



Navroc M7-2023 Computer Installation Instructions

The Navroc M7-2023 computer is designed for commercial fishing customers to use Time Zero Professional and Navigator, Olex, P-Sea Windplot and other navigation/marine software. Years of reliable operation depend on a quality installation. If you have further questions, please contact the supplier of the computer.

Specifications:

Intel i7-10870H 8-core CPU fanless and bios configured to 45w max for thermal reliability
8GB DDR4 RAM (expandable to
500GB Samsung NVME SSD (expandable to 2TB)
Windows 11 Pro
3 HDMI
2 Gigabit ethernet, wifi
6 Com ports, analog audio,
8 USB (4 USB2, 4 USB3)
Powered by included DC-DC 10A converter or AC power adapter.

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Sold:
Invoice:

What's in the box?

Computer (in it's own box)

Accessory box containing:

DC-DC regulator power supply

AC power supply and cord

Mouse pad

Waterproof mouse

Waterproof keyboard

USB extension cable

USB memory stick for backups

2 crimp terminal connectors

Small tube of dielectric grease

GPS receiver & overhead mounting bracket

Not included (to be provided by installer):

Screws for mounting computer and DC-DC regulator

NMEA cables to instruments

Ethernet cable to switch or other instruments

Zip-ties

Video cables (various lengths and connector options for every installation)

Monitor and mount (various styles and sizes for different boats and needs)

Trackball or wireless mouse/keyboard if desired by end user.

Warnings and disclaimers:

A computer with Navigation software is an aid to navigating and should not be relied upon as the only source of navigation information on a boat. We always recommend skill and multiple independent aids of navigation.

While the computer system is meant for use on a boat, it is not waterproof. It should be mounted in a dry place, connections greased, and drip loops used on wiring to keep it's insides dry. As it is fanless and has a solid state drive, it should be more reliable than other computers as it will not draw in corrosive salty air. Water damage voids any warranty.

Do not use power sources other than the provided DC-DC regulator or AC power supply.

Mounting:

The computer should be mounted where it will stay dry. It will also need to be accessed to press the power button or insert/remove flash drives or cables. The best place to install needs to be considered by the installer and boat captain. Water damage will void the warranty. We recommend forward of the bulkhead or in a dry wheelhouse. An open wheelhouse is a bad location.

Inspect the mounting area for dried salt or other signs of intermittent water and avoid those areas.

The computer's case has four holes which allow the computer to be fastened to a wall with screws. We recommend self-tapping screws that do not penetrate the far side of cored fiberglass. You may need a second person to hold the computer in place while placing the first screw. If you are using an electric drill to drive the screws, a magnetic extension bit helps prevent the chuck from being damaged by the computer case.

Screw the computer tight enough to prevent vibration, but not so tight as to bend the metal of the computer. If the metal starts to bend, back off the screw as needed.

Cabling:

Cables going to the computer should have some slack where it can rest lower than the computer and come back up into the computer. This is called a drip loop, and if water runs down the exterior of a cable, it will drip at the loop instead of following the cable to the computer.

Dielectric grease should also be used at the connections into the computer. If you do not have dielectric grease, any clean greasy non-conductive grease is OK, such as Petroleum Jelly / Vaseline. Avoid metal greases like moly or lithium greases. Lanolin products like Fluid Film would be acceptable. As of 12/2020 a small package of dielectric grease is included with the computer to aid installation. It is great on the power connector, video connectors, serial connectors, ethernet connectors, and USB connectors.

Dielectric grease is also helpful as a lubricant for pushing cables through tight paths you thought could not take any more wires. In such a case, run the wires with the biggest connectors first, followed by wires with smaller connectors as the space fills up.

Power:

Some boats have both DC power (12 or 24 volts) and AC power (120-230 volts). We provide power supplies for either system. (Due to inverter quality, transfer switches, generators, etc... the DC tends to be more

reliable) Do not wire the round power connector straight to your boat's 12v power. The included DC-DC regulator must be used to connect the computer to 12v (or 24v) power. The computer expects an exact voltage at all times, and the boat's 12v power can vary between 10 and 15v. For this reason, the DC-DC regulator is provided. The wire with the round connector goes to the computer, and the other wire goes to the breaker/fuse panel. You may wish to shorten the wire going to the fuse panel to neaten the install. Crimp terminal connectors are provided.

If there are other computer accessories that need power wiring, you may also be able to crimp them with the computer power wires in the crimp terminal connectors. An installer should have extras in the event a connector is dropped or needs to be redone. After crimping, they can heat shrink with a lighter or heat gun.

The DC-DC regulator can be mounted near the computer with two screws.

If you use the AC power supply, ziptie or otherwise fasten the power supply where it will not fall or become loose. Power consumption is quite low for a computer. The computer uses 35-55 watts of power. (3-5A at 12v, 0.5A at 120v)

Network:

The computer has auto-sensing gigabit ethernet labeled "Furuno" and in Windows 10 is configured to be "172.31.3.150/255.255.0.0" which is the standard network configuration for a computer on a Furuno navnet ethernet network. This jack should be used for connections to Furuno instruments such as NXT radar, black box sounders, multifunction displays, and other ethernet based sensors/instruments. If you have more than one item, use an ethernet switch to combine the data. If you have more than one computer on the network, each must have a unique unused address; try 172.31.3.149 for a second computer for example. Other brands of equipment may specify different network configurations which you may use.

The computer also has a second ethernet and WIFI which you can use to connect to a phone hotspot or other wifi network.

Serial:

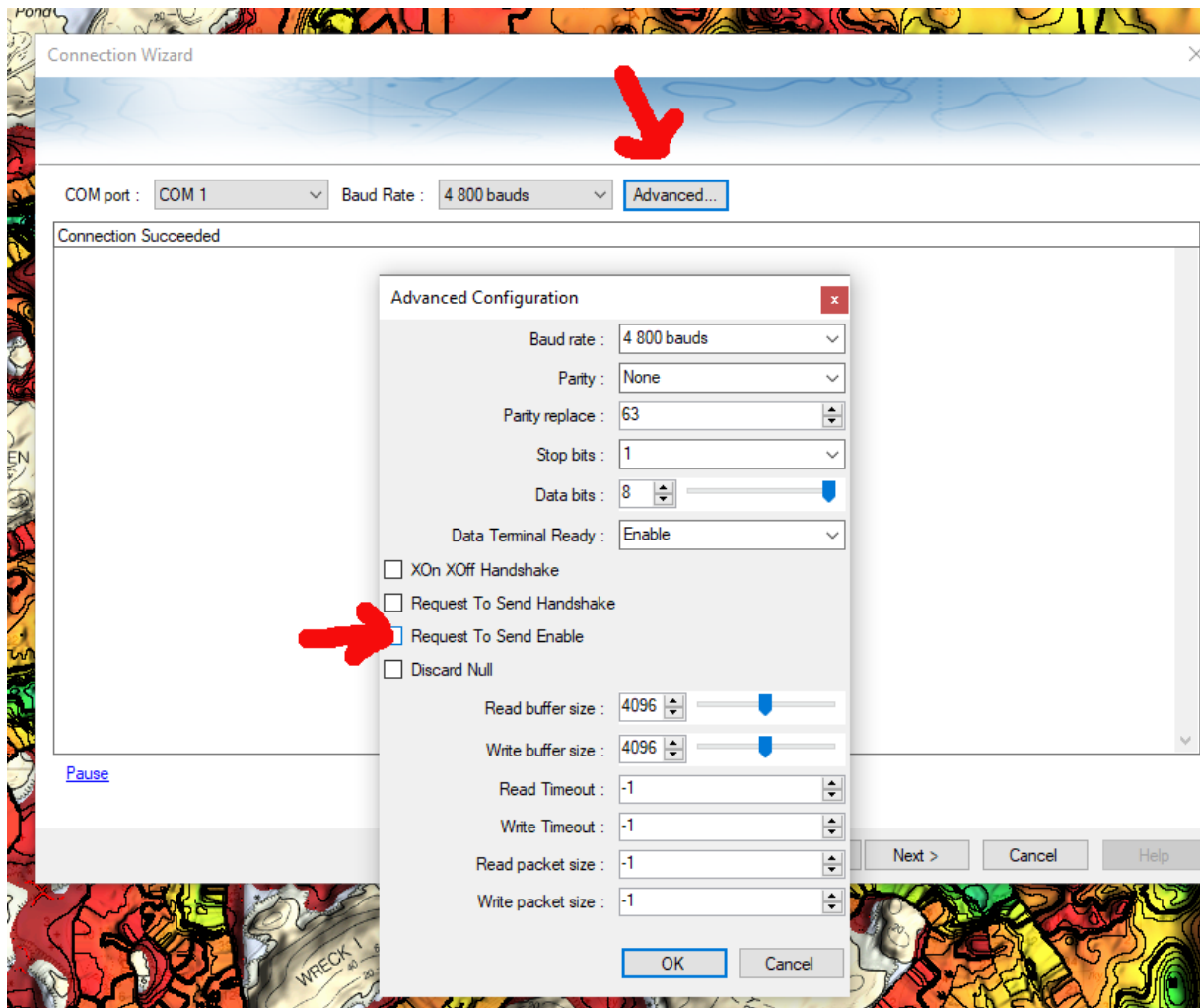
The computer has six rs-232 serial connectors which may be suitable for NMEA-0183. Some equipment may connect directly to the serial ports with a simple inexpensive connector+cable such as the Actisense DB9-F. Hondex and Garmin work well with this. Other equipment (all Furuno for example) would use an isolated cable like the Actisense Opti-4 to connect the NMEA data to the computer.

One of the benefits of using serial ports rather than USB for NMEA-0183 data is that they do not change Com port numbers within Windows. Com ports numbers are used in software to represent the connections, but are assigned sometimes arbitrarily by Windows to USB devices. Having many ports allows you to keep wiring simple and isolated between the computer and instrument; no need for multiplexers or complex wiring.

Sometimes, if instruments are started before the computer, Windows software will detect that instrument as mouse movement and make the pointer jump around on the screen. This is a fault of Microsoft's software, not the computer. We make unique efforts to prevent this in advance by connecting and disabling actual serial mice during the assembly and testing process, but can not guarantee your ability to avoid this. If this happens, shut off the instrument, go into Windows Device Manager, then into mice, and disable the Serial

Mouse. Then you can turn the instrument back on. You can make a habit of starting the computer before your connected instruments.

In Time Zero's connection wizard it may also be necessary to enable request to send if incoming data shows in the desktop port monitor utility but not in Time Zero connection wizard.



Video:

The computer has three connectors which you can connect HDMI video cables. If your display has another type of connector, use a converter cable to adapt it. We can provide short HDMI-VGA converters to allow more displays wired for VGA (blue connector) to connect. For new installs, HDMI and DVI provide a clearer picture than VGA. Many monitors have DVI (big white connector) and we recommend a HDMI-DVI cable. The HDMI end is easy to route through tight wiring spaces, holes in bulkhead, etc..

Windows 11 allows you to configure how the displays will work.. You may choose to duplicate the display if you want to see the same screen in more than one location on your boat. This is preferable to using a HDMI splitter to duplicate displays. You may choose to extend the displays if you want to see more than a single display can show. Software such as Time Zero also need configuring in it's software options to determine what to do with more than one display.

If you have duplicate displays so the computer can be seen from more than one location, you may also find it useful to connect more than one mouse/keyboard. Additional USB extensions may be needed for this.

USB:

The computer has two types of USB connectors. The blue plastic in some USB connectors indicates USB3. This is mostly backward compatible such that anything can work in it. The USB with white or black in the middle is USB2. Keyboards, mice, thumb drives work in any of them. Some instruments with USB specify USB2 or USB3 for best operation. A USB extension cable is provided and is useful since the cable on a mouse or keyboard is not long enough on most boat installations.

If you use a wireless mouse or keyboard, you may find the device is too far from the computer for reliable operation. Use the USB extension cable to move it's wireless receiver closer to the keyboard/mouse.

Instruments providing data to the computer with USB typically are assigned a COM port number in Windows. If you plug an instrument into a different USB port, you may be assigned a different COM port number in Windows and your navigation software might then need to be reconfigured. Use a label maker to label USB ports which connect instruments.

If you use USB to connect to NMEA2000 with a Actisense NGT-1, you may find the software in the downloads folder necessary to make it work. It is possible you may also need software or updates from the Actisense website for installation. While the device comes with a CD, the computer does not have a drive for it and the CD may be outdated anyhow.

GPS receiver:

Most navigation software requires a GPS source. This can be provided either with a USB GPS as we provide or a NMEA or Ethernet network source. As a labor and cost savings convenience the USB GPS is less expensive than many NMEA interface cables or wiring labor. It may also be desirable to not depend on your other instruments for position if the computer is intended to be a backup or independent system for navigation.

The GPS receiver should be mounted with the dome upwards in a dry place. It will receive signals through fiberglass and most windows. Do not mount it under a metal object which shields it from reception. There are few surfaces for magnetic mounting, so double sided tape to a cleaned surface is acceptable. You may also tape it down.. I have electrical taped them to the top of ductwork or bundles of wiring to hold them in position. Included is a metal GPS bracket which may be used to fasten the GPS puck to a ceiling made of fiberglass and/or dry wood. Tape the GPS to the bracket and fasten the bracket with a screw.

There is a GPS utility on the computer to verify signal strength. Some navigation software will also monitor signal strength. Use the same USB port (labeled) so that it will keep the same COM port number.

An external GPS connected with NMEA0183, NMEA2000 or ethernet to a MFD with external GPS might be advisable for certain features or performance requirements. A satellite compass or heading sensor are examples of this. An outdoor GPS receiver might be needed on some boats and would also connect in these ways.

Operation:

To prevent voltage spikes and sags from damaging the computer, it is recommended to start the engine before starting the computer or other electronics. A round button on the computer starts the computer. A blue light will indicate the computer is on.

When you are finished using the computer, exit the navigation software. Then shut down the computer with the red shutdown icon or click the Windows logo on the taskbar, then power and shutdown. No need to use the power button for shutdown. Cutting power to the computer while it is in Windows or the navigation software can corrupt the computer and data and should be avoided.

The computer will get toasty warm during operation and this is normal. As there are no fans, the whole case is a heatsink/radiator for the eight core processor and other electronics inside. It has been tested from below freezing to hot engine room environments for long periods of time. We have further adjusted BIOS and Windows power settings during preparation to provide further heat protection.

Shipping:

If sending the computer in for any sort of work/upgrades/repair, the small box and foam spacers that it came in are ideal for shipping. If those are no longer, use at least an inch of bubble wrap or similar protection for shipping. Avoid foam peanuts or wrap that causes static electricity. Include your name and contact information with the computer so that your dealer can keep track of it.

Label your wires before removing the computer from its place in your boat. Photograph the computer and its labeled wires in place so you can easily hook it back up without confusion or questions.