

CONNECTBOX CONNECTION REQUIREMENTS



PRODUCT: ALL MODELS WITH CONNECTBOX INTERFACE

OVERVIEW

The following Technical Bulletin provides a detailed overview of the connection requirements of the Seakeeper ConnectBox. Seakeeper units outfitted with a ConnectBox require a NMEA 2000 GPS signal and a compatible MFD display or Seakeeper 5" display for operation. This bulletin outlines the options for required display, GPS connections, and GPS installation troubleshooting.

DISPLAY OPTIONS

The ConnectBox requires a connection to a compatible display and the vessel's NMEA 2000 backbone with an active GPS signal for Seakeeper operation. The display options for the ConnectBox are as follows:

1. Ethernet connection to a Seakeeper-compatible multi-function display (MFD). Compatible devices and ethernet cable part numbers are listed in the following section.
2. A Seakeeper 5" Touch Screen Display is purchased separately.

Compatible MFDs are recommended over Seakeeper's 5" Touch Screen Display as they also provide the required GPS connection, among broader features and functionality. Garmin, Raymarine, and Navico all offer compatible systems starting below \$1000 USD. The ConnectBox includes an ethernet cable extension to support integration with compatible MFDs, the extension cable length is the same as the display cable length supplied with the 5" Display today; 33 ft (10 m) for Seakeeper 1 through 6 models and 82 ft (25 m) for Seakeeper 9 and above models.

COMPATIBLE MFDs

Seakeeper compatible MFD's are recommended because they serve to provide both a GPS signal and required display interface. The following MFD systems are currently compatible with the Seakeeper ConnectBox and can be connected as shown in the [ConnectBox Generic Wiring Diagram \(90663\)](#).

1. Compatible Garmin MFDs, refer to [Technical Bulletin 90478](#)
2. Compatible Raymarine MFDs, refer to [Technical Bulletin 90479](#)
3. Compatible Navico MFDs (Simrad / Lowrance / B&G), refer to [Technical Bulletin 90480](#)
4. Compatible Furuno MFDs, refer to [Technical Bulletin 90598](#)

When using MFD with integrated GPS as the source of required signal, a NMEA backbone must be established between the Seakeeper and MFD connection (see Figure 1).

5" TOUCH DISPLAY

The 5" Display is no longer part of the standard scope of supply for these models after the ConnectBox is released. If a compatible MFD is not installed, then an optional Seakeeper 5" Touch Display must be installed.

1. For Seakeeper 1 through 6 models (12 VDC units) use the 5" Touch Screen Display Kit P/N 90467-2SP-10M, includes a 33 ft (10 m) connection cable.
2. For Seakeeper 9, 18, 26, and 40 models (24 VDC units) use the 5" Touch Screen Display Kit P/N 90467-2SP-25M, includes an 82 ft (25 m) connection cable.

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NMEA 2000 GPS SIGNAL REQUIREMENTS

The Seakeeper ConnectBox requires a connection to the vessel's NMEA 2000 network backbone via a drop cable for access to the GPS signal. The Seakeeper will monitor GPS information on the NMEA network to support and optimize performance. If no GPS signal is detected, a warning (Code 131) will appear on the Seakeeper display. Without the presence of a GPS signal the unit can still spool up and coast down but will not precess to provide roll reduction.

NMEA 2000 installation standards must be met for the NMEA 2000 CAN network. Some basic requirements of the standard are as follows:

- Maximum cable drop length to a single device is 19.7 ft (6 m)
- No more than 50 devices on a network
- Backbone must have 120-ohm resistor at each end
- Total drop length per backbone to all devices is 256 ft (78 m)
- No more than 250 addresses available on network
- 9 to 16 VDC maintained on backbone by power supplies

Additionally, in NMEA networks where the voltage drop calculations exceed network limits, multiple power tees will be needed. If the backbone is located more than 6 m from the Seakeeper, the backbone must be extended closer to the Seakeeper installation location or the ConnectBox must be remote mounted in the vicinity of the backbone. A ConnectBox helm mounting kit (P/N [90558](#)) is available for remote mounting to a panel. The full standard can be obtained from the [NMEA website](#).

New boats that are shipped to dealers without electronics installed, or existing vessels without a NMEA 2000 compatible GPS signal will need to have a GPS added to operate the Seakeeper unit for sea trial and demo purposes. There are two basic solutions to support Seakeeper functionality:

1. A Seakeeper compatible MFD Display with integrated GPS, recommended
2. A standalone NMEA 2000 compatible GPS antenna

Note: If there is no NMEA backbone available one can be established as shown in Figure 1, where the GPS signal can be provided by a compatible MFD or a standalone GPS antenna.

STANDALONE GPS ANTENNA

A simple solution to provide a NMEA 2000 GPS Signal is shown in Figure 1, which illustrates a NMEA 2000 backbone with a compatible GPS antenna, power supply, and Seakeeper ConnectBox connection. This configuration can be temporarily mounted anywhere on the boat for demo purposes or installed permanently in addition to existing hardware. The NMEA backbone should be connected in accordance with NMEA 2000 standards. This proposed GPS setup is transferable and could be utilized repeatedly for commissioning or demonstration purposes.

The components of the arrangement shown in Figure 1 can be purchased off-the-shelf from various vendors including: West Marine, Maretron, and Amazon. A NMEA 2000 starter kit can be found on [Amazon](#) which includes: 1 x meter long power cable with power tee, 1 x Male and 1x Female terminators, 1 x Dual tee connector, and 2 x 2 m drop cables.

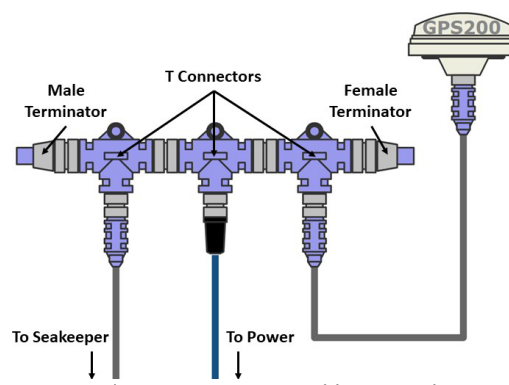


Figure 1: NMEA Backbone with GPS Antenna

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Compatible GPS antennas can be found from a variety of sources:

[Maretron](#)

[SIMRAD](#)

[LOWRANCE](#)

[RAYMARINE](#)

[GARMIN](#)

[B&G](#)

GPS SIGNAL TROUBLESHOOTING

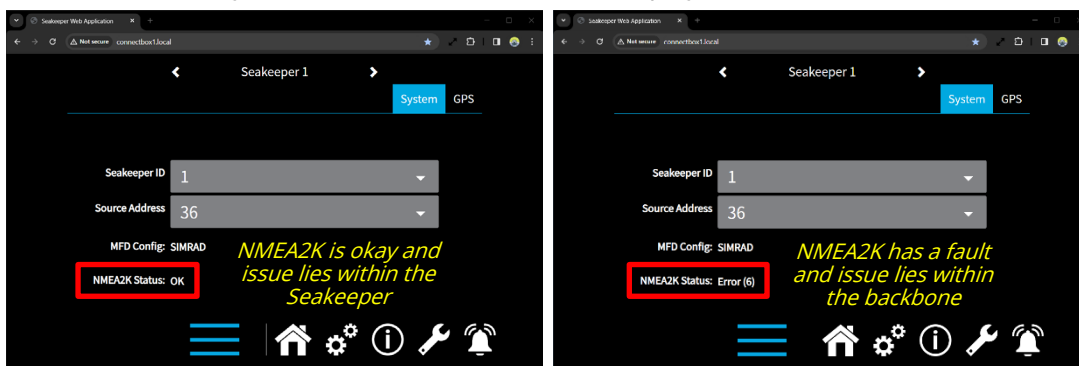
Should the Seakeeper produce a warning code 131, GPS Signal Lost, investigate as follows:

1. Check NMEA status on the Seakeeper app or 5" touch display as follows:

- a. From the settings page, perform a long press of the 'settings' icon to display the hidden settings page.



- b. Under the 'System' tab, the NMEA status is displayed.



NOTE: in case of the status flickering between *OK* and *Error*, it is implied that ConnectBox does not have a reliable NMEA2K connection.

- c. If 'NMEA2K Status' indicates an error, the issue lies in the NMEA2K backbone and not in the Seakeeper CAN.
2. Ensure connections made securely on back of ConnectBox.
 3. Ensure GPS receiver is operating by viewing its output at any MFD display served by the antenna. Seakeeper 5" display does provide a list of NMEA signals under the 'GPS' tab of the settings' page hidden screen (shown above).
 4. Verify the integrity of the NMEA cable routing (i.e., no sharp bends, no fraying/abrading).
 5. On NMEA cable at ConnectBox, ensure there is greater than 9 VDC between pins 2 and 3.
 6. If less than 9 VDC on NMEA cable, troubleshoot NMEA voltage drop.

