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DBX1 MANUAL

PRECISION DIGITAL BAROGRAPH

XTREME



FIRMWARE VERSION 3.60



THE





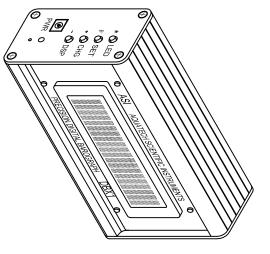








TO



DIGITAL BAROGRAPH

inHg and mb

IMPORTANT!

BATTERIES ARE ON STANDBY WHEN UNIT IS PLUGGED IN BATTERIES ARE ALREADY INSTALLED! PRESS AND HOLD THE "DSP" BUTTON UNTIL THE SCREEN TURNS ON

DBX1

REV 1.0

REV 1.0

INTRODUCTION

THANK YOU FOR PURCHASING THE DBX1 PRECISION DIGITAL BAROGRAPH.

for contact information functions. If you have any questions, please contact us. *See page 18 Please read through this entire manual to become familiar with this unit's

The DBX1 is a precision digital barometer. The DBX1's intended use is to detect changes in atmospheric pressure. No other use is described

damages resulting from a defect in the unit. no event will be liable for direct, indirect, special, incidental or consequential independent laboratory test a sample set of our units for accuracy. (ASI) in AQUATECH SCIENTIFIC INSTRUMENTS LLC (ASI) has had an outside

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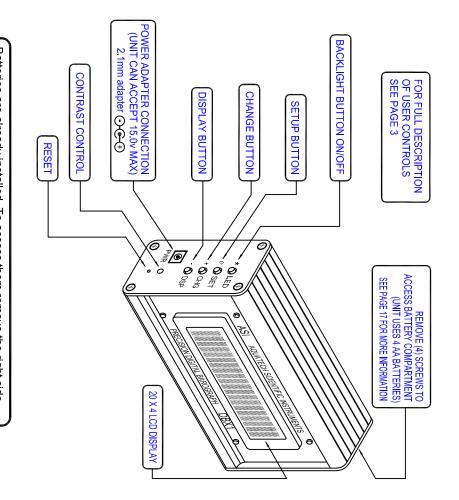
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See warranty information on page 18 of this manual.

Table of contents

3 :	Warranty and contact information
17	Battery access and Trouble shooting.
16	Accessories
15	Wiring harness information
4	Unit specifications
13	Terms and Definitions
12	Care and frequently asked questions
<u> </u>	Interpreting the pressure graphs
10	Display overview
9	Display options (History and Realtime ASM)
ω	System setup (Threshold and Sound)
7	System setup (Elevation for Sea Level Pressure))
6	System setup (Time, Date and Format)
5	Calculating Sea Level Pressure
4	Unit setup
ω	Control overview
2	Unit overview
_	Introduction

DBX1 UNIT OVERVIEW



are not used. The unit does not recharge the batteries. Batteries are already installed. To access them remove the right side cover. When your unit is plugged in, the batteries are on standby and

Marine craft users, the DBX1 unit can accept up to 15.0 volts.

No voltage conversion is required. The DBX1 unit works directly with 12v power systems

(Replace batteries every 3 months in a marine environment.)

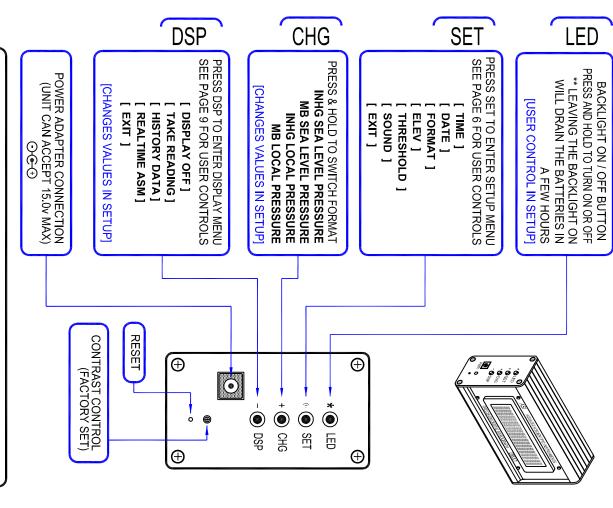
See the mounting option on page 16. Use a 2.1mm female power adapter to connect to your power system.

POWER CONSUMPTION:

5.0 mA @ 5.0 volts in standard operation mode. 160.0 mA @ 5.0 volts in standard operation mode with LED backlight on.

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DBX1 CONTROL OVERVIEW



The backlight may be left on when unit is powered by the wall adapter or marine power. Be aware that the backlight uses around a 160.0 mA of power. Turning off the display will automatically turns off backlight as well as the lcd and save additional power

Use a small phillips head screwdriver to adjust the contrast control.

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DBX1 UNIT SETUP

- Unpack the DBX1 Digital Barograph and accessories.
- Plug the DBX1 in with the provided AC/DC wall adapter.
- Press and hold the "DSP" button until the display turns on.
- 4. Please read the information below before proceeding to page 5.

WHAT IS SEA LEVEL PRESSURE? (SLP)

Barometers are usually setup for SEA level pressure. SEA level pressure is the actual LOCAL air pressure at your elevation, plus the additional air pressure below your elevation down to sea level. All world pressure maps use this format. By adjusting your pressure to SEA level, you can easily compare your pressure reading with other locations around the world. The DBX1 uses an ELEVATION value to adjust the SLP. See detail on page 5.

To set your SEA level pressure, you only need to know your elevation above sea level. You can also set the unit with a known oressure. For example, if the local news reports your reading as 29.87 inhg, that is the SEA level value. Simply adjust the ELEVATION until SEA reads that known value.

WHAT IS LOCAL PRESSURE? (LP)

The LOCAL pressure is the actual air pressure at your elevation. The DBX1 is calibrated to read the actual LOCAL pressure. Local pressure is generally used in the research, automotive, medical fields, testing laboratories, manufacturing, etc.

THRESHOLD ALERT T

The Threshold alert allows the user to set a pre-determined pressure that when reached will signal an audible and visual alarm. To clear alerts see display options on page 9.

DBX1 GRAPH @ @

When first setup the 1-Day and 5-Day graph will show only one bar on the right side of the screen. The 1 day graph will add a bar every hour and the 5 day graph will add a bar every 6 hours.

DBX1 CONTROLS

At anytime in normal operating mode you can:

Press "LED" to turn the backlight on or off.

Press "SET" to access setup functions.

Press "CHG" to switch between inhg and mb formats.

Press "DSP" to access display functions.

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DBX1 SYSTEM SETUP

HOW TO SET YOUR SEA LEVEL PRESSURE

SEA LEVEL PRESSURE

a mobile phone with GPS capabilities or you can use a program such as google earth to pin down your elevation. Then simply enter this elevation as FEET in the DBX1 setup. elevation above sea level. You can determine your elevation through To set your SEA LEVEL PRESSURE you only need to know your

Simply press and hold the "CHG" button to select format! You can change to any of the below format when not in setup mode.

MB SEA LEVEL PRESSURE MB LOCAL PRESSURE INHG LOCAL PRESSURE INHG SEA LEVEL PRESSURE



LOCAL PRESSURE

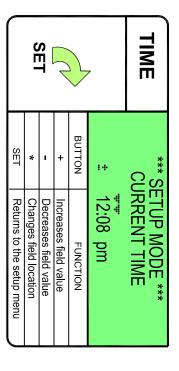
27.89"

944.35 mb

SET MENU EXIT FORMAT THRESHOLD] ELEV] DATE TIME]

SOUND

PRESS "SET" TO EDIT MENU OPTION PRESS "CHG" TO SELECT MENU OPTION PRESS "SET", THE SYSTEM WILL THEN PRESS "SET" TO ENTER SETUP MENU RESUME NORMAL OPERATING MODE TO EXIT SETUP MENU SELECT "EXIT" AND



	о П		5		,	DATE
SET	*	I	+	BUTTON	1+	*** S
Returns to the setup menu	Changes field location	Decreases field value	Increases field value	FUNCTION	** dd yy 05 / 08 / 10	*** SETUP MODE *** CURRENT DATE

LOCAL PRESSURE AT +2100'-0

SEA LEVEL PRESSURE

30.00" 1015.88 mb

2100'-0" ABOVE SEA LEVEL

ELEVATION DIFFERENCE

+2.11" 71.53 mb

SET CHG	BUTTON		FORMAT	
CHG Select format inHg, mb, mmHg	ON FUNCTION	ENIER FORMAT		

LOCAL PRESSURE + OFFSET PRESSURE = SEA LEVEL PRESSURE

Sea Level

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<u> </u>	SET —				INHG		i	PRESSURE
SET	*	1	+	BUTTON	SEA:	ELEV:		LOCAL:
Returns to the display menu	Changes field location	Decreases field value	Increases field value	FUNCTION	30.192" ±	+00030 FT	##	30.160"

Important: Your offset value will always be positive if you live at or above sea level. You can change your offset to a negative offset value if you live below sea level.

<u> </u>	SET				MB	PRESSURE
SET	*	1	+	BUTTON	SEA:	LOCAL
Returns to the display menu	Changes field location	Decreases field value	Increases field value	FUNCTION	+00030 FT 1022.34 ±	

After you setup your DBX1 unit the first time with the correct pressure, record your OFFSET PRESSURE for later use. You can use this OFFSET to reset your unit without knowing the pressure, as long as your unit's altitude has not changed.

Important: You can display either the LOCAL or SEA level pressure on the DBX1. Pressing the CHG button when you are in normal operating mode will switch between values.

DBX1 SYSTEM SETUP

THRESHOLD	** SE THRE	** SETUP MODE ** THRESHOLD ALERT
7	1+	[2950] in
	BUTTON	FUNCTION
	+	Increases field value
SET		Decreases field value
0	*	Changes field location
	SET	Returns to setup menu

The Threshold alert allows the user to set a pre-determined pressure that when reached will signal an audible and visual alarm. To clear alerts see display options on page 10.

SOUND	** SI	** SETUP MODE ** SOUND
		[NO]
	BUTTON	FUNCTION
SET	CHG	Select sound ON or OFF
	SET	Returns to setup menu

Turns off all audible sounds. It is recommended that the audible sounds be turn on when adjusting the unit. This allows the user clear audio / visual ques when pressing buttons.

The DBX1's data is cleared when you change the pressure. You can view the pressure and offset without clearing data as long as you do not change the offset value. All other setup functions will not affect the pressure data.

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RESUME NORMAL OPERATING MODE. PRESS "DSP" AND THE SYSTEM WILL THEN PRESS "DSP" TO SELECT MENU OPTION PRESS "CHG" TO SELECT MENU OPTION PRESS "DSP" TO ENTER DISPLAY MENU TO EXIT DISPLAY MENU SELECT "EXIT"

DSP MENU

HISTORY DATA] TAKE READING DISPLAY OFF]

REALTIME ASM

EXIT]

TAKE READING

Reads current pressure and clears warning messages and threshold alert if active.

	SET			HISTORY
	DSP	BUTTON	02 May08 03 May08	* PRESSUI 01 May08
Displays 48 hourly records	Pause and resume scrolling	FUNCTION	y08 11:00 1020 y08 10:00 1019	* PRESSURE HISTORY * 01 May08 12:00 1021

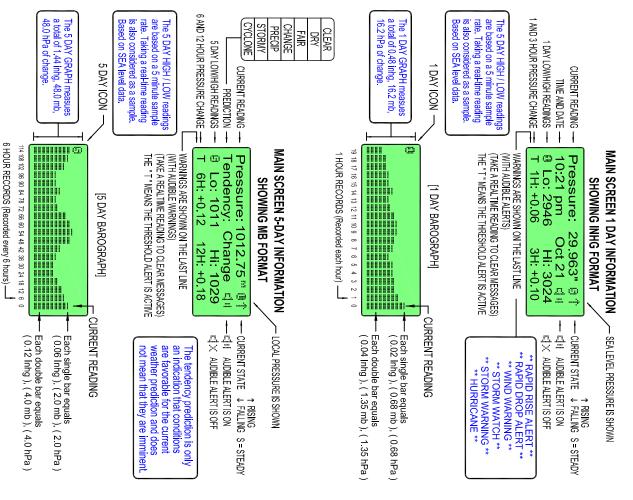
hours of SEA LEVEL pressure data. You can pause and resume at any time by pressing the "DSP" button Important: The HISTORY DATA function will scroll through 48

REALTIME	/38 **	REALTIME ASM **
	SENSOR:	R: 1012.75 " 🖲
	BUTTON	FUNCTION
SET	DSP	Press DSP to return to
		the Display Menu, then EXIT

selected by pressing and holding the CHG button. actual SENSOR pressure, make sure that LOCAL mode is press & hold DSP to return to the Display menu then select exit. All data and graph information is still recorded in this mode. Note: REALTIME ASM allows you to display SEA level pressure. This is the SENSOR pressure including the SEA level OFFSET. the air pressure every 10 seconds. If you wish to display the Active sample mode requires more battery power. To Exit Important: REALTIME ASM (active sample mode) samples

DBX1 DISPLAY OVERVIEW

(SCREENS ARE DISPLAYED IN THE FOLLOWING ORDER



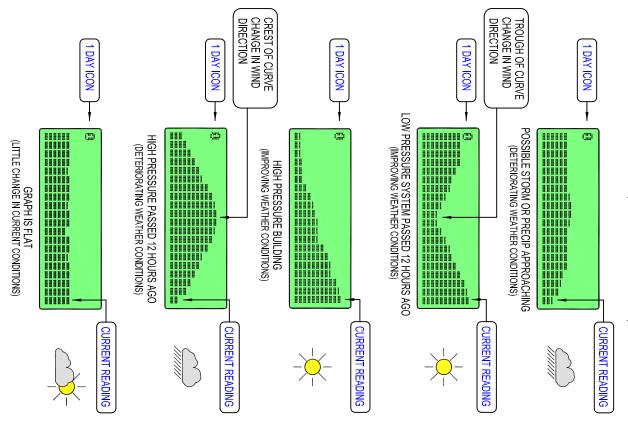
The screen rotates every 5 seconds.

The pressure is read every 5 minutes based on the time clock. The pressure is recorded on the hour based on the time clock

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DBX1 - WEATHER FORECAST

1 DAY GRAPH (20 HOURLY RECORDS



FREQUENTLY ASKED QUESTIONS

WHEN FIRST SET, WHY DOES THE 1 DAY AND 5 DAY GRAPH ONLY DISPLAY ONE BAR?

each hour until the whole screen is full. The 5 Day graph will show a new bar pressure reading. See page 10 for record sequence. every 6 hours until the whole screen is full. The right most bar is the current The barograph does not have any data yet. The 1 day graph will show a new bar

WILL THE DBX1 RETAIN ITS SETTINGS WHEN CHANGING THE BATTERIES?

intormation. Yes, if you have the unit plugged in and you remove the batteries, the unit will retain its

HOW LONG WILL THE BATTERIES LAST?

for using the backlight unit is on battery power alone they will last for about a month. This does not account That depends, if the unit is plugged in or is hardwired they will last for over a year. If the

WHAT IS THE MAXIMUM DC INPUT VOLTAGE?

power systems The unit can handle a maximum of 15.0 volts. It was designed to work with marine

HOW IS A SYSTEM FIRMWARE UPDATE DONE?

There are 2 ways we offer this service:

can send the unit to us and we will update your system and ship it back. We can send you a firmware update chip with installation instructions or you

CARE AND MAINTENANCE

Do not use Windex or cleaning solutions. Clean the LCD screen with a soft damp cloth and let air dry. Use water only Clean the case with a soft damp cloth. Use a mild water and soap solution and dry thoroughly,

problems with your DBX1 barograph There are no user repairable parts. Please contact (ASI) if you are experiencing any

DBX1 TERMS AND DEFINITIONS

SENSITIVITY: Refers to the smallest pressure change the unit can detect. ACCURACY: Refers to how far from the true pressure the unit will deviate.

RESOLUTION: Refers to how many decimal places that each format will display.

Pressure See Page 5 for more information. sea level pressure (relative pressure). Local Pressure is also know as Station LOCAL PRESSURE: The actual air pressure read by the DBX1, not offset to

and your LOCAL pressure. See Page 5 for more information. **OFFSET PRESSURE:** The pressure difference between SEA level pressure

SEA LEVEL PRESSURE: Local air pressure calculated to sea level pressure. You use the ELEV adjustment to change you sea level pressure

See Page 5 for more information. All pressure maps are based on sea level pressure also know as relative pressure. This allows you to compare your values with other stations around the world

when the air pressure drops below that user set value. THRESHOLD ALERT: A user set value that will sound an audible and visual alert

ASL: Above Sea Level

inHg: English Format. Inches of mercury. The standard U.S. format.

mb / hPa: Metric format. Millibars / Hectopascal used outside the U.S.

Metric format. Millimeters of mercury. Used in the medical field

NIST: National Institute for Standards and Technology.

FIRMWARE: The DBX1's upgradable operating system.

DBX1 ICONS AND SYMBOLS

- Œ П SEA LEVEL PRESSURE IS DISPLAYED
- LOCAL PRESSURE IS DISPLAYED
- ONE DAY INFORMATION
- FIVE DAY INFORMATION
- **AUDIBLE ALERT IS ON**
- <u>⊒</u> Ⅱ
- □X = AUDIBLE ALERT IS OFF
- 3 MILLIBAR FORMAT
- RISING PRESSURE
- FALLING PRESSURE
- USE THE PLUS OR MINUS TO ADJUST VALUE
- FIELD SECTION ARROW

DBX1 SPECIFICATIONS

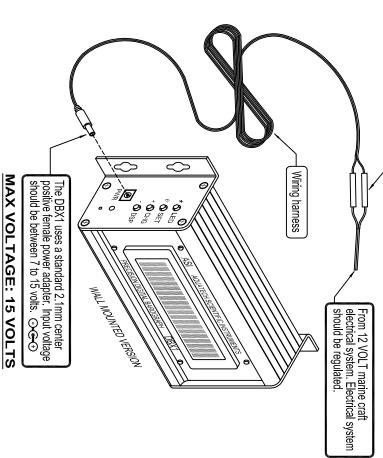
A piezoresistive transducer (state of the art monolithic silicon pressure sensor). On Chip Signal Conditioned. Temperature Compensated 2.5% Maximum Error over 0 to 85C, and Calibrated. Sensor range; (2.2 to 16.7 Ps), (15 to 115 kPa.) (1.50 to 115 kPa.) (1.50 to 115 kPa.) (2.50 to 16.7 Ps), (15 to 115 kPa.) (1.50 to 115 kPa.) (2.50 to 16.7 Ps), (15 to 115 kPa.) (1.50 to 115 kPa.) (1.50 to 115 kPa.) (2.2 to 16.7 Ps), (15 to 115 kPa.) (1.50 to 115 kPa.) (1.50 to 15.5% Maximum Error over 0 to 85C, and Calibrated. Sensor range; (2.2 to 16.7 Ps), (15 to 115 kPa.) (1.50 to 115 kPa.) (1.50 to 15.7 kPa.) (1.50 to 15.5% Maximum Error over 0 to 85C, and Calibrated. Sensor shows a single show in the color of t	Includes one A/C power adapter with 9v output and 2.1mm female connector. Includes 4 AA backup batteries and battery holder. It can run up to one month on batteries depending on usage can handle up to 15 volts. Power Adapters available for U.K., Europe & Australia.	Barograph Power
ity ity ion ion e sensor e sensor e sensor e sensor e sensor format e format e format gh ph ph ph Graphing ph from ph Graphing	Audible Barograph alert at 85db with on/off control. Automatic audible alert on large drop detect with warning messages. User settable drop threshold alert. For example, a user could set an audible alert if the pressure falls below 29.60 inhg.	Alerts and Warnings
ph e sensor e sensor lity lity lion lon Review e asm ph ph ph ph from long long long long long long long long	4 Control buttons with multiple functions, LED backlight control, SET, CHG, DSP (Display control). Contrast control. Sound on/off control. format control (inhg/mb format). Real-time reading control. Set Threshold Alert and Clear warning message control.	Barograph Controls
ph e sensor e sensor lity lity lion lon lon liph liph liph liph lion		Barograph Display Graphing
ity ity ion e asm e asm ph	Current Pressure, [1] Day high and low pressure, [5] Day high and low pressure, Tendency, Warning messages and rate of rise and fall. Pressure Change showing: 1, 3, 6, and 12 hour pressure differences. Time and Date. History review showing 48 hours of data.	Barograph Display Information
graph sure sensor litivity lution lution ry Review lime asm de de	20x4 column green transflective LED backlit LCD display. User adjustable contrast control. Backlight ON/OFF control.	Barograph Display
graph sure sensor litivity lution sure format sure format ry Review ry Review de	AVR risc processor running @ 1 mhz. 32K Flash memory. Upgradedable Firmware. Built in 6 pin "ISP" in system programming.	Microcontroller
graph sure sensor racy racy litivity lution sure format ry Review lime asm	Barograph operates at altitudes up to 12,000 ft / 3658 meters.	Altitude
graph sure sensor racy litivity lution sure format	Active Sample Mode - samples the air pressure every 10 seconds	Realtime asm
graph sure sensor racy lithity lution sure format	48 hours history review shown as: [REC] [DATE] [TIME] [PRES]	History Review
graph sure sensor racy racy lution lution	Date function with records stored in mm/dd/yy.	Date
ensor	12 hour time format with records stored in 24 hour format.	Time
ensor	SE	Pressure format
sensor	Barograph Resolution 0.01 mb/hPa. and 0.001 inhg.	Resolution
	Barograph Sensitivity 0.100 mb/hPa. and 0.003 inhg.	Sensitivity
	Barograph Precision ±0.25 mb/hPa. and ±0.007 inHg. for NIST units. NIST testing range is from 26.00 - 31.00 inhg, 880 - 1050mb/hPa and 660 - 787mmhg. Accuracy may vary outside this range.	Accuracy
	A piezoresistive transducer (state of the art monolithic silicon pressure sensor). On Chip Signal Conditioned, Temperature Compensated 2.5% Maximum Error over 0 to 85C, and Calibrated. Sensor range: (2.2 to 16.7 Psi), (15 to 115 kPa.) (150 to 1150 mb/hPa.), (4.43 to 33.96 inhg.). Settable application range (406 to 1134 mb/hPa.), (12.00 to 33.50 inhg.). The actual intended application range is from 26.00 - 31.00 inhg, 880 - 1050mb/hPa and 660 - 787mmhg.	Barograph Pressure sensor

DBX1 WIRING HARNESS DIAGRAM

WIRING INSTRUCTIONS

Important: Always follow your local marine electrical code when wiring your unit

place with a heat gun. Turn on marine power, test unit again, then re-install batteries. Mount unit as desired Cut wires and slide heat shrink tubes over each wire. Splice and twist wire, matching positive and negative. Turn off the marine craft's electrical system. Unscrew and remove batteries from right side of DBX1 Turn on marine power and test unit then turn off marine power. Solder wires and heat shrink the tubing in



NOTES:

Use a 2.1mm female power adapter to connect to your power system (Replace batteries every 3 months in a marine environment.) The DBX1 will switch to battery power if the external power goes below 7 volts. The DBX1 can handle external power in the range between 7 to 15 volts. The DBX1 unit works directly with 12v Marine craft power systems.

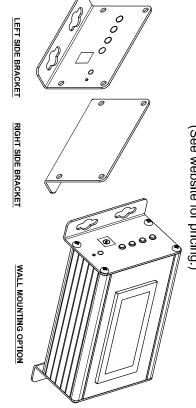
POWER CONSUMPTION

 $5.0~\mathrm{mA} \ @ 5.0~\mathrm{volts}$ in standard operation mode. 160.0 mA $\ @ 5.0~\mathrm{volts}$ in standard operation mode with LED backlight on.

DBX1 ACCESSORIES

DBX1 WALL MOUNTING KIT SOLD SEPARATELY

(See website for pricing.)



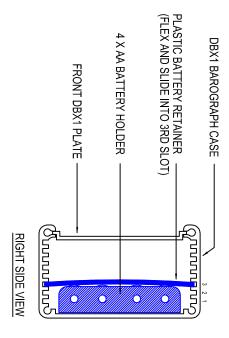
SUS	11	AC/D
JY.N		C POWER.
EUROPEAN	•	AC/DC POWER ADAPTER TYPE
AUSTRALIA	\ /	TYPE

DRX1 4XAA BATTERY HOLDER WITH CONNECTOR	P0009
DBX1 AUS 2.1MM POWER WALL ADAPTER	P0008
DBX1 EURO 2.1MM POWER WALL ADAPTER	P0007
DBX1 UK 2.1MM POWER WALL ADAPTER	P0006
DBX1 US 2.1MM POWER WALL ADAPTER	P0005
DBX1 WIRING HARNESS FOR USE WITH MARINE 12V POWER	P0004
DBX1 MOBILE 12 VOLT CAR POWER ADAPTER	P0003
DBX1 WALL MOUNTING KIT INCLUDES 2 BRACKETS	P0002
FIRMWARE UPGRADE KIT WITH INSTRUCTIONS	P0001
Description	Item No.

See Website for latest pricing

DBX1 BATTERY ACCESS

To access the batteries, remove the (4) screws from the right side of the DBX1 unit. Grasp the battery holder and side out with the plastic battery retainer. Change batteries then put the battery holder back in place. Next, flex plastic battery retainer and slide into the 3rd slot on the DBX1 case as shown.



DBX1 TROUBLE SHOOTING

Your DBX1 unit should run continuously for months without any issues. Still, there are a few situations that can cause the DBX1 to lock-up or appear to lock-up. Here are the main causes:

- Low battery power
- 2. A fluctuating a/c power supply.
- 3. A bad wall power adapter.

QUICK STEPS TO RESOLVE YOUR ISSUE:

Problem: The unit is unresponsive or the LCD displays 2 initialization bars.

- Solution 1: Press and hold the display button "DSP" until the screen re-initializes. (You will not lose any settings or data and unit should run normally)
- Solution 2: Reset your unit using a paper clip through the small bottom hole on the left side of the unit. See Page 2. (Settings and data will be lost)
- Solution 3: Check and replace batteries if necessary. (Settings and data will be lost)

Tip: Please make sure that the DBX1 is plugged into a surge suppressor.

If this does not resolve your problem please email: TECHNICAL SUPPORT.

WARRANTY AND CONTACT INFORMATION

Please see the website for additional information, including (FAQs) Frequently Asked Questions and Abobe PDF documents before contacting technical support

ASI LIMITED WARRANTY:

1 Year Limited Warranty from date of purchase.

AQUATECH SCIENTIFIC INSTRUMENTS LLC Warrants this unit to be free from defects in materials and workmanship under normal consumer usage for the period outlined.

COMPANY INFORMATION:

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