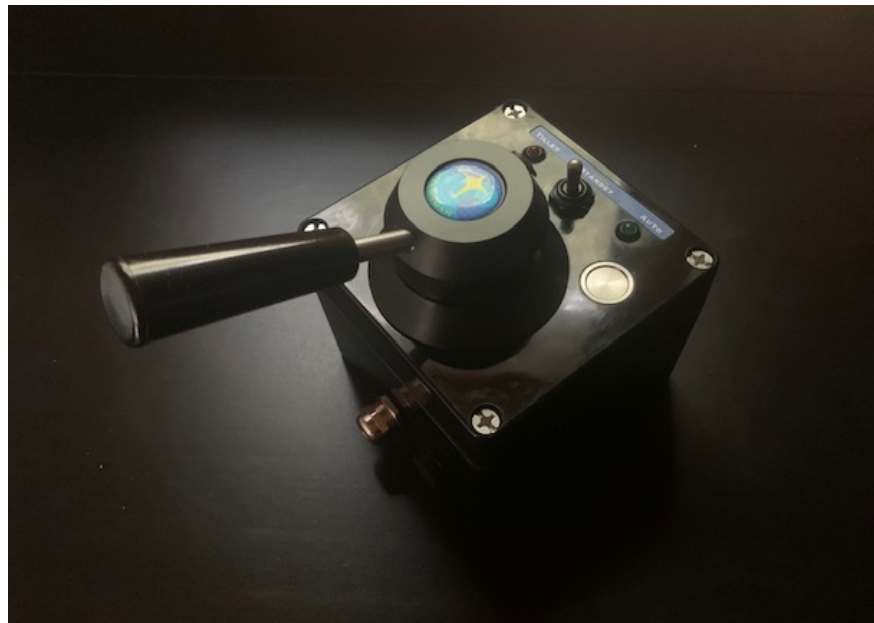




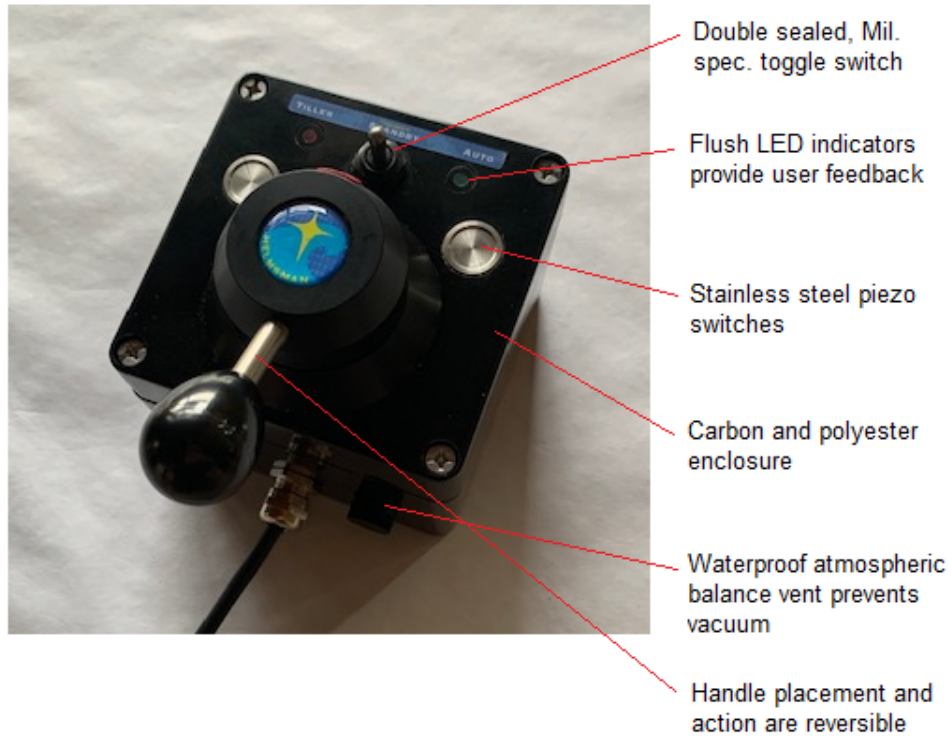
Helmsman RTC20C
operation and installation instructions



Helmsman RTC20C heavy duty steering control for
ComNav Marine commercial autopilots



Overview



Helmsman RTC20C full followup steering control for Comnav autopilots

The Helmsman RTC20 series is a heavy duty, full followup, steering control intended for use in all-weather, marine conditions. The Helmsman RTC20C adds value to ComNav Marine's 1001, 1101, 1201, and 2001 commercial automatic pilots by incorporating design features that make them more versatile and reliable than the original equipment. The RTC20C is built for hard work, yet it has a smooth, tactile, action. These design advantages improve the operator's connection with the vessel, increasing efficiency and reducing the possibility of downtime.



Operation of the Helmsman RTC20C

Full followup steering simply means that the ships rudder position emulates the position of the steering lever. This is in contrast to “jog” steering, which only commands rudder direction, but not rudder position. Full followup steering makes docking and maneuvering the vessel much more intuitive and efficient.

To take command from the RTC20C, the operator presses the port and starboard buttons simultaneously. The port and starboard LED indicators will illuminate for one second, indicating that the command has been sent to the autopilot. Once the RTC20C is in command, the user can then select one of three operating modes, TILLER, STANDBY, or AUTO.

Moving the toggle-switch to TILLER position gives the operator direct command of the ship’s rudder. While in TILLER mode the autopilot behaves like a servo, keeping the ships rudder position in agreement with the RTC20C’s lever position. This mode is most often used when docking or maneuvering the vessel.

Moving the toggle switch to the STANDBY position leaves the RTC20C in command, but in a safe, passive, state in which the lever, or push-buttons, have no effect. STANDBY would be selected when an operator wants to leave the steering station in command while, for example, hauling a crab trap aboard the vessel.

When AUTO is selected, the autopilot will keep the current heading. For example, the operator can use TILLER mode to steer the vessel on a desired course then maintain that course by moving the toggle-switch back to AUTO. While in AUTO mode the operator can also make 1 degree course adjustments by pressing the port, or starboard, pushbuttons. Whenever the port or starboard pushbutton is pressed the corresponding LED indicator will illuminate momentarily to let the operator know that a one-degree course change has been sent to the autopilot.

Note: The Comnav control unit can take command from the Helmsman RTC20C at any time, by pressing the port and starboard buttons on the autopilots control head. Refer to the Comnav Marine operator’s manual for details specific to each model.



Installation

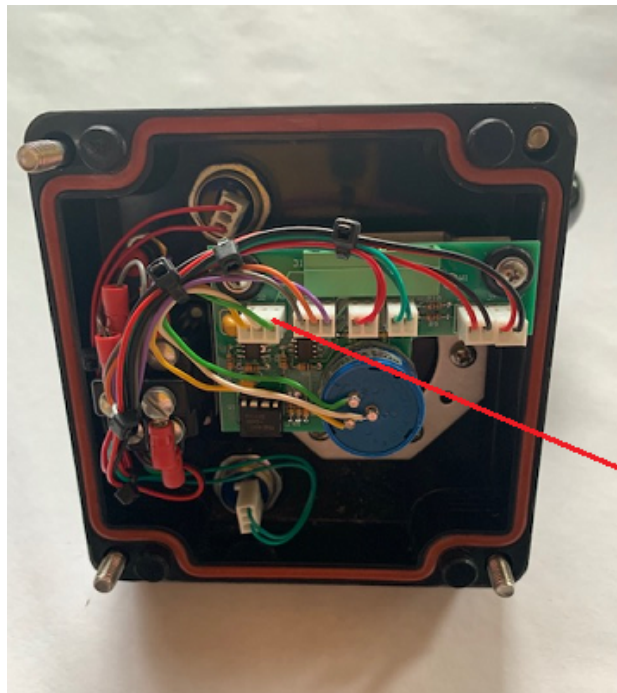
Before making wiring connections between the Helmsman RTC20C and the autopilot, the installer should confer with the end-user regarding their steering preferences in terms of handle placement and action.

Lever placement:

The handle can be installed in two positions on the hub in order to suit the operator's preference. To change location of the lever, simply remove the protective hole-plug and position the handle on the opposite side of the hub. Reinsert the plastic hole-plug to protect the open threads.

Lever action:

The action of the handle can also be reversed to suit the operator's preference, so that port, or starboard, rudder movement will correspond with clockwise, or anticlockwise rotation of the hub.



Reverse this plug to change action of the lever

To reverse the levers action, simply open the RTC20 enclosure and reverse the potentiometer connector as shown above. (This reverses the potentiometer connection 180 degrees.) Replace the enclosure cover.



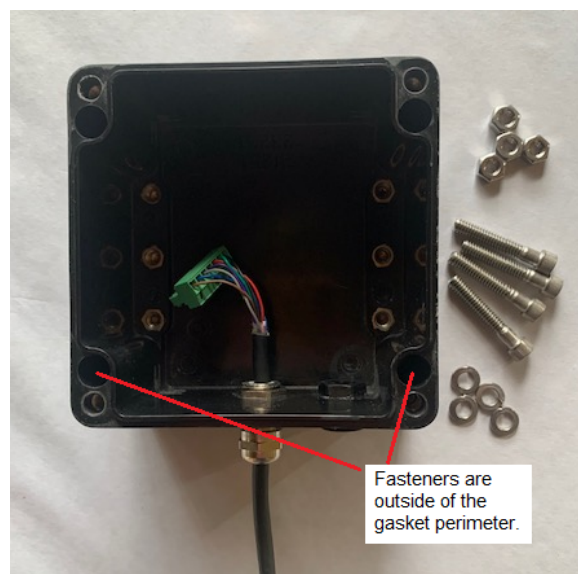
Note: Before replacing the cover, inspect the perimeter gasket to ascertain that there is no debris on the gasket, or on the mating surface, which may compromise sealing integrity.

Mounting the enclosure:

When mounting the Helmsman RTC20C, ensure that the surface is flat and free of debris, welding ridges, or other obstructions. A clean and flat surface will ensure that the enclosure is not warped when the mounting fasteners are tightened. Also, make sure that the handle can swing freely without interfering with other objects or controls that may be in close proximity.

The RTC20 does not have an external mounting flange as the fasteners are inset under the enclosure cover. The fastener bolt-holes are outside the gasket perimeter as shown in the following illustration.

The enclosure is typically secured with (4) ¼-20 hex-bolts. If the unit will be mounted to a wood surface the installer can use self-tapping screws instead of bolts. A bolt-pattern diagram is included with this manual. A template is also included.





Cable:

The RTC20C is most often attached to an existing Comnav, neoprene jacketed cable. If an existing cable will be used, the installer should verify that it is “dry” and that there are no punctures in the outer jacket. Even though the Helmsman RTC20 is pressure balanced to prevent vacuum formation, water will always seek the lowest point. Other cable types can be used provided that the cable is shielded, waterproof, and within the diameter range specified for the cord grip.

Note: Some alternative cables would include Belden 9932 (Seven 24 AWG conductors), Belden 9943 (Seven 22 AWG conductors) and Belden 9612 (Seven 24 AWG conductors).

Cord grip:

The Helmsman RTC20 series use a liquid-tight cord grip that is rated IP68 and submersible to 300ft. The cord grip will accommodate cables having outside diameter between 0.16” to 0.30” (4 to 8mm). The compression nut must be secured to provide strain relief and full sealing integrity.

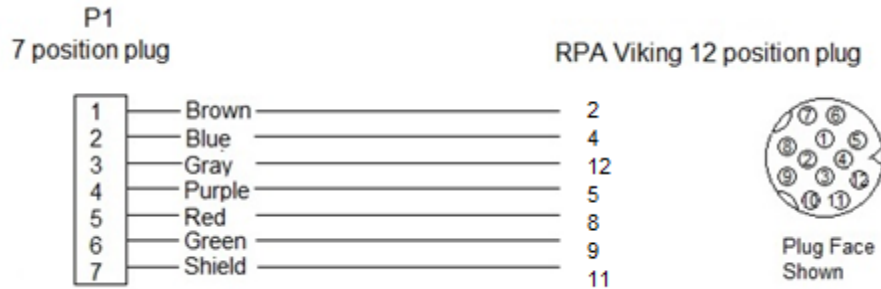
Connections:

Wiring connections are typically made after the enclosure has been mounted at the steering station. The following wiring diagram shows a standard Comnav cable with a 12-pin connector plug.



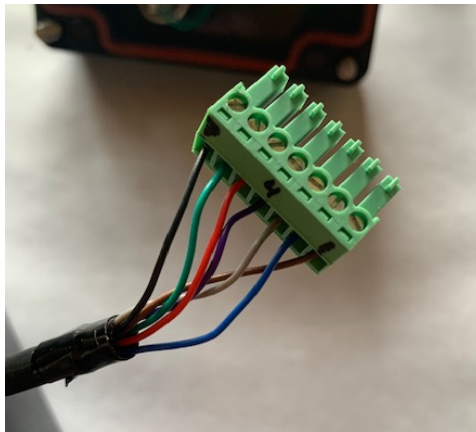


Open the enclosure cover and remove the 7-position plug. The terminals are numbered 1 through 7 as shown on the wiring diagram.



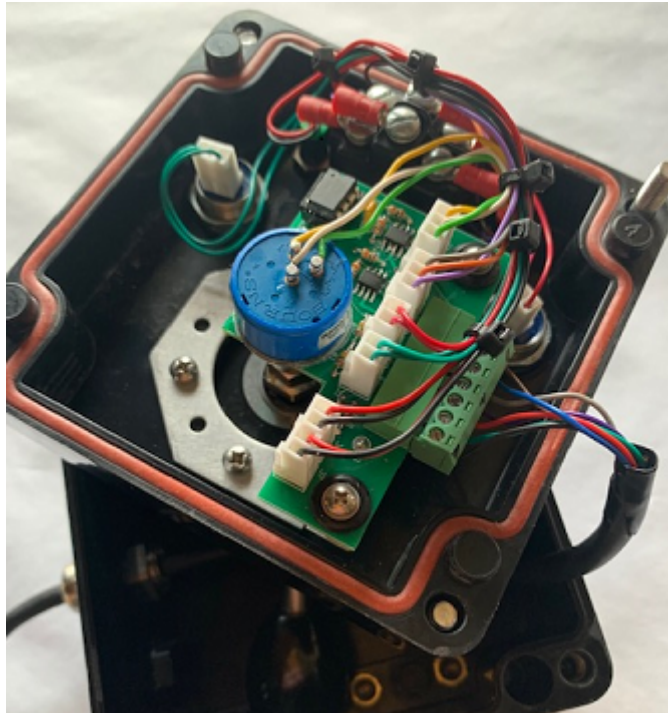
Feed the cable through the cable-seal (cord grip) and remove three or four inches of the outer insulation. Separate the shield and needed wires then strip ¼" of insulation from each. Insert into the 7-position plug and secure each wire using a small flat bladed screw driver. Inspect each wire for random wires and tug each wire to ensure contact integrity.

The unused wires should be trimmed back or wrapped in electrical tape to prevent electrical contact with other wires or the circuitry.





Reinsert the 7-position plug and secure the cord grip before replacing the cover.

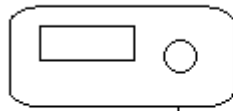


Note: Before replacing the cover, inspect the perimeter gasket to ascertain that there is no debris on the gasket or on the mating surface which may compromise sealing integrity.

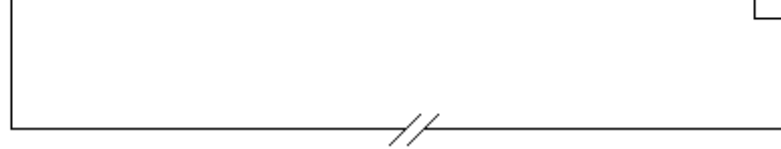
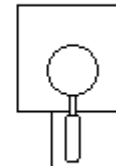
The Helmsman RTC20C can now be connected to the Comnav autopilot control unit or the Comnav 4-port remote expander unit.



Comnav control unit



Helmsman RTC20C



Dockside tests:

After connecting the Helmsman RTC20C, it is essential that the installer test the autopilot system to verify correct operation.

- 1) Apply power to the Comnav autopilot system and select “Power Steer” on the control unit. Make sure the rudder-drive system is active.
- 2) Set the RTC20C mode switch to STANDBY.
- 3) Press the port and starboard piezo-switches on the Helmsman RTC20C and confirm that the port and starboard LEDs illuminate for approximately 1 second. Also confirm that the Comnav control unit indicates the command change.

Note: Refer to the Comnav operation manual to review mode indications specific to model.

- 4) Set the RTC20C mode switch to TILLER.
- 5) Move the steering lever full port (or full starboard) and confirm that the rudder moves in the proper direction. If the direction of rudder travel is opposite to that expected, then reverse the RTC20C’s potentiometer connector as explained previously.
- 6) Return the steering lever to mid-ship position to confirm that the rudder stops at mid-ship.



- 7) Set the RTC20C mode switch to AUTO. Again, confirm the mode change indication on the Comnav display.
- 8) Press the port pushbutton on the Helmsman RTC20C and confirm that the port LED illuminates momentarily. Repeat, using the starboard button and verify that the starboard LED illuminates momentarily.
- 9) Take command from the Comnav control unit by pressing the port and starboard keypad buttons on the Comnav control unit.

Note: If the Helmsman RTC20C does not perform as expected please contact 1(907)518-0341 for assistance.