MANTA Float Installation & Removal

MK1.0

Summary

S.Etherington | 05/06/2024 | MK1.0

Overview

This deployment procedure relates to the installation and removal of MANTA's float.

Version

MK1.0 05/06/24	Initial release of procedure.

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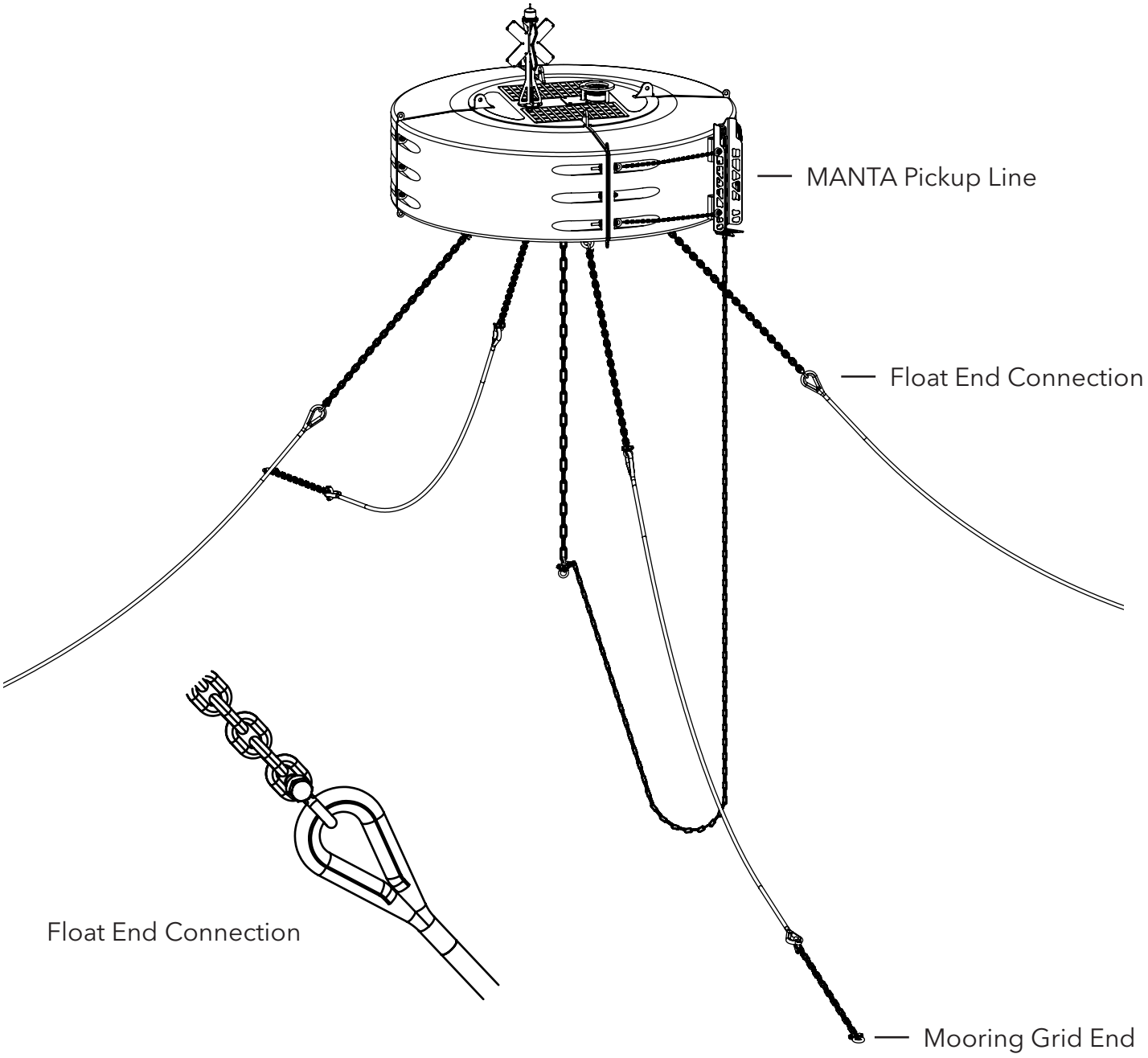
Float & Bridle Assembly Detail

S.Etherington | 05/06/2024 | MK1.0

Shown below is the deployment assembly of the MANTA float and the bridle lines. For the purposes of this document, the bridle line attachment to the grids mooring plates is not shown. After the completion of the float insallation procedure, the deployed assembly should look like the following.



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Float Detail

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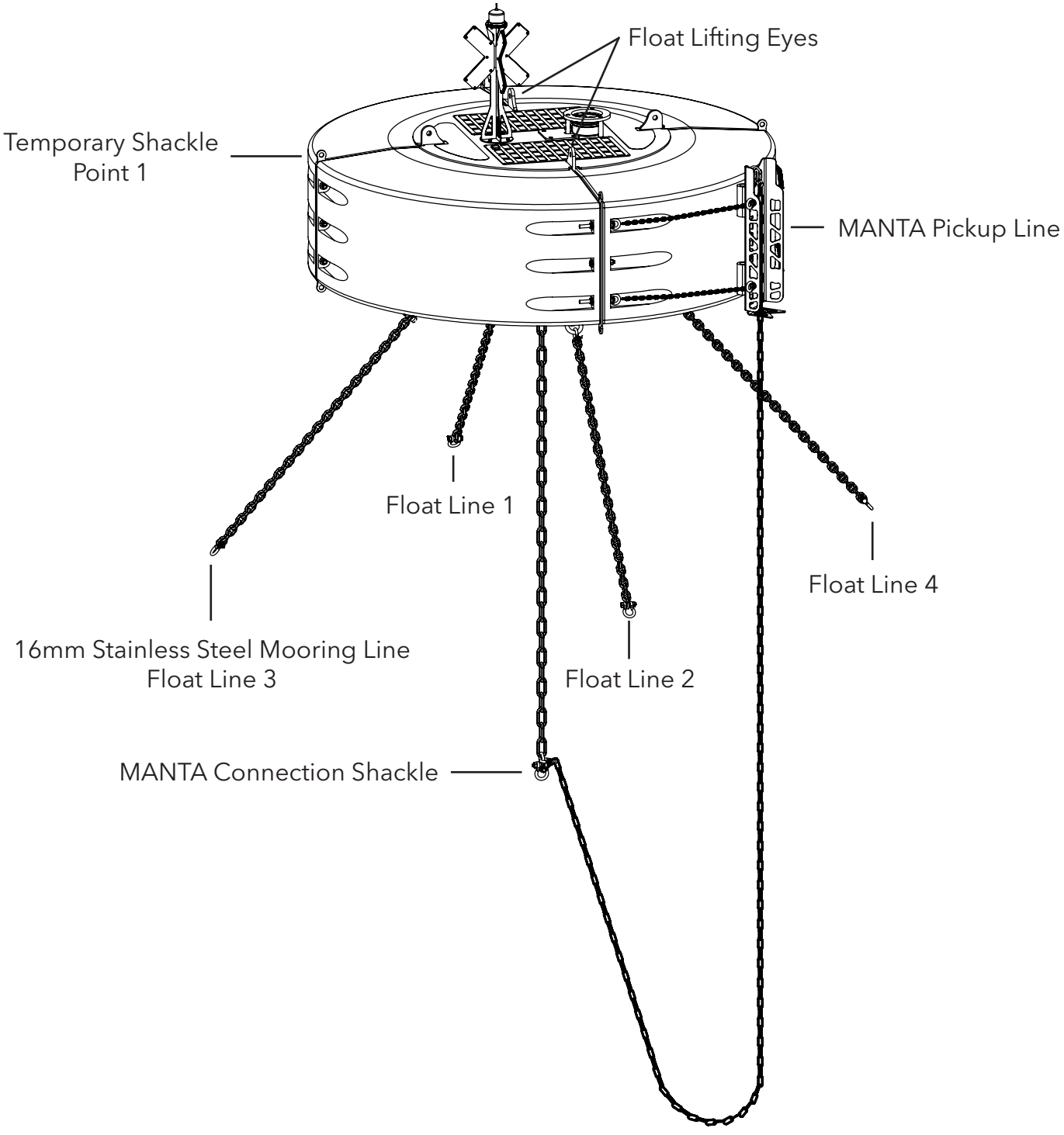
Shown below is the float assembly. The float assembly will be deployed to the site as shown.



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Bridle Line Detail

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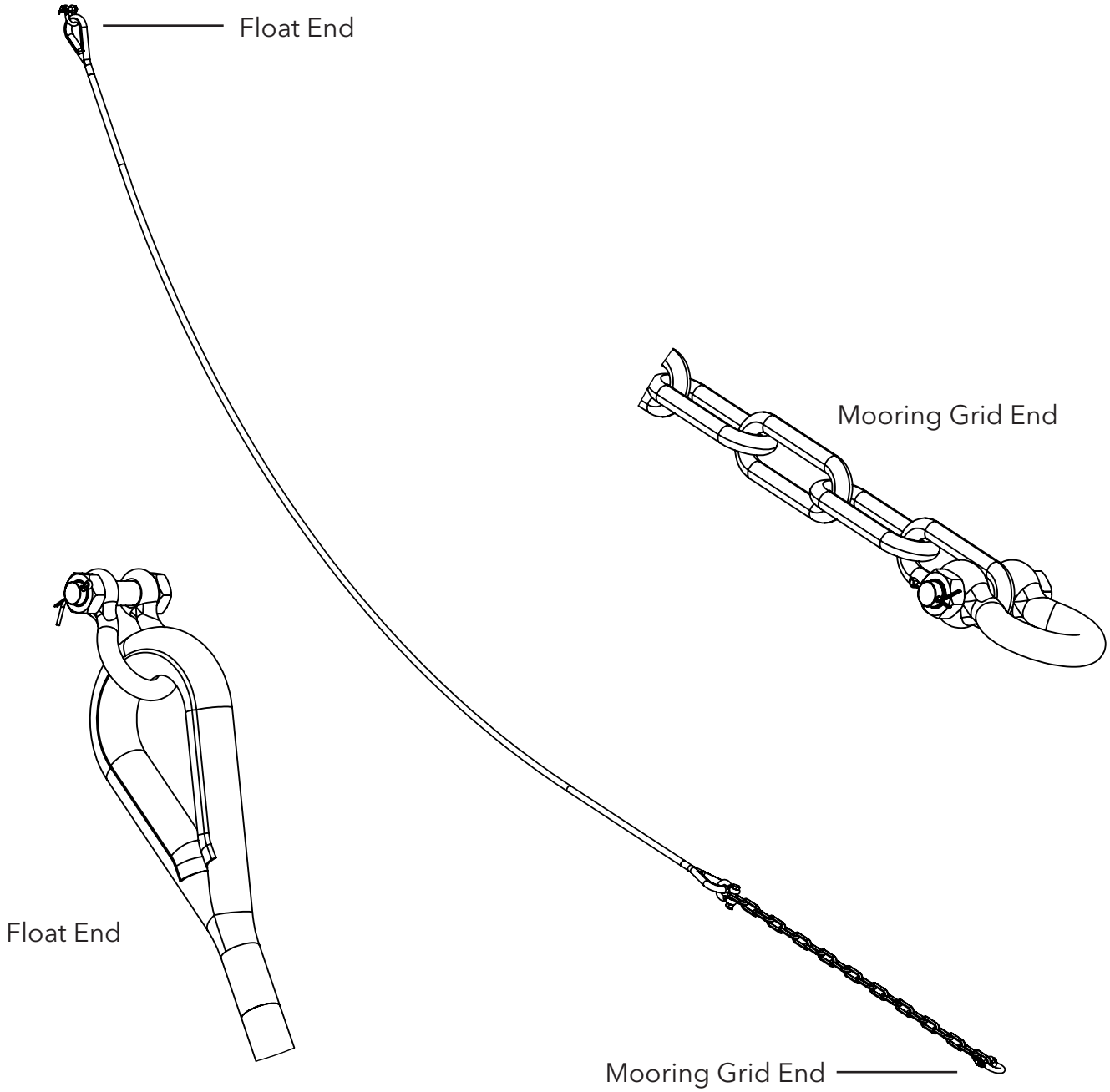
Shown below is one of the four bridle lines which is shackled to the float and the grid in four equispaced locations. When the float is installed, the float end of the bridle connects to the floats 16mm short link stainless steel mooring line, of which there are four. The mooring grid end connects to the grids mooring plate, of which there are four.

If the float is not installed, the float end connects to one of the four tails found on the temporary float assembly, which is used to ensure the bridles are correctly positioned when the float is not installed.



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Temporary Float Assembly Detail

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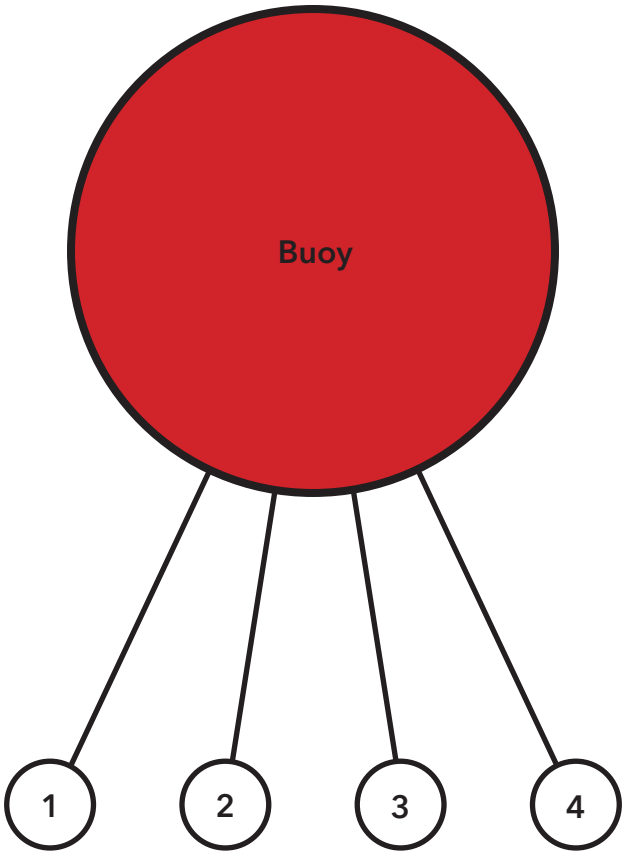
Shown below is the temporary float assembly, which is used when MANTA's float is not installed within the grid. The purpose of the temporary float assembly is to tether the bridles centrally to avoid any abrasion of the bridles on the grids mooring lines, to avoid the bridles drifting in opposite directions, and to ensure the bridles to not sink.

The temporary float assembly consists of a buoy, and four tails with quick release carbine hooks. The carbine hooks can be quickly attached to the float end of the bridles. Below the carbine hooks are labelled 1,2,3, and 4.



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Float Installation Procedure

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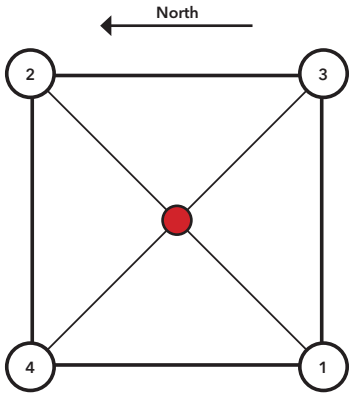
Step 1

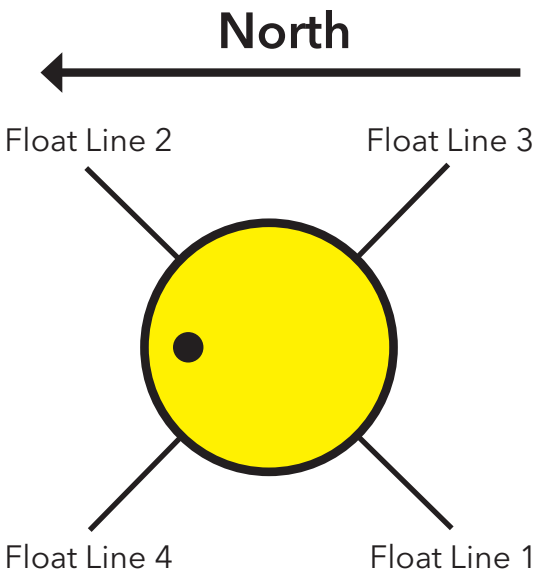
Before deploying MANTA's float, the bridle lines need to be installed. If the bridle lines are not installed, follow the procedure in the bridle deployment document.

If the bridles have been installed, the deployment assembly should look like the following.



Step 2

Below is an aerial view of the MANTA float. It is important for correct operation of the MANTA system that the float is moored in the correct position. The black dot denotes the MANTA pick up line location, which should be leeside of the prevailing waves.



NOTE ORIENTATION

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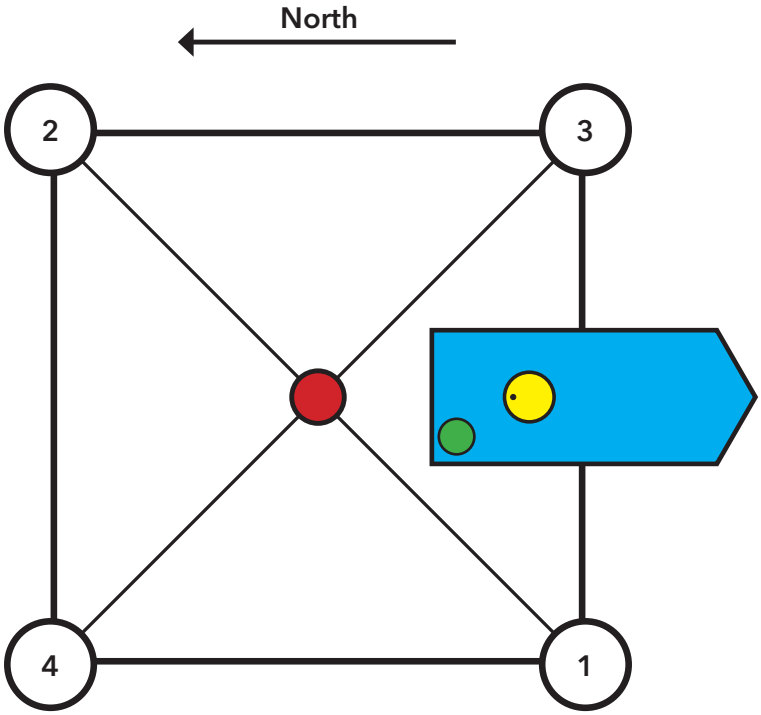
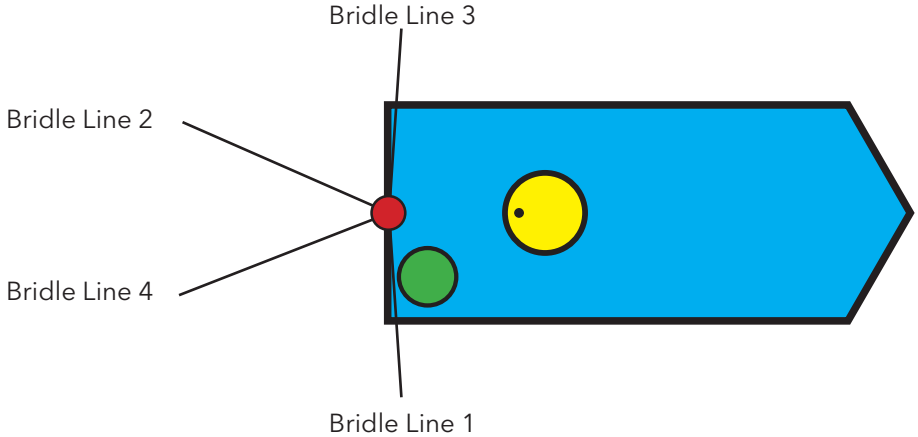
Step 3

Position the workboat (blue boat) into the prevailing wave direction in front of the temporary float assembly (red circle). Place a slip knot bridle over the temporary float assembly and pull to tighten around the temporary float's base. Gently start to motor away so as to slacken bridle line 3 and bridle line 1, and make bridle line 2 and 4 taught. Once bridle line 3 and bridle line 1 are slack, trim the boat to however in position.



Step 4

Using the workboat's (blue) crane (green), lift the temporary float assembly clear of the water and hover over the back of the workboat deck. Take caution that line 1 does not rub on the crane base.



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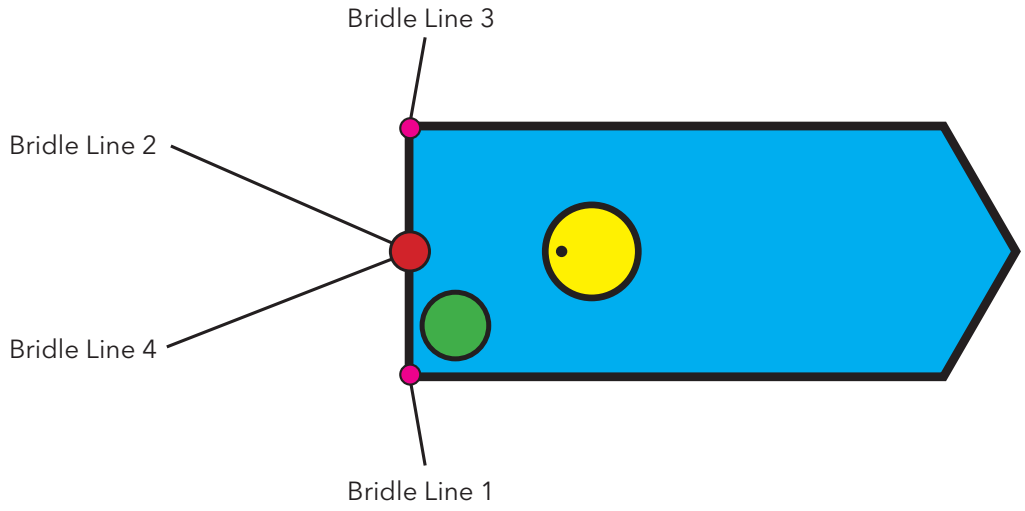
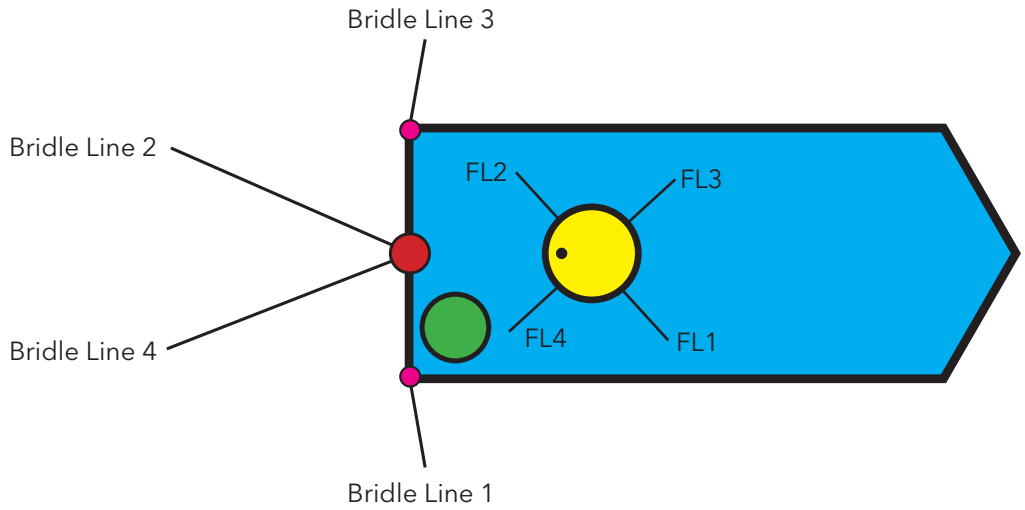
Step 5

With the temporary float assembly suspended over the rear of the workboat, remove bridle line 3 from the temporary float assembly by unhooking the carbine hook. Re attach bridle line 3 to the workboats rear cleat (pink circle), which is naturally inline. Remove bridle line 1 from the temporary float assembly by unhooking the carbine hook. Re attach bridle line 1 to the workboats read cleat (pink circle, which is naturally inline. The current deployment assembly should look as follows.



Step 6

With the temporary float assembly still suspended over the rear of the workboat, layout on the workboat deck the float lines (denoted here as FL1, FL2, FL3, and FL4).



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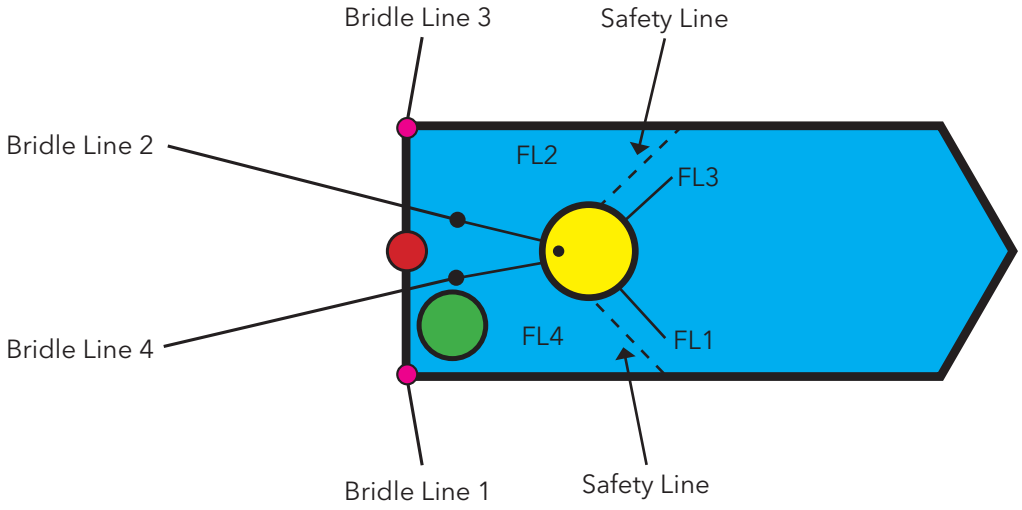
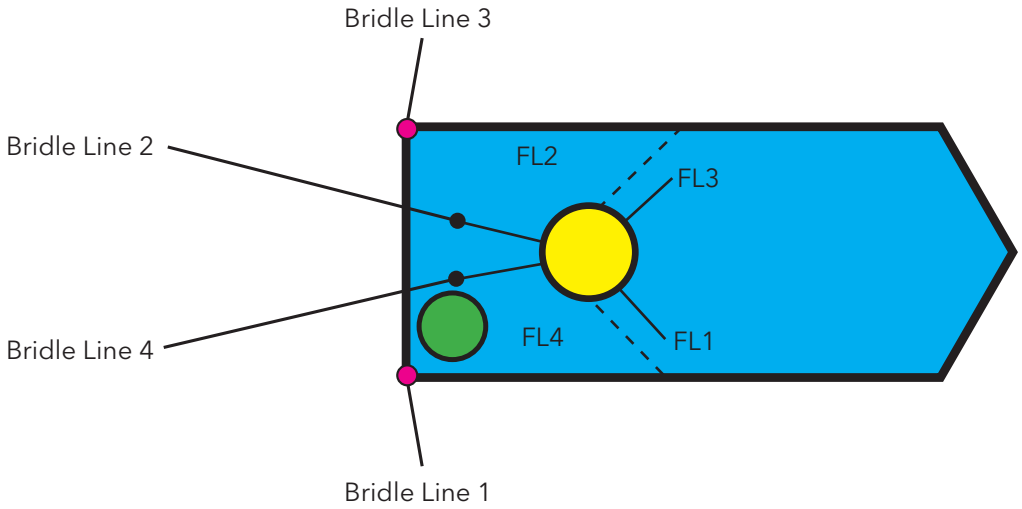
Step 7

Attach safety lines between the float and the workboat, to ensure the float is not pulled off the workboat. Remove bridle line 2 from the temporary float assembly and shackle (black circle) it directly onto float line 2. In addition, remove bridle line 4 from the temporary float assembly and shackle (black circle) it directly onto float line 4. Ensure the safety pins are in place on the shackles and that the bridle lines are not rubbing on the workboat.



Step 8

There should be no bridle lines attached to the temporary float assembly. The temporary float assembly can now be unhooked from the workboat crane and placed in a safe place, out of the way of ongoing workboat deck operations. For the purpose of this diagram, the temporary float assembly is removed completely.



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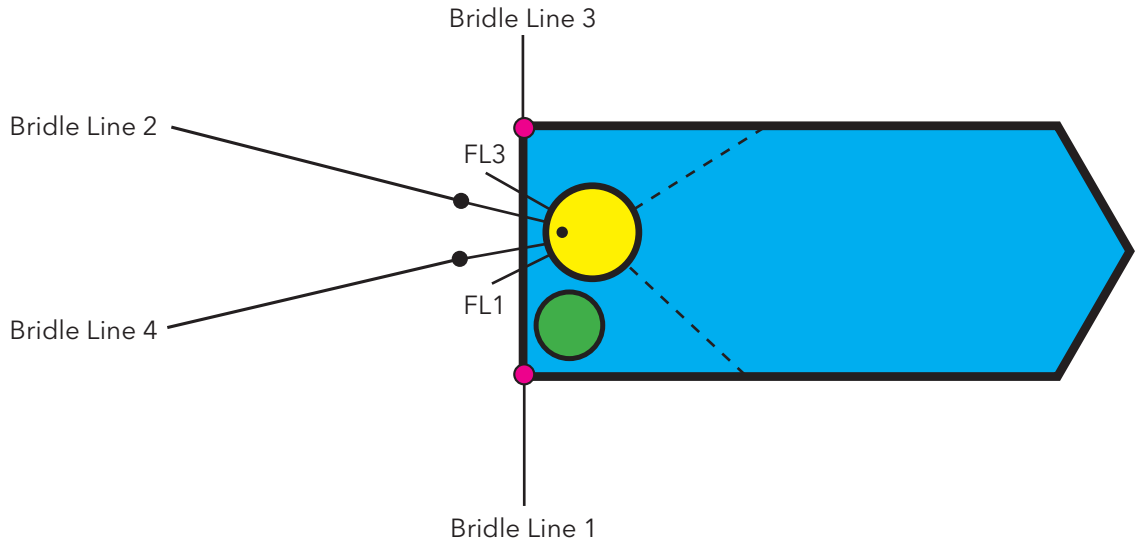
Step 9

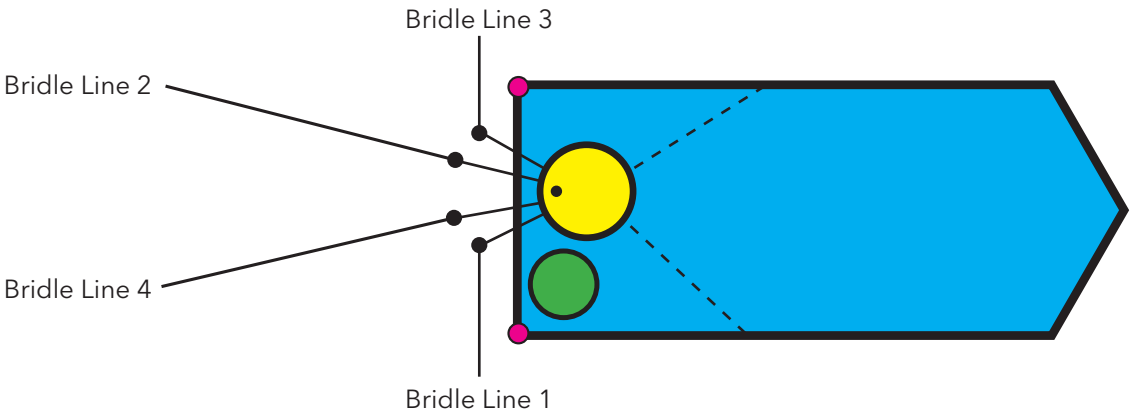
Using the workboat crane (green circle), move MANTA's float (yellow circle) closer to the rear of the workboat deck. The repositioning of the float ensures that float line 3 and float line 1 can be shackled to bridle line 3 and bridle line 1 with ease.



Step 10

With the float resting on the workboat deck, but still attached to the workboat crane (green), detach bridle line 3 from the workboat cleat (pink circle) and shackle it to float line 3. Detach bridle line 1 from the workboat cleat (pink circle) and shackle it to float line 1. At this point, all the bridle lines should be shackled to their associated float lines.

Remember to insert safety pins in the shackles.



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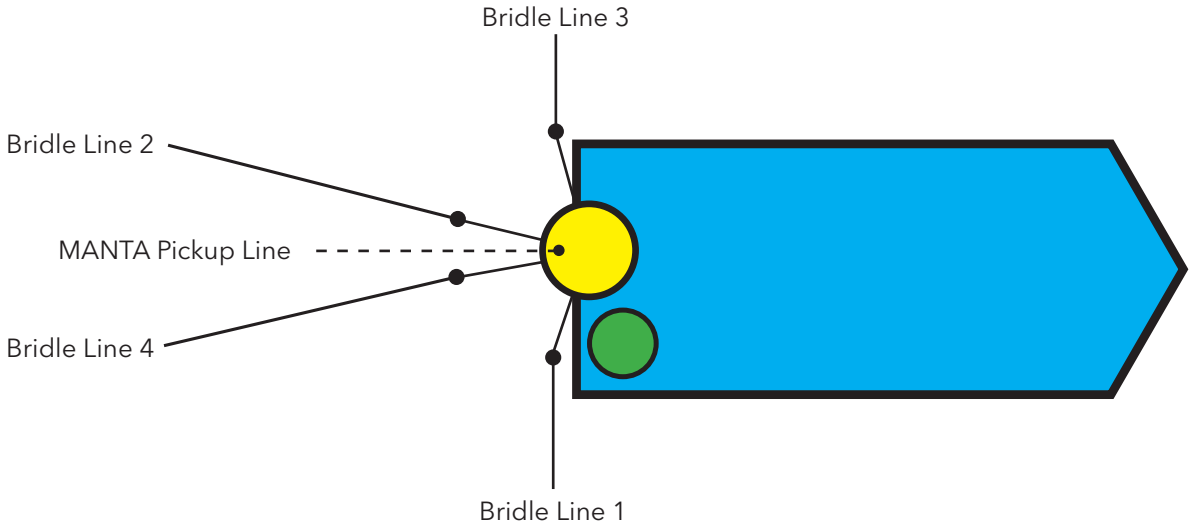
Step 11

With all the bridles attached, the float (yellow circle) can now be released from the safety lines, lifted, moved, and lowered using the workboat crane (green circle) so that the MANTA Pickup Line is clear of the rear of the workboat. Once the float is resting on the workboat deck, the MANTA pickup line should be gently lowered into the water. Take care to ensure the pickup line is lowered between bridle line 2 and bridle line 4, and that the bridle line does not become twisted when being lowered into the water.

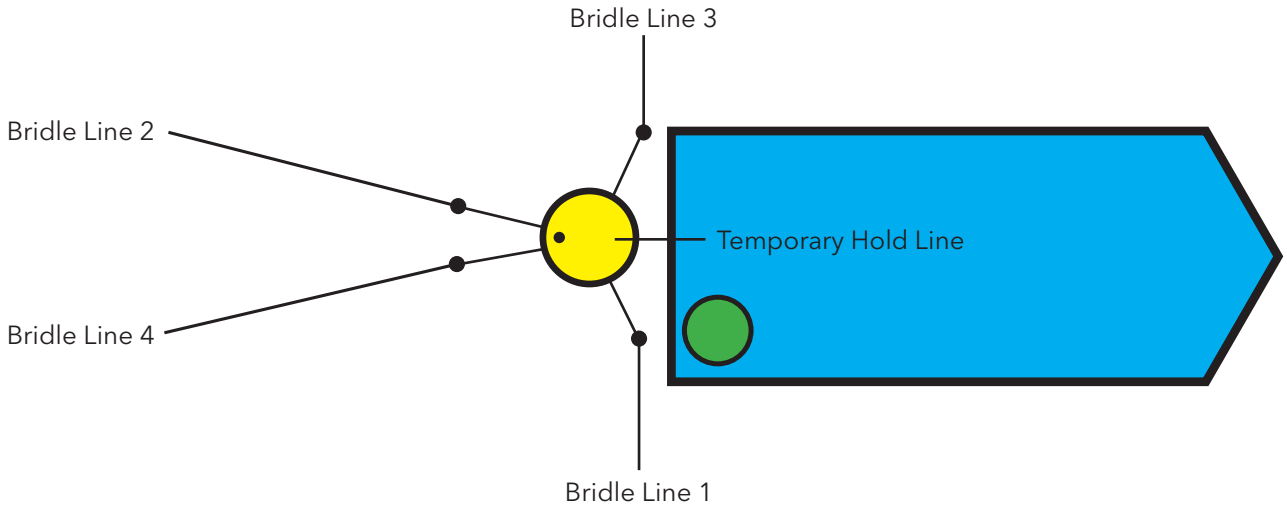
Ensure Dummy Connectors Are Installed



Step 12

Finally, lift the float (yellow circle) clear of the workboat deck using the workboat crane (green circle) and lower into the water. Ensure the float is at a safe distance from the rear of the workboat when lowering into the water to avoid a swell induced collision.

Once the floats mass is buoyantly supported, attach a temporary hold line sling to keep the float near the workboat.



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Step 13

Remove the workboat crane lifting shackles and strops from the float. To avoid collision and damage to the float and the workboat, this step is achieved more easily in a small rib type craft, which can work alongside the float. With the smaller craft alongside the float, operators can easily reach across and remove the lifting shackles and strops.

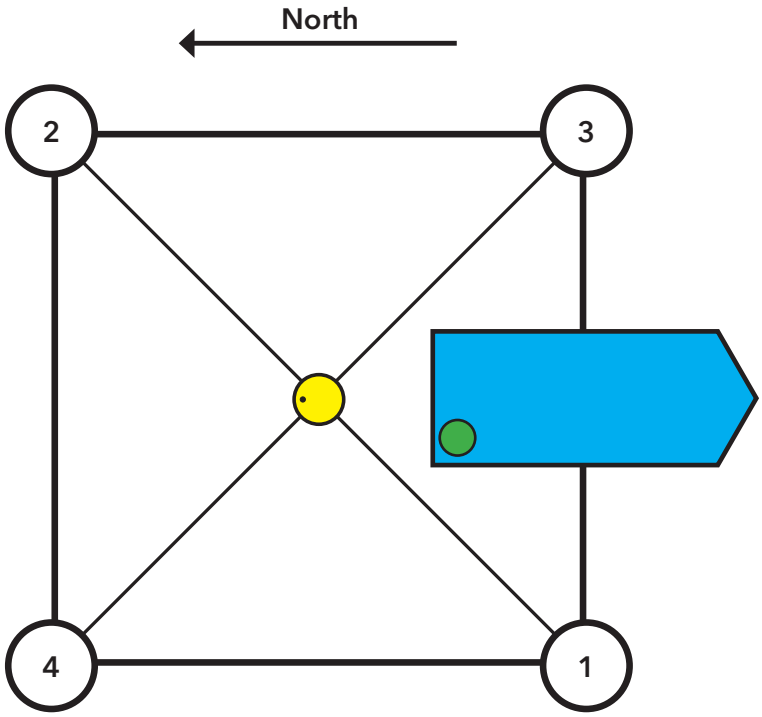
Removing the lifting shackles from the float can be achieved with greater ease by a person boarding the float and removing the shackles and lifting strops. However, this can only be undertaken if health and safety regulations allow.

With the workboat crane (green circle) lifting point removed from the float (yellow circle), the installation of the float is now complete. Before releasing the float ensure the following critical procedures have been completed:

- Orientation of the float is correct.
- Bridle lines are attached to the corresponding float lines.
- None of the lines are twisted or rubbing.
- All shackles have had their safety pins inserted.
- The MANTA Pickup Line has been lowered into the water and is not twisted.
- All dummy connectors are plugged in to the cables.

Step 14

With the critical procedure steps complete the float (yellow circle) may now be released from the workboat. The deployment assembly should now look as follows.



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Float Removal Procedure

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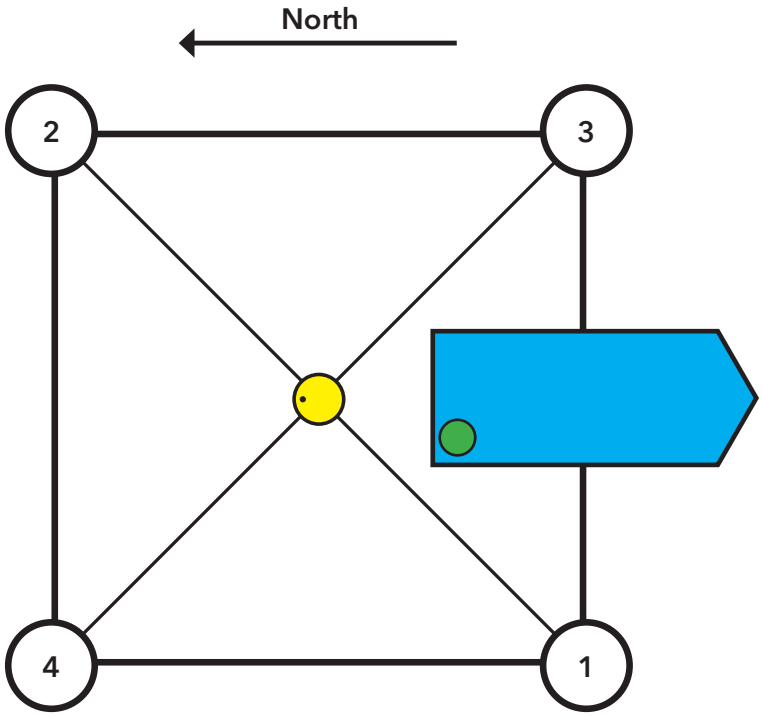
Step 1

Using a small workboat, such as a rib, work alongside the float (yellow circle) to attach the lifting shackles and strops to the designated lifting eyes on the float. After this task, the smaller workboat is no longer required.

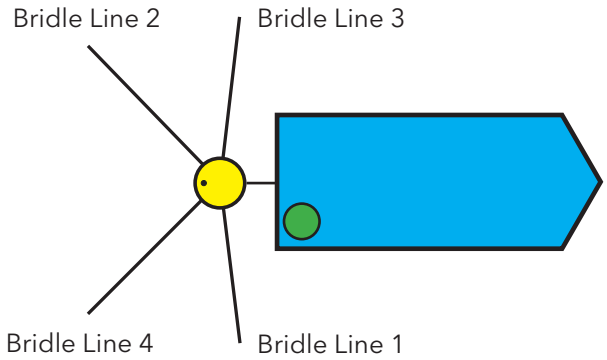
Step 2

With the lifting shackles and strops attached, the workboat (blue) can position itself pointing into the dominant prevailing wave direction. The workboat operator can trim the position of the workboat to ensure the working position is maintained. The orientation of craft, grid, and workboat should look as follows.



Step 3

It may be necessary to attach a temporary hold line on the float, so that the float can be pulled into the predominant wave direction to slacken bridle line 3 and bridle line 1. The orientation of craft, grid, and workboat should look as follows.



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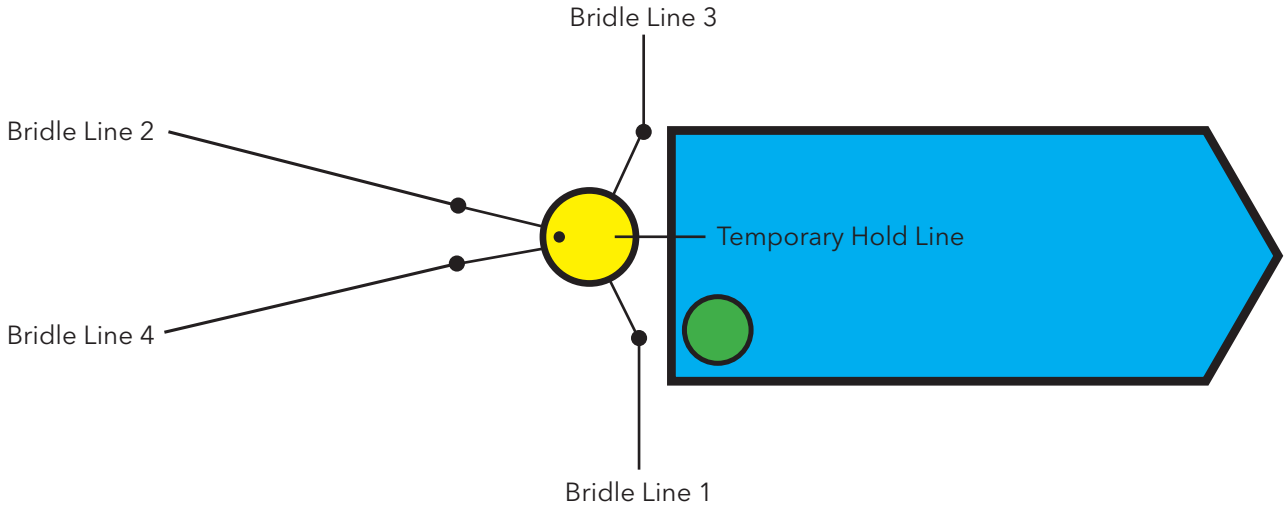
Step 4

With the bridle lines in a more compliant position to avoid the workboats propellers, shackle the workboat crane's (green circle) hook to the lifting shackle on the buoy, which was previously installed

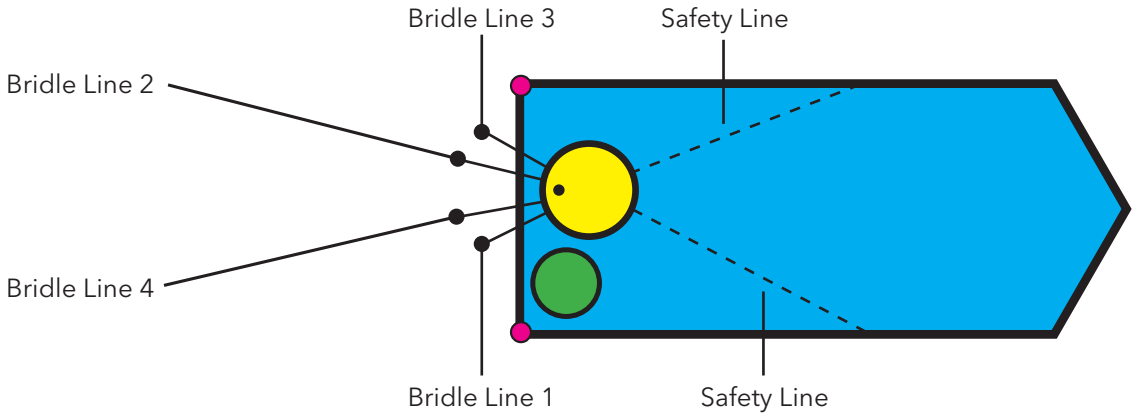


Step 5

Using the workboat crane (green circle), lift the float (yellow circle) clear of the water and onto the workboat deck. When the float passes over the rear of the workboat deck, ensure that the MANTA Pickup Line is carefully pulled up out of the water, as opposed to dragging the line over the deck's edge.

When the MANTA Pickup Line is clear of the water and neatly laid out on the workboat deck, the float (yellow circle) can be lowered onto the workboat deck.

If required, safety lines can be attached to the float and workboat to stop the potential risk of the float being dragged over the rear of the deck, due to the tension in bridle line 2 and bridle line 4.



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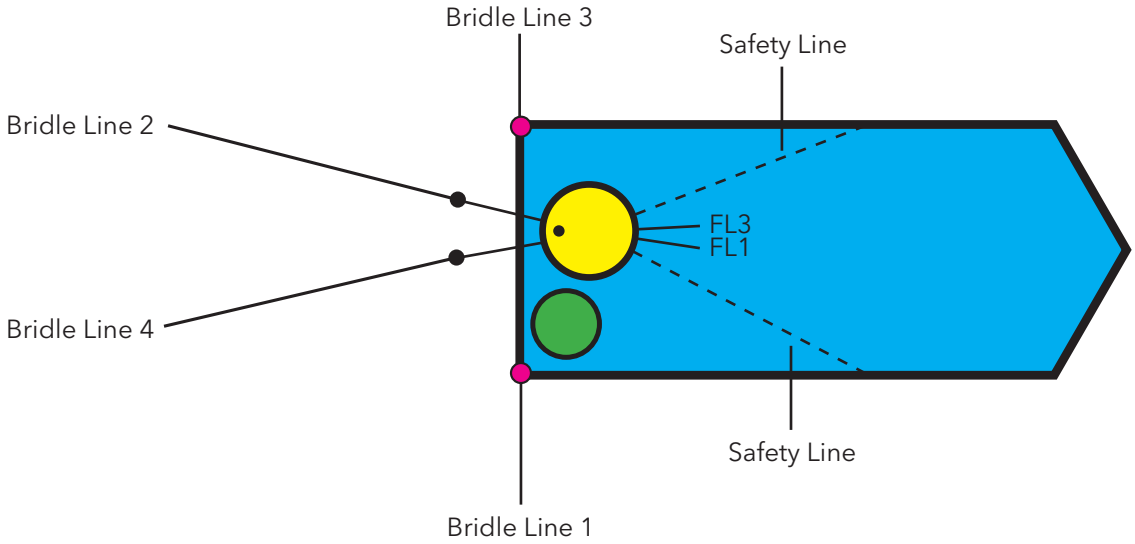
Step 6

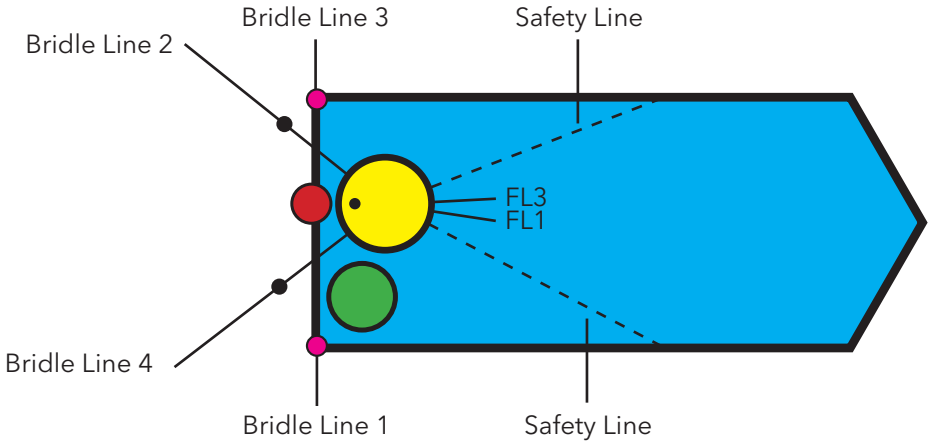
With the float (yellow circle) resting on the workboat deck and still shackled to the workboat crane (green circle), bridle line 3 can be removed from float line 3 by removing the shackle pin. With float line 3 and bridle line 3 now separated, bridle line 3 can be attached to the workboats cleat that is naturally inline. In addition, bridle line 1 can be removed from float line 1 by removing the shackle pin. With float line 1 and bridle line 1 now separated, bridle line 1 can be attached to the workboats cleat that is naturally inline.

With bridle line 3 and bridle line 1 out of the way of the workboats propellers, and fastened to the workboats cleats, the workboat operator can reduce the tension on bridle line 2 and bridle and 4 by reversing the workboat.



Step 7

Unshackle the float (yellow circle) from the workboat crane (green circle) and attach the temporary float assembly (red circle). The temporary float assembly should now be suspended from the workboat crane, and bridle line 2 and bridle line 4 still connected to the float (yellow circle).



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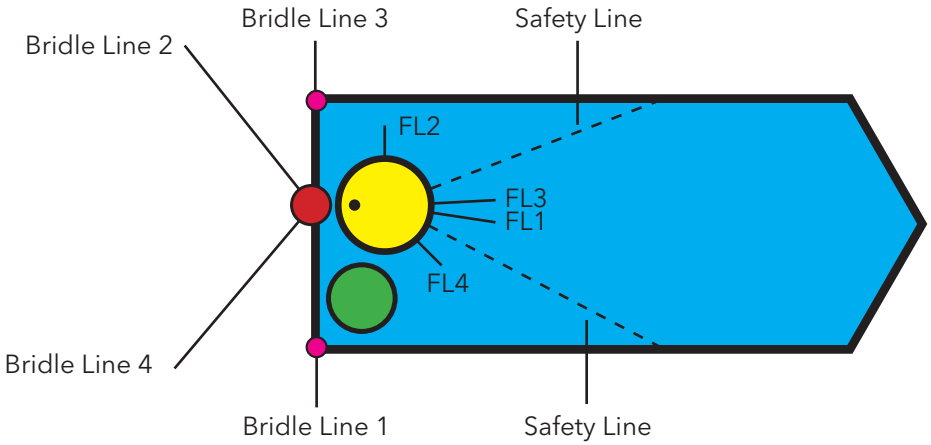
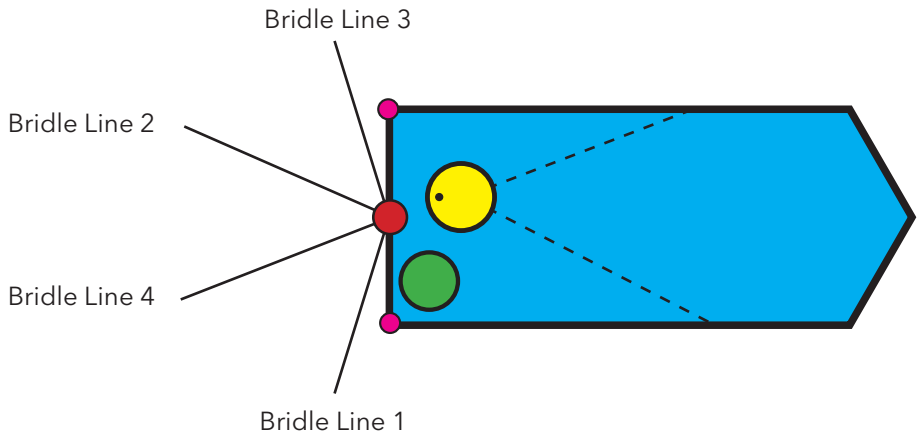
Step 8

Remove the shackle pin attaching bridle line 2 to float line 2. Now that bridle line 2 and float line 2 are separated, re attach bridle line 2 to the temporary float assembly (red circle) carbine hook 2. In addition, remove the shackle pin which attaches bridle line 4 and float line 4. With bridle line 4 now separated, re attach bridle line 4 to the temporary float assembly carbine hook 4. The deployed assembly should look as follows.



Step 9

Remove bridle line 3 from the workboats cleat (pink circle) and attach it to the temporary float assembly carbine hook 3. In addition, remove bridle line 1 from the workboats cleat (pink circle) and attach it to the temporary float assembly (red circle) carbine hook 1. The float (yellow circle) should not be completely detached from the bridles, whilst the temporary float assembly (red circle) should have all the bridles attached to it, in the correct order and position.



Step 10

With MANTA's float (yellow circle) now detached from the bridle lines, and the temporary float assembly (red circle) coupled to the bridle lines, the temporary float assembly can be lowered into the water and released from the workboat. The temporary float assembly should drift to the natural central point of the grid, due to the catenary effect of the bridle lines.

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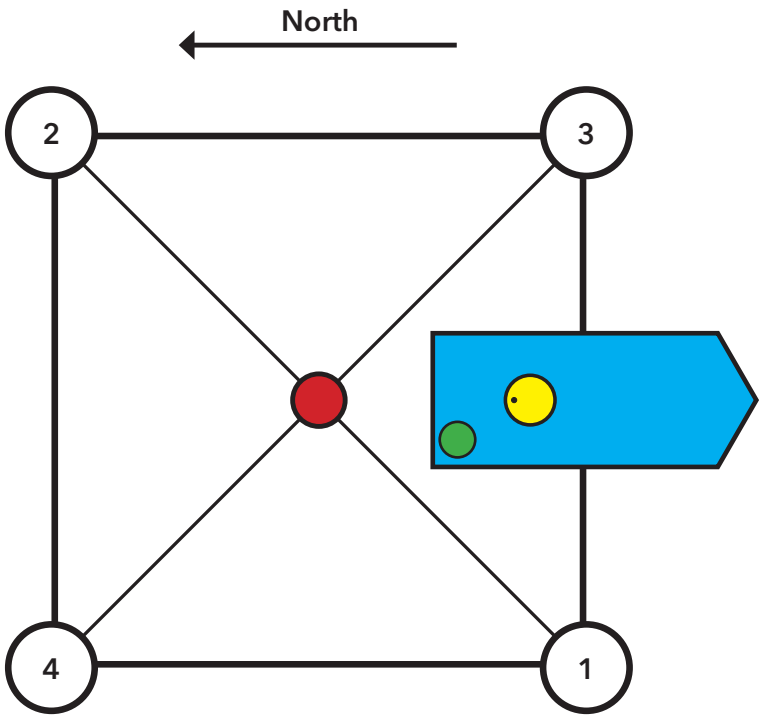
Step 11

The removal of the float (yellow circle) from the grid is now complete. The float should be appropriately fastened to the workboat deck to remove its ability to move on the deck surface. The orientation of the float, the temporary float assembly (red circle), the bridles and the grid should be orientated as follows.



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