



Sail Master

User Guide



Sail Master user guide.

Congratulations on the purchase of your **Sail Master**. Tacktick have combined technological innovation with feedback from top sailors around the world to bring you the ultimate sailboat instrument.

All Tacktick equipment and accessories are designed to the best industry standards for use in the leisure marine environment. Their design and manufacture is in compliance with CE Mark requirements, this includes electromagnetic compatibility.

Please read this User Guide carefully before using your **Sail Master** and keep it for future reference.

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1. Registering your Sail Master

To register for your international warranty, complete and return the warranty card to Tacktick Limited, PO Box 27, Emsworth P010 8YU, England. Retain your proof of purchase as you will need it in the event of a warranty claim.

We also recommend that you keep a record of your purchase:

| | | |
|----------------------|----------------------|----------------------|
| Date of purchase: | Place of purchase: | Serial number: |
| <input type="text"/> | <input type="text"/> | <input type="text"/> |

2. Package Contents

Supplied as standard

Sail Master
 Mounting Cradle
 4 M5 nuts, bolts and washers for the mounting cradle
 Connectors (seven)
 Cap (to protect connector on cradle when the unit is removed)
 Two spare Caps
 Deck Gland
 User guide
 Warranty card

Supplied dependant on packaging option (check outside of box)

Speed transducer (through hull)
 Depth transducer (standard)

Order No.

T900
 T901

Accessories (may be purchased separately)

Single mast bracket
 Double mast bracket
 Deck bracket
 Depth transducer ("V" hull)

T041
 T043
 T050
 T902

3. Features and Benefits

Simple installation, powered for life with Tacktick's unique **solar system**

Portable, yet rugged with the Tacktick snap in cradle

Boat speed display

Precision **heading** display

Log and **trip-log** displays

Water depth display and **shallow alarm**

Top speed memory

Wind shift display in graphic and numerical formats

Easy to use **countdown timer** with **resynchronisation** function

Graphic **water depth** indicator

Back-light with automatic shut off in daylight (patent pending)

Waterproof, submersible to 10m

No need to adjust for **southern hemisphere** effects

Twin displays which are easy to read even when hiking (patent pending)

Full calibration

Automatic power down

Low battery indicator

Tacktick's unique solar system and twin display has patents pending in the UK.

4. Introduction

4.1. What can Sail Master do for me?

Sail Master gives you precise, clear numerical and graphical readouts of your speed, heading, and the water depth. **Sail Master** can quickly and easily be set up to display wind shifts and countdown to the start of a race, so that during a race, you will get an instant visual display of:

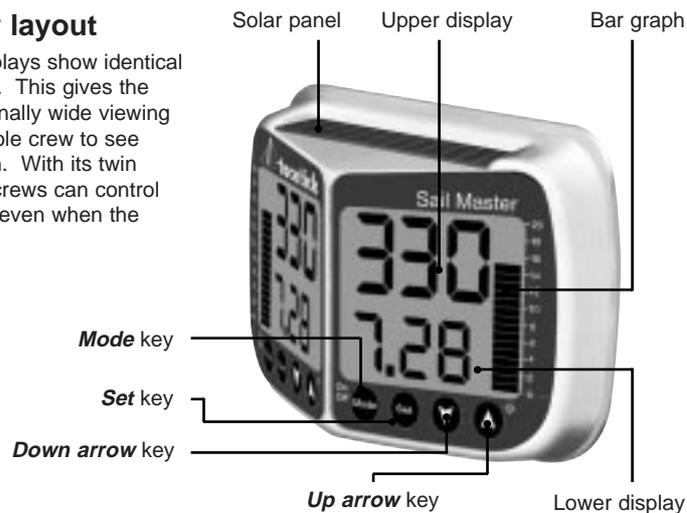
- Boat speed
- Heading
- Water depth
- Wind shifts
- Countdown to the start (or elapsed time since the start)

Sail Master is simple to operate, and straightforward to install. With Tacktick's unique solar system, connections are reduced to the minimum giving you the ultimate reliability.

For sounder-only installations, the lower display can be configured to show water depth rather than boat speed (refer to the calibration section, "shallow water")

4.2 Sail Master layout

Sail Master's twin displays show identical information at all times. This gives the instrument an exceptionally wide viewing angle, allowing the whole crew to see critical race information. With its twin (duplicated) keypads, crews can control the **Sail Master** easily even when the boat is heeling.



5. Using your Sail Master

5.1. Switching ON / OFF

To switch ON Press and hold down the *mode* key until the display appears.
 To switch OFF Press and hold down the *mode* key until the display clears,
 (this will take 5 seconds).

If **Sail Master** detects no boat speed for 60 minutes it will power down (this cannot happen at sea).

5.2. Reading the displays on the main page

When you first power up the **Sail Master**, the battery level is displayed briefly, indicating the number of hours of charge remaining in the internal cells (a full charge is 199 hours). After showing the battery level, the main page is displayed automatically.

Upper display

The upper display on the main page shows the boat's heading. If you wish to correct for variation and thus show a true heading, refer to the Calibration section below. **Sail Master** can be automatically compensated for the effects of deviation (magnetic disturbances from metal within your boat), refer to the calibration section below. There is no need to correct for southern/northern hemisphere effects.

Lower display

The lower display on the main page normally shows the boat's speed in knots. When the water depth is below 2m (6ft), the speed display is replaced with the depth display, which flashes to indicate shallow water. The 2m (6ft) shallow indicator depth can be user defined, as can the units (meters or feet), refer to the calibration section below.

Bar graph

The bar graph shows the water depth in meters. When the depth exceeds the maximum sounding range, or when the depth signal is lost, the bar graph will flash the last known depth. Note that the units cannot be changed, since the bar graph range of 20m (60ft) is appropriate for coastal navigation and racing.

Audible alarm

This sounds when the water depth is shallow. From the factory, the alarm is switched off, however you may change this by adjusting the "shallow water audible alarm" setting in the appropriate calibration page, refer to the calibration section below.

5.3. Log, trip-log and top-speed pages

To access the log page, press and hold the mode key. The log page will time-out after 7 seconds, or can be cleared by pressing the mode key. The log is in units of nautical miles, and rolls over to zero after 1999nm. The log is set to zero from the factory, but accumulates each time you sail and does not reset on power down.

To access the trip-log page, first go to the log page, then press the *mode* key. The trip log is in units of hundredths of a nautical mile and does reset on power down.

To access the top-speed page, first go to the trip-log page, then press the mode key. The top speed is displayed in knots, and is the maximum speed experienced since power up.

5.4. Controlling the Backlighting

To turn the backlighting on:

1. Press and hold the *up arrow* key until the display shows L1.
2. Adjust the light intensity with the *up* and *down arrow* keys with a range from L1 - L2

To turn the backlighting off:

As above and press the *down arrow* key to adjust the level to LOFF

If the battery power is not sufficient to power the backlighting, bAt will appear on the display screen

Daylight Detection: If daylight is sensed for over 4 minutes the backlighting will automatically switch off

Note: Backlighting will use stored battery power, turn off when not needed and recharge during the day after use.

5.5. Battery status display

The battery status is shown for 5 seconds after the **Sail Master** is switched on. The bar graph shows the charge level (a full bar graph indicates a full charge of 199 hours). The charge level is also displayed numerically in hours remaining (assuming the backlighting will not be turned on). If the backlighting is turned on see the table below.

Effect of backlighting on battery level (assuming a full charge initially)

| | |
|----------------------|---------------------|
| Backlighting off | 199 hours remaining |
| Backlighting level 1 | 30 hours remaining |
| Backlighting level 2 | 15 hours remaining |

The backlighting uses battery power heavily. If using backlighting ensure that the **Sail Master** is recharged before using again by leaving on a windowsill facing out towards the sun until the battery charge shows 199 hours.

See maintenance section for recharging times.

If the battery level falls below 50 hours then the battery status will appear on the display screen for 2 seconds every 4 minutes and the backlighting will automatically be turned off.

6. Using your Sail Master for racing

6.1. Definitions and terminology

True Wind Direction: The instantaneous magnetic bearing of the true wind.

Mean Wind Direction: the average true wind direction during the race.

Tacking Angle: the angle through which the yacht turns when changing from one tack to the next (typically around 90°).

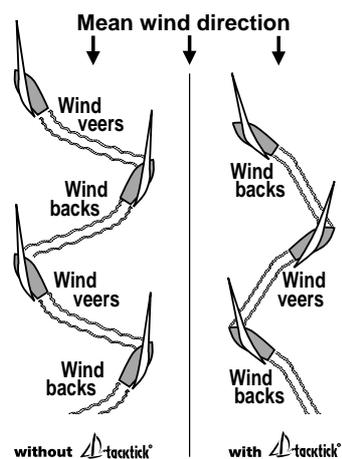
When **Sail Master** displays lifts and headers, it assumes that your boat is close-hauled and that your Tacking Angle is constant. **Sail Master** calculates your True Wind Direction by adding or subtracting half of your Tacking Angle to your heading. The True Wind Direction is only accurate if you are sailing close-hauled and your Tacking Angle has been set up for the prevailing conditions.

6.2. Racing and wind shifts

Like most things in sailing, the wind does not remain constant in either strength or direction. The crew tend to react naturally to gusts but find wind shifts more difficult to detect. The wind does, however, tend to shift in regular patterns, oscillating between a back and a veer.

These oscillations give the sailor a chance to gain an advantage by sailing a shorter distance to the upwind mark.

In the diagram, the boat on the right sails a shorter course by tacking when headed and thereby sailing mostly in lifts.



6.3. Before the race

Before the race, you will need to set up the mean wind direction, the tack angle and the countdown timer. To alternate between the **Main Page** and **Timer Page** in the **lower** display press the mode key. In the Timer Page, the units of "m" for minutes or "s" for seconds are displayed to the bottom right.

Setting the Countdown Timer

1. Check you are looking at the Timer page.
2. Adjust the timer by pressing the *up* and *down arrow* keys.
3. Press the set key to start the countdown. Audible beeps will count you down to the start.
4. If the initial gun was not timed accurately, press the *set* key at any subsequent gun to automatically **resynchronise** the timer to the nearest full minute.
5. The main page is automatically displayed once the countdown period has elapsed and the race begins.
6. The timer will now count race time elapsed and is displayed in timer mode (press mode key).

You should see an "s" or "m" annunciator at the bottom right of the display, if not press the *mode* key.

The *up* and *down arrow* keys can be used at any time whilst in timer mode to reset the start time.

The countdown timer can be set up to 40 minutes. Between 20 and 40 minutes the display will alternate between seconds and minutes remaining.

For rolling starts, count the number of fleets ahead of your start, and multiply the start time accordingly. This procedure ensures you have an automatic transition to the main page at the start.

Setting up the wind shift displays

You must estimate and directly input your average close-hauled headings.

1. Sail upwind for several minutes to determine your average close-hauled heading on each tack.
2. Steer your average port close-hauled heading.
3. Ensure the **Sail Master** is showing the Main Page.
4. Press the *set* key, you will hear a double beep and the bar graph will flash once.
5. Tack through the wind.
6. Steer your average starboard close-hauled heading.
7. Press the *set* key, you will hear multiple beeps and the bar graph will flash twice.
8. You can adjust the tack angle, by using the *up* and *down arrow* keys.

If not then press the *mode* key.

Sail Master displays '- - t' if it does not register a tack angle of 60° to 120°.

Keep the delay between tacks short to minimise the chance of a wind shift.

Sail Master displays the tacking angle e.g. 90t for a 90° tacking angle.

After 7 seconds, **Sail Master** automatically starts to display wind shifts.

Mean Wind Direction and Tacking Angle are now stored in the **Sail Master** memory and wind shifts will be displayed (alternating with heading) on the upper display.

You may start the procedure on starboard tack, but bear in mind that you will not have right of way when you subsequently tack onto port, so plan ahead accordingly.

6.4. During the race

Sailing upwind, tack to sail in the lifts. Sailing downwind, gybe to sail in the headers.

Reading the upper display

The heading is shown in the upper half of the display, alternating with the windshift information. The rate at which the displays alternate can be adjusted, refer to the calibration section below.

Upwind Windshifts are indicated by 'L' or 'H' with the degree of lift or header eg. L23°
 Downwind Windshifts are indicated by \swarrow or \searrow and show how far the boat is from the mean downwind direction eg. \swarrow 45° indicates 45° to starboard (\searrow indicates to port)

Permanent wind shifts

Permanent wind shifts can be recognised by constant headers on one tack and corresponding lifts on the other tack. In this situation the Mean Wind Direction can be manually adjusted:

Ensure **Sail Master** shows the main page, then:

- If on starboard tack, press the *up arrow* key
- If on port tack, press the *down arrow* key

Sail Master automatically adjusts BOTH your close-hauled headings (the tack angle is assumed to be unchanged)

Elapsed time

Elapsed time can be accessed during the race by pressing the *mode* key.

7. Advanced operation

7.1 Setting the wind-shifts by going “head to wind”

Assuming you have already set up the tack angle (either by the set up method described in “before the race” above, or by direct entry as described below), you can set the mean wind direction by sailing head to wind:

1. Take the boat head to wind.
2. Ensure the **Sail Master** shows the Main Page.
3. Press and hold down the *set* key until the rotating lines are shown.
4. Press *set*.
5. To fine tune your direction, press *set* again.
6. Press the *mode* key, to complete the operation.

If **Sail Master** is not in ‘wind mode’ then press the mode key.

Sail Master stores the wind direction.
Sail Master stores the wind direction.
 The main page is displayed.

7.2. Setting the wind-shifts “single handed”

Unlike the standard set up method you press and hold the set key just once and **Sail Master** then guides you through the sequence without the need to press any more keys. **Sail Master** will average each close-hauled heading for 10 seconds.

1. Sail upwind for several minutes to determine your average close-hauled heading on each tack.
2. Ensure the **Sail Master** is in 'wind mode'.
3. Press and hold down the *set* key until the rotating lines are shown.
4. The rotating lines will circle for 30 seconds while you power the boat up on the first close-hauled tack. **Sail Master** will register the average heading of the last 10 seconds as your normal close-hauled heading for this tack. This is indicated by the rotating lines freezing.
5. **Sail Master** now tells you to tack - indicated by 'tAC' on the display, and beeping.
6. You now have 15 seconds to tack and steady her on the new course. The rotating lines appear again.
7. After 20 seconds, **Sail Master** registers the average of the last 10 seconds of headings and beeps again.
8. You can adjust the tacking angle, by using the *up* and *down arrow* keys.

If **Sail Master** is not in 'wind mode' then press the mode key.

Sail Master displays the tacking angle e.g. 90t for a 90° tacking angle.

After 7 seconds, **Sail Master** automatically starts to display wind shifts.

Mean Wind Direction and Tacking Angle are now stored in the **Sail Master** memory and wind shifts will be displayed on the bar graph.

You may start the procedure on starboard tack, but bear in mind that you will not have right of way when you subsequently tack onto port, so will have to plan ahead accordingly.

7.3. Setting the wind-shifts before you set sail

You must input the Mean Wind Direction and Tacking Angle.

Wind direction information can be gained from a variety of sources pre-race:

- Weather Forecast
- Race committee boat
- The bearing to the windward mark

The Tacking Angle will be stored in the **Sail Master** from your previous race, however, if you feel that it has changed you can enter it directly.

To enter the Mean Wind Direction:

1. Ensure the **Sail Master** shows the Main Page.
2. Press the *set* key and hold it for 4 seconds (ignore the rotating lines, just keep holding the *set* key down). The lower display will show the previously stored Mean Wind Direction (180° from factory).
3. To adjust the setting press the *up* or *down arrow* keys
4. When you have finished, press the *mode* key to return to the Main Page.

If **Sail Master** is not in 'Wind mode' then press the mode key.

Holding down the *up* and *down arrows* keys will scroll the display when adjusting settings.

To enter the Tacking Angle:

1. Ensure the **Sail Master** shows the Main Page.
2. Press the *set* key and hold it for 6 seconds (ignore the rotating lines and the true wind direction display, just keep holding the *set* key down). The lower display will show the previously stored Tacking Angle (90t from factory).
3. To adjust the setting press the *up* or *down arrow* keys.
4. When you have finished, press the *mode* key to return to the Main Page.

Mean Wind Direction and Tacking Angle are now stored in the **Sail Master** memory and wind shifts will be displayed on the bar graph.

8. Adjusting the Calibration

Your **Sail Master** is designed to operate correctly from the factory and there should be no need to alter the calibration. This section is included only for customers with unusual boat types or other special requirements.

1. To **enter** calibration press and hold the *mode* and set keys simultaneously for 2 seconds. The upper display will show "CAL".
2. To **move through** each of the following calibration pages, press the *mode* key.
3. To **exit** calibration and save the new inputs press the *mode* key repeatedly until you return to your normal display. Any changes you have made will then be stored, even if you power down.

The calibration pages are grouped as follows:

d: depth settings L: log settings
C: compass settings U: user interface settings

d1 - Units for displaying water depth (m or ft)

Note that this only affects the numerical displays, the bar graph is always calibrated in meters. The maximum depth displayed on the bar graph is 20m (60 ft).

Switch the units by pressing the *up* and *down* arrow keys.

The two settings are "M" for meters and "ft" for feet. The factory setting is "M".

Press the *mode* key to move to the next page

d2 - Adjusts for the keel depth

If you want to display water depth below the keel, you need to apply a negative offset equal to the distance between the transducer siting point and the bottom of the keel, typically about 1.2m (3.6ft). If you prefer to display actual water depth, then you will need to dial in a positive offset equal to the distance from the water surface to the transducer, typically about 0.4m (1.3ft).

Increase or decrease by pressing the *up* or *down* arrow keys.

The units are as defined above, meters or feet. The factory setting is "-1.2 meters" or "-3.6 feet".

Press the *mode* key to move to the next page

d3 - Shallow water audible alarm

You may adjust the depth at which the audible alarm starts to sound.

Increase or decrease by pressing the *up* or *down* arrow keys.

The units are as defined above, meters or feet. The factory setting is "OFF".

Press the *mode* key to move to the next page

d4 - Shallow water flashing numeric display

The lower display normally shows boat speed, however when in shallow water the lower speed display changes to a flashing numeric depth display. You may adjust the depth at which the lower display switches from speed to depth. For sounder-only installations, you should set this to the maximum value (40m), then the lower display will always show depth.

Increase or decrease by pressing the *up* or *down* arrow keys.

The units are as defined above, meters or feet. The factory setting is "2.0 meters" or "6.0 feet".

Press the *mode* key to move to the next page.

L1 - Responsiveness of the speed display

You may adjust the speed of response of the display between slow (1), medium (2) and fast (3). If the responsiveness is too high, you may find that the speed readout never settles down when in a heavy sea, however if it is too low the display may be slow to respond to real changes in boat speed.

Increase or decrease by pressing the *up* or *down arrow* keys.

Adjustment range: 1 (slowest), 2 and 3 (fastest). The factory setting is "2 (medium)".

L2 - Speed calibration

On some installations the speed may over or under read. You can apply a correction factor, either (1) by adjusting the displayed speed until it matches an accurate speed reference e.g. a GPS, (2) by adjusting the correction factor itself or (3) you can sail up and down a measured mile and **Sail Master** will **auto-calibrate** for you. The L2 - speed calibration page starts at method 1, to access method 2 you must press the set key, and to access method 3 you must press the set key twice.

Method 1: adjusting the displayed speed until it matches an accurate reference

Using a GPS or other reference, directly adjust the displayed speed using the *up* and *down* keys.

Each key press adjusts the displayed speed by 1%

Press the *mode* key to exit speed calibration.

Method 2: adjusting the correction factor directly

Press the *set* key once. You can now view the correction factor, and adjust it by pressing the *up* or *down arrow* keys.

Adjustment range: 0.2 to 2.5, if in doubt, set to 1.00 The factory setting is "1.00".

Press the *mode* key to exit speed calibration

Method 3: auto-calibration by travelling a known distance

You need to locate two fixed marks or transits, which are a known distance apart. Often in coastal waters, a measured mile can be accurately located from transits ashore. Determine the distance between the marks before you start the procedure. You need to make a double run to cancel the effect of tide, and ensure that any tidal current is running mainly from one mark to the other - cross current will reduce the accuracy of the auto-calibration procedure. It is always best to calibrate during slack water.

Press the *set* key twice. Use the *up* and *down arrow* keys to enter the distance between the two marks in nautical miles.

The flashing number indicates the distance between the two marks in nautical miles.

Sail directly towards the second mark and as you pass the first mark, press the *set* key.

The lower display will change to show 0.00, then it will count up in hundredths of a nautical mile.

When you reach the second mark, press the *set* key.

The calibration value will automatically be calculated and displayed.

Turn the boat around then sail directly towards the first mark.

This time you will be moving in the opposite direction.

As you pass the second mark, press the *set* key. Continue towards to the first mark.

The display will count up in hundredths of a nautical mile.

Press the *set* key when you reach the first mark.

The display will show the averaged calibration value based on both runs.

The calibration is now complete. Press the *mode* key to move to the next calibration page.

If the run was unsuccessful, you must start again - exit calibration and re-enter.

C1 - Adjusts the responsiveness of the heading display

You may adjust the responsiveness of the display. If the responsiveness is too high, you may find that the heading readout never settles down when in a heavy sea, however if it is too low the display may be slow to respond to real changes in heading. The automatic setting compensates for the sea-state.

Adjust the response speed by pressing the up and down arrow keys.

Adjustment range: automatic (A), 1 (slow), 2 (medium), 3 (fast). The factory setting is "A (automatic)".

Press the mode key to move to the next page.

C2 - Adjusts the compass offset

Should the unit be mounted away from the fore/aft alignment of the boat, a correction will be needed for the compass heading.

Adjust the heading offset by using the up and down arrow keys.

From the factory, the compass is designed to display 000° when the compass faces North. If, for example, your bracket is slightly skewed an offset will be required.

Press the mode key to move to the next page.

C3 - Compensates for Compass deviation

This allows the compass deviation to be automatically compensated. Any previously detected magnetic interference is shown eg. d12° means 12° deviation previously detected.

1. Fix **Sail Master** in its normal place and choose open water and a calm day. Do not put up the sails as you need to be able to control the boat in a very slow gentle circle.
2. Press the set key - rotating indicators will appear in the bottom of the display.
3. SLOWLY circle the boat to port or starboard - a quarter of a turn should take **AT LEAST ONE MINUTE**.
4. On completion of a full turn the **Sail Master** will beep and the new deviation will be displayed to the bottom right of the display.

Alternatively, you can calibrate ashore on a trailer. Fix **Sail Master** in its normal position (ensuring that the metal of the trailer is at least 4 feet from the compass site).

If the rotating indicator speeds up and the **Sail Master** beeps rapidly then reduce your rate of turn or start again.

If the deviation exceeds 20° the **Sail Master** should be resited.

Press the mode key to move to the next page.

U1 - Adjusts changeover time for the wind shift display

When you have set up for wind shifts (see the section on racing above) the compass display will alternate with the wind shift display. You may adjust the dwell time for each display, or select a permanent wind shift display.

Adjust the dwell time (in seconds) by pressing the up and down arrow keys.

Adjustment range: OFF (permanent wind shifts), 1,2,3,4,5, HdG (permanent heading). The factory setting is "2".

To exit calibration and save the new inputs press the mode key.

9. Installation

Warnings

1. The notes below are for guidance only. Before installing your transducers, read the installation instructions, which are enclosed separately in the packaging.
2. The depth wires (blue and black) carry a high power signal (400V), which will damage the speed transducer if a connection is accidentally made. **DO NOT PUT YOUR Sail Master INTO ITS CRADLE UNTIL YOU HAVE COMPLETED AND CHECKED THE INSTALLATION.**
3. Plastic transducer housings are not suitable for wooden hulled vessels, since the wood can swell causing the housing to crack, leading to the possible sinking of the vessel. For wooden boats, consult your Tacktick dealer and ask for bronze transducer fittings.

9.1. Below decks

Installing your T900 speed transducer (standard installation)

The standard installation does not require specialist skills or tools. Please follow the instructions included with the transducer. The T900 is a low profile fitting, which will have no significant effect on sailboat performance even in the most competitive race fleets.

Installing your T900 speed transducer (flush to the hull)

Some qualified boat builders mount speed transducers flush to the bottom of the hull. This involves modifying the transducer to remove the flange, drilling the hull, then bonding the transducer from the inside of the hull. This operation requires **SPECIALIST SKILLS**, since failure to achieve a good bond may result in the transducer becoming dislodged, resulting in the possible sinking of the vessel. **If you require your speed transducer to be flush mounted, you must employ a qualified boat builder who ALREADY HAS EXPERIENCE with this operation.**

Choosing your depth transducer and its installation

For most installations, the T901 (standard) depth transducer is the most suitable. The T901 can be mounted either THROUGH-HULL or IN-HULL. The advantage of an in-hull installation, where the transducer is bonded to the inside of the hull, is that no hole is required in the hull. Note that for foam sandwich boats the inner skin and foam core must be removed since depth signal cannot travel through foam. The advantage of a through-hull installation, where the transducer is in direct contact with the water, is that the operation of the sounder is not dependent upon the installation (i.e. the construction of the hull). **If you need to core out the foam or in any way alter your hull, you must employ a qualified boat builder who ALREADY HAS EXPERIENCE with this operation.**

For deep V hulls (i.e. hulls with dead-rise exceeding 15°), the T902 ("V" hull) depth transducer should be fitted. Alternatively, the T901 can be mounted skew to ensure the transducer points directly at (or within 15° of) the seabed.

Installing your T901 depth transducer through the hull

Follow the instructions supplied with the transducer.

Installing your T901 depth transducer from inside the hull

Check that the hull is made from a dense material (fibreglass is sufficiently dense but a foam core is not). Where the hull is constructed with foam or other such materials, you must core out a diameter sufficient to take the transducer, removing material from the inside and stopping at the outer skin. Note that you may wish to file or saw away the outer flange of the T901, in order to reduce the diameter of the core.

Use **epoxy-resin** to bond the T901 directly to the hull from the inside (note that a **RTV/silicon** bond will absorb too much sound energy for the transducer to perform properly). Ensure that the mixing process does not introduce air bubbles into the liquid, or that the air bubbles have settled out before setting down the transducer.

When considering the optimum siting arrangement, the following background information may be helpful. Depth transducers send and then receive an ultra-sonic sound wave, which reflects off density boundaries (normally between the sea and the seabed). Their operation can be impaired where other density boundaries occur, for example air bubbles in the prop wash of a passing vessel. In the case of an in-hull installation, porosity or air pockets in the fibreglass laminate or in the epoxy used to bond the transducer to the hull will significantly impair performance. Consult an experienced boat builder if you are in doubt about your installation.

Installing your T902 (“V” hull) depth transducer from inside the hull

Follow the instructions supplied with the transducer.

Working with other transducers (for example transducers already in your boat)

Tacktick Limited can only guarantee operation when using a transducer supplied by Tacktick, however:

- Speed transducers are generally compatible, so long as they are based on the three-wire system. Look for the “Airmar” logo on the transducer cable - if this is present then the transducer will almost certainly be compatible.
- Depth transducers are generally compatible so long as they operate at 200kHz.

9.2. Above decks

Mount the **Sail Master** within 20° of the vertical to ensure the compass is able to operate accurately. Mounting at a more extreme angle will cause deviation errors.

There are 2 options for installation.

1. Mast mounting with the T041 mast bracket and the mounting cradle

- i. Drop the slug into the mast groove. Use the centre bolt to secure the slug at the correct height. Loosely fit the two outer bolts.
- ii. Fit the cradle to the bracket using the four nuts/washers/bolts provided.
- iii. Offer the bracket assembly to the mast, dropping the assembly over the key-way, then tightening the bolts with a posidrive screwdriver through the holes in the cradle.
- iv. Fit the two velcro straps for additional rigidity if required.
- v. Now clip your **Sail Master** to the cradle each time you race.



Cradle

Mast Bracket

2. Bulkhead mounting with the mounting cradle

- i. Fit the cradle to the bulkhead using M5 countersunk bolts (supplied) and a sealant to ensure the cradle is sealed to the surface. **WARNING:** take care to avoid damage to existing wiring.
- ii. Now clip your **Sail Master** to the cradle each time you race.

9.3. Cabling

Cable gland

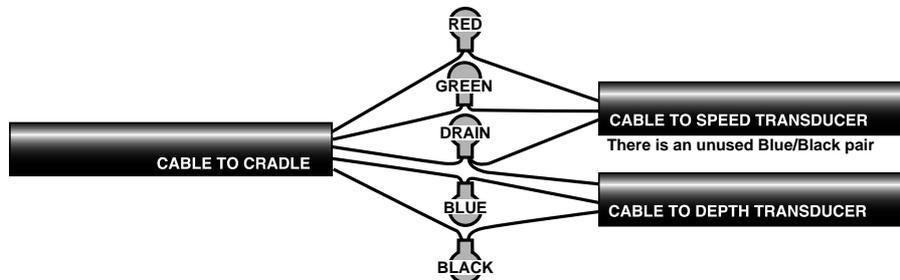
Use the cable gland provided, and pass the single cable from the mast down through the gland. Tighten the gland to obtain a watertight seal.

Cable lengths

For the T900 speed transducer, you may cut or extend the cable to any length. For the T901 and T902 depth transducers, the Tacktick circuit has been engineered to allow cable lengths of between 2m (6ft) to 8m (24ft).

Joining the cables

Simply join the transducer cables colour to colour with the cable from the cradle. Both the unshielded "drain" wires from the two transducers must be twisted together, then joined with the single drain wire from the cradle cable:



When joining the wires, use the connectors supplied (there are two spares). The connectors are loaded with silicon grease to prevent water ingress. **DO NOT STRIP THE COLOURED SHEATH**, it will be displaced automatically when the connector is closed and ensures ALL the strands are taken into the connector. Close the connector with pliers **AFTER PUSHING THE WIRES ALL THE WAY** home into the connector. You should inspect each connector from the rear after closing, looking to see that both the coloured wires have been pushed fully home.

Where a depth transducer is not installed, ensure that the blue and black wires are properly insulated. The depth signals are high power, and will permanently damage your speed transducer if they short across.

10. Maintenance

The **Sail Master** is totally sealed against water and is not serviceable. Any attempt to take the **Sail Master** apart will invalidate the warranty.

To clean, use only a damp soft cloth. No detergents, solvents or abrasives should be used.

To avoid damaging the **Sail Master**, we recommend storing in the Sail Master soft pack (T042).

When sailing in bright sunlight it should not be necessary to recharge your **Sail Master** after use. If the battery level falls below 100 hours, recharge by leaving on a windowsill facing outside towards the sun until the battery level is recharged to 199 hours.

Approximate recharging times

| | |
|-------------|---------|
| Bright sun | 2 days |
| Cloudy days | 5 days |
| Dull days | 10 days |

It is not possible to recharge batteries with electric lighting - sunlight must be used.

Ensure the mounting bracket is secure and check that the security bolts are tight before each race.

9. Problem Solving

| Problem | Possible cause | Action required |
|---|---|--|
| Sail Master turns itself off | Sail Master has no speed input and the depth is not changing | Turn Sail Master on again. Sail Master will automatically power down in a completely static environment after 60 minutes. |
| | Low battery power | Check battery status screen (battery status section). If battery is close to zero recharge batteries (maintenance section). |
| Backlighting turns itself off or will not turn on | Daylight detected | No action required. Sail Master is designed to turn the backlighting off when light is detected to save battery power. |
| | Battery power is not sufficient for backlighting | Check battery status (battery status section). If charge level is below 50 hours recharge batteries (maintenance section). |
| Compass deviates from the expected heading | Sail Master is not mounted correctly | Ensure the mounting angle is within 20° of the vertical. |
| | Magnetic objects are within 70cm (2ft) of the Sail Master | Remove magnetic objects or adjust compass correction (refer to the calibration section (page 9)). |
| Sail Master 'rattles' when shaken | The sound is the internal liquid damping system | No action required - this is normal. |
| Speed reads low or reads zero | Weed or calibration error | First remove the paddle-wheel and fit the bung. Check for weed and clean if required. If the reading is still low, refer to the calibration section (page 9) and follow the procedure for speed calibration. |
| Depth bar graph is blank | The bar graph goes blank when the Sail Master cannot detect a transducer connection | Check the transducer wiring and connections. |
| Depth bar graph flashes | No depth echo detected within 40m range | This is normal when in deep water, or when passing over the aerated wake of a power boat. |
| Depth alarm does not sound | In calibration, the audible depth alarm is set to OFF | Go to the appropriate calibration page and set the activation depth, as you required. |
| Depth alarm only sounds for 10 seconds | This is normal operation | In order to save battery power, and to avoid the distraction of a continuous alarm when sailing in shallows to avoid the tide, the alarm only sounds for 10 seconds after first entering shallow water. |
| Speed responds | Speed response needs | Go to the appropriate calibration section (page 10) and increase the speed response to 3 (fast). |

If you still experience problems contact your local Tacktick dealer.

Note:

If your Sail Master appears to malfunction, leave on a window ledge facing the sun for 2 days to fully recharge the batteries. Remove from sunlight when the battery charge reaches 199 hours.

10. Sail Master Specification

| | |
|---------------------|---|
| Character Height | 30mm on upper display. 20mm on lower display |
| Backlighting | Yes |
| True Wind Direction | Calculated from heading and tack angle |
| Calibration | Fully adjustable |
| Mounting plane | Vertical (or fore-aft tilt of less than 15°) |
| Waterproofing | Submersible to 10m |
| Depth range | 40m (120ft) - the bar graph displays to a maximum of 20m (60ft) |
| Depth resolution | 0.18m (0.5ft) |
| Speed range | 0.5 to 25 knots |
| Speed resolution | 0.01 knots |
| Speed accuracy | You must calibrate your log to ensure good accuracy |
| Heading Resolution | 1° |
| Heel & pitch angle | ±30° |
| Timer | 1 second resolution, 1 to 40 minutes |
| Countdown alarms | Audible tones indicate time to start |
| Size | 165 x 120 x 55mm |
| Weight | 430g (15oz) plus 300g (11oz) per transducer |
| Battery Charging | Solar power |
| Battery Life | 199 hours (20 with backlighting) automatic solar recharging |

11. Warranty and After Sales Service

Tacktick Limited or its authorised Distributors will repair or replace a Tacktick product free of charge where a manufacturing fault becomes apparent within two years of the purchase date provided:

- No unauthorized attempt has been made to repair the product
- The product has not been misused, operated outside of its intended environment or operated in a manner which is incompatible with the written instructions supplied on purchase

Proof of purchase date is required for the warranty to be valid.

Failure *within* the Warranty Period:

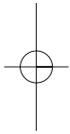
Simply return your **Sail Master** to your nearest authorised Tacktick Distributor, together with proof of purchase date.

Failure *outside* the Warranty Period:

Simply return your **Sail Master** to the nearest authorised Tacktick Distributor and an estimation for repair will be provided.

Authorised Tacktick Distributor details can be found on:

<http://www.tacktick.com>, the back of Tacktick brochures, or contact Tacktick Limited in England +44 (0)1243 379331 for your nearest dealer.



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