# SeaSwitch

# **User's Manual**



# **Chetco Digital Instruments**

Copyright © 2005 Chetco Digital Instruments, Inc.

All rights reserved.

SeaGauge<sup>™</sup> is a trademark of Chetco Digital Instruments, Inc.

SeaSwitch<sup>™</sup> is a trademark of Chetco Digital Instruments, Inc.

#### WARNING!

# USE THIS UNIT ONLY AS AN AID TO MONITORING ENGINE PERFORMANCE INFORMATION.

#### CAUTION

When showing sensor data, this unit will only show information based on the sender used and its installed position.

The operating and storage temperature for your unit is from -4 degrees to+167 degrees Fahrenheit (-20 to +75 degrees Celsius). Extended storage temperatures higher or lower than specified will cause the liquid crystal display to fail. Neither this type of failure nor its consequences are covered by the warranty. For more information, consult the factory customer service department.

All features and specifications subject to change without notice.

Chetco Digital Instruments may find it necessary to change or end our policies, regulations, and special offers at any time. We reserve the right to do so without notice.

All screens in this manual are simulated.

#### **NOTICE!**

Free software upgrades will be available on our website at http:// www.seagauge.com as they are released. Please check our website periodically for these and other information as they become available.

Thank you for choosing Chetco Digital Instruments

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.

#### Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

• Consult the factory customer service department for help.

#### SPECIFICATIONS

Dimensions:
Input Voltage: 10 - 15 vDC, 12-volt Nominal
Processor Frequency: 18.432 MHz
Maximum Current:
Display:
Operating and Storage Temperature4 to +167 degrees Fahrenheit -20 to +75 degrees Celsius
Switched Circuits :
Max Label length: 8 characters
NMEA 2.0 Instrumentation Sentences \$IIXDR,S

# **Table Of Contents**

Table Of Contents	5
Introduction	7
Welcome	7
What You Get	8
Unit	8
Cables	8
Operation	9
Select	9
Set	10
Normal Operation	10
Setup Modes	13
Backlight	.13
All-Off	14
SET HOUR	14
SET MINUTE	14
Set Options	.15
Port Select Sub-mode –	.15
Port Baud Rate Sub-mode	.16
Save Options Sub-mode	.16
Set Display	.16
Save Display sub-mode	18
Set Position	18
Set Channel	.19
Save Channels mode	20
Connectors	.22
22	
System Power	23
Switch Ports	24
Ports	24
Installation	.26
Cutout	26
Power	.27
Signals	28
Label set-up	29
Serial Port Protocols	31
NEXT MENU	32
SET Function	32
Real-time data	32
Program Mode	.32
Bluetooth module initialization	.33
One Year Warranty	35

# Introduction

# Welcome

Thank you for purchasing a Chetco Digital Instruments product. SeaSwitch<sup>™</sup> provides custom instrumentation in a rugged compact design. Its menu driven functions allow it control many different circuits from a single location. Optional built-in wireless capability allows control and real-time display from remote locations.

# What You Get

# Unit

SeaSwitch head unit with power and 8 circuit inputs. The unit provides user defined text labels to represent each of 8 switch positions. A built-in microprocessor monitors a sealed silicone button and presents a switch label on the 24X2 character display each time the button is pressed. Once a desired circuit is displayed – pressing a second sealed button will toggle the switch label on/off and activate the associated relay. If the switch was previously off – the unit will display the label in a predefined position on the display and energize the relay to close the contacts. If the switch is on – the unit will remove the label and deenergize the relay which will open the contacts. This process is repeated in similar fashion for all of the 8 switch labels.

# Cables

SeaSwitch is supplied with 10 water resist cables for installation. The power and switched circuit cables are un-terminated and will need to be modified for you installation. The serial interface cable will connect directly to any RS232 computer interface.

# Operation

SeaSwitch will allow control of up to eight 15-Amp circuits from a single labeled location. Each circuit is identified by a user configured text label which can be up to 8 characters in length. Two sealed silicone buttons provide menu driven control of all functions.

A 48 character display (24 X 2) provides menu selection and switch status information. A built-in microprocessor monitors the two sealed buttons and displays user defined switch names in an 8 character menu area in the upper left corner. Active switch labels are displayed in the 40 character status area as switches are toggled on/off using the bottom right button.

All switch names and positions are user configurable using menu driven setup modes which allow customization of order of appearance. Switch settings can be reconfigured in the field without a computer hookup as often as needed. A built-in serial port or wireless interface also allows the unit to be connected to a computer or PDA for remote programming and display.

Each switch position drives a 15-Amp 110 Volt relay circuit. The mapping of switch positions to relays can be changed at anytime to allow for reassignment. This feature is useful if it is desired for one switch position to drive multiple relays or to remap a failed circuit.



#### Select

The top right button is used for switch and menu selection. Pressing the button for 0.5 seconds will select the next switch label or menu item. This information is displayed in the first 8 positions starting from the upper left corner (MEMU area). Continuing to hold the button down will automatically scroll to the next switch or menu. The remaining 40 positions form a STATUS area. If a switch is ON – it's label will appear in the STATUS area.

М	Ε	Ν	U													
							S	Т	A	Т	U	S				

#### Set

The bottom right button used to enter setup mode or toggle a switch on/off. Pressing the bottom button while a switch label is in the MENU area will toggle the switch on/off. Pressing the bottom button for 0.5 seconds while viewing the "SEASWITCH" label will enter setup mode. Once in setup mode – you must scroll through all menu choices using the top menu select button to exit setup and return to normal display. In setup mode this button is used to change various settings.

# Normal Operation

When the unit is powered up it will display the "SEASWITCH" label in the upper left corner. This MENU area is where all switch names will appear when pressing the top button. The unit supports 8 user programmable switch labels from 1-8 characters in length.

			1							1	[							 1
•								~										÷
	3		A	3	vv													1
_	-	_		-		-	-	-										1
!									 <u></u>			 	 	 	 	 		 2
			1															2
			1			1				1							1	2
			1											 				2

If no selections are made in 60 seconds, the unit will revert to display the currently set time. When in time display mode – pressing the top button will show the first switch label. Pressing the bottom button in time display mode will enter SET-UP mode.

1	1	:	3	0										

Whenever the "SEASWITCH" label is displayed. – pressing the top button will show the first switch label. Pressing the bottom button will enter SET-UP mode.

2100000000		 	121010000000		 	210100000	 				 			 
	 					-					-			 
											-			
		 		 	 						-			
					 _						-			
				 							-			
											-			
				 	_						-			
	 	 		 	 	-					-			 
	 										-			
S	 	 		 	 		 	 	·	 	 ā	 	ā	 

200	 	 		and a second sec	 gunnan managar		 	 gana ana ana ana ang a	 	mg construction of a good	on an
	 			-				 	 -		
	 			=	: :		 	 	 -		
	 					;	 :	 			
			1 1				 	 	=		
			1 1				 	 			

Pressing the top button shows the first switch label in the upper left MENU display area.


Pressing the top button again will erase the first label and show the next

G	Ρ	S											

Pressing the top button again will show the next label

S	0	N	A	R										

Pressing the bottom button whenever a switch label is displayed in the upper left MENU area will toggle the switch on/off. If the switch was off – pressing the bottom button will turn it on and display the label in the predetermined position on the display STATUS area.

S	0	N	A	R							S	0	N	A	R	

If the switch was on – pressing the bottom button will turn it off and remove the label from the display. The current switch label will remain in the upper left corner until the top button is pressed

S	0	N	A	R										

Pressing the bottom button will turn on the switch if the label is currently being shown

S	0	Ν	A	R							S	0	N	A	R	

Pressing the top button will show the next switch label. If another switch was already on - its label will remain in the specified position to indicate it is active. At this point you will see two switch labels because one is active/on (SONAR) while the other (GPS) is selected/off. The upper left corner only shows the current label and not its state (ON/OFF). A switch's ON state is only indicated if its label appears in the status portion of the display.

			 ,	 	 	,	 	,	,	 	,	 					
G	Ρ	S										S	0	Ν	A	R	

Pressing the bottom button will activate the second switch and put its label into the status area of the display. At this point you will see two switch labels to indicate that both switch's are ON.

G	Ρ	S						G	Ρ	S	 S	0	N	A	R	 /

Pressing the top button will bring up the third switch label

В	I	L	G	E					G	Ρ	S	S	0	N	A	R	
					 			 		<u>.</u>							 

Pressing the bottom button will activate the third switch and display its label. Once a switch is activated and a new switch position selected – it can not be deactivated until its label is cycled through and appears in the upper left corner again.

В	I	L	G	E						G	Ρ	S	S	0	Ν	A	R	
					В	L	G	Е										

Pressing the top button repeatedly will cycle through all the switch labels and allow selection of a switch label that was previously chosen. .

G	P	S						(	GP	S	\$ S 0	N	A	R	
				BI	L	GI	Ε								

Pressing the bottom button will deactivate the current switch because its label was already displayed in the status area.

	 		 	 				 	 	 		Commence and a second second					 	•
								-				-						
												=						
-	_	-											_			_		
															_			
											-				_			
																		ε.
_		_											_					
												_	_					
												-						Ξ.
	 		 	 			,	 	,	 ,				••••••••••••••••••••••••••••••••••••••				
												-						а.
											-	-			-			
					_	-						-						
	 											-						а.
	 							 			-	-			-			۰.
	 											-						
	 											=						з.
							_	 				-			-			
	 											-						а.
																		а.

# Setup Modes

The bottom right button used to enter setup mode or change a setup setting. Pressing the bottom button for 0.5 seconds while viewing the clock or SEASWITCH label will enter setup mode. Once in setup mode – you must scroll through all menu choices using the top menu select button to exit setup and return to normal display. In setup mode this button is used to change various settings

There are eight setup modes which appear in the following order:

- Backlight On/Off Used to turn on the backlight for low-light viewing
- ALL OFF Used to turn off all functions
- **SET HOUR** Used to adjust clock hours
- SET MINUTE Used adjust clock minutes
- Set Options various unit options including serial port modes.
- Set Display Set the text label which is used to identify each switch
- Set Position Set the display position for each switch label
- Set Channel assign switch labels to input pins.

Once you enter setup mode, you must cycle through all modes before you can exit and get back to sensor displays. You can choose to skip each of the setup sub-modes by pressing the top right button (menu select). Pressing the bottom right button (item set/adjust) will enter the various sub-modes for each setup menu.

# Backlight

The first setup mode is used to turn on the backlight if required for low light viewing. In this setup mode you will see the following display.

В	A	С	Κ	L	G	Н	Т									
					0			 9 <b>111111111</b>								

Pressing the bottom right button will toggle the light on/off. If there is no activity for 15 seconds while in Back Light mode, the unit will revert to normal operation and the MENU area will revert back to the clock function

To exit this mode presses the top right button to take you to the next setup menu or wait 15 seconds.

Since the backlight is the first setup menu choice activated by the bottom button – pressing the bottom button twice while in normal operation will activate the backlight. This can be convenient when operating in low light conditions.

# All-Off

This mode is used to globally disable all switches and turn off the display. The clock will continue to keep time but the unit will enter low power mode. This function provides a convenient way to quickly turn off all equipment..

A	L	L	0	F	F										

Pressing the bottom right button will turn off all switches and blank the display. Pressing any button while in all-off mode will reset the unit.

To exit this mode presses the top right button to take you to the next setup menu

# SET HOUR

This mode is used to adjust the hour setting on the clock. Pressing the bottom button while in this mode will increment the hour digits by one hour. After the maximum of 23 hours is reached it will start over again at 0. Clock settings are only retained if power is supplied to the unit. Removing power will reset the clock function.

S	Ε	Т	Н	0	U	R									

To exit this mode presses the top right button to take you to the next setup menu

# SET MINUTE

This mode is used to adjust the minute setting on the clock. Pressing the bottom button while in this mode will increment the minutes digits by one minute. After the maximum of 59 minutes is reached it will start over again at 0. Clock settings

are only retained if power is supplied to the unit. Removing power will reset the clock function.

S	E	Т	Μ	I	N										

To exit this mode presses the top right button to take you to the next setup menu

# Set Options

This setup mode has various sub-modes used to configure the unit. You can skip this mode by pressing the top right button (NEXT) or enter the sub-modes by pressing the bottom right button (SET)

0	Ρ	Т	0	N	S							N	E	X	Т	>
													S	Ε	Т	>

### Port Select Sub-mode -

This sub-mode is used to determine which port data is transmitted from. On units equipped with the optional BlueTooth wireless module you will have two port options. Pressing the bottom right button while in this sub-mode will toggle which port data is sent out of.

S	E	Т		0	P	Т	I	0	N	S							
P	0	R	Т		S	Ε	R	I	A	L							

S	E	T		0	P	Т	I	0	N	S						ĺ	
P	0	R	Т		В	L	U	Ε									

To exit this mode press the top right button to take you to the next Options submode

#### Port Baud Rate Sub-mode

This sub-mode to set the baud rate for the serial ports. Normal operation is 9600 but some NMEA equipment requires 4800. Setting to the slower baud rate will affect the display update rate of the remote viewing software.

S	E	T		0	Р	Т	I	0	N	S									
В	A	U	D		R	A	Т	Ε			9	6	0	0					

Press the lower right button to toggle between the two options

S	E	Т		0	Ρ	Т		0	N	S									
В	A	U	D		R	A	Т	E			4	8	0	0					

To exit this mode press the top right button to take you to the next Options submenu

#### Save Options Sub-mode

This sub-mode to save any changes made in any of the sub-modes. Any changes made up to this point have not been permanently saved and will be lost if the unit is reset or if you exit this sub-mode. Pressing the top right button (NO) will erase all changes and exit the SET OPTIONS setup mode.

S	A	V	Ε	0	Ρ	Т	I	0	N	S						N	0	>	
															Y	Ε	S	>	

Pressing the lower right button (YES) will save the changes and reset the unit..

## Set Display

This setup mode is used to set the eight possible characters for each of the switch labels. You can skip this mode by pressing the top right button (NEXT) or enter the 8 display sub-modes by pressing the bottom right button (SET). Once you enter the sub-modes you must go though all of them before you exit though you do not need to make any changes.

D	S	Ρ	L	A	Y							N	E	X	T	>	1
													S	Ε	Т	>	

Once you enter the display sub-mode the unit will current label assigned to each of the 8 displays. Each label can have up to 8 characters. The display will flash on the current character starting from the first position. Pressing the top right button will advance to the next character position. Once you advance you can not go backwards. You must advance through all 8 characters for all 8 labels (64 positions) before you can exit the SET DISPLAY mode.

S	E	Т		D	I	S	P	L	A	Y	(	0	)	S	0	Ν	A	R		

In this example the cursor is in the "S" position. Pressing the top right button would advance the cursor to the "O" position. Pressing the top right button again would advance to the "N" position and so on.

SE	: T		D	I	S	P	L	A	Y	(	1	)	G	P	S			

Once you advance through all eight positions for a selected label the display will change to the next label.

To change a character for any position (flashing cursor) press the bottom right button to select the next character from the character set.

S	E	Т		D	S	Ρ	L	A	Y	(	1	)	 Р	S			

In this example the bottom button was pressed once to select the space character. This is a special character since it used to indicate that this position is not to be displayed. By using the space character in the correct position you can shorten any display string to less then 8 characters. In this example the last 5 characters will not be displayed which will create room for additional display labels. By using the space character you can control exactly how long each label is on the display.

S	Ε	Т		D	I	S	Р	L	A	Y	(	1	)	A	Ρ	S			

Pressing the bottom button again increments to the "A" character and so-on.

There are 85 possible characters to choose from in the following order:

*		Α	В	С	D	Ε	F	G	Η		J	Κ	L	Μ	Ν	0	Ρ	Q	R	S	Т
U	V	W	Χ	Υ	Ζ	а	b	С	d	е	f	g	h	i	j	k	I	m	n	0	р
q	r	s	t	u	v	w	x	У	z	0	1	2	3	4	5	6	7	8	9	I	"
#	\$	%	&	"	(	)	+	,	-		1	:	;	<	Π	٧	?	@			

If you miss a character you must cycle through the list again before you can change it. Once you have specified a character, press the top button to move the cursor to the right one position. Once you have gone through all 8 positions for a display label, the next label will appear. You must go through all 64 positions before you can save changes.

## Save Display sub-mode

This sub-mode to save any changes made in any of the display sub-modes. Any changes made up to this point have not been permanently saved and will be lost if the unit is reset or if you exit this sub-mode. Pressing the top right button (NO) will erase all changes and exit the SET DISPLAY setup mode.

S	A	V	E	D	I	S	P	L	A	Y						N	0	>	and a second sec
															Y	Ε	S	>	

Pressing the lower right button (YES) will save the changes and reset the unit.

# Set Position

This setup mode is used to set the position on the display for each of the switch labels. You can skip this mode by pressing the top right button (NO) or enter the 9 position sub-modes by pressing the bottom right button (YES). Once you enter the sub-modes you must go though all of them before you exit though you do not need to make any changes.

P	0	S	I	T	0	N						N	E	X	Т	>	-
													S	E	Т	>	

Once you have entered the position sub-mode you see the current label and the display position. Pressing the top button will advance to the next label while pressing the bottom button will increment the display position.

The positions number is assigned from left to right starting at 0 and ending at 23. Row numbers are assigned from top to bottom with row 1 at the top and row 2 at the bottom.

#### DO NOT USE POSITIONS 0 – 7 ROW 1 AS ARE ASSIGNED TO THE MENU FUNCTION AND WILL OVERWRITE YOUR LABELS.

S	E	T		 	Ρ	0	S	I	Т	I	0	N	<u> </u>							
S	0	N	A	R				R	0	W	(	1	)	Р	0	S	(	18	)	

In this example the bottom button was pressed once to increment the RPM label over one position to the right.

S	E	T			Ρ	0	S	I	Т		0	N								
S	0	N	A	R				R	0	W	(	1	)	P	0	S	(	19	)	

Once the desired position is selected, pressing the top button shows the next display label and currently assigned position.

S	Ε	Т			Ρ	0	S	I	Т	I	0	Ν								
В	I	L	G	Ε				R	0	W	(	2	)	Ρ	0	S	(	0	)	

You must cycle through all 8 display labels using the top button before you can save any changes

**Save Positions mode** – This sub-mode to save any changes made in any of the positions sub-modes. Any changes made up to this point have not been permanently saved and will be lost if the unit is reset or if you exit this sub-mode. Pressing the top right button (NO) will erase all changes and exit the SET POSITIONS setup mode.

Pressing the lower right button (YES) will save the changes and reset the unit.

S	A	V	E	P	0	S	I	Т	I	0	N					N	0	>	
															Y	Ε	S	>	

## Set Channel

This setup mode is used to set the input pin for each of switch labels. You can skip this mode by pressing the top right button (NO) or enter the 8 channel submodes by pressing the bottom right button (YES). Once you enter the sub-modes you must go though all of them before you exit though you do not need to make any changes.

It is rare that you need to make any changes here as channel assignments are made based on the documented pin out. However, in the event a relay fails you can reassign a switch function to another relay port.

С	H	A	N	N	E	L							N	E	X	T	>	
														S	Ε	Т	>	

Once you enter channel assignment sub-mode you see the first sensor label and the channel it is assigned to. The pin out diagram for your unit will show how channels are mapped to specific pins on the connector. Changing a channel changes relay assigned to the switch label. Pressing the top button changes the label while the bottom button increments the channel assignment. Channels are numbered 0 to 7 and start over when you increment past the maximum.

S	E	Т		С	Η	A	N	N	E	L	 		 	 	 	
G	Ρ	S							0							

In this example the "GPS" switch channel was changed from 0 to 1 by pressing the bottom button one time.

			 						,	,	 	 	 	 	 	 
S	E	T		C	Η	A	N	Ν	Ε	L						
G	Ρ	S							1							

Pressing the top button displays the next witch label.

5	F	T			C	H	Δ	N	N	F				,		 	
S	С 0	• N	A	R	×		~	••		<b>4</b>			 		 	 	 

You must cycle through all 8 switch labels before you can exit and save changes.

#### Save Channels mode

This sub-mode to save any changes made in any of the channels sub-modes. Any changes made up to this point have not been permanently saved and will be lost if the unit is reset or if you exit this sub-mode. Pressing the top right button (NO) will erase all changes and exit the SET CHANNELS setup mode.

Pressing the lower right button (YES) will save the changes and reset the unit.

SAVE CHANNEL NO>	
	N 0 >

- 52	 	 	 unununungu.		 	 	and the second second	 	 <b>BRANK BRANCE</b>	 		 me.
		 				 			 	 · —	_	
	 		 						 			- 8
	-	 		-		 			 			
÷.	 -		 						 	 	-	 - 8
	-	 -		-		 			 -	-		
	 	 	 		 	 		 	 	 		 ••••

# Connectors

The SeaSwitch unit has 10 water-resist quick-connect connectors on the rear panel. Each connector is keyed to ensure proper alignment when attaching the supplied cables. Never force a cable in. Rotate the cable until the keys align and it should smoothly insert.

The serial cable (P9) can be left disconnected under normal operation. Only connect the serial cable when programming the unit or attachment to a computer for remote display. The optional Bluetooth serial adaptor can also be attached to this interface.



Connector	Function	Pins
P1	Switched Signal 0	2
P2	Switched Signal 1	2
Р3	Switched Signal 2	2
P4	Switched Signal 3	2
Р5	Switched Signal 4	2
P6	Switched Signal 5	2
P7	Switched Signal 6	2
P8	Switched Signal 7	2
Р9	Power	6
P10	Serial	8

## System Power

System power is supplied via the 6-pin power connector.



	POWER (P2)									
Pin	Color	Function	Direction	Volt						
1	Black	Ground	OUT	0						
2	-	Not connected	-	-						
3	Orange	Not Used	OUT	0-3.3						
4	Green	Not Used	IN	0-3.3						
5	Red	Power	IN	12-14						
6	White	Reference Voltage	OUT	3.3 or 5						

The Power wire is connected to battery (+12 volts) via a switched 3 Amp fuse circuit. Never connect directly without providing a fused circuit. Circuit should be powered when key is on and power removed when key is off.

The ground wire should be connected to a solid ground bus located near the unit. The case is grounded and can be connected to system ground. Be sure to connect the ground wire from the cable and never rely on the case for ground.

The reference voltage is used to supply senders that require a regulated 5 volt source. Some senders like pressure, position, and fuel level may require fixed reference voltage. Never connect the reference without a 1 Amp fuse. Maximum current supplied by the reference is 850 mAmps.

## Switch Ports



SIGNAL (P1-P8)									
Pin	Color	Function	Direction	Volt					
1	Red	Switch Lead 0	OUT	0-120					
2	Black	Switch Lead 1	IN	0-120					

# Ports

The serial port connector provides the interface to a computer RS232 interface for command and status control of the unit. The unit can be remotely controlled via this interface using ASCII command sequences or the optional software utilities. Status information is transmitted out this interface using NMEA 0185 \$IIXDR sentences. Status information includes current gauge readings and display labels.

Cables are supplied for connection to this interface and there should be no need to interface directly. A serial interface cable is normally used to remotely control the unit or to collect status information in NMEA 0185 format. A separate reprogramming (FLASH) cable is used if the unit needs to be reprogrammed. This cable is compatible with RS232 protocols but requires special software to provide this function. This cable is supplied only with the purchase of the development kit.



8-#20\*

	SERIAL (P3)									
Pin	Color	Function	Direction	Volt						
1	Grey	BTPOWER	OUT	3.3						
2	Brown	Flash TX	OUT	0-3.3						
3	Brown	Serial RX	IN	0-3.3						
4	Yellow	Serial Ground	IN	0						
5	Red	Serial TX	OUT	0-3.3						
6	Red	Flash RX	IN	0-3.3						

7	Green	DEBUG	IN	0-3.3
8	Yellow	Flash Ground	IN	0

BTPOWER is a 3.3 volt regulated output to provide power for the optional BLUETOOTH serial adapter. This signal should not be used for any other purpose. Maximum output is 200 mA and is not fuse protected.

FLASHTX is the serial transmit line for reprogramming the unit. It is compatible with standard RS232 transmit protocols

FLASHRX is the serial receive line for reprogramming the unit. It is compatible with standard RS232 receive protocols

FLASHGND is the serial ground when reprogramming the unit.

SERIALTX is the serial transmit line for status information from the unit. It is compatible with standard RS232 transmit protocols

SERIALRX is the serial receive line for control information to the unit. It is compatible with standard RS232 receive protocols

SERIALGND is the serial ground. It is compatible with standard RS232 transmit protocols

DEBUG is for internal use only and should not be connected.

# Installation

# Cutout

SeaSwitch can be mounted directly in the dash by performing a rectangular cut out a shown in the figure. The bezel lip is only 0.25" from the cutout dimensions so care must be taken to not to make the cutout any larger the specified. It is a good idea to practice on scrap material before cutting into the panel. You must allow for the 3" depth of the unit plus another 4" to support the cables for a total of 7" behind the dash.



The unit can be secured in place by using slotted "L" brackets in the threaded gimbal holes on either side of the unit. Be careful not to tighten down the supplied screws into the holes with out a washer or "L" bracket or else damage to the internal seal will result.

#### Power

Power is supplied from the accessory bus via a 3 amp fuse. Never attempt to connect power without providing a fused input or serious damage may result. Unit should have power applied when key is in the accessory or run position and power removed when key is off.

Be sure to attach ground lead to a solid ground bus for proper operation. All sensor/sender grounds should be attached to the same ground buss.



# Signals

The unit supports up to eight 15 amp circuits. A separate two-pin cable is provided for each circuit. Each circuit is isolated and there is no common power bus. The circuit is a simple SPST relay. If you need to drive a current load greater then 15 amps then use the SeaSwitch circuit to drive a higher rated relay.

#### Always use a 15 amp fuse on each circuit or permanent damage will result. No internal fuses are provided.

Switch labels are mapped to relay numbers with label 1 mapped to relay 1 and so forth



# Label set-up

Each switch can be identified by a label up to 8 characters long. When a switch is activated this label is placed in the status area of the display. The status area is 40 characters. All active switch labels go in the common status area.

М	Е	Ν	U													
							S	T	A	Т	U	S				

If all 8 switch positions are active and each switch label is 8 characters - 64 characters would be required to display all labels. Since the status area is only 40 characters – there will not be enough room if all labels are 8 characters. For this reason you will need to choose label names so that the total is less then 40 characters including any spaces.

Switch labels can be entered/modified in setup mode. When entering labels – spaces are ignored and serve to indicate the end of label. For example entering: SONAR followed by space creates a five character label. The easiest way to determine label names and positions is to use the template below to try out different combinations. Be sure to leave a space between adjacent labels.

MENU	8 9	) 10	11	12	13	14	15	16	17	18	19	20	21	22	23
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	8 9	9 10	11	12	13	14	15	16	17	18	19	20	21	22	23

The numbers represent the start position for each label you will need to enter in setup mode.

This is an example.

М	Е	Ν	U								V	Η	F		G	Р	S		S	0	Ν	Α	R
								8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Ν	Α	V	L		B	Ι	L	G	Ε		W	Ι	Р	Ε		С	A	B	Ι	Ν		A	N
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

# **Serial Port Protocols**

The serial port interface of the SeaSwitch unit can be used for real-time status and reprogramming. The status information is sent in NMEA 0183 format using the \$IIXDR,S sentence format which supports switching instrumentation. Custom NMEA control sentences are used to control the unit via the serial port interface.

To access the serial port information – connect the supplied cable to computer RS232 port. Set the baud rate of the computer interface to match the baud rate of the unit (4800 or 9600). Use the standard 8 bits, no parity, and 1 stop bit (8-N-1). Start a serial interface program such as HyperTerminal with these settings then power up the unit. If the connection is correct you will see a status message from the unit –

SeaSwitch Version 1.02. This indicates the settings are correct.

NMEA 0183 support custom message formats for command and control of propriety equipment. SeaSwitch uses the sentence structures:

\$PCDIC,X - for control were X is the control command

- **N** = Next menu. Same as pressing the top button
- **S** = Set function. Same as pressing the bottom button
- **G** = Start dumping NMEA \$IIXDR sentences in real-time at two updates per second
- **P** = Initiate programming the unit
- **B** = Initialize the Bluetooth module.

\$PCDIS,YYYYY – for status where YYYYY is the returned status information

• \$PCDIS,SEASWITCH,0001.100,,\*79 = Model Name and Firmware revision

Instrumentation data is returned using the standard NMEA \$IIXDR,S sentence structure:

#### \$IIXDR,S,DATA,U,LABEL,CHECKSUM

- **S** = NMEA SWITCH instrument indicator
- **DATA** = switch state = ON or OFF
- **U** = unit of measurement not used here
- **LABEL** = 8 character switch label and a 1 character number representing the channel
- **CHECKSUM** = NEMA check sum calculation on the string

## NEXT MENU

The **\$PCDIC,N** command is used to command the unit to display the next menu or group. It functions exactly the same as pressing the top button on the unit

## **SET Function**

The **\$PCDIC,S** command is used to enter Set-up mode or increment a setting. It operates the same as pressing the bottom button on the unit.

#### Real-time data

The **\$PCDIC,G** command is used to view real-time instrumentation from the serial port. When the unit is first powered up it will start listening to the default serial port (RS232 or Bluetooth) for commands. It will not dump data until it receives the **\$PCDIC,G** command. To view real-time data type this command in HyperTerminal after you see the prompt. Data for each of the switches will immediately begin to be displayed in NMEA 0183 \$IIXDR,S sentence format. The unit will dump data for all 8 switches every 0.5 seconds.

\$IIXDR,S,OFF ,B,BILGE 2,\*67

Indicates switch labeled "BILGE" on relay channel 2 is OFF

\$IIXDR,S,ON ,C,SONAR 6,\*67

Indicates switch labeled "SONAR" on relay channel 6 is ON

HyperTerminal allows capture of real-time data to a text file. First enable the Capture Text command under the Transfer menu. Select the file name and location to capture to. Next enter the **\$PCDIC,G** command string to start dumping data to the specified file.

#### **Program Mode**

The **\$PCDIC,P** command is used to put the unit into reprogramming mode. Once in this mode a programming file can be sent to the unit to update Switch labels, Label positions, or channel assignments.

#### Use caution when using this command as improper use will erase the unit and it will have to be sent back for reprogramming.

Programming files can be obtained from Chetco Digital Instruments for use in this mode. These are in a special propriety format and can not be constructed or edited in the field. Contact Chetco Digital Instruments for more information on this option.

Download of new table information requires three steps:

- Enter program mode
- Erase existing table
- Load new table

Program mode is entered by using the \$PCDIC,P command from HyperTerminal. If this command is successful the unit will display:

#### • READY->

At this point the unit will wait to receive the starting and ending pages to erase. Page numbers are 512 bytes and can be calculated by dividing the starting page memory location by 512. The following table will help you determine the table page numbers.

Table	Address	Start Page	End Page	Erase Command
Switch Labels	C000	60	60	*6060
Not Used	C200	61	61	*6161
Label Positions	C400	62	62	*6262
Not Used	C600	63	63	*6363
Channels	C800	64	64	*6464
Parameters	CA00	65	65	*6565

To erase the memory you must enter a "\*" symbol followed by the start and end page values with no spaces. For example to erase the Switch labels table enter:

#### • \*6060

Once you have entered the 5 characters the unit will erase the memory and respond with

#### • ERASED->

At this point the unit will wait to receive the data to reprogram the unit. Use the HyperTerminal Send Text File function to transfer the appropriate file to reprogram the memory. As the file is transferring data the unit will display the memory address for each update. The display should increment till it reaches the end of file and then reset if no errors occur.

## Bluetooth module initialization

The **\$PCDIC,B** command is used to reinitialize the optional Bluetooth module. This mode should only be used if the module is replaced or other reprogramming required.