

WatchMate 850 Install Guide



vespermarine

Your AIS WatchMate® 850 is a Class B Transponder with an integrated display and GPS receiver.

The WatchMate provides information to improve your situational awareness and assist in avoiding collisions at sea. Because it consumes very low power, it may be left turned on whenever your vessel is underway. It works by interpreting Universal Shipborne Automated Identification Systems (AIS) messages which are sent over VHF by transponders installed on other vessels. The AIS system uses two dedicated VHF channels designated for this purpose and with the installation of the WatchMate to receive these signals you can view AIS information. You can also distribute AIS information to other devices on board your vessel (e.g. chart plotters and computers) using NMEA 0183 and USB. In addition, your vessel data is transmitted to other AIS-equipped vessels within range.

For more information go to www.vespermarine.com/watchmate850.

WHAT YOU NEED TO GET GOING

- ☒ WatchMate 850
- ☒ Mounting Bracket
- ☒ 10 pin power/data cable
- ☐ AIS/VHF antenna
- ☐ MMSI number
- ☐ 2A fuse or circuit breaker

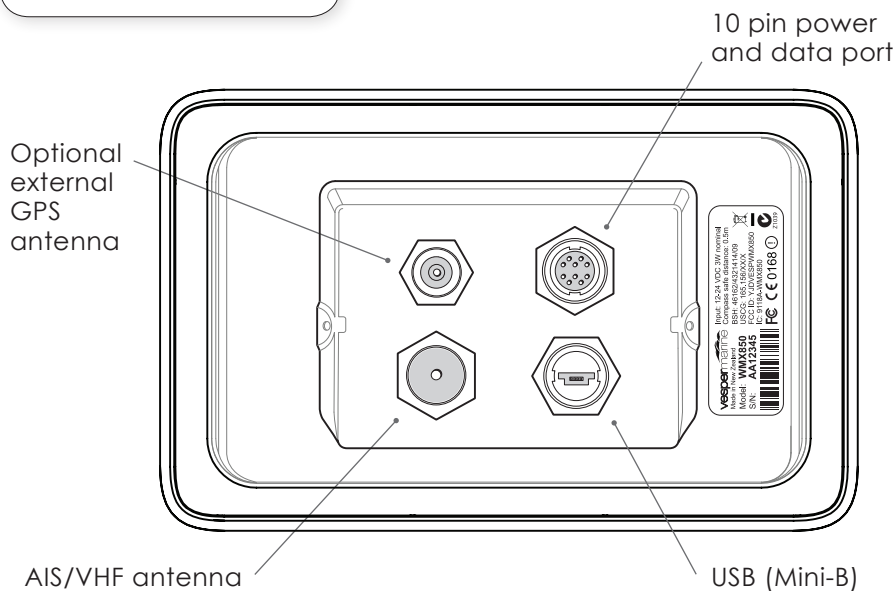
✓ = Item Included

OPTIONAL ACCESSORIES

- ☒ 1m USB cable (for configuration)
- ☒ Panel mount template, gasket and 4 screws
- ☐ Waterproof 5m USB cable with locking security ring
- ☐ SP160 Antenna Splitter
- ☐ External GPS antenna with 10m cable
- ☐ Consider other equipment you may need to install on your vessel (e.g. additional cable, cable ties, mounting screws, wire strippers, screwdriver etc.)

✓ = Item Included

CONNECTIONS



Mount the WatchMate at least 0.6m (2 ft) from any compass. Test your compass to verify that it operates properly when the WatchMate is operating.

VHF ANTENNA

- A dedicated VHF antenna or Vesper Marine AIS/VHF Antenna Splitter is required.
- Choose an omnidirectional VHF antenna designed for the marine band (156-162MHz) and ensure it is well tuned at the AIS end of the band (VSWR 2:1 or less at 162MHz).
- Mount the antenna as high as possible (at least 2-3 metres (6-10 ft) above the water surface). It is not recommended to place the VHF antenna near a mast or other metal structures.



CAUTION: Install the antenna a minimum of 1m (4 ft) from any other VHF or HF antennas and not within the beam path of a radar. Inadequate separation may damage the device and void your warranty.



CAUTION: Never operate this device unless it is connected to a suitable VHF antenna or Vesper Marine AIS/VHF Antenna Splitter. The use of any other splitter may damage the device and void your warranty.



HINT: Use the WatchMate's VSWR meter on the AIS Status screen to check your antenna system installation.

GPS ANTENNA

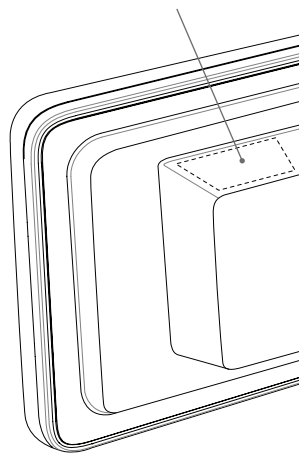
The WatchMate requires a GPS fix before it can transmit its position.

Internal

The WatchMate has a built-in GPS patch antenna.

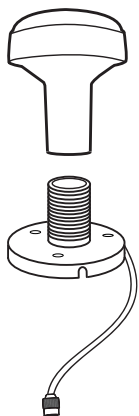
- This antenna requires an unobstructed view of the sky.
- The antenna performance may be significantly reduced if the WatchMate is installed on, under, or near large metal structures.
- The antenna faces upwards and is located as shown.
- For faster fix times, switch the unit off but keep power connected to the unit.

Internal GPS antenna location



HINT: Use the GPS Status screen to view satellite signal strengths which will assist in determining the best location for the WatchMate or the external GPS antenna.

External (optional)



If you are mounting the WatchMate in a location which will not provide adequate GPS signal coverage, then you must install a dedicated GPS antenna.

- The GPS antenna should be situated so that it has an unobstructed view of the sky above.
- Do not place the GPS antenna near or in the path of radar or HF antennas.
- The antenna cable is terminated with a TNC connector. Do not cut the cable unless you have the proper tools to crimp a new connector. Make the connection to your AIS transponder last after antenna installation is complete.



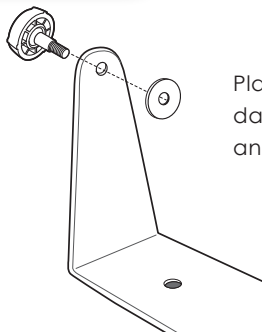
CAUTION: The Vesper Marine GPS antenna is designed specifically for use with the WatchMate Transponder. Performance cannot be assured unless you use a Vesper Marine GPS antenna. Use of a different antenna may damage the device and void your warranty.

MOUNTING AND WIRING

Mounting bracket

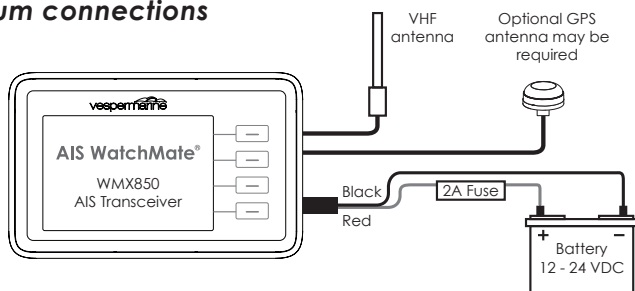
Securely mount with appropriate length screws in the holes provided.

Rotate bracket to hang the WatchMate from a shelf or other surface above.

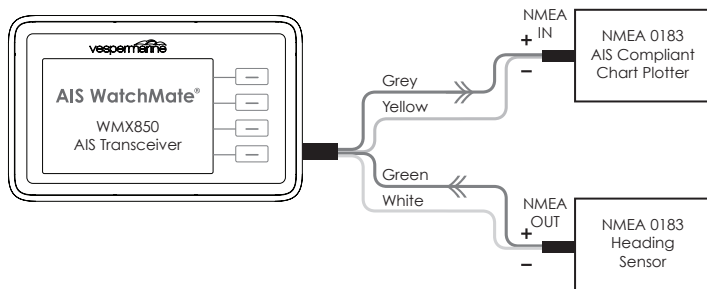


Place the rubber vibration damper between the bracket and your WatchMate.

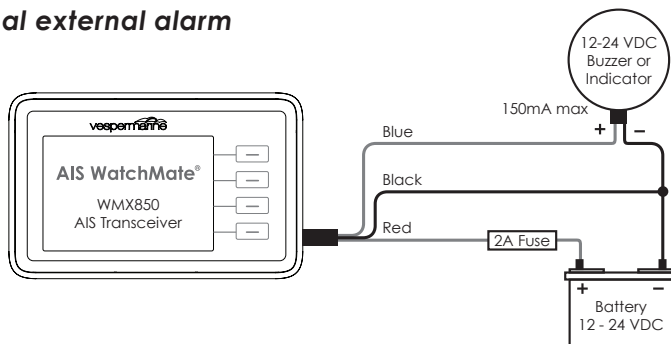
Minimum connections



Optional chart plotter/MFD and heading sensor



Optional external alarm

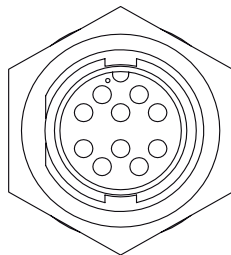


POWER / DATA CABLE

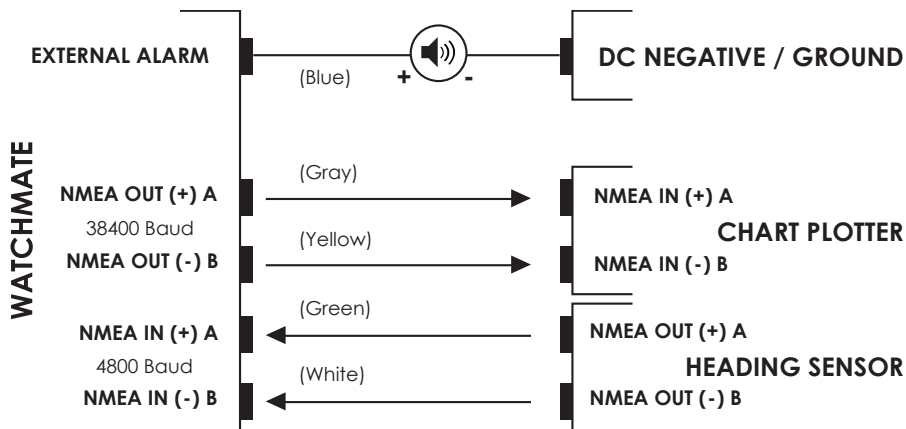
A 2m (6 ½ft) cable with attached 10 pin connector is supplied for connecting the WatchMate to power, other devices over NMEA 0183 and an external alarm. You may extend this cable as necessary.

- Check you have the VHF antenna connected before connecting to power.
- Fully engage the locking ring to ensure a watertight seal.
- Received NMEA 0183 data is output on USB.

COLOR	DESCRIPTION
Red	DC positive (+) (12-24 volts). Always use a 2A fuse or circuit breaker. Do not connect directly to battery. If you must extend the power connections use high quality pre-tinned marine grade wire which is at least 16 AWG (1.5mm²) .
Black	DC negative (-)
Gray	NMEA 0183 out (+) A
Yellow	NMEA 0183 out (-) B
Green	NMEA 0183 in (+) A
White	NMEA 0183 in (-) B
Blue	External alarm. When an alarm is triggered and the external alarm is enabled this wire will have the input voltage (from the red wire) applied, current limited to 150mA. You can use this to provide power to an external buzzer, light or other signaling device.

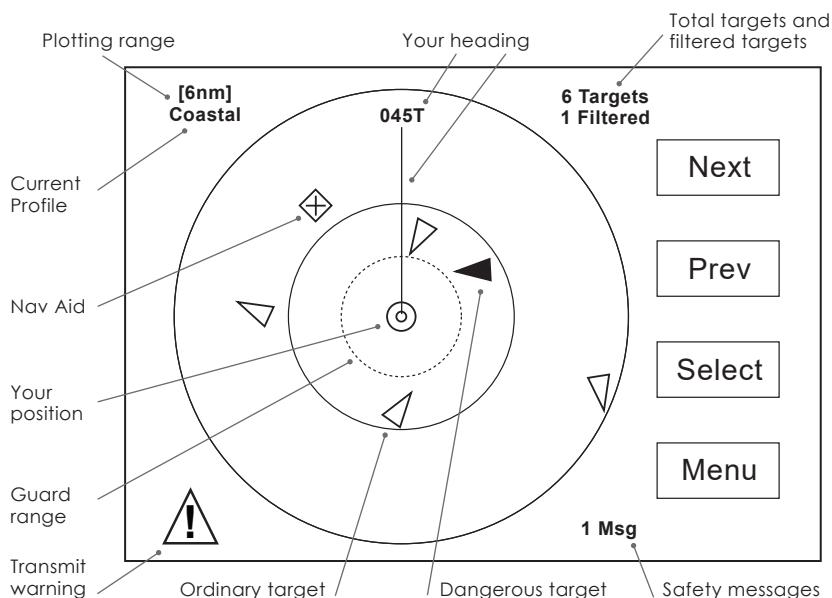


(Do not connect brown, orange or pink wire)



AIS PLOTTER

- Color of targets change depending on their alarm state.
- The target icon points in the direction of the targets heading. If heading data is not available it will use course over ground (COG).
- You must have a valid GPS fix for any targets to be shown on the AIS plotter.
- Go to www.vespermarine.com/watchmate850 for additional information.



- ▲ Triangle points in the direction of the target's heading.
- ▲ This target meets one or more of your alarm criteria.
- ◆ An aid to navigation.
- ⊗ Search and rescue transponder (AIS SART) or man overboard device (AIS MOB).
- Ⓐ Target is marked as a member of your "fleet".
- Selected target. Press the *Select* button to view the complete target details.
- ✕ Target is "lost". No AIS data has been received from the target within the expected intervals.
- ↑ Display is oriented North-Up for this profile. Use setup to change.
- ⚠ AIS data is not being transmitted. Check the AIS Status screen. You must configure your vessel MMSI in order to transmit.

GETTING STARTED

Alarm Types:

Guard alarm - based on each target's current distance from your vessel.

CPA alarm - there are several settings associated with CPA alarms: CPA alarm distance, time until CPA (TCPA), target speed and your vessel speed. The CPA alarm distance indicates which targets will trigger the alarm. The other settings suppress alarms if the TCPA is too great, or either vessel's speed is too slow. Help for these, and all other settings, is displayed on each setup screen.

Muting Alarms

Alarms are muted for each individual target. All other targets remain active.

Profiles

Alarm and filter settings are grouped into four profiles (anchored, harbor, coastal, offshore). You can change the settings for each profile and switch between profiles at any time. Select the current profile from the main menu

Filters

You may filter targets based on their speed, range or CPA. Filters can be used to reduce clutter. Use setup to establish filters for the current profile.

Setup

To change alarm and filter settings associated with a profile, you must select the profile prior to entering setup mode. Setup mode is accessed from the main menu.

Target List

Shows targets in priority order. Particularly useful when there are many targets and the screen is cluttered.

USB

- When you connect the WatchMate to your PC or Mac using USB, it will automatically create a COM port. This COM port may then be used with the vmAIS utility or 3rd party navigation software. Download vmAIS from **www.vespermarine.com/watchmate850**.
- The first time you plug in the WatchMate, most operating systems will automatically install the necessary drivers.
- If a COM port is not created the first time your plug in the WatchMate, you may need to install the drivers manually. Download the USB drivers from **www.vespermarine.com/watchmate850**.

CONFIGURATION ON-SCREEN

- Before the WatchMate can transmit your position you must configure your vessel details and enter a valid MMSI number. Your MMSI may have already been entered by your dealer. **You must have an assigned MMSI for your vessel.** If you do not have an assigned MMSI, contact the relevant authority in your country.
- You can configure your WatchMate on-screen in setup mode or using the vmAIS PC/Mac utility software. vmAIS is available for download from www.vespermarine.com/watchmate850.
- **Once you save the MMSI number you cannot change it.** If you need to change the MMSI, please contact an authorized dealer or Vesper Marine.
- To configure your vessel details use the on-screen setup mode as shown below:

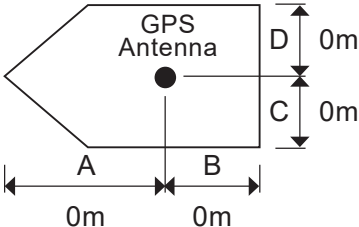
Your vessel AIS details

MMSI: 0 0 0 0 0 0 0 0 0

Type:

Name:

Call sign:



GPS Antenna

A 0m

B 0m

C 0m

D 0m

▲

▼

Modify

OK

- | | |
|--------|--|
| ▲ | Move the selection box to the previous field |
| ▼ | Move the selection box to the next field |
| Modify | Enter a new value for the selected field |
| OK | Save your changes and exit configuration |

CONFIGURATION USING A PC OR MAC

You can also configure your WatchMate using the vmAIS PC/Mac utility software. vmAIS is available for download from www.vespermarine.com/watchmate850.

Before the WatchMate can transmit your position you must configure your vessel details and enter a valid MMSI number. Your MMSI may have already been entered by your dealer. **You must have an assigned MMSI for your vessel.** If you do not have an assigned MMSI, contact the relevant authority in your country.

- Install vmAIS on your PC or Mac.
- Plug the WatchMate in to an available USB port (see USB section).
- Select the appropriate COM port and click the **Connect** button.
- Enter your vessel details carefully and click on the **Save Data** button.

Once you save the MMSI number you cannot change it.

The screenshot shows the vmAIS configuration window. At the top, there are fields for 'Com Port' (set to 'USB Serial Port (COM4)'), 'IP Address', and 'Port', along with a 'Disconnect' button. Below this is a section for device identification: 'Model: VMX850', 'Serial Number: G224429', 'Application: N/A', and 'AIS Version: 5.09.7646'. The main area is titled 'Configure Vessel Data' and contains several tabs: 'VHF', 'MMEA-01B3', 'MMEA-2000', 'Status', 'GPS', 'Firmware update', and 'Serial Data'. The 'MMSI' field is highlighted with an 'Info...' button. Other fields include 'Name', 'Call Sign', and 'Type' (set to 'Pleasure craft (primary propulsion is engine)'). A diagram of a boat is shown with dimensions A, B, C, and D, and a 'GPS ANTENNA' location. A note states: '* Data is always stored in whole metres. Therefore not all dimensions in feet can be represented.' At the bottom, there is a 'Save Data' button and a version number '2.3.8097'.

YOU'RE FINISHED!

If you have a GPS position and there is no warning symbol in the status bar, your WatchMate is transmitting your position and is successfully installed! Your position will be transmitted every 3 minutes when your speed is under 2 knots or every 30 seconds otherwise. Your vessel information (e.g. name, callsign, etc) is transmitted every 6 minutes. If the warning symbol is still visible, choose the AIS Status display from the menu to display the reason. See the troubleshooting section for the probable cause.


REGISTER YOUR WATCHMATE








Vesper Marine releases downloadable updates from time to time. These updates often add new features. To be notified when a new update is available please register your WatchMate at www.vespermarine.com/register.

GOT A QUESTION?

Visit www.vespermare.com/watchmate850 for comprehensive answers to frequently asked questions, the complete user manual, technical support, downloads, local dealer contacts and more...

TROUBLESHOOTING

The  symbol indicates your AIS data is not being transmitted. It is located at the bottom left of the WatchMate screen. Use the menu to view the AIS Status.

STATUS		DESCRIPTION
MMSI CONFIGURED		You must have a valid MMSI programmed before you can transmit your position (see configuration section).
SILENT MODE IS OFF		Silent mode is on. If this is not intentional check silent mode is switched off in AIS settings.
STARTUP COMPLETE		Before the WatchMate can transmit it needs 1 minute to initialize.
GPS POSITION FIX		The WatchMate requires a GPS fix before it can transmit its position. This may take a few minutes. If it is taking a long time check your GPS antenna installation (see GPS antenna section) and GPS signal strength using the menu to select GPS Status.
POSITION REPORT SENT		This may happen from time to time in very busy areas with lots of AIS traffic. This is normal behaviour for a Class B AIS device.
VSWR		<p>Check your antenna installation. Use the VSWR meter on the AIS Status screen. A poorly tuned antenna, bad cabling or connections are typical reasons for a high VSWR. Your WatchMate will continue to operate normally but transmit performance will degrade.</p> <p>The VSWR meter is a black bar that extends from the left. Lower VSWR is indicated by a shorter black bar.</p> <p>1:1  >5:1</p>

TECH SPECS

Size (not incl bracket)	208mm wide x 135mm high x 76mm depth (8 3/16" x 5 5/16" x 3")
Flush mount thickness	17mm (11/16")
LCD panel	125mm (5"), FSTN 320x240 LED backlit
Power supply	10-32 VDC 2A max, 3W nominal
Environmental	Watertight (USCG CFR-46, IPx7)
Operating temperature	-25°C to +55°C (-13°F to 131°F)
Storage temperature	-25°C to +80°C (-13°F to 176°F)
Serial data	1 USB port (isolated), 1 NMEA input (isolated RS422), 1 NMEA output (non-isolated RS422)
Baud rate	4800 or 38400. AIS output requires 38400 baud
Data port impedance	NMEA input: 96k ohm, NMEA output: 28 ohm
NMEA output	RMC, GSV, GSA, GGA, GLL, VTG, VDO, VDM, TXT, DSC
NMEA input (optional)	HDG, HDM, HDT
Number of receivers	2 AIS, 1 DSC (timeshared)
Number of transmitters	1 AIS
Receive frequency range	156.025 – 162.025 MHz
Transmit frequency range	161.500 – 162.025 MHz
AIS sensitivity	-113 dBm < 20% PER
Power output	33 dBm (2W)
GPS sensitivity	-159dBm tracking & navigation -142dBm acquisition
GPS SBAS support	WAAS, EGNOS, MSAS, GAGAN
External alarm maximum	150 mA @ VDC
Power/data connector	10 pin circular
USB connector	Mini USB (USB 2.0)
GPS antenna connector	TNC
VHF antenna connector	SO-239
VHF antenna required	50 ohm, max 2:1 VSWR @ 162MHz. PL-259 connector.
Firmware version	5.06

WARNINGS

This AIS Transponder works in conjunction with other vessels and systems, such as other AIS transponders and GPS devices. The accuracy of this device and the AIS system can be affected by many factors, including equipment failure or defects, environmental conditions and incorrect installation, handling or use. Vesper Marine does not warrant that this product is error-free. It is the user's responsibility to exercise common prudence and navigational judgment. This device should not be relied upon as a substitute for such prudence and judgment. Always maintain a permanent watch so that you can respond to situations as they develop. The prudent mariner will not rely on a single aid to navigation. The user should verify the information obtained from this AIS Transponder is in accordance with expected situations and conditions. The information is not guaranteed to be accurate or reliable and this AIS Transponder is not a substitute for proper seamanship. Vesper Marine Limited cannot be held liable for any injury, damage or loss, caused by, during, or because of the installation, use or inability to use this device. This AIS Transponder is to be installed and used entirely at your own risk. By installing and/or using this AIS Transponder you fully accept all risk and agree to hold Vesper Marine Limited harmless. If you do not agree to accept all risk, return this product unused in its original factory condition to your dealer for a full refund.

Intended Use

This product is intended to be used on leisure or commercial vessels (excluding IMO/SOLAS class). Vesper Marine has designed and manufactured this product to be used only aboard vessels.

Warranty Void

Do not disassemble the unit or remove the screws which hold it together. The unit is sealed and disassembly will void the warranty.

FCC Warning:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Warning:

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with RSS-310 of Industry Canada. Operation is subject to the condition that this device does not cause harmful interference.

To satisfy RF exposure requirements for mobile transmitting devices, a separation distance of 1 metre or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended.

The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter.

This device has been designed to operate with an antenna having a maximum gain of 3dBi. Antennas having a gain greater than 3dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

WARNINGS

Industry Canada Warning:

Pour satisfaire aux exigences d'exposition aux fréquences radio pour les appareils mobiles de transmission, une distance de 1 mètre ou plus doit être maintenue entre l'antenne de ce dispositif et les personnes pendant son fonctionnement. Pour assurer la sécurité, les opérations plus près de cette distance ne sont pas recommandées.

L'antenne utilisée pour ce transmetteur ne doit pas être co-localisée avec toute autre antenne ou transmetteur.

Ce dispositif a été conçu pour fonctionner avec une antenne ayant un gain maximal de 3dBi. Les antennes ayant un gain supérieur à 3dBi sont strictement interdites pour une utilisation avec cet appareil. L'impédance d'antenne requise est de 50 ohms.

Pour réduire le risque d'interférence aux autres utilisateurs, le type d'antenne et son gain doivent être choisis pour que la puissance isotrope rayonnée équivalente (PIRE) ne soit pas supérieure à celle requise pour une communication réussie.

MMSI Programming Warning

IMPORTANT: In most countries, the operation of an AIS unit is included under the vessel's marine VHF license provisions and the vessel on which this device is to be installed may be required to possess a current VHF radiotelephone license which lists the AIS system and the vessel Call Sign and MMSI number.

An MMSI number is required in order for this device to operate as a transmitter.

Please contact the relevant authority in your country for more information.



AT	BE	BG	CY	CZ	DE	DK	EE	ES	EL
FI	FR	HR	HU	IE	IT	LT	LU	LV	MT
NL	PL	PT	RO	SE	SI	SK	UK		

For Customers in the USA

This device must be programmed with data corresponding to the vessel on which it will be installed. Programming must be carried out by a Vesper Marine dealer. The included instructions contain information on how to verify the correct programming.

WARNING: It is a violation of the rules of the Federal Communications Commission to input an MMSI that has not been properly assigned to the end user, or to otherwise input any inaccurate data in this device.

RF Emissions Warnings



CAUTION: This device generates and radiates electromagnetic energy. This device must be installed and operated according to the instructions contained in this manual. Failure to do so may result in product malfunction and/or exposure to potentially harmful levels of radio frequency radiation. Changes or modifications to the unit not expressly approved by Vesper Marine Ltd will void the user's authority to operate this equipment.



CAUTION: The system has a Maximum Permissible Exposure (MPE) radius of 1m from the antenna. This has been determined assuming the maximum power of the transmitter and using a standard half-wave monopole VHF antenna with a maximum gain of 3dBi and termination impedance of 50 ohms.

When installing the antenna and operating the equipment consider the following:

- The antenna should be mounted as high above deck as possible.
- Higher gain VHF antennas will require a larger MPE radius.
- Do not operate the unit when anyone is within the MPE radius of the antenna.
- The antenna should not be collocated or operated in conjunction with any other transmitting antenna.

WARRANTY

Your Vesper Marine product is warranted, when properly installed and used, to be free from defects in materials or workmanship for two years, from the date the product was purchased by the first retail customer. This warranty applies to the original retail purchaser only and is not transferable. This warranty only applies to products purchased from Vesper Marine or from an authorized Vesper Marine reseller. Within this period, Vesper Marine will, at its sole option, repair or replace any components which fail in normal use. Repairs or replacement will be made at no charge for parts or labor, provided that the customer shall be responsible for any transportation costs. This warranty does not cover failures due to abuse, misuse, accident, improper installation, unauthorized alterations or repairs, shipping damage, wear and tear, or corrosion.

This warranty will not apply if the product's external housing has been opened, the serial number or other labels have been removed or altered, or the specified input voltage has been exceeded. This warranty will not apply if the product has been operated with an incompatible GPS antenna or without a suitable VHF antenna, where applicable to the product.

Vesper Marine retains the exclusive right to repair or replace the unit at its sole discretion. In the event Vesper Marine chooses to replace the unit it may be replaced with a factory reconditioned unit or a new unit at its sole discretion. Where a replacement is provided the original product becomes the property of Vesper Marine and the warranty will remain from the original purchase date.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE.

IN NO EVENT SHALL VESPER MARINE BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

Vesper Marine retains the exclusive right to repair or replace the product or offer a full refund of the purchase price at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY.

*These warranty terms and conditions are provided as a summary and the specific terms and conditions of your warranty may vary by region. Please see www.vespermarine.com/watchmate850 for details of the warranty terms and conditions specific to your region.

Vesper Marine declares that this AIS Class B transponder is in compliance with Directive 2014/53/EU.

The full text of the EU Declaration of Conformity is available at the following internet address: www.vespermarine.com/compliance

This product is for use worldwide, including the following countries:

AT	BE	BG	CH	CY	CZ	DE	DK	EE	ES
FI	FR	GR	HU	IE	IS	IT	LT	LU	LV
MT	NO	NL	PL	PT	RO	SE	SI	SK	UK

This device is also approved for use in the United States, Canada, Australia and New Zealand.



Electronic Waste Recycling

Various regional and national regulations exist regarding the recycling of certain electronics.

Please consult your local authorities or contact Vesper Marine for recycling information.





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Source code for the applicable software is available upon request from Vesper Marine Ltd.

WatchMate 850 1710

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