



**Datamarine**  
Precision Marine Instruments

OWNERS MANUAL FOR THE

**S-200DL**

*L.C.D. digital depth sounder*

## INTRODUCTION:

Datamarine is extremely proud of its new Model S-200DL, LCD digital depth sounder, and pleased that you have chosen to have it installed on your boat. The S-200DL, with its liquid crystal display, has been manufactured specifically to provide a reliable instrument to meet the needs of sailors with all size cruising and racing sailboats. However, with the various optional transducers available, the S-200DL is adaptable to any type and size of power or sail boat.

Having set the rear panel adjustment for shallow gain to suit local conditions, the S-200DL is totally automatic in operation. However, its performance on any boat will depend heavily upon the proper installation and placement of the transducer.

Take a few moments to read through this short installation and operation manual to familiarize yourself with your new S-200DL.



#### GENERAL DESCRIPTION:

The S-200DL is a digital depth sounder which will automatically determine and display the depth under the transducer from 2.5' to 199'. Depths from 2.5 to 10 feet will be displayed in tenths while depths over 10 feet will be displayed in whole number increments. The front panel alarm control switch has three positions, providing an alarm OFF position, plus two alarm depths at 4' and 8 feet. There is a back panel switch for day or night operation.

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When properly installed, the S-200DL will be both waterproof and theftproof and is suitable for all types of sailboats as well as motorboats requiring weather proof recessed installations.

The low-profile flush transducer is easily installed and will provide excellent operation at most boat speeds when properly located. There are a number of optionally available transducers to cover all installation needs.

Although the S-200DL is waterproof from the front, the back panel is NOT 100% waterproof and should be protected from heavy spray, rain and wet environments. Water damage to circuit boards and components can be severe and may result in a voided warranty (see Warranty Statement).

## SPECIFICATIONS:

- Depth Range:** 2.5 to 199 feet.\* Auto range less than 10' — indicates to 0.1 feet.
- Accuracy:** within 1 foot beneath transducer above 10'  
within 0.2 feet beneath transducer below 10'
- Transducer:** 210kHz low profile A-111, 30' cable. Optional transducers available.
- Alarm:** Front panel select, OFF — 4 ft. — 8 ft.
- Miss Detector:** Displays "S" if sounder fails to detect a return echo.  
M  
D
- Display:** —large 0.6 inch Liquid Crystal Display  
—“non blinking” memory display  
—easily visible under all lighting conditions
- Gain Control:** Completely automatic, adjusts to signal strength. 80db dynamic range
- Power Required:** 11 to 16Vdc, .020 Amp normal, .10 Amp, with backlight
- Protection:** reverse and over voltage
- Case:** Standard 4" hard anodized aluminum in clear or black finish
- Environment:** Operation (10°F to 125°F) for specified accuracy, Storage (-20°F to 175°F)
- NOTE:** The liquid crystal will be readable at temperatures between 10°F and 175°F.

\*Maximum depth performance is determined by bottom conditions (hardness, slopes, coral, etc.), transducer location and condition (paint, angle, cable extenders, etc.), battery voltage, boat electrical noise, speed and sea state. Transmitted power, gain and display capability are provided to meet or exceed specifications under normal conditions, however, maximum reliable depth may be limited to less than specification by uncontrolled external conditions.

## OPERATION:

Once installed, the S-200DL is totally automatic in operation. The following paragraphs will familiarize you with the instrument's operation.

Referring to the rear panel one will note the following controls:

*OFF-DAY-NIGHT SWITCH:* Used to control the instrument. *OFF* denotes no power to instrument. *DAY* turns the instrument on for viewing in daylight, without backlighting. In the *NIGHT* position the instrument will be on with soft red backlighting. Power drain is minimal in the day mode.

*SHALLOW GAIN CONTROL:* Refer to section entitled "Shallow Gain Adjustment." An initial adjustment of this control may be necessary at time of installation.

*POWER:* 12V dc (.020 ampere) power connector to ships battery.

Front panel controls are limited to an alarm switch.

*OFF - 4' - 8' ALARM:* *OFF* position disables alarm. At the 4' setting, the rear panel alarm will sound when the water depth below the transducer is less than 4 feet. At the 8' setting the rear panel alarm will sound when the water depth below transducer is less than 8 feet.

The panel of your S-200DL is scratch resistant and the housing has a hard coat anodized finish. You may clean and wipe the face panel and instrument case as you would other parts of the boat. Do not, however, spray the rear panel connections.

The liquid crystal display of your new instrument has been thoroughly tested and manufactured for the marine environment. Under extreme temperatures, however, the display will tend not to perform as specified. Extreme heat (above 175 degrees F) will tend to black out the display (display will become operational again when temperature is re-

duced) while extreme cold (below 10 degrees F) will slow the digits to a point where they will "freeze" on one number. This is normal and should be expected by the new owner. As noted in the specifications, storage temperatures are higher and lower than the above mentioned operation temperatures, however, temperature extremes beyond those specified will destroy the liquid crystal display and void the warranty. *We suggest that your instrument be removed from your boat during storage to avoid these extreme temperatures and possible damage.*

In normal operation a small amount of heat will be generated by the night lighting of the S-200DL. This will not harm the instrument and may be desirable even in daylight while operating in colder temperatures.

Your S-200DL has a front panel cover to help protect the face and the liquid crystal display when the instrument is not in use. This protective cover should be used whenever your

boat is left for a period of time or when conditions warrant added instrument protection.

#### INSTALLATION:

The S-200DL is intended to be permanently installed in a cabin bulkhead or instrument console. It will be watertight and theft proof when properly installed. Select a location on a flat surface which is easily seen by the helmsman while in his normal steering position.

Saw a 4 $\frac{1}{8}$ " diameter hole in the panel for clearance of the body of the instrument. Remove the clamp ring from the instrument. Apply a small amount of waterproof bedding compound around the outer edge of the hole and press the instrument into place. Make sure the panel markings line up horizontally.

Next, place the clamp ring on the S-200DL's body, from the inside, and press against the bulkhead or console. Tighten the set screws to the instrument then the set screws against

the mounting panel to hold the S-200DL in place.

Service of the instrument may be accomplished by removing the "spring retaining ring" from the rear panel, sliding the electronics package out through the back of the instrument and disconnecting the plug in wiring harness from the front panel switch. This eliminates the need to break the instrument's waterproof seal.

## 8 POWER CONNECTIONS:

The 12 volt d.c. power for the S-200DL should be connected using the power cord provided. The RED leads go from the "12v" terminal to the ships POS (+) power and the BLACK lead is connected from the "NEG" terminal to the ships NEG (-) power. The "lamp" terminal (which is jumped to the 12v terminal) is only used when the accessory remote lighting control (A-180) is connected. Try to obtain power as directly from the battery as possible. The S-200DL is protected

against polarity reversal. The instrument's power cord is fused with a 3AG-1; 1 ampere fuse. Do not use any other size. Care should be taken to avoid power circuits which share loads with tachometers, radios, motors or radars. Excessive electrical noise associated with these devices may "break through" and affect the operation of the S-200DL.

If excessive electrical noise is affecting the operation of your S-200DL, a noise filter (A-109) may be purchased from your local dealer to help alleviate the problem. This filter is designed to help eliminate transient voltage spikes caused by ignition or alternator electrical noise from affecting the unit's operation. The A-109 noise filter should be connected as shown on its case with the center connection being a common ground and the input and output being connected to the two outermost terminals as noted.

When power is applied to the S-200DL and the instrument is switched "ON", the display should read "MSD" when the transducer is

not connected. The "MSD" display (abbreviation for "bottom missed") has been provided to inform you that the return echo has not been detected. This may be due to several factors, e.g., depth beyond maximum range, unusual bottom conditions, poor or missing transducer connection, etc. If this does not occur within 30 seconds, reread the above section and carefully check your wiring.

Plug in the transducer cable (see transducer installation). Your S-200DL is now ready to operate and if your boat is in the water, the correct water depth below the transducer should be indicated.

## TRANSDUCER INSTALLATIONS AND OPTIONS:

The S-200DL features a uniquely designed transducer as standard equipment. The transducer (Model A-111) is made of glass-reinforced nylon and is designed with a low-profile external exposure. It is simple to install and will provide minimum drag while allowing full water contact. The key to proper operation of any sounder, however, is the correct installation and maintenance of the transducer.

The transducer location should be chosen such that the deadrise angle is minimum (see Figure 1 and 2), normally amidships at maximum beam.

If the deadrise angle is greater than 20°, the S-200DL will not operate to full depth when the yacht is heeled down on the opposite side. In such cases, two transducers can be installed, one on each side with a gravity operated switch to select the leeward transducer automatically, see Figure 3.

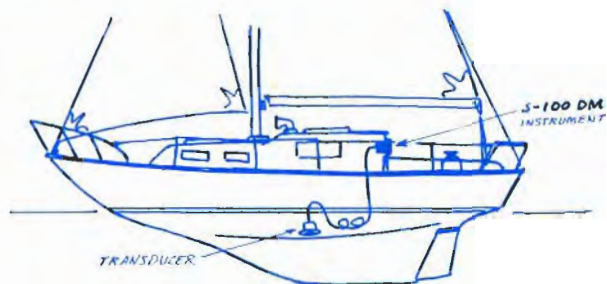


Figure 1, location amidships

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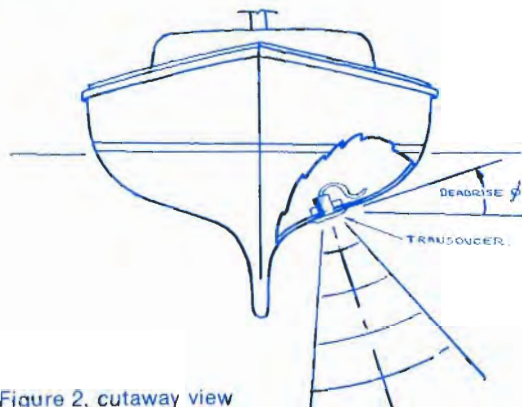


Figure 2, cutaway view  
A-111 transducer.

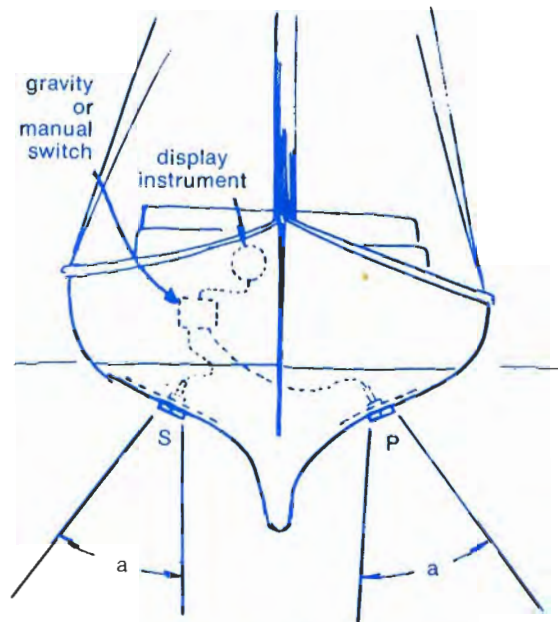


Figure 3  
Dual transducer installation  
Leeward transducer is selected by switch  
A-111 transducers (2).

- A. Do not cut or shorten the transducer cable. Coil up extra length.
- B. Do not allow paint to build up on the face of the transducer. One thin coat is recommended. Gently sand off and renew paint if fouling is a problem.
- C. Do not overtighten the transducer nut — firm hand tightening is sufficient.

To install the A-111 transducer, carefully choose the best location in the hull. Bore a hole  $2\frac{1}{16}$ " in diameter and bed the transducer flange on to the hull using one of the high grade marine bedding compounds sparingly. On rigid hulls such as fiberglass, it is recommended that a block of  $\frac{1}{4}$ " or  $\frac{3}{8}$ " plywood be drilled  $2\frac{1}{16}$ " in diameter and bedded between the hull and nut, (see Figure 4). This acts as a locking device and also provides a compliant interface to accommodate variations in the hull inner surface. Next, tighten the nut firmly. The cable is then routed to the S-200DL to complete the installation. The A-111 may be mounted flush to the hull, provided the deadrise angle is less than  $20^\circ$ .

#### Optional Transducers:

- A. A-112 bronze low profile: This transducer is identical to the standard A-111 glass-reinforced nylon transducer with the exception of its bronze housing and hex nut which replaces the nylon wing nut. All installation procedures that apply to the standard A-111 also apply to the bronze A-112. The A-112 may be mounted flush to the hull provided the deadrise angle is less than  $20^\circ$ .
- B. A-104 bronze stem-type: If the low-profile, flush transducer is unsuitable for installation, the A-104 stem-type transducer may be substituted. This transducer requires a small diameter hole through the hull and leveling blocks. This transducer may also be recessed into the stem of the boat. (see Figures 5 and 6)

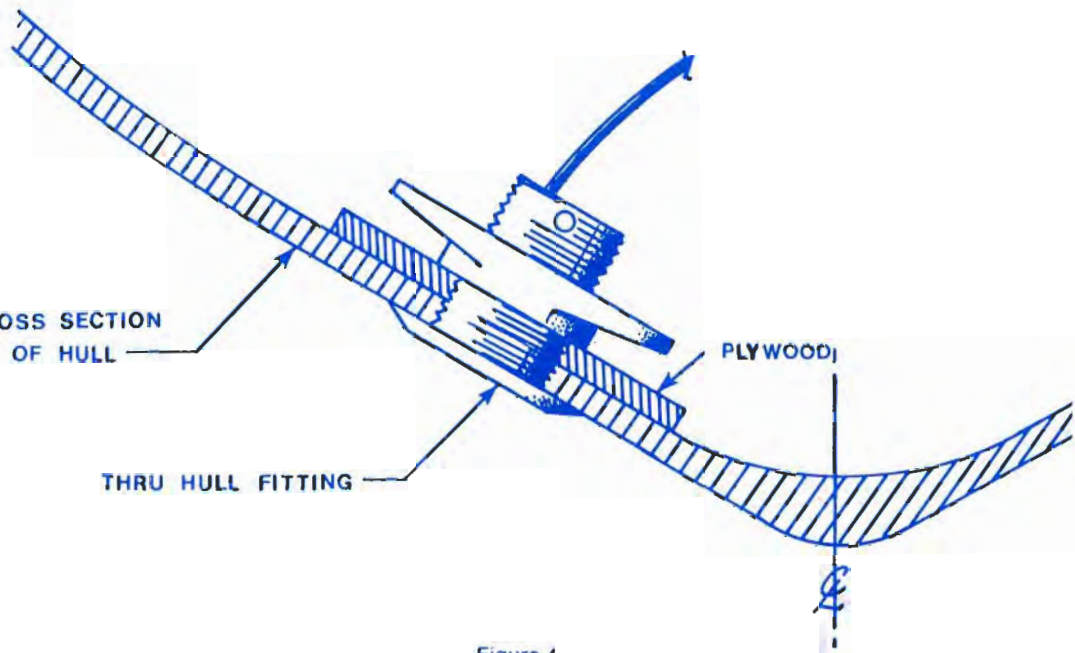
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CROSS SECTION  
OF HULL

THRU HULL FITTING

PLYWOOD

Figure 4



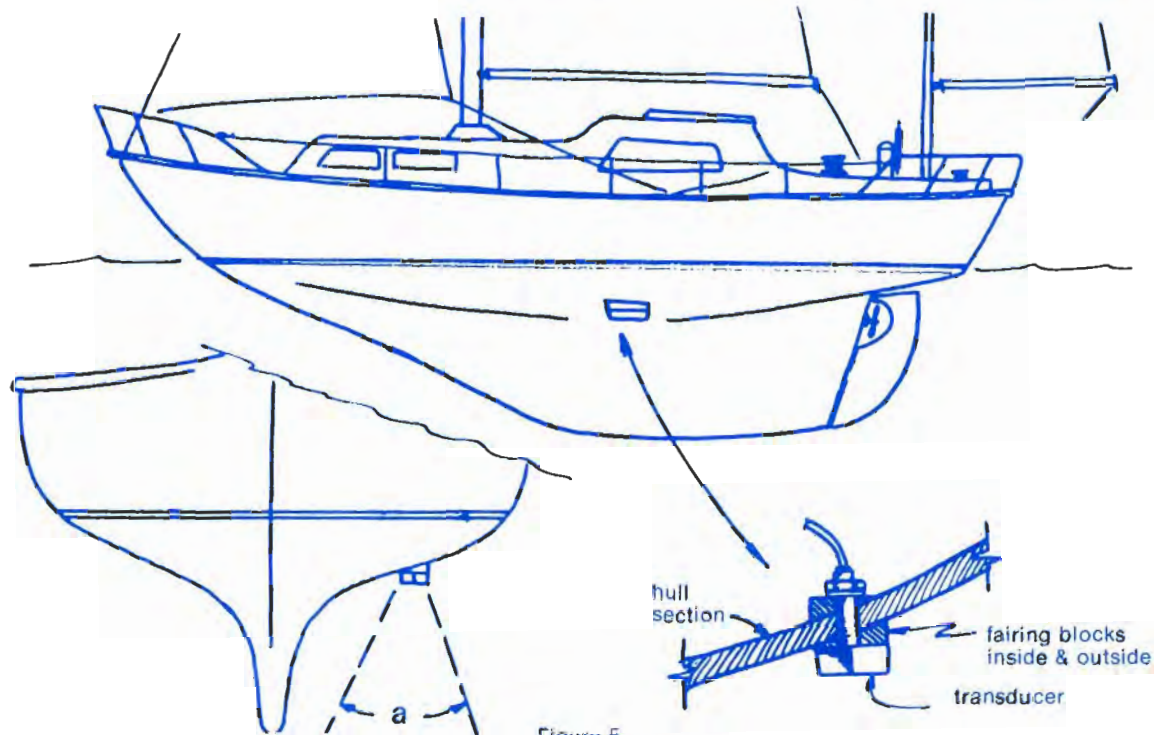


Figure 5  
Typical thru-hull installation  
A-104 transducer (option)

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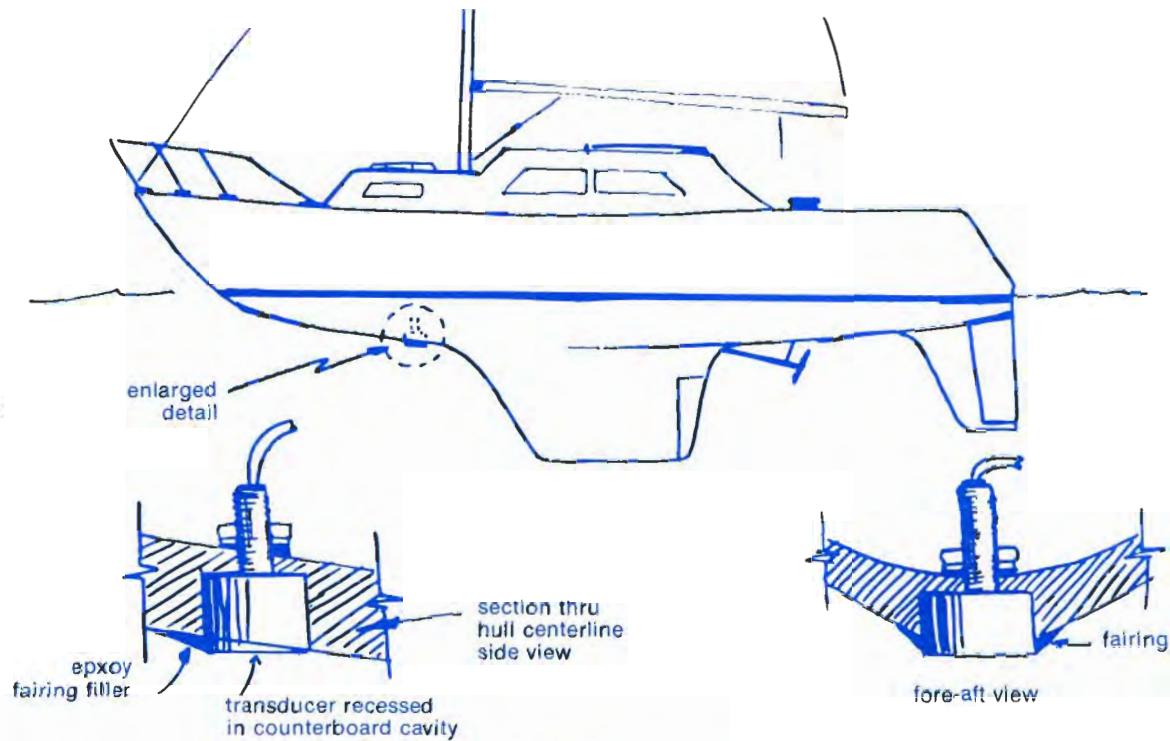


Figure 6  
Low drag mount recessed in stem

**CAUTION: A BRONZE TRANSDUCER MUST NOT BE INSTALLED DIRECTLY ONTO A STEEL OR ALUMINUM HULL. SPECIAL PRECAUTIONS ARE NEEDED TO AVOID DAMAGE DUE TO ELECTROLYSIS OF DISSIMILAR METALS. (PLEASE REQUEST TECHNICIAN BULLETIN #9 FROM DATAMARINE FOR DETAILS).**

#### **IN-HULL WATER BOX:**

Water boxes contained within the boat hull are popular in some areas and are often successful. However, a successful installation depends upon many factors that are beyond the control of Datamarine, such as hull thickness, hull material, type of glass weave, resin voids, etc. Therefore, Datamarine *does not warrant* that the S-200DL will operate to its specifications when the transducer is mounted within the hull of a boat.

#### **INITIAL OPERATION:**

Sometimes when first launched, the transducer face will not be fully wetted due to paint film, oily surface or a microscopic film of air. The S-200DL will miss continuously until the boat has run a short distance to wash the transducer clean. A pre-launch application of detergent soap to the face of the transducer will usually prevent this initial problem.

## DEPTH ALARM:

When a warning of decreasing depth is required or a particular depth contour is to be located as an aid to navigation, the increments of 4' and 8' may be selected by the alarm switch on the front panel. Having set a depth, the alarm will sound whenever the indicated depth is less than the set alarm depth, and will continue to sound until either the alarm depth is readjusted or the water depth increases.

- 16 Note that the S-200DL may occasionally detect a false shallow signal (fresh wake or fish) causing the alarm to sound momentarily in error. Should false alarms become a nuisance (due to boat traffic or abundant fish) and safe operating depths are otherwise assured, the alarm may be disabled by setting the alarm switch to the OFF position.

Incorrect adjustment of the SHALLOW GAIN control located on the rear panel of the unit can also induce frequent false alarms by not rejecting the surface wake signals suf-

ficiently (see the shallow gain adjustment section).

## SHALLOW GAIN ADJUSTMENT:

There is an adjustment control on the rear panel for shallow gain which operates independently of the primary automatic gain. The shallow gain affects only the first 20 feet of depth sounding. This control limits shallow gain to allow the S-200DL to ignore shallow echo returns such as from wake, stormy aerated surface water, or nearby boat structures. The control was set to a calibrated position at the factory for typical conditions. If your S-200DL has a tendency to display 02' or 03' too often over wake or stormy surfaces, you may make a small correcting adjustment by moving the slotted control clockwise  $\frac{1}{8}$  turn. If your S-200DL should miss soundings over shallow, muddy bottoms too often, rotate the control  $\frac{1}{8}$  turn counterclockwise. Some experimenting may be necessary with the shallow gain setting and a number of  $\frac{1}{8}$  turn steps may be necessary to achieve the op-

imum setting. This control has no effect whatever on soundings over 20' deep, only on shallow depths and wake suppression.

#### **ANTI-FOULING PAINT:**

We recommend a single, thin coat of anti-fouling paint on the transducer face to prevent fouling. It should be recoated each time the boat bottom is painted. First, gently sand off any previous paint such that only one fresh coat is on the epoxy transducer face. Paint buildup will reduce performance, as will a fouled transducer.

#### **GENERAL CAUTIONS:**

1. The S-200DL is not designed to operate on any transducers other than those supplied for it by Datamarine. Any attempt to tune or match to another transducer is at the owner's risk.
2. The S-200DL is designed *only* for operation on 12 volt battery systems.
3. Should the S-200DL fail to work properly, check power wiring and voltage, transducer connections and transducer condition. Many reported cases of failure or malfunction are traced ultimately to water box installations, fouled transducers, heavily painted transducers and spliced transducer cables. **DO NOT ATTEMPT TO TUNE OR ADJUST YOUR S-200DL. SEEK SERVICE OR ADVICE FROM YOUR DATAMARINE DEALER OR THE FACTORY.**

## WARRANTY CONSIDERATIONS:

At the time of purchase, be sure that the warranty card for your S-200DL is properly filled out and returned to the factory for proper warranty registration.

### PLEASE NOTE

#### WARRANTY WILL BE VOIDED BY:

- 18 \* IMPROPER FUSES
- \* OVERVOLTAGE DAMAGE
- \* PHYSICAL DAMAGE
- \* SALT WATER IMMERSION
- \* IMPROPER ATTEMPTS AT REPAIR
- \* OPERATION OR STORAGE AT TEMPERATURES BEYOND THOSE SPECIFIED

## INSTRUMENT SERVICE:

FOR PROMPT FACTORY SERVICE,  
MAIL OR SHIP TO:

Datamarine International, Inc.  
Service Department  
53 Portside Drive  
Pocasset, MA 02559 USA  
Telephone: (617) 563-7151

(Include return address and symptoms, transducer and installation factors). REPAIRS OUT OF WARRANTY WILL BE PERFORMED AT MODEST COST FOR LABOR AND PARTS. THE INSTRUMENT WILL BE RETURNED TO ADDRESS SPECIFIED WITH A C.O.D. CHARGE FOR SERVICE AND FREIGHT. Please refer to complete Warranty Statement and Service Program, enclosed with product shipment.

# *Warranty*

All Datamarine products are covered by a 12 month limited warranty and a subsequent four year service program. Please refer to the complete warranty statement or consult your servicing Datamarine dealer. Please be sure to complete and return the warranty registration card at the time of purchase.



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