

CageSense® NetClean GPS Installation Guide to FNC8



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1. Introduction

Chapter 2 describes the installation to be completed by Sperre (FNC8 manufacturer) before the unit is shipped to the customer.

Chapter 3 describes the installation to be completed on the service vessel (net cleaning boat)

Chapter 4 is the checklist which is to be filled out for each installation.

In case of needed support, this checklist needs to be sent forward to Sperre support and/or Water Linked support.

Support information for Sperre:

Phone: +47 350 25 000

Support information for Water Linked:

support@waterlinked.com

www.waterlinked.com

2. Rack and Locator installation

2.1. Introduction

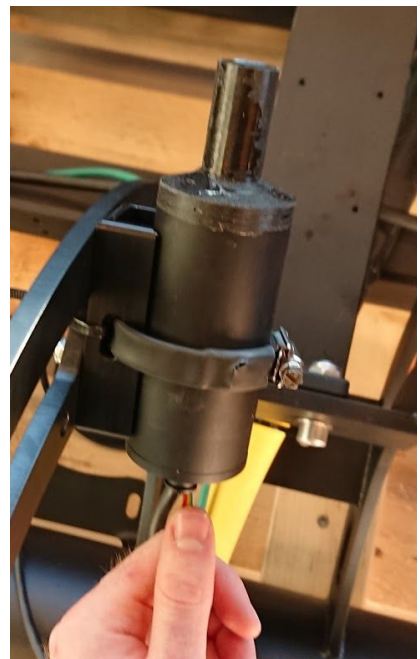
This document describes how to install the Water Linked Locator-P2 on the Sperre FNC8 2.0 and Rack topside on the vessel. See [W-TN-20011-3_NetClean_GUI_Guide.pdf](#) for info on using the GUI.



2.2. Installing Locator-P2 to FNC8 frame

Fasten the mounting bracket for the P2 on top part of the curved bracket at the back of the FNC8. Use one screw, washer and nut in the mounting hole and one cable tie to secure the bracket to the frame.

Then fasten the Locator-P2 to the bracket using one hose clamp. The Locator should be pointing outwards as shown in the image below.



The cable is fastened to the frame with cable ties at multiple points and the connector is connected to port 13 on the FNC8 electronics flask.

2.3. Upgrade Underwater GPS Rack

The Underwater GPS Rack needs to be running version 3.2.0 or later of the Underwater GPS software.

Verify software version running by:

- Make sure PC used for upgrading is configured with a static IP on 192.168.194.xx subnet
- Opening <http://192.168.194.94> and go to about
 - (curl <http://192.168.194.94/api/v1/about>)

Upgrade process (if needed):

An offline software upgrade package can be downloaded from <https://update.waterlinked.com/>. Enter the chipID of the Underwater GPS found on the About page in the GUI.

Upgrade process

- Download offline software upgrade package (.wlup)
- Make sure PC used for upgrading is on 192.168.194.xx subnet
- Connect pc to Underwater GPS Rack via eth cable.
- Power on the Underwater GPS Rack
- Go to <http://192.168.194.94:9000>
- Upload offline software package (.wlup)
- System reboots automatically once done
- Go to <http://192.168.194.94>
- Force a refresh of the browser by clicking Ctrl-F5
- Verify the new software version installed.

2.4. Run setup/installation

The script below sets up the receivers, search range, generic configuration and IP address.

Set up receivers

```
curl -X PUT "http://192.168.194.94/api/v1/config/receivers/0" -H "Content-Type: application/json" -d '{"id": 0, "x": -5, "y": -1.5, "z": 3}'
curl -X PUT "http://192.168.194.94/api/v1/config/receivers/1" -H "Content-Type: application/json" -d '{"id": 1, "x": -5, "y": -0.5, "z": 3}'
curl -X PUT "http://192.168.194.94/api/v1/config/receivers/2" -H "Content-Type: application/json" -d '{"id": 2, "x": -5, "y": 0.5, "z": 3}'
curl -X PUT "http://192.168.194.94/api/v1/config/receivers/3" -H "Content-Type: application/json" -d '{"id": 3, "x": -5, "y": 1.5, "z": 3}'
```

Set main configuration

```
curl -X PUT "http://192.168.194.94/api/v1/config/generic" -H "accept: application/vnd.waterlinked.operation_response+json" -H "Content-Type: application/json" -d '{"antenna_enabled": false, "channel": 5017, "compass": "static", "environment":
```

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```
\\"openwater\\", \\"external_pps_enabled\\": true, \\"gps\\": \\"static\\", \\"imu_vehicle_enabled\\": false,
\\"locator_type\\": \\"p2\\", \\"range_max_x\\": 50, \\"range_max_y\\": 50, \\"range_max_z\\": 50,
\\"range_min_x\\": -50, \\"range_min_y\\": -50, \\"search_direction\\": 0, \\"search_radius\\": 100,
\\"search_sector\\": 180, \\"speed_of_sound\\": 1475, \\"static_lat\\": 63.422, \\"static_lon\\": 10.424,
\\"static_orientation\\": 0}"
```

Set correct IP address

```
curl -X PUT "http://192.168.194.94/api/v1/config/ip" -H "Content-Type: application/json" -d "{
\\"address\\": \\"172.16.1.94\\", \\"dns\\": \\"172.16.1.1\\", \\"gateway\\": \\"172.16.1.1\\", \\"prefix\\": 24}"
```

After a power cycle, the new IP address will be used.

2.5. Installing UGPS Rack in the FNC8 cabinet

The UGPS Rack is to be mounted one space above the switch.

Mount the rack using 4 standard rack screws with washers.

Connect the power cable to the rack and make sure to tighten the screw to prevent the connector to come loose.

Connect the power brick to the power strip at the back of the cabinet.

Next plug the ethernet cable to the back of the rack and plug the other end to the ROV Net section of the switch.

Change settings on switch to support 100Mbit and not 1Gbit. (Contact Sperre for detailed instructions)

Power on the rack using the power button in the front.

Open a web browser on the FNC computer and go to <http://172.16.1.94> and verify that the Water Linked GUI shows up.

2.6. Installing FNC8 GUI on main computer/video logger

Downloading the latest FNC8 GUI from https://waterlinked.com/netclean_download/, site password: Waterlinked. Unzip the FNC GUI executable file (wcagecleaner.exe) and place it at `c:\Waterlinked`. Use NSSM and install it as a service that starts automatically.

Install service using NSSM:

start->cmd, right click, run as administrator

```
cd c:\tools\servicemanager
```

Install WL FNC GUI Service

```
nssm install WLCageCleaner c:\waterlinked\wcagecleaner.exe
```

Only running: "nssm install" will bring up a GUI for more detailed install if required

Show status of service

```
sc query wlcagecleaner
```

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Test that the GUI is working correctly by opening it in a web browser. The url is <http://127.0.0.1:8080>.

2.7. Verify web socket services

start->cmd, right click, run as administrator

Verify that FNC websocket services are running

```
net start|find "FNC"
```

Result should list:

```
FNClive [WS Port 8000]  
(FNClog)  
(FNCnemo)  
FNCrpy [WS Port 8001]
```

Start non-running services

```
net start FNCrpy  
net start FNClive
```

Install missing FNC Services:

```
cd c:\tools\servicemanager  
nssm install FNCrpy c:\tools\websocketd\fnrpy.cmd nssm install FNClive  
c:\tools\websocketd\fnclive.cmd
```

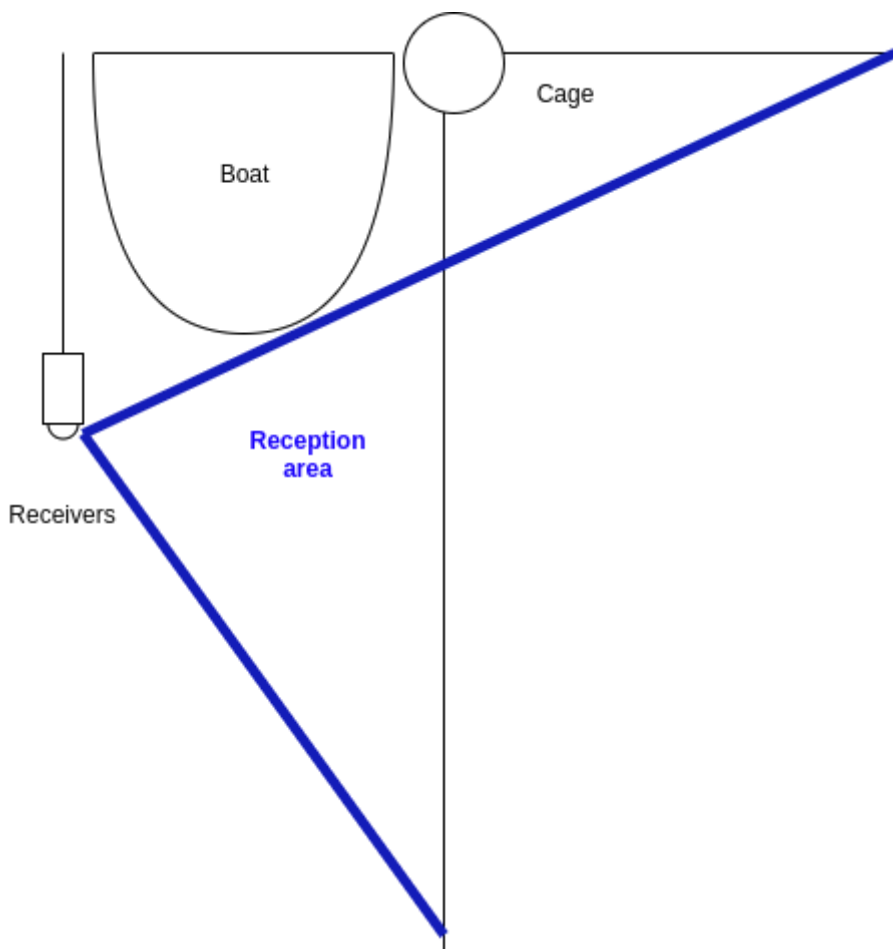
3. Installation on boat

3.1. Mount Rod Antenna/ Receivers

The Rod Antenna needs to be mounted leveled and below the keel of the boat for optimal performance of the system. Best placement is the opposite side which is used to dock the boat to the fish cage. Take a note of the depth of the Receivers on the Rod Antenna as this needs to be configured in the GUI.

Note:

Be aware of blind zone (4-5 m splashing zone) close to the boat. This is due to the missing line of sight between Locator and Rod antenna.



3.2. Mount GPS

The Garmin GPS needs to be mounted as high on the vessel as possible and with an unobstructed view of the sky. Use the M4 magnets to magnetically secure the GPS to the boat (magnetic surfaces only). Alternatively use M4 screws or double-sided tape to secure the GPS.

The Garmin GPS cable can be extended using a Cat5e RJ45 coupler and a Cat5e networking cable.

Now all of the outside mounting is done and the next step is to check that the configuration of the system is correct.

3.3. Settings configuration verification

Let's verify the preset settings applied in chapter 2 are correctly set (default setting by Sperre).

Start the Water Linked system using the power button on the rack. Go to <http://172.16.1.94> in the web browser to open the Water Linked GUI. Next navigate to the settings page. Here you need to **verify** that the correct Locator is selected and channel. Should be Locator-P2 and channel 4.

Locator setup

Locator type ?

Locator-D1 Locator-A1 Locator-U1 Locator-S2 **Locator-P2**

External input needed

The Locator you have selected does not provide depth measurements, so you will need to provide depth data to the system in order for the positioning to work correctly. External depth data will need to be provided via the HTTP interface described in [Swagger / Open API Specification \(OAS\)](#)

Channel ?

1 2 3 **4** 5 6 7

Speed of sound ?

1475 m/s Custom

Next verify that GPS is set to static and that IMU is static as well.

? Top-side setup

GPS ?

On-board **Static** External

63.442877 Latitude

10.428286 Longitude

? Compass ?

On-board **Static** External

0 Degrees

3.4. Search range and receiver configuration

Next navigate to the receivers page. Verify that the search range is set to the maximum size of 100M.

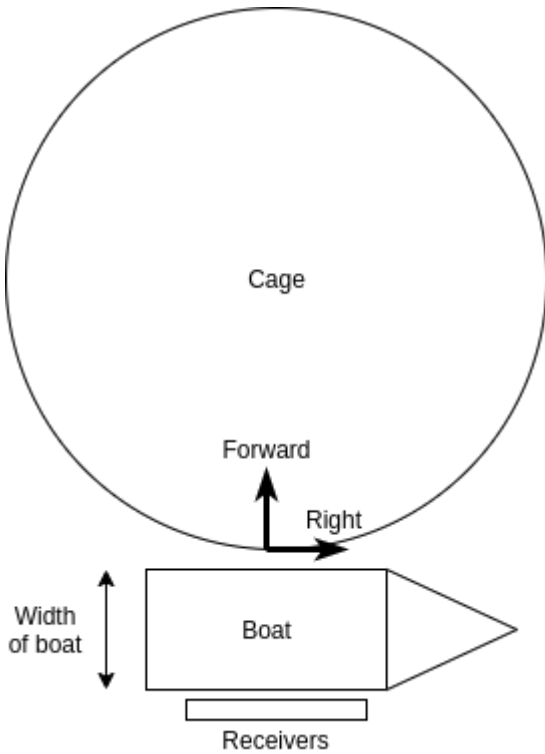
Search range

? Direction	0.0	(Degrees)
▼ Sector	180.0	(Degrees)
↔ Radius	100.0	(meters)

Next configure the receivers correctly for the given vessel:

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The origin (zero point) of all axes are placed at the edge of the cage where the boat docks to the cage, this means that the receivers are placed “backwards” by the width of the vessel. The accuracy of the width of the vessel is less important (this will just give a static offset on the forward axis). Depth being the previously noted depth of the rod antenna needed to get below the keel of the boat. Ref image in section 2.1.



Example where the Receivers are placed 1.0m apart:

	Receiver 1	Receiver 2	Receiver 3	Receiver 4
Backward	Width of vessel	Width of vessel	Width of vessel	Width of vessel
Left/Right	1.5 Left	0.5 Left	0.5 Right	1.5 Right
Depth	Depth of rig	Depth of rig	Depth of rig	Depth of rig

Ignore the messages saying that the receivers are placed too close to each other.

Press the “Apply” button when done.

Control that there are no error messages at the top right corner of the GUI.

Example for a 5 meters wide vessel with receiver rig at 3 meters depth:

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Receiver 1			Receiver 2			Receiver 3			Receiver 4		
↓ Backward	5.0	(meters)	↓ Backward	5.0	(meters)	↓ Backward	5.0	(meters)	↓ Backward	5.0	(meters)
← Left	-1.5	(meters)	← Left	-0.5	(meters)	→ Right	0.5	(meters)	→ Right	1.5	(meters)
↓ Depth	3.0	(meters)	↓ Depth	3.0	(meters)	↓ Depth	3.0	(meters)	↓ Depth	3.0	(meters)

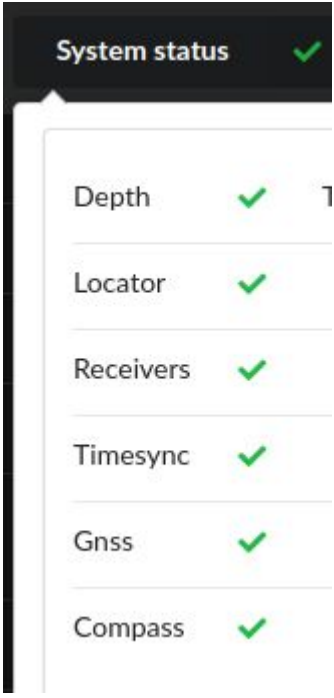
4. Installation checklist

Checklist to be filled out and signed each time a CageSense NetClean system is installed on a boat.

Unit	Name/Serial number	Initials
Vessel		
FNC8		
Underwater GPS rack		

	Pre-Installation	Date	Initials
1	Install Locator P2 and verified Green LED on power on		
2	Water Linked Underwater GPS Rack is running latest release		
3	Settings applied to Water Linked Underwater GPS Rack		
4	Water Linked Underwater GPS Rack mounted and connected in Sperre rack		
5	Switch correctly set up for Water Linked Underwater GPS Rack		
6	Verified Underwater GPS GUI visible on Sperre PC (http://172.16.1.94)		
7	4 receivers connected to Water Linked Underwater GPS Rack and verified on errors with missing receivers		
8	Verify Water Linked CageSense NetClean GUI is running using NSSM		
9	Reboot Sperre PC and Water Linked rack		
10	Verify Water Linked CageSense NetClean GUI is running and has no warnings		

	On site/ on vessel installation		
	If installation on existing FNC8 1.0 (Serial number <50): Verify bulkhead for Locator-P2 is installed		
11	Rod Antenna installed on boat and connected to Water Linked Underwater GPS Rack		
12	Garmin GPS installed and connected to Water Linked Underwater GPS Rack		
13	Settings and search range is set correctly in Water Linked Underwater GPS GUI		
14	Receiver settings are set correctly in Water Linked Underwater GPS GUI		
15	<p>Verify the following warnings are not present in Water Linked Underwater GPS GUI:</p> <ul style="list-style-type: none"> - "No PPS is received on GPS header." (from Garmin GPS) - "Receiver 1-4 not detected. Please verify connection." (from Rod antenna) <p>Expected warnings to be present:</p> <ul style="list-style-type: none"> - "External depth not received" - "Acoustic signal from Locator not detected" 		
16	<p>Power on FNC8. Verify green LED on Locator-P2 Verify following warning is not present in Water Linked Underwater GPS GUI:</p> <ul style="list-style-type: none"> - "External depth not received" <p>Expected warnings to be present:</p> <ul style="list-style-type: none"> - "Acoustic signal from Locator not detected" 		
17	<p>Lower Rod antenna (4 off receivers) to predetermined depth</p> <p>NOTE: Be aware of blind zone (4-5 m splashing zone) close to the boat. This is due to the missing line of sight between Locator and Rod antenna. PS: This is unrelated to the high pressure pump system.</p> <p>Do not start the washing yet.</p> <p>Lower FNC8 into water at a depth of at least 2 meter below the boat keel/hull to <i>avoid the blind zone</i>.</p>		

	<p>Verify signal from Locator is ok by checking that the “system status” is “ok” in Water Linked Underwater GPS GUI</p> 		
18	<p>Verify Water Linked CageSense NetClean GPS GUI is running and has no warnings: http://127.0.0.1:8080.</p>		
19	<p>Start an operation according to W-TN-20011-3 NetClean GUI Guide</p> <p>Verify:</p> <ul style="list-style-type: none"> - Fly the FNC8 away from the blind zone (next to the boat) - Starting High pressure pump system (HPPS) will color tiles in the NetClean GUI - Stopping HPPS will stop coloring tiles in the NetClean GUI 		

Sign

5. Troubleshooting

See troubleshooting chapter of the **W-TN-20011-3 NetClean GUI Guide**

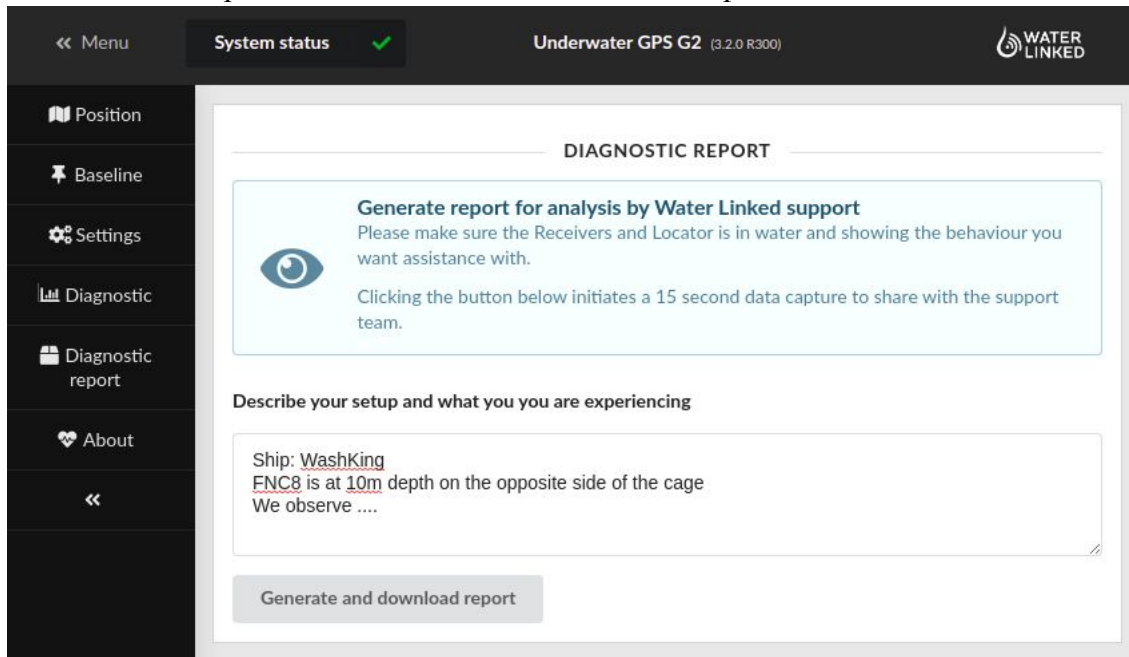
Contacting support

Before contacting support, please perform the following actions:

- Go through troubleshooting guide above
- Generate a diagnostic report:
 - Lower the FNC8 into water and fly to a position outside of the “blind spot”
 - Click on “diagnostic view in lower left corner” then “Diagnostic report” of the FNC8 GUI (or go directly to <http://172.16.1.94/#/collect>)



- Describe the setup and click “Generate and download report”



- Attach this report when contacting support

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