start the PowerCon shore power system.**
- 5. Contact information for errors or questions**

Godkjent av		Ansvarlig	Lars Tore Sjøstad
Dato		Versjon	1

1. General procedure for connecting and disconnecting ships in accordance with IEC 80005-3

Use of Plug's shore power systems is required to follow the IEC-standard IEC 80005-3 as shown in the picture below.

General operating procedures

A low voltage shore connection system operation, on shore and on board, shall include procedures shown in Figure F.1.

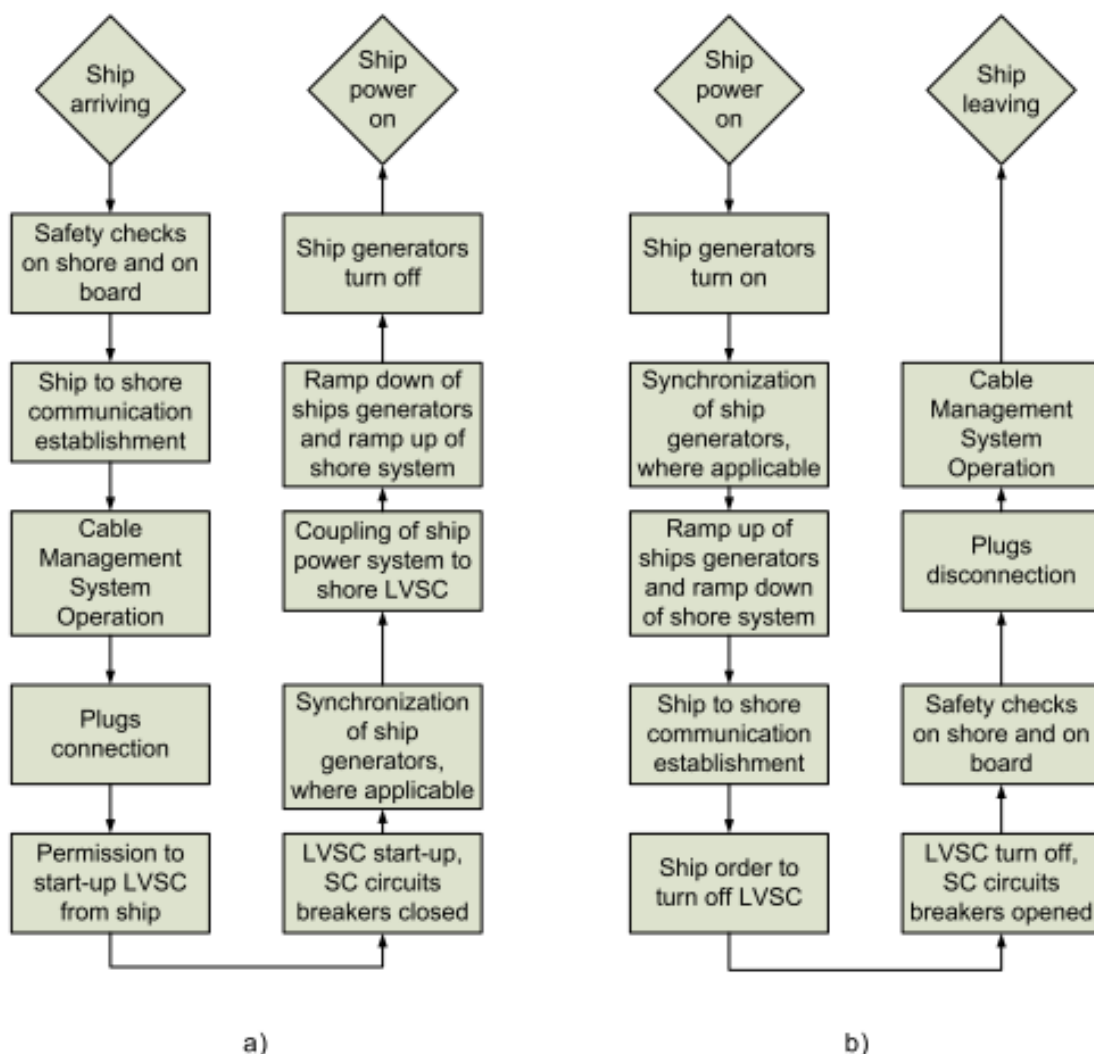


Figure F.1 – LVSC general operating procedures for connection a) and disconnection b)

	Connecting Shore Power Larsneset	Side 3 av 12
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Godkjent av		Ansvarlig	Lars Tore Sjøstad
Dato		Versjon	1

2. Larsneset LV Shore Power Facility

The Larsneset shore power installation consists of one quay-mounted shore cabinet with four low-voltage outlets. Two Zinus ZPP115 Cable Management Systems (CMS), each equipped with two cable modules, are available for use at the facility. Together, the CMS units enable the system to supply one vessel with up to four cables, or two vessels simultaneously with two cables each

Power Capacity

- ☐ Each plug can deliver up to **350A**
- ☐ Supported voltage range: **400V, 440V & 690V,**
- ☐ **CCW/CW**
- ☐ **50Hz / 60 Hz**

Godkjent av		Ansvarlig	Lars Tore Sjøstad
Dato		Versjon	1

2. User guide for Zinus cable management system (CMS), ZPP115

Activation of the control panel

A **key switch** activates the system.

When turned to **ON**, the CMS becomes fully operational.

When set to **OFF**, no control buttons are functional. However, all **safety systems** and **signal lamps** remain active.

When switching from **OFF** → **ON**, the system performs an **indicator lamp test**, cycling through **GREEN**, **YELLOW** and **RED** for approximately **8 seconds**.

The CMS is fully operational during this test.



Emergency stop (EMS).

- ☐ Pressing the Emergency Stop (EMS) immediately stops all cable operations.
- ☐ When EMS is activated, all signal lamps flash RED continuously until the button is released.



Godkjent av		Ansvarlig	Lars Tore Sjøstad
Dato		Versjon	1

External signal status

WARNING

Automatically activated when less than **5 meters** of cable remaining on the CMS.
(Indicated with yellow blinking light).

ALARM

Activated under one or more of the following conditions:

- ☐ Cable tension exceeds safe limits
- ☐ Only 3 meters of cable remain on the drum
- ☐ The emergency stop has been triggered

Safety functions

Emergency Stop (EMS)

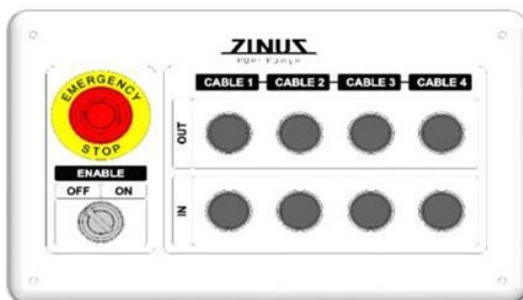
If activated:

- ☐ All manual and automatic functions are disabled
- ☐ All indicator lamps flash RED
- ☐ Further payout is blocked unless the drum brake is manually overridden
(service personnel only)

Godkjent av		Ansvarlig	Lars Tore Sjøstad
Dato		Versjon	1

Manual Cable Operations

The operator can manually control each cable drum using the front panel.



Cable Payout (OUT)

1. Turn the key switch to ON.
 2. Press and hold the OUT button for the desired cable for at least 5 seconds.
 3. When the indicator lamp flashes GREEN, the cable is ready for payout.
 4. The drum will begin feeding cable out automatically when a constant pulling force is applied.
- ☐ Pulling force above the upper limit → drum speed increases
 - ☐ Pulling force below the lower limit → drum slows down or stops

Important:

- ☐ Only pull out the amount of cable required for a safe connection.
- ☐ Never allow the drum to run empty.

Multiple cables may be spooled out at the same time.

⚠ Important: Remember to turn the key switch back to OFF before initiating shore power supply. The CMS will not be able to deliver power while the switch is in the ON position.

Godkjent av		Ansvarlig	Lars Tore Sjøstad
Dato		Versjon	1

Cable Retrieval (IN)

1. Ensure the key switch is in ON position.
2. Press and hold the IN button for the selected cable.
 - ☐ All cables may be retrieved simultaneously if needed.
 - ☐ **Speed reduces as the cable approaches the inner end position.**

Overload Protection During Cable Retrieval

- ☐ If cable tension exceeds the maximum pulling force (>100 kg), the drum motor stops and the RED overload indicator flashes.
- ☐ Releasing the IN button allows the cable to automatically move out of the overload condition.
- ☐ A load cell continuously monitors cable tension.

When tension exceeds the setpoint, the drum brake is released to prevent damage.
- ☐ If the drum becomes completely emptied, a dedicated emergency release system disconnects the cable to prevent the CMS from being pulled out of position.

Cable Length Monitoring

- ☐ The PLC monitors drum rotation and continuously calculates the amount of cable deployed.
- ☐ The **inner position** is registered by a mechanical stopper, which resets the counter to ensure correct reference.
- ☐ If the cable reaches maximum permissible payout, the CMS automatically stops further deployment (manual or automatic).
- ☐ If the rotation sensor fails, a **backup break-loop system** stops further payout and de-energizes the drive system.

Godkjent av		Ansvarlig	Lars Tore Sjøstad
Dato		Versjon	1

Description of Warning Lights

Each cable module has a warning light on the front that changes color depending on various detections, such as ready status, hazard, and alarm. Below is a description of the colors and corresponding actions:

Color	Indication	Description
Green	Steady light	Cable in the inner position
Green	Blinking	Cable is ready for unreeling
Yellow	Steady light	System is set to “service mode” (for service personnel only)
Yellow	Blinking	Warning: Limited cable remaining on the drum (reduced speed) Cable approaching the inner position (reduced speed)
Red	Steady light	Emergency stop activated
Red	Blinking	Alarm: Out of cable Excessive cable tension System set to “Override Mode” (for service personnel only)

Godkjent av		Ansvarlig	Lars Tore Sjøstad
Dato		Versjon	1

3. Starting the PowerCon Shore Power System



Login

Login

The Shore-side cabinet is equipped with an HMI touch panel, used for operating the shore power system.

For username and password, contact the Harbor master's office.

3.2 HMI Configuration

Before starting the OPS system, the vessel must configure the following parameters on the HMI:

Load 1: Off
Free

Load 2: Off
Free

Vessel name

IMO number

Start

Stop

Voltage
Select

Frequency
Select

Power outlets

☐ 1
☐ 2
☐ 3
☐ 4

Ground supervision
Enabled

Clear

Phase order
Select

Synchronisation method
Select

Droop voltage
+ 0.0 % -

Droop frequency
+ 0.0 % -

Voltage adjust
+ 0.0 % -

Godkjent av		Ansvarlig	Lars Tore Sjøstad
Dato		Versjon	1

- ☐ Voltage selection
- ☐ Frequency selection
- ☐ Phase sequence
- ☐ Number of outlets used
- ☐ Synchronization method (A1 recommended)
- ☐ Load selection corresponding to the cabinet in use

Normally, ground fault monitoring is set to **disabled** if the ship has its own ground fault monitoring. Failure to do so may result in blackouts.

The standard synchronization method is **A1**, where the ship synchronizes with the land-based system.

Screen for Starting Power Supply to the Ship

Start

Stop

Clear

Power outlets

	V	A	Hz	kW	Pilot
1	0	0	0	0	✓ / ✓
2	0	0	0	0	✓ / ✓

Loads

Vessel	State	kW	kWh
1 Test	Off	0	0

Once all selections have been entered and the start button lights green, the system is ready to start.

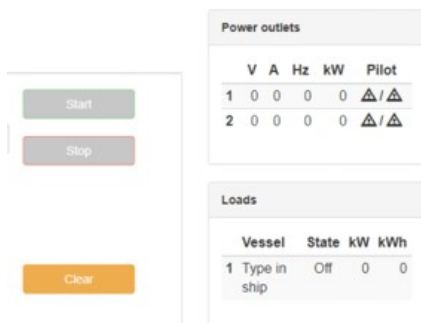
Note: Check for voltage on pilot circuits

If the start button does not light green, there are typically two reasons for this:

1. A fault in the pilot circuit, which will display a triangle on the screen. The first triangle indicates a fault on the land side, while the second triangle indicates a

Godkjent av		Ansvarlig	Lars Tore Sjøstad
Dato		Versjon	1

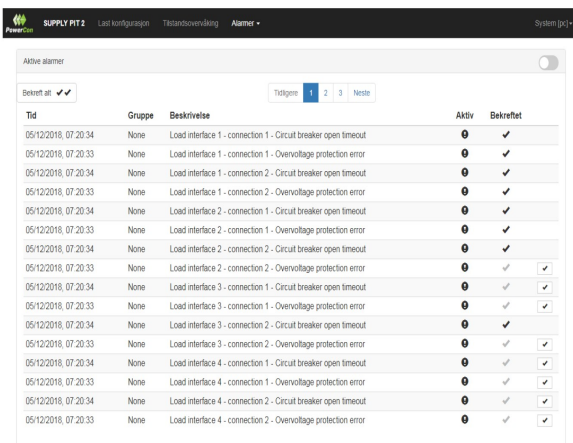
fault on the ship side. The illustration below shows faults on both sides for demonstration purposes.



- Active alarms in the system. These must be deactivated before starting the system.



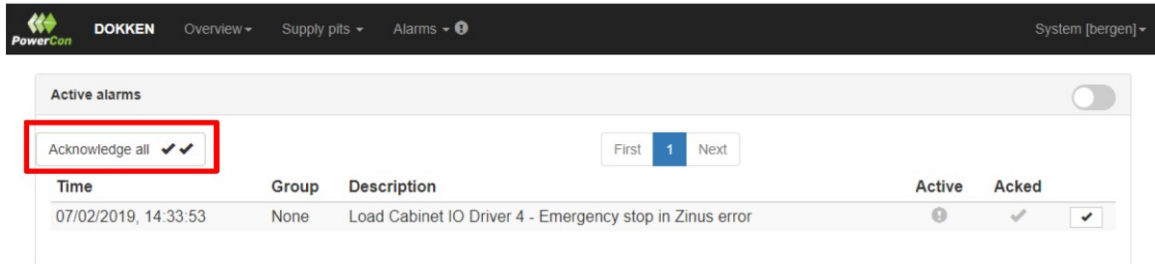
Screen for Displaying Active Alarms



Tid	Gruppe	Beskrivelse	Aktiv	Bekreftet
05/12/2018, 07:20:34	None	Load interface 1 - connection 1 - Circuit breaker open timeout	0	✓
05/12/2018, 07:20:33	None	Load interface 1 - connection 1 - Overvoltage protection error	0	✓
05/12/2018, 07:20:34	None	Load interface 1 - connection 2 - Circuit breaker open timeout	0	✓
05/12/2018, 07:20:33	None	Load interface 1 - connection 2 - Overvoltage protection error	0	✓
05/12/2018, 07:20:34	None	Load interface 2 - connection 1 - Circuit breaker open timeout	0	✓
05/12/2018, 07:20:33	None	Load interface 2 - connection 1 - Overvoltage protection error	0	✓
05/12/2018, 07:20:34	None	Load interface 2 - connection 2 - Circuit breaker open timeout	0	✓
05/12/2018, 07:20:33	None	Load interface 2 - connection 2 - Overvoltage protection error	0	✓
05/12/2018, 07:20:34	None	Load interface 3 - connection 1 - Circuit breaker open timeout	0	✓
05/12/2018, 07:20:33	None	Load interface 3 - connection 1 - Overvoltage protection error	0	✓
05/12/2018, 07:20:34	None	Load interface 3 - connection 2 - Circuit breaker open timeout	0	✓
05/12/2018, 07:20:33	None	Load interface 3 - connection 2 - Overvoltage protection error	0	✓
05/12/2018, 07:20:34	None	Load interface 4 - connection 1 - Circuit breaker open timeout	0	✓
05/12/2018, 07:20:33	None	Load interface 4 - connection 1 - Overvoltage protection error	0	✓
05/12/2018, 07:20:34	None	Load interface 4 - connection 2 - Circuit breaker open timeout	0	✓
05/12/2018, 07:20:33	None	Load interface 4 - connection 2 - Overvoltage protection error	0	✓

If the system has active alarms, they must be deactivated before the system can be started.

Godkjent av		Ansvarlig	Lars Tore Sjøstad
Dato		Versjon	1



PowerCon DOKKEN Overview Supply pits Alarms System [bergen]

Active alarms

Acknowledge all ✓✓

First 1 Next

Time	Group	Description	Active	Acked
07/02/2019, 14:33:53	None	Load Cabinet IO Driver 4 - Emergency stop in Zinus error	ⓘ	✓ ✓

If the alarm does not disappear, it is still active. Contact authorized personnel to clear the alarm.

4. Contact Information for Issues or Questions

For system issues, report to:

Harbor Masters Office Harstad: +47 770 01 212

Plug Operations: +47 475 14 999

Email: Operations@Plugport.no