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**OCEANREEF<sup>®</sup>**  
underwater, naturally.

For nearly 60 years, OCEAN REEF has been involved in the underwater diving industry. We have contributed much to this industry, from fins and snorkels to the most modern systems of underwater communication. Through the spirit of intrepid pioneers, brilliant inventors, passionate divers, and dynamic entrepreneurs, OCEAN REEF has been able to turn dreams into reality in the underwater world.



OCEAN REEF USA



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Please refer to our web site:  
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# GSM DC COMMUNICATION UNIT OWNER'S MANUAL

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The Communication unit described in the following manual is the:

**GSM DC**

**WARNINGS, CAUTIONS, NOTES**

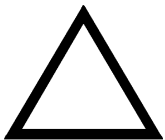
Pay special attention to information provided in warnings, cautions and notes that are accompanied by these symbols:



A **WARNING** indicates a procedure or situation that, if not avoided, could result in serious injury or death to the user.



A **CAUTION** indicates any situation or technique that could cause damage to the product, and could subsequently result in injury to the user.



A **NOTE** is used to emphasize important points, tips, and reminders.

## INTRODUCTION

The GSM DC communication unit is lightweight and compact. The frequencies it uses are compatible with other communication systems on the market.

**The high quality of the product does not allow the user to ignore the problems connected with the correct use of the product and the rules for safe diving.**

GSM DC has two special features:

1. DAT mode, Digital Activated Transmission
2. Possibility to talk and receive on two different frequencies  
Channel 1 → 32.768 kHz  
Channel 2 → 41.000 kHz

### GENERAL PRECAUTIONS AND WARNINGS



Use of SCUBA equipment by uncertified or untrained persons is dangerous and can result in serious injury or death.



NEVER wash any part of the communication with anything else than water.



**DO NOT** apply any type of aerosol spray on the GSM DC communication units. Doing so may cause permanent damage to certain components.



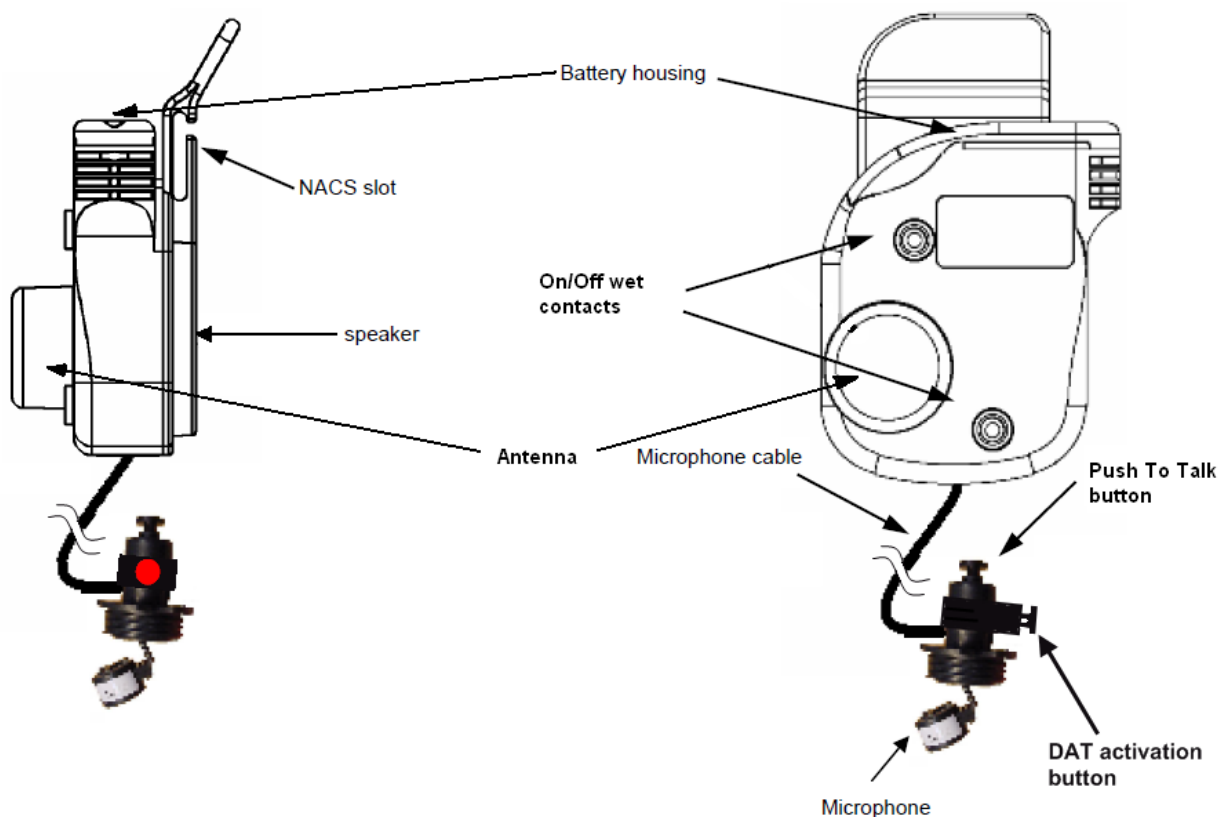
Continue to breathe while surfacing from a dive even if you are listening to the communications unit. Lung expansion injuries may result if you ascend while holding your breath. **DO NOT STOP BREATHING WHILE SURFACING FROM A DIVE.**



If you are going to speak while diving, you should take in a larger than normal breath. **ALWAYS MONITOR YOUR PRESSURE GAUGE.** Before attempting to use this device in open water you must practice using the unit in confined water (such as a pool).

## GSM DC transceiver unit

### TECHNICAL CHARACTERISTICS



Main parts of the unit are:

- **Battery housing:** inside the battery housing there is a label with the serial number and the polarity to insert the battery. The unit uses a 9volt alkaline battery, rechargeable batteries will last shorter. The autonomy with the alkaline battery (receiving mode) is around 9 hours with 1 hour of low battery alarm (one “beep” every 30 seconds) starting when voltage goes below 7.5volt.
- **Antenna:** it is made of ceramic, made to transmit and receive ultrasound to a frequency of 32.768 kHz and 41.000 kHz (UCF).
- **Wet contact screws:** the unit is automatically turned on when it is submerged in water, to perform a dry test is possible to turn it on using the fingers.
- **PTT & DAT activation buttons & MIC:** buttons are magnetic. The YELLOW one is the Push To Talk button, the RED one is the DAT activation button. Pressing both is to changes transmission channel. The D-Mic is dynamic (see following specs). The PTT & Microphone assembly is connected to the main unit with 30cm (1 ft) of polyurethane reinforced cable.
- **Speaker:** it is made of ceramic sealed with a special silicon resin; it is designed to work underwater so the best quality is achieved when the unit is submerged.
- **Slot for inserting the NACS:** the NACS is an OCEAN REEF patented support to hold the communication unit in position making the mask more comfortable.
- **Range of operation** 200→250m in calm water. (This may vary due to salinity, particulate, water temperature and noise level in the water)
- **Depth of operation** within the recommendation or training agencies.



## ATTACHING THE UW UNIT TO A FULL FACE MASK

The GSM DC can be attached to any of the major full-face masks available on the market if equipped with a female DIN connection for the transmission and microphone button assembly. For optimum functioning we recommend using the unit on OCEAN REEF Neptune masks, as the unit's acoustic characteristics are designed to suit these masks.

### HOW TO INSTALL THE NACS™ (Neptune Adjustable Communication Support)

Hold the NACS™ as pictured with the transparent stationary part to the left and the black rotating part to the right. Remove the o-ring from the notch at the end of the black rotating part of the NACS™.

Slide the GSM DC onto the NACS™. Place back the o-ring on the notch at the end of the black rotating support. The left middle strap (of the octopus strap) must be positioned over the rotating support.

Attach the NACS™ to the mask by positioning the holes of the transparent part over the black buttons of the clamping band and pressing. These buttons are the same ones that hold the protective shield when the mask is not in use. Make sure the protective shield is removed prior to attaching the NACS™ to the mask.

The black rotating part of the NACS™ has a vertical rotation angle of 25°. After wearing the mask you will find the most comfortable angle for you. If you prefer to move the GSM DC closer or farther away from your face, simply slide the unit over to the selected position and move the o-ring to a different notch.

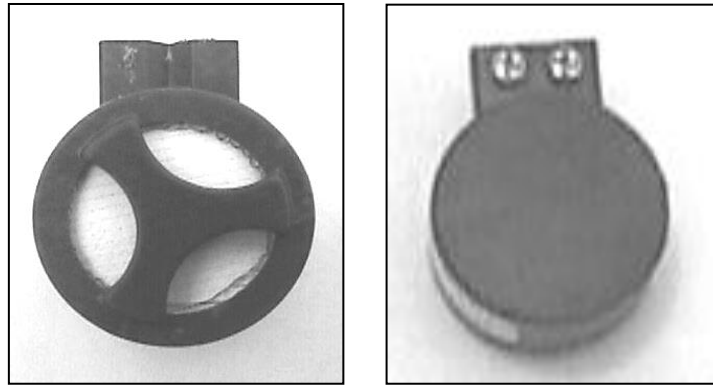
The use of the NACS™ allows for a more comfortable wearing of the mask and best strap adjustment.

The GSM DC must be always used with the NACS.

**NACS is a patented product of OCEAN REEF.**



## MICROPHONE



The GSM DC use a dynamic microphone, "D-Mic" encapsulated and protected by a hydrophobic membrane.

The microphone allows dependable clear reproduction of the human voice. It removes unnecessary noise such as the noise of bubbles being exhaled from the mask.

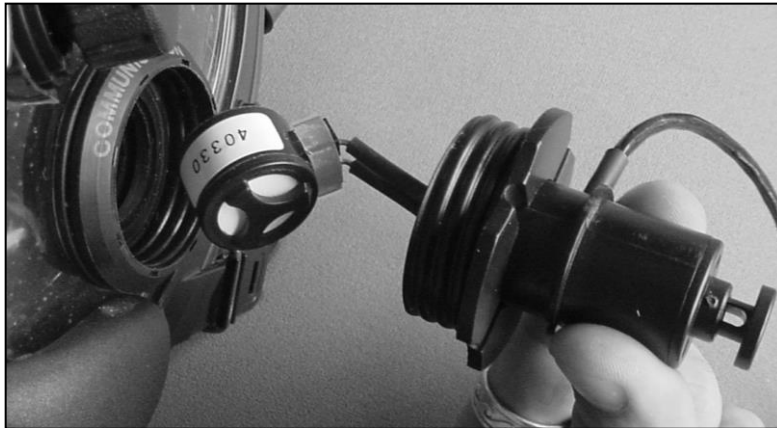
The D-Mic microphone uses a hydrophobic membrane that allows air to pass through while protecting the microphone from water. This membrane also reduces the "muffling" effect allowing a phonic performance that is very high. Another characteristic of the hydrophobic membrane is its mechanical strength. The D-Mic, is fitted with a membrane that is designed to handle pressure of more than 1bar (14.7 PSI). If the membrane breaks, the microphone will flood causing transmission to stop. Remember that the Neptune masks are designed to operate with "balanced" pressure. If the mask is removed underwater the microphone WILL NOT suffer any damage. However, continuing to descend WITHOUT the mask sealed on the face the microphone may be damaged if the limits, indicated above, are exceeded. (In relation to the depth at which the mask was removed). Ascending must be done in accordance with the dive tables or dive computer to avoid decompression problems. The communicator and microphone should be rinsed with fresh water (immersed, not a strong "flow of water") after each dive and should be placed in a well ventilated area that is not exposed to direct sunlight to dry.

D-Mic does not have a polarity restriction when assembled on the PTT contacts. Be careful to unscrew the two screws before removing it.

Clean the contacts and lubricate them on a timely base.



## PROCEDURE FOR THE ASSEMBLING OF A PTT & D-MIC MICROPHONE ON THE MASK



- Unscrew the communication port plug; insert the microphone through the port into the mask with the hydrophobic membrane facing the visor.



- If the membrane is turned the wrong way, facing the mouth, phonic performance will be diminished. Move the microphone so that it does not interfere with the diver's lips or the pressure equalization system.

The D-MIC is supplied with a “flexible contacts protective band”.  
The band prevents interaction of the mouth with the D-MIC connectors.

## DAT MODE AND SECOND CHANNEL

The red button on the GSM DC unit has two different functions:

- Pressed with the yellow one switches communication from channel one (32.768 kHz) to channel 2 (41.000 kHz)
- Pressed alone activates the DAT mode



### Changing Frequency

Press the yellow button and, keeping it pressed, immediately after push the red one too and release them simultaneously, you'll hear a message "channel two" meaning that you switched from channel one to two.

Now you are communicating on 41.000kHz frequency, push the PTT button (yellow) to transmit and release it to receive.

Do again the previous operation to go back to channel one.

### Digitally Activated Transmission

When a diver is in need to be in contact with the surface without having to push the PTT button continuously can activate the DAT mode.

Simply press and release the red button and a particular sound will confirm to you and to the surface that the DAT mode has been activated.

DAT mode is a loop of 30 seconds transmitting and 20 seconds receiving, in between the two periods two different sounds will distinguish transmitting from receiving time.

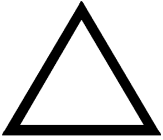
Pushing again the red button will quit the DAT mode and another sound will be heard.



**It is strictly recommended to test the unit before diving to familiarize with it and its different functions.**

## CHECKING BEFORE USE

Once the battery has been installed and you have checked that the cap and cover have been closed properly, dampen your fingers and touch the two screws (On/Off switch contacts) and activate the polarity circuit. You will hear a voice saying “channel one” indicating activation.



When the unit is turning on it will always and automatically go on channel one

Run another finger along the antenna. You will hear a “zzzzzz” type sound coming from the speaker.

Try to bring the antenna transducer near the antenna on a M105 DC unit, or the antenna on a GSM DC unit (about 5 cm / 2 inches), keeping your fingers on the On/Off contacts. You should also be able to hear the communication when the unit is not immersed in water.

Pushing the PTT button you will hear a “beep” indicating that you can transmit, speak keeping the PTT button pressed and check that the other unit is receiving.

Do the opposite operation to check the receiving of your GSM DC

Push the PTT button and immediately after push also the DAT button and release them simultaneously, you will hear a voice “channel two” indicating that you switched to the second frequency, change the channel also on the second unit and test again transmission, receiving and DAT mode.

Pushing the DAT button only you will activate the Digital Activated Transmission mode. Check that it is working on both channels.



Only one diver per time should use the DAT mode!! Disregarding this direction will cause communication to be confused and useless.



A repeated “beep” (about every 30 seconds) means that the battery is running low. Change it.

## BASIC INSTRUCTIONS FOR UNDERWATER COMMUNICATION

The GSM DC is activated for reception as soon as it is immersed in water, and it turns off a few seconds after it dries out.

When it's switched on, this is confirmed by a message "channel one".

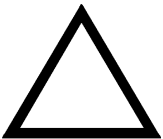
Push the PTT button and the activation of the transmission mode is anticipated by a "beep", wait until this is over before speaking.

When a message is incoming from your buddy or from the surface you'll hear the "beep" that anticipate the transmission, breath slowly to avoid bubbles to disturb communication.

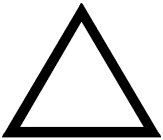


Inform your buddies before switching to a different transmission channel!

### NOTES:



- When speaking to other divers, remember that they are diving. It is best to attract their attention before sending a message.



- Talking and listening while underwater requires practice. With experience, divers will become more proficient in the use of the communications system.



- Speak slowly, and pronounce each word clearly. Only speak after having sent a call impulse by pressing the PTT button on the microphone. It is advisable to practice in a swimming pool before using the device in open water.



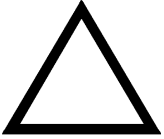
- Bubbles, and especially, small air bubbles, that are in contact with or near those communicating reduce the transmitting power. When using the unit in swimming pools or in highly oxygenated water, coat your antenna in silicone lubricant. This will make it more difficult for the air bubbles to adhere to it.



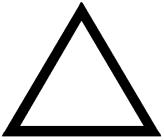
- Obstacles such as rocks may reduce your communication range.



- When breathing out (exhaling), reduce the emission of bubbles as far as possible (WITHOUT STOPPING EXHALING WHEN RESURFACING). Bubbles cause noise or ultrasonic base signals.



- It is normal to receive a background signal like clutter. Movement of sand and pebbles on the seabed, marine motors, cetaceans, and other sources can create vibrations in the water that give rise to a range of ultrasonic waves that can be picked up by the DC.



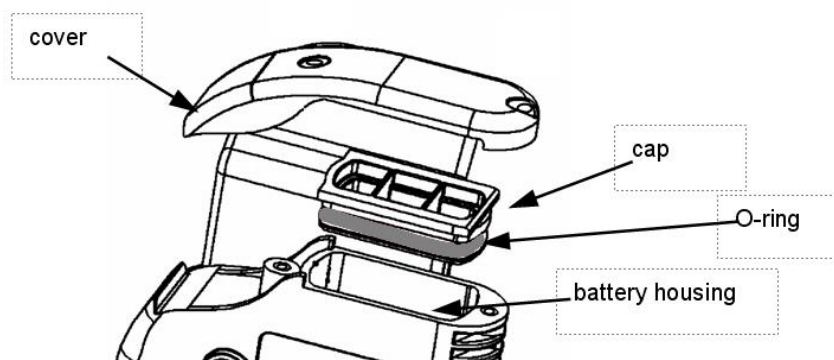
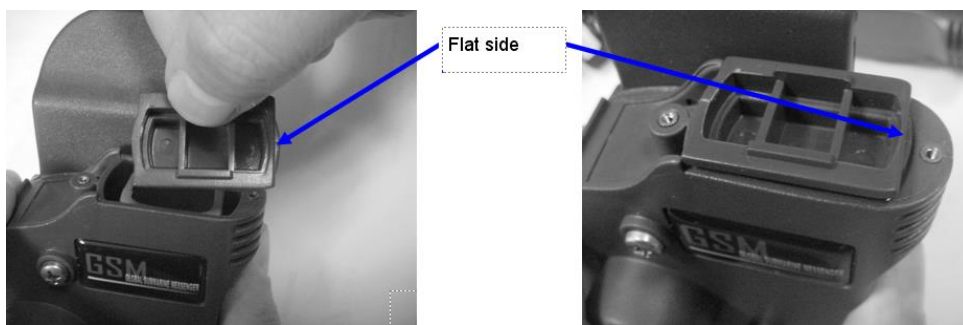
- When using the device in shallow water, you may experience difficulty communicating because:
  - (1) The surface is full of air bubbles formed by the waves.
  - (2) The sand under water is causing ultrasonic noise due to the waves.

**For more extended information:**  
**[www.oceanreefgroup.com/training.html](http://www.oceanreefgroup.com/training.html)**

## INSTALLING/REPLACING THE BATTERY

GSM DC works with a conventional 9V alkaline battery.  
Do not use manganese batteries.

- Unscrew the two screws on the cover and remove the cover and cap with its o-ring.
- Remove the dead battery from the main compartment.
- Install a new battery in the compartment, making sure that the polarity is correct (see label on the inside).
- Clean and lubricate the o-ring. Reposition the cap as indicated in figure below. The cap **MUST** face the right direction. The flat side of the battery cap must be on the rear side (when wearing the mask with the GSM) in order to get a good seal.
- Holding the cap in position, position the cover and screw the two screws in place until they are tight. **DO NOT OVER-TIGHTEN** the screws!



When the battery has been installed, check that the battery housing and O-ring are clean. The o-ring must always be lubricated with a thin layer of silicone lubricant.



A screwdriver for GSM DC units battery installing/replacing is provided in the com unit package.



If the units are not going to be used for a while, the battery should be removed. The cap must be stored inside the battery compartment. This will ensure that the unit will work properly for a longer period of time.

## PRECAUTIONS & TROUBLESHOOTING

- Do not use solvents (such as diluents) to clean the unit. They can cause irreparable damage. Only use neutral detergents.
- Use running water to remove the seawater from your GSM DC after use. The system must be kept completely dry and in good condition.
- Do not twist the microphone cable.
- Do not expose the unit to direct sunlight.
- Do not leave the unit in your car.
- Do not keep the unit in places that are too hot or too cold, such as near air conditioners.
- Do not keep the unit near magnetic fields.
- Do not allow it to fall or be knocked around.
- Replace the battery when it is running low. When not using the unit for extended periods of time, remove the battery from its housing to prevent damage.
- Only use 9V alkaline batteries. Install them in the battery housing, ensuring that they are of the correct charge and polarity. Do not activate the polarity circuit using metal wires or pieces of metal.
- Make sure there is no dirt, debris or water in any part of the unit, especially in the battery housing or under the o-ring. If any dirt, debris or water is found, remove it.
- When replacing the battery check the o-ring for damage. If it is damaged, replace it. The O-ring must be lubricated with a thin layer of silicone lubricant.
- Do not dismantle or repair this unit yourself.
- Follow the instructions for correct maintenance of the microphone and battery housing, given in previous chapters.
- If the battery compartment should be flooded, remove the battery; rinse the compartment with fresh water and leave to dry. Remove any debris, and clean the gold plated contacts, then install a new battery. If the unit does not function, check the state of the microphone.
- Routinely clean the microphone contacts and check the integrity of the hydrophobic membrane and the casing. If the microphone is flooded, it CANNOT BE recovered and must be replaced.
- Do not touch the hydrophobic membrane with any sharp objects that may damage it.



	<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>ACTION</b>
1	The unit doesn't switch on	The battery is missing, the contacts are isolated, the battery is dead	Insert a charged battery. Remove isolation caps.
2	"	The polarity is inverted.	Insert the battery correctly
3	"	The contacts are broken.	Send for servicing.
4	"	Battery compartment flooded.	Remove water, rinse with fresh water, let dry. Lubricate the O-ring. Clean Contacts. Insert new battery.
5	Battery compartment flooded	O-ring dirty, incorrectly positioned or broken	Clean the O-ring, lubricate with silicone lubricant. If broken, replace. Proceed as per point 4.
6	"	Cap broken	Replace the cap – proceed as per point 4
7	"	Seating for cover screws broken	Replace the cap cover
8	"	Main casing broken	Send for servicing.
9	The unit switches on and receives but does not transmit.	PTT button not working	Send for servicing.
		Microphone flooded or defective.	Change the microphone
10	"	Microphone contacts disconnected or dirty	Clean the contacts with fresh water, then sand and lubricate.
11	"	Cable between microphone and casing broken.	Send for servicing.
12	The unit does not receive.	The transmission unit is not working.	Try another transmission unit.
13	"	Speaker or internal components defective.	Send for servicing.
14	The unit transmits continually	PTT button defective	Send for servicing
15			
16			

## TECHNICAL SPECIFICATIONS

	<b>GSM DC</b>
<b>Code</b>	33122
<b>Type</b>	Wireless ultrasonic
<b>Activation</b>	Automatic
<b>Transmission</b>	PTT/DAT
<b>Receiving</b>	Automatic/DAT
<b>System type</b>	H-SSB
<b>Frequency</b>	32.768 kHz ch1 41.000 kHz ch2
<b>Working range (* )</b>	200m/600 feet
<b>Rated depth (** )</b>	40m/120 feet
<b>Powered by</b>	9v alkaline
<b>Autonomy (total)</b>	9 hours
<b>Low battery autonomy (after alarm starts)</b>	1h
<b>Low battery alarm</b>	1 beep every 30 seconds under 7.5v
<b>Automatic Transmission Activation (DAT)</b>	yes
<b>Transmission / receiving cycle</b>	30" transmi 20"receive
<b>Squelch</b>	Automatic
<b>Weight with batteries</b>	370g/12.9 oz

## WARRANTY

1. OCEAN REEF communication units are guaranteed to be free of material or manufacturing defects for a period of 24 months from the time the unit is purchased. For the duration of the guarantee, the Company's responsibility is limited to replacement of any parts that are defective in our opinion, and that have not been used incorrectly or handled negligently. The unit must be returned to the outlet from which it was bought, along with the warranty card.
2. Even during the guarantee period, this guarantee shall not be valid where:
  - Damage was caused by incorrect handling or carelessness.
  - Damage was caused by the unit falling after it was purchased.
  - Damage caused by fire, earthquake, floods, lightning, or other natural disasters, pollution or electrical charges.
  - The warranty card is not produced.
  - Our name, the date of purchase, and the seller's name do not appear on the warranty card.



MESTEL Safety s.r.l  
Via Arvigo 2, 16010 Genova (Italia)  
Phone +39 010 7082011  
E-mail: [ocean.reef@oceanreefgroup.com](mailto:ocean.reef@oceanreefgroup.com)

OCEAN REEF, Inc.  
1699 La Costa Meadows Dr. Suite 101 San Marcos, CA 92078  
Phone +1 760 744 9430 Fax +1 760 744 9525  
E-mail: [operator@oceanreefgroup.com](mailto:operator@oceanreefgroup.com)

OCEAN REEF on the Web:  
[www.oceanreefgroup.com](http://www.oceanreefgroup.com)

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