

ECHOMAP™ ULTRA 2 16XSV INSTALLATION INSTRUCTIONS

Important Safety Information

WARNING

See the *Important Safety and Product Information* guide in the product box for product warnings and other important information.

When connecting the power cable, do not remove the inline fuse holder. To prevent the possibility of personal injury or product damage caused by fire or overheating, the appropriate fuse must be in place as indicated in the product specifications. Connecting the power cable without the appropriate fuse in place voids the product warranty.

Failure to install this device according to these instructions could result in personal injury, damage to the vessel or device, or poor product performance.

CAUTION

To avoid possible personal injury, always wear safety goggles, ear protection, and a dust mask when drilling, cutting, or sanding.

To avoid possible personal injury or damage to the device and vessel, disconnect the vessel's power supply before beginning to install the device.

To avoid possible personal injury or damage to the device or vessel, before applying power to the device, make sure that it has been properly grounded, following the instructions in the guide.

To avoid possible personal injury or damage to this device and vessel, only install this device when the vessel is on land, or when properly secured and docked in calm water conditions.

NOTICE

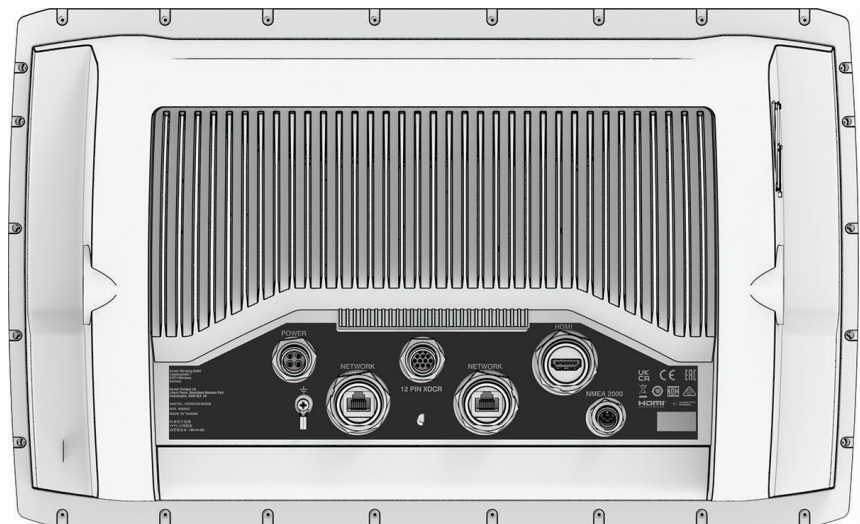
When drilling or cutting, always check what is on the opposite side of the surface to avoid damaging the vessel.

Read all installation instructions before proceeding with the installation. If you experience difficulty during the installation, contact Garmin® Product Support.

Tools Needed

- Drill
- Drill bits
 - Bail mount: 3 mm ($\frac{1}{8}$ in.) drill bits and screws appropriate for the surface and hardware
 - Flush mount: 3.2 mm ($\frac{1}{8}$ in.) and 8.5 mm ($\frac{11}{32}$ in.) drill bits
- #2 Phillips screwdriver
- Jigsaw or rotary tool
- File and sandpaper
- Marine sealant (optional)

Connector View



POWER	Power
12 PIN XDCR	12-pin transducer
HDMI	HDMI® video out
	Ground screw
NETWORK	Garmin network cable port for connection to compatible LiveScope™, GCV™, and ECHOMAP devices NOTE: This device is not compatible with some Garmin Marine Network devices such as GPSMAP®, GSD™, and radar devices.
NMEA 2000	NMEA 2000® network

Software Update

You may need to update the chartplotter software after installation. For the instructions on how to update the software, see the owner's manual at garmin.com/manuals/echomap_ultra_2_16xsv.

Mounting Considerations

You can flush mount the device in the dashboard or bail mount the device on the dashboard.

When selecting a mounting location, observe these considerations.

- The mounting location must provide a clear view of the screen and access to the keys on the device.
- The mounting location must be sturdy enough to support the device and the mount.
- The cables must be long enough to connect the components to each other and to power.
- To avoid interference with a magnetic compass, do not install the device closer to a compass than the compass-safe distance value listed in the product specifications.

Bail Mounting the Device

NOTICE

If you are mounting the bracket on fiberglass with screws, it is recommended to use a countersink bit to drill a clearance counterbore through only the top gel-coat layer. This will help to avoid cracking in the gel-coat layer when the screws are tightened.

You can use the bracket to bail mount the device on a flat surface.

- 1 Using the bail-mount bracket ① as a template, mark the pilot holes ②.



- 2 Using a 3 mm ($\frac{1}{8}$ in.) drill bit, drill the pilot holes.
- 3 Secure the bail-mount bracket to the surface using the included washers and wood screws ③.
- 4 Install the bail-mount knobs ④ on the sides of the device.
- 5 Place the device in the bail-mount bracket, and tighten the bail-mount knobs.
- 6 Install the trim caps by snapping them in place around the edges of the device.

Flush Mounting the Device

NOTICE

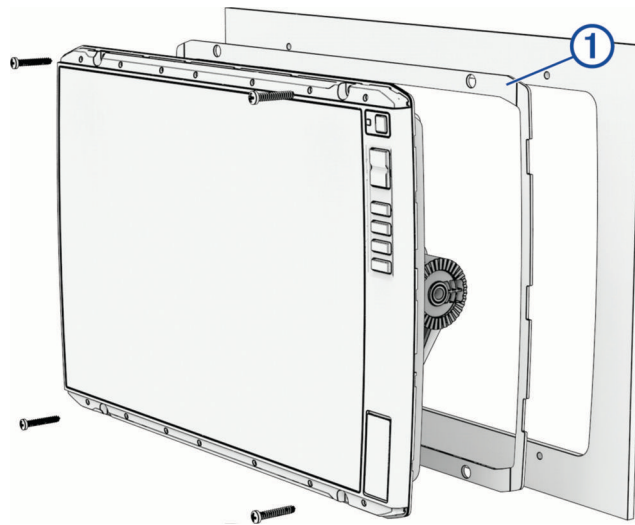
Be careful when cutting the hole to flush mount the device. There is only a small amount of clearance between the case and the mounting holes, and cutting the hole too large could compromise the stability of the device after it is mounted.

Using a metal pry tool such as a screwdriver can damage the trim caps and the device. Use a plastic pry tool when possible.

You can mount the device in your dashboard using the flush-mount template and included screws.

- 1 Secure the template to the mounting location.
- 2 Using a 8.5 mm ($11/32$ in.) drill bit, drill one or more of the holes inside the corners of the solid line on the template to prepare the mounting surface for cutting.
- 3 Using a jigsaw or rotary cutting tool, cut the mounting surface along the inside of the solid line indicated on the template.
- 4 Place the device into the cutout to test the fit.
- 5 If necessary, use a file or sandpaper to refine the size of the cutout.
- 6 Use a pry tool, such as a flat piece of plastic or a screwdriver, to carefully pry up the corners of the trim caps, and remove the trim caps.
- 7 Place the device in the cutout, and ensure the mounting holes on the device line up with the pilot holes on the template.
- 8 If the mounting holes on the device do not line up with the pilot holes on the template, mark the new hole locations.
- 9 Using a 3.2 mm ($1/8$ in.) drill bit, drill the pilot holes.
- 10 Remove the template from the mounting surface.
- 11 Install the rubber gasket ① on the back of the device.

The individual pieces of the rubber gasket have adhesive on the back. Make sure you remove the protective liner before installing them on the device.



- 12 Connect all necessary cables ([Connector View, page 2](#)), and turn the locking rings clockwise to secure the cables to device before placing it into the cutout.

NOTICE

To prevent corrosion of the metal contacts, cover unused connectors with the attached weather caps.

- 13 Place the device into the cutout.
- 14 Secure the device to the mounting surface using the included screws.
- 15 Install the trim caps by snapping them in place around the edges of the device.

Connection Considerations

After connecting the cables to the device, tighten the locking rings to secure each cable.

Connecting the Device to a Transducer

Go to garmin.com/transducers or contact your local Garmin dealer to determine the appropriate type of transducer for your needs.

NOTE: If you use an existing transducer and the transducer cable pin connector does not match the device port, you may be able to use a transducer cable adapter to connect your existing transducer to this device. Go to garmin.com for more information about transducer accessories.

- 1 Follow the instructions provided with your transducer to correctly install it on your boat.
- 2 Route the transducer cable to the back of your device, away from sources of electrical interference.
- 3 Align the divot on the transducer cable connector with the keying on the 12 PIN XDCR port on the back of the device.

NOTICE

You must align the holes on the cable connector with the pins in the cable port. Misalignment of the cable connection could damage the devices.

- 4 Push the connector firmly into the port until fully seated.

If the device behaves erratically, the cable connector may not be fully seated. Disconnect the cable connector from the port, check the pin alignment, and firmly push the connector into the port.

Network Connection Considerations and Requirements

You can use the NETWORK port to connect a compatible Garmin device such as a LiveScope transducer, GCV sonar module, or another ECHOMAP chartplotter. This device is not compatible with the Garmin BlueNet™ network or the Garmin Marine Network, and you should not connect devices such as a GPSMAP chartplotter or a Garmin radar.

When connecting a compatible device to the NETWORK port, observe these considerations and requirements:

- Any device connected to the NETWORK port must connect to the same ground as this device. If multiple power sources are used between the devices, you must tie the ground connections from the power supplies together using a low resistance connection or tie them to a common ground bus bar, if available.
- You must use a Garmin network cable for any connections using the NETWORK port.
 - You must not use third-party CAT5e or CAT6 Ethernet cable and RJ45 connectors.
 - Additional Garmin network cables and connectors are available from your Garmin dealer.
 - Although it is not recommended, you can use a field-installable connector to create a custom-length Garmin network cable if necessary. Follow the directions provided with the connector.

NMEA 2000 Considerations

NOTICE

If you are connecting to an **existing** NMEA 2000 network, identify the NMEA 2000 power cable. Only one NMEA 2000 power cable is required for the NMEA 2000 network to operate properly.

A NMEA 2000 Power Isolator (010-11580-00) should be used in installations where the existing NMEA 2000 network manufacturer is unknown.

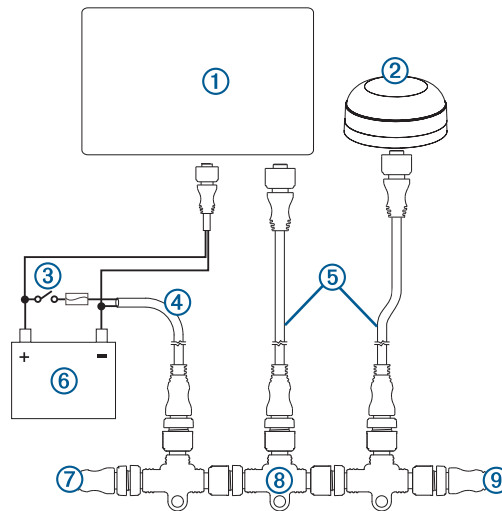
If you are installing a NMEA 2000 power cable, you must connect it to the boat ignition switch or through another in-line switch. NMEA 2000 devices will drain your battery if the NMEA 2000 power cable is connected to the battery directly.

You can connect your device to a NMEA 2000 network on your boat to share data from NMEA 2000 compatible devices such as a GPS antenna or a VHF radio. The necessary NMEA 2000 cables and connectors are sold separately.

This device is not powered through the NMEA 2000 network. You must connect the device to a power source .

If you are unfamiliar with NMEA 2000, you should read the *Technical Reference for NMEA 2000 Products* at garmin.com/manuals/nmea_2000.

The port labeled NMEA 2000 on the cradle is used to connect it to a standard NMEA 2000 network.



Item	Description
①	ECHOMAP Ultra 2 16xsv device
②	GPS antenna or other NMEA 2000 device
③	Ignition or in-line switch
④	NMEA 2000 power cable
⑤	NMEA 2000 drop cable
⑥	12 Vdc power source
⑦	NMEA 2000 female terminator or backbone extension cable
⑧	NMEA 2000 T-connector
⑨	NMEA 2000 male terminator or backbone extension cable

HDMI Out Video Considerations

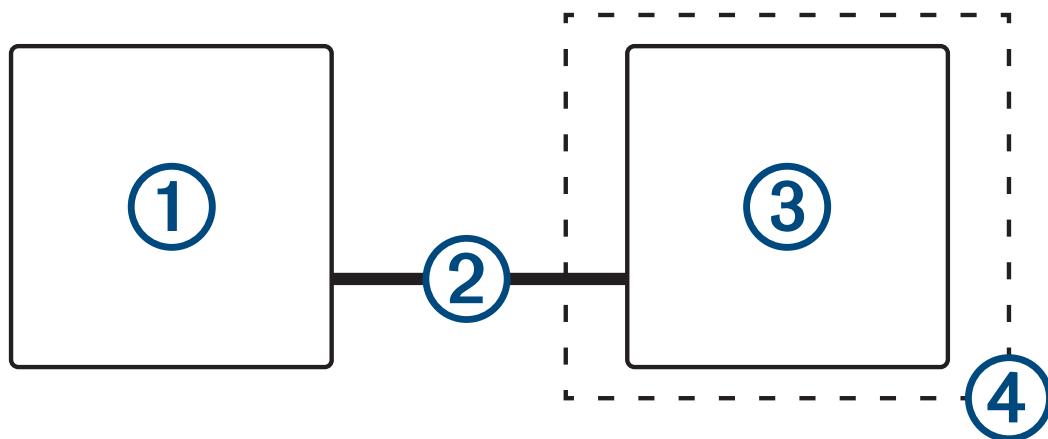
NOTICE

To prevent corrosion due to moisture, you must use Garmin accessory cables when connecting the chartplotter to the video display. Using different cables voids your warranty.

The ECHOMAP Ultra 2 16xsv chartplotter models have HDMI out capability to duplicate the chartplotter screen on another device, such as a television or monitor.

The Garmin HDMI accessory cable is 4.5 m (15 ft.) long. If you need a longer cable, you should use an active HDMI cable only. You need an HDMI coupler to connect the two HDMI cables.

You must make all cable connections in a dry environment.



Item	Description
①	ECHOMAP Ultra 2 16xsv chartplotter
②	Garmin HDMI cable (HDMI)
③	Display with an HDMI In port, such as a computer or television
④	Dry environment, protected from moisture

Specifications

Temperature range	From -15° to 55°C (from 5° to 131°F)
Material	Polycarbonate plastic and die-cast aluminum
Water rating	IEC 60529 IPX7 ¹
Input voltage	From 9 to 18 Vdc
NMEA 2000 LEN @ 9 Vdc	2
NMEA 2000 draw	75 mA max.
Memory card	2 microSD® memory card slots, 1 TB max. card size, formatted to exFAT.
Dimensions (W × H × D)	384.7 × 266.4 × 78 mm (15 1/8 × 10 1/2 × 3 1/16 in.)
Dimensions with cover on bail mount (W × H × D)	405.9 × 277.3 × 110 mm (16 × 10 15/16 × 4 3/8 in.)
Clearance to next obstruction behind chartplotter	94 mm (3 3/4 in.)
Display size (W × H)	345.2 × 194.6 mm (13 9/16 × 7 11/16 in.) 396.3 mm (15 5/8 in.) diagonal
Display resolution	FHD, 1920 × 1080 pixels (IPS)
Weight	4.45 kg (9.8 lb.)
Compass-safe distance	85 cm (33.5 in.)
Wireless frequency	2.4 GHz @ 16.4 dBm maximum
Max. power usage at 10 Vdc	45 W
RMS current draw at 12 Vdc	3.6A @ 12V
Peak current draw at 12 Vdc	6.5A @ 12V
Fuse	8 A, 125 V fast-acting

¹ The device withstands incidental exposure to water of up to 1 m for up to 30 min. For more information, go to www.garmin.com/waterrating.

NMEA 2000 PGN Information

Transmit and Receive

PGN	Description
059392	ISO acknowledgment
059904	ISO request
060160	ISO transport protocol: Data transfer
060416	ISO transport protocol: Connection management
060928	ISO address claimed
126208	Request group function
126993	Heartbeat
126996	Product information
126998	Configuration information
127237	Heading/track control
127245	Rudder
127250	Vessel heading
127258	Magnetic variance
127488	Engine parameters: Rapid update
127489	Engine parameters: Dynamic
127490	Electric drive status: Dynamic
127491	Electric energy storage status: Dynamic
127493	Transmission parameters: Dynamic
127494	Electric drive information
127495	Electric energy storage information
127505	Fluid level
127508	Battery status
128002	Electric drive status: Rapid update
128003	Electric energy storage status: Rapid update
128259	Speed: Water referenced
128267	Water depth
129025	Position: Rapid update
129026	COG and SOG: Rapid update
129029	GNSS position data
129283	Cross track error
129284	Navigation data

PGN	Description
129285	Navigation - route/waypoint information
129539	GNSS DOPs
129540	GNSS satellites in view
130060	Label
130306	Wind data
130310	Environmental parameters (obsolete)
130312	Temperature (obsolete)

Transmit

PGN	Description
126464	Transmit and receive PGN list group function
126984	Alert response
127258	Magnetic variation
127497	Trip parameters: Engine
127502	Switch bank control (DEPRECATED)

Receive

PGN	Description
065030	Generator average basic AC quantities (GAAC)
065240	Commanded address
126983	Alert
126985	Alert text
126987	Alert threshold
126988	Alert value
126992	System time
127233	Man overboard
127237	Heading/track control
127245	Rudder
127251	Rate of turn
127252	Heave
127257	Attitude
127498	Engine parameters: Static
127501	Switch bank status
127503	AC input status (obsolete)

PGN	Description
127504	AC output status (obsolete)
127506	DC detailed status
127507	Charger status
127509	Inverter status
128000	Nautical leeway angle
128275	Distance log
128780	Linear actuator
129038	AIS class A position report
129039	AIS class B position report
129040	AIS class B extended position report
129041	AIS Aids to Navigation (AtoN) report
129044	Datum
129285	Navigation: Route, waypoint information
129794	AIS class A static and voyage related data
129798	AIS SAR aircraft position report
129799	Radio frequency/mode/power
129802	AIS safety-related broadcast message
129808	DSC call Information
129809	AIS class B "CS" static data report, part A
129810	AIS class B "CS" static data report, part B
130067	Route and waypoint service: Route, waypoint name and position
130311	Environmental parameters (obsolete)
130313	Humidity
130314	Actual pressure
130316	Temperature: Extended range
130569	Entertainment: Current file and status
130570	Entertainment: Library data file
130571	Entertainment: Library data group
130573	Entertainment: Supported source data
130574	Entertainment: Supported zone data
130576	Trim tab status
130577	Direction data

物質宣言

部件名称	有毒有害物质或元素									
	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚	邻苯二甲酸二(2-乙基己)酯	邻苯二甲酸丁苄酯	邻苯二甲酸二丁酯	邻苯二甲酸二异丁酯
印刷电路板组件	✗	○	○	○	○	○	○	○	○	○
屏幕/背光	✗	○	○	○	○	○	○	○	○	○
金属零件	✗	○	○	○	○	○	○	○	○	○
电缆 电缆组件 连接器	✗	○	○	○	○	○	○	○	○	○
塑料和橡胶零件	○	○	○	○	○	○	○	○	○	○

本表格依据 SJ/T11364 的规定编制。

○: 代表此种部件的所有均质材料中所含的该种有害物质均低于 (GB/T26572) 规定的限量

✗: 代表此种部件所用的均质材料中, 至少有一类材料其所含的有害物质高于 (GB/T26572) 规定的限量

* 该产品说明书应提供在环保使用期限和特殊标记的部分详细讲解产品的担保使用条件。



10
产品

中国微功率无线电发射设备合规

- 一) 工作于 2.4 GHz 频段的 ANT 技术无线遥控设备 , 使用频率 : 2.4 GHz, 发射功率限值 : <10 mW (e.i.r.p.)(e.i.r.p), 频率容限 : <170 kHz
- 二) 不得擅自改变使用场景或使用条件、扩大发射频率范围、加大发射功率 (包括额外加装射频功率放大器) , 不得擅自更改发射天线 ;
- 三) 不得对其他合法的无线电台 (站) 产生有害干扰 , 也不得提出免受有害干扰保护 ;
- 四) 应当承受辐射射频能量的工业、科学及医疗 (ISM) 应用设备的干扰或其他合法的无线电台 (站) 干扰 ;
- 五) 如对其他合法的无线电台 (站) 产生有害干扰时 , 应立即停止使用 , 并采取措施消除干扰后方可继续使用 ;
- 六) 在航空器内和依据法律法规、国家有关规定、标准划设的射电天文台、气象雷达站、卫星地球站 (含测控、测距、接收、导航站) 等军民用无线电台 (站)、机场等的电磁环境保护 区域内使用微功率设备 , 应当遵守电磁环境保护及相关行业主管部门的规定 ;
- 七) 禁止在以机场跑道中心点为圆心、半径 5000 米的区域内使用各类模型遥控器 ;
- 八) 微功率设备使用时温度 -15-55℃ 直流电压 10-32 Vdc 。

联系信息

制造厂商 : 台湾国际航电股份有限公司
 销售厂商 : 上海佳明航电企业管理有限公司
 联络地址 : 上海市徐汇区桂平路 391 号 (新漕河泾国际商务中心 A 座 37 层)
 电 话 : 021-60737675
 客服专线 : 400-819-1899

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ECHOMAP™ 162sv/165sv/166sv

M/N: A05043

FCC ID: IPH-05043 IC: 1792A-05043 Garmin Corporation

航海電子設備

