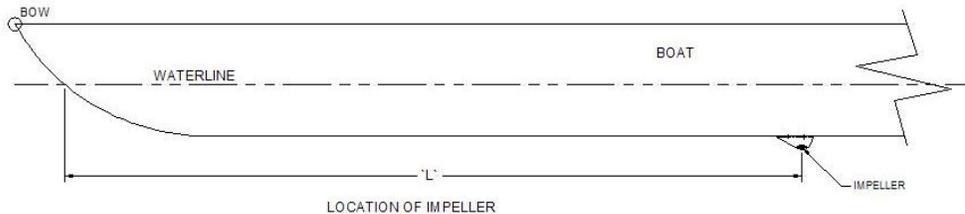


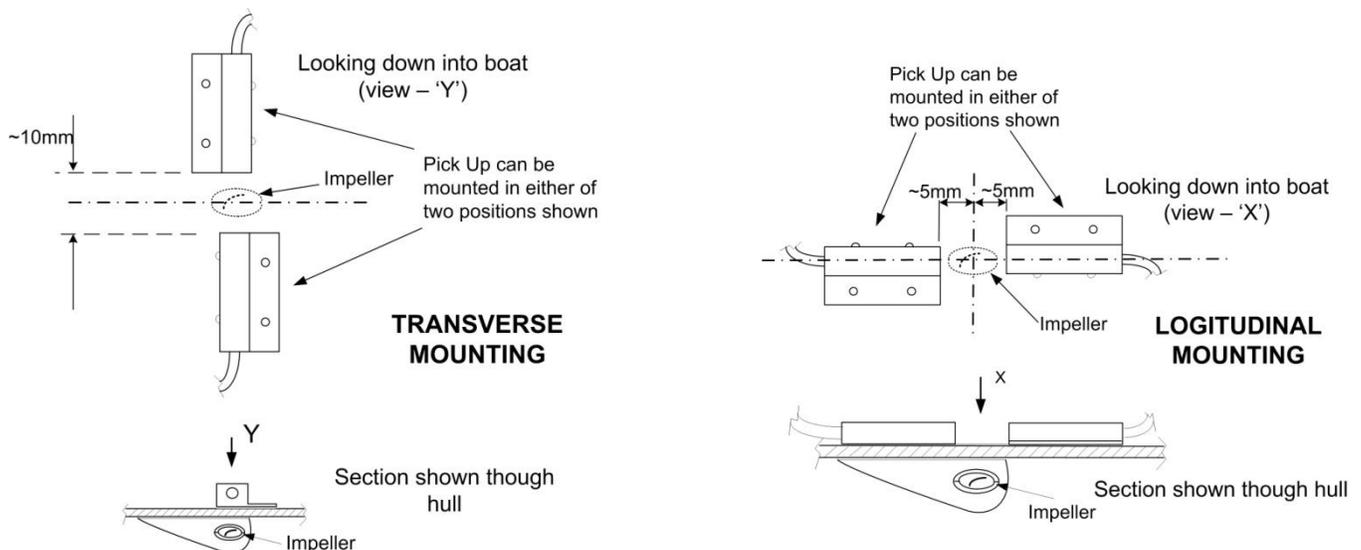
Coxmate Impeller (SX-Imp-xxx) Speed Sensor

The speed sensor kit comprises a micro impeller which mounts to the outside of the shell, and a pick up sensor on the inside of the hull. The pick up has a cable attached. There are a number of options for the cable: -(7+9)m for eight, -7m for stern coxed fours, -2m for bow coxed fours and a (2+11)m for Dragon Boats – this enables cable to connect to SX at either Sweep or Drummer position. The pick up can also be used with a Coxmate Std-Imp(stainless steel fin), a Coxmate 'Jumbo' impeller or a Nielsen Kellerman impeller - Note SX should be set to 'NK' under impeller selection if STd-Imp, Jumbo or NK impeller are used. If Micro impeller is used selection should be 'CMT'

The nominal calibration figure supplied with sensor is $K=1.000$. However as this is only a nominal calibration, and in boat calibration is required for high accuracy- the SX has inbuilt GPS, which facilitates this. It is important to mount the speed sensor as far forward as possible. As the sensor gets further from the bow, so does the degree of turbulent noise. This noise appears on the instantaneous speed curve, and reduces it's value for analysis. Practical access restrictions may limit how close to the bow the sensor is mounted. If access was not a problem then distance $L=$ between 1 and 1.5 metres would be optimal. If you do not want to use the 'stroke profile analysis', i.e. the variation of speed through the stroke, features of the software, then the impeller can be mounted further astern. In this case, all other functions will still operate.



The mounting of the speed sensor impeller and pick up is shown in following diagram. Four mounting arrangements are shown. To assist in positioning the sensor in respect to the impeller, two magnets (approx 3 x 6mm diameter) are included. Place one magnet on inside of hull and one on outside of hull.



The alignment of the impeller fin is critical – it must be in line with the hull. It is helpful to use a long straight edge to align fin. It is generally recommended for the fin to be mounted at or within ~100mm from the centreline of the hull on a scull/double and up to 200mm for a four/eight.

The fin is normally affixed with double sided tape. If you are using the tape, carefully mark intended position of fin on hull with a pencil. It is important to position fin correctly first time - once backing tape is removed from fin, and it is stuck to boat, it is difficult to reposition it. The hull must be clean and dry. If surface is not clean, a gentle rub with Scotchbrite™ or similar, and a wipe with an alcohol swab should be adequate. If the fin is to be removed from boat, then apply a steady force, to ease fin off. A knife can be used to separate fin from hull, but care should be taken to avoid hull damage. Wrenching fin off without care may result in damage to the gel coat or paint finish.

The speed Pick Up is also attached with double sided tape. Again it is important to have a clean dry surface. Sometimes it is difficult to achieve this as the inside of boats is sometimes hard to dry. If the double sided tape does not work, then standard adhesive sealants can be used – some commonly available acrylic sealants are suitable for wet surfaces.

To test speed sensor before putting boat in water, plug pick up into jack socket on side of SX, and start timer. Blow on impeller to cause it to spin. The SX should then register some distance. Remember the timer will stop if it does not see a stroke for 30 seconds. If this happens, then press 'start' button to restart timer. The impeller will make a whirring sound – this is normal.

Fault finding:

If there is no speed or distance reading, then the first thing to check is the fin to ensure it is clear of weed. The 'whirring' sound mentioned above is usually a good indicator that impeller is not fouled. It is often possible for the bow man to put his hand under the boat and clear weed. If impeller is clear, then check pick up is in correct position, cable is connected – including section connector for eight and check speed sensor as per above. For eight cable, the male plug at section connector can be plugged directly into SX- if problem persists, then it is unlikely to be in extension cable.