



# Cochran

UNDERSEA TECHNOLOGY

A Division of Cochran Consulting, Inc.

*Diving Into The 21st Century*

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# Cochran

# GEMINI

With

## Intelligent WU

## Owner's Manual

English – Imperial

Ver: Gemini.Int.1.01

Manual Part Number: 4400812

For your records, please fill in the following:

Serial Number of the Tank Unit: \_\_\_\_\_

Serial Number of the Wrist Unit: \_\_\_\_\_

Your Name: \_\_\_\_\_

Your Contact: \_\_\_\_\_

\_\_\_\_\_

Purchase Date: \_\_\_\_\_

Purchase Place: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

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**Product Introduction:** Your GEMINI Dive Computer from Cochran Undersea Technology is one of the most advanced instruments made for this application. The GEMINI is actually two computers in one. The GEMINI consists of two component parts, the Tank Unit (TU) and the Wrist Unit (WU), the TU contains the High Pressure Transducer Assembly, Depth/Altitude Sensor, and the computer's electronics. The TU performs the time-depth calculations and is where the detailed dive statistics and profiles are stored. The GEMINI WU is a technological step forward for air integrated hoseless/wireless computers. The GEMINI WU contains its own Depth Sensor and microprocessor. In the extremely unlikely situation where the communications link between the TU and the WU is interrupted the GEMINI WU will automatically revert from its Slave mode to its Independent mode and take over and perform the necessary time-depth calculations, refer to Slave/Independent Switching on page 52. The GEMINI WU can also be used as an independent stand-alone wrist mounted dive computer, but when used in this fashion the diver will lose the profile storage capability that the TU offers. The GEMINI incorporates more user-programmable functions than any other dive computer made, yet is one of the simplest to use. You may enter personal preferences, dive site, and condition-specific settings. The GEMINI calculates these factors in the background, displaying to you, the diver, the critical information you need, in an easy to comprehend display. The GEMINI computers are one of the first dive computers to implement a Training Mode, which enables the computer to record and store data in shallow water training environments (swimming pools, shallow lakes, etc.). To get the safest and most effective use of this instrument, it is important that the user fully understand the product. Please read and understand this entire manual and know the principles and practice safe diving before using this device. By using the GEMINI, the diver specifically acknowledges that he has been adequately and thoroughly trained and certified to engage in diving by a professional, competent, recognized training agency.

This Manual is divided into the following Sections:

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**INSTALLATION:** The Tank Unit (TU) high-pressure sensor installs into a high-pressure port of your first-stage regulator. Your Authorized Dealer should do this at the time of purchase. Should you choose to install the TU yourself:

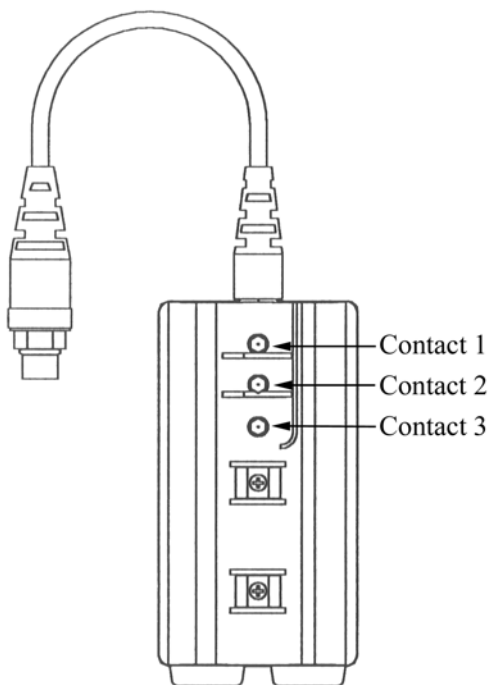
1. Remove your current high-pressure hose or the high-pressure plug from your first stage regulator.
2. Lightly lubricate the sensor O-ring only with a lubricant approved for use with Enriched Air Nitrox equipment. **DO NOT USE SILICONE GREASE.**
3. Screw the sensor, **HAND TIGHT**, into the first-stage high-pressure port
4. Using a Scuba Tool, or thin 9/16" open-end wrench, **snug** the high-pressure transducer connection taking caution to not over tighten.

**CAUTION: DO NOT** use tools such as vise-grips or channel lock pliers. These tools can damage the transducer and such damage is not covered by the limited warranty.

**CAUTION: DO NOT** use your hand to tighten the high-pressure connection. This procedure should only be accomplished by using the appropriate tool placed over the metal nut of the high-pressure connection. It must not be over tightened.

With the first stage properly attached to a filled SCUBA cylinder, slowly open the cylinder valve. Once the valve has been opened, listen to the TU's high-pressure connection for any escaping gas. If possible, completely immerse the tank and regulator in water to see if bubbles form around your connection. If any gas leak is seen or heard, immediately turn the gas off by closing the cylinder valve and take the entire regulator system to the place where you purchased your GEMINI.

The Tank Unit (TU) clips to a low-pressure hose close to the first-stage, it is recommended that the TU be located on the divers left side. When clipping the TU onto the low-pressure hose, a rolling motion will provide better results rather than pushing the TU straight down onto the hose. The Wrist Unit (WU) may be worn on the wrist or attached to your Buoyancy Control Device with the optional retractor.



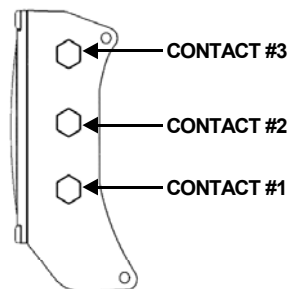
**Figure 49**  
**Tank Unit Touch Contacts**

**TANK UNIT TOUCH CONTACTS:** The Contacts are used to let the user command the unit to do a number of functions, communicate with a PC for extracting information or configuring the unit, and determining water conductivity. When Contacts 1 & 2 are shorted, the GEMINI TU can detect the difference between wet fingers, metal objects, fresh water, salt water, and a PC interface cable.

**TURNING ON THE GEMINI TU:** The TU will automatically activate when it senses a cylinder pressure greater than 200 psi. Bridging touch Contacts 1 and 2, which are located on the underside of the tank unit (see Figure 51), with wetted fingers for two seconds will manually activate it also.

**NOTE:** If the TU is activated by cylinder pressure it will issue three beeps, if it is activated by the touch contacts it will issue five beeps.

**WRIST UNIT SIDE CONTACTS:**



The Contacts are used to let the user command the unit to do a number of functions, or extract information and/or configuring the unit. When Contacts 1 & 2 are shorted, the GEMINI WU can detect the difference between wet fingers, metal objects and water.

**TURNING ON THE GEMINI WU:** Although the GEMINI WU automatically turns on when it is submerged in water, it is **STRONGLY** recommended that the WU be turned on prior to the dive. Wetting two fingers and simultaneously touching Contacts 1 and 2 for two seconds to manually power the unit up accomplish this. This allows the diver to ensure that the unit is operating correctly and has adequate battery capacity prior to entry. The WU will receive information from the TU from approximately 50 inches; the actual distance will vary depending on the orientation of the WU to the TU. Once activated and in communications with the TU, the unit will remain on until the TU turns off, usually 60 minutes. When the WU is beyond the communication range of the TU the WU's display will flash. When the WU is back in communication with the TU the display will cease flashing. Notice that when Contacts 1 & 2 is first bridged, a short beep is issued which indicates that the unit is recognizing the touch. If the WU is activated and not in communications with the TU, it will turn off after 15 minutes.

The GEMINI WU will not turn on if the battery voltage is less than 2.0 volts, or a fault is detected during the self-test.

As the GEMINI WU & TU first recognize a turn-on command, it begins a "Diagnostic" function where many aspects of the system will be exercised and tested. This procedure takes about five seconds and an audible beep is issued each second as certain tests are successfully completed. During this time, all of the segments of the display are turned on so that the user can confirm their operability. Should a test indicate a malfunction or marginal test, the unit will turn back off again. The user should ensure that all of the display segments are on and operating correctly.

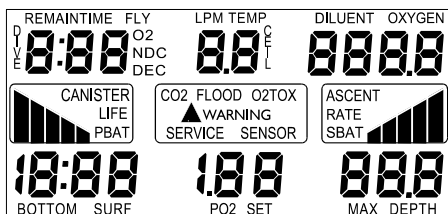


Figure 01 Self Diagnostics Mode

**CAUTION:** After the WU is activated the "SERVICE" legend will be illuminated, this indicates that the WU's memory is being updated with information from the Tank Unit. It may take several minutes for this process to be completed. A dive should not be started while the "SERVICE" legend is illuminated.

**TURNING OFF THE GEMINI:** After the Post Dive Interval following a dive, the GEMINI TU will remain on for one hour before automatically entering its "Sleep Mode". During the Sleep Mode, all calculations continue but the display is off. This is a power saving feature of the GEMINI. The unit will continue calculating Surface Interval, compartment off gassing as required, and any changes in altitude as it affects Nitrogen Loading. The current Surface Interval and PreDive Predictions can be viewed by reactivating the units.

You cannot manually turn the TU off. The TU will turn off:

1. After 60 minutes if no tank pressure is sensed and no dive is made.
2. After all 16 half-time compartments are completely off-gassed on repetitive dives.

**NOTE:** The GEMINI TU will not enter the sleep mode or turn off as long as cylinder pressure is being applied to the TU.

**GEMINI WU INDEPENDENT/SLAVE SWITCHING:** The GEMINI Intelligent Wrist Unit will automatically switch from the Slave Mode to the Independent mode only if the GEMINI is in the Dive or Decompression Mode. Should the communication link between the TU and WU be interrupted after approximately 10 seconds the WU display will begin to flash. This indicates that the information being shown is not current. If the communication link is interrupted for 90 continuous seconds the GEMINI WU will switch to the Independent Mode. The GEMINI WU will assume the current TU configuration (refer to following chart). The WU will continue all nitrogen and oxygen based calculations, depth measurements, temperature measurements, and Ascent Rate issues. The only information that the WU will not supply is the current cylinder pressure. Because of the difference in mounting locations between the TU and the WU there may be a slight difference in Depth. Also due to the fact that the WU and TU have independent temperature transducers the diver may see a difference in the displayed Temperature after a switch is made. Once the WU has switched to the Independent Mode the user must switch the WU back to the Slave Mode via Touch Contact Programming. While in the Independent Mode the WU will record and store all of the statistical information that was stored in the TU, the WU has no Profile Storage capability.

The Following chart shows the WU configuration after a switch to the Independent Mode. When the TU is configured for three Blend Nitrox, the resulting WU configuration is dependent upon the Gas Blend in use at the time the switch is made.

<u>Tank Unit</u>	<u>Blend Being Used</u>	<u>Wrist Unit (After Switch)</u>
Air Only	Air	Air Only
One FO <sub>2</sub>	Normal FO <sub>2</sub> Blend	One FO <sub>2</sub> - Normal FO <sub>2</sub>
Two FO <sub>2</sub>	Normal FO <sub>2</sub> Blend	One FO <sub>2</sub> - Normal FO <sub>2</sub>
Two FO <sub>2</sub>	FO <sub>2</sub> Blend #2	One FO <sub>2</sub> - Blend #2 FO <sub>2</sub>
Three FO <sub>2</sub>	Normal FO <sub>2</sub> Blend	Two FO <sub>2</sub> - Normal FO <sub>2</sub> & Deco FO <sub>2</sub>
Three FO <sub>2</sub>	FO <sub>2</sub> Blend #2	Two FO <sub>2</sub> - Blend #2 FO <sub>2</sub> & Deco FO <sub>2</sub>
Three FO <sub>2</sub>	Deco Blend	Two FO <sub>2</sub> - Normal FO <sub>2</sub> & Deco FO <sub>2</sub>
Single PO <sub>2</sub>	Normal PO <sub>2</sub> Blend	One PO <sub>2</sub> - Normal PO <sub>2</sub>
Two PO <sub>2</sub>	Deco PO <sub>2</sub>	Two PO <sub>2</sub> - Normal PO <sub>2</sub> & Deco PO <sub>2</sub>

If the Tank Unit is using Blend #2 when the switch to Independent is made after the ten minute Post-Dive Interval the Wrist Unit's FO<sub>2</sub> Blend(s) will be the Tank Units original Normal and if applicable Deco Blend. To continue to dive with the GEMINI WU in the Independent Mode, refer to the 'Cochran GEMINI WU Independent Mode Owner's Manual'.

## MAIN GEMINI OPERATING MODES:

- Surface Interval (No Nitrogen Residual)
- Surface Interval (With Nitrogen Residual)
- Dive Mode (Normal No Deco)
- Decompression Mode
- Post Dive Interval
- Touch Programming

## SURFACE INTERVAL – AIR ONLY/SINGLE GAS NITROX:

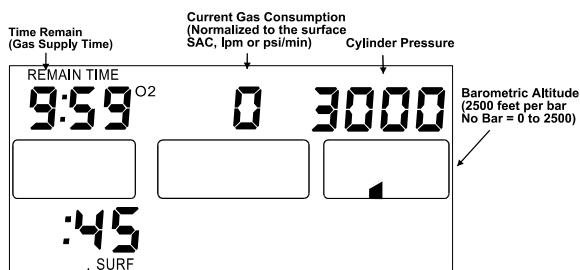


Figure 02 Surface Mode, No Nitrogen, Air Only, Primary Screen

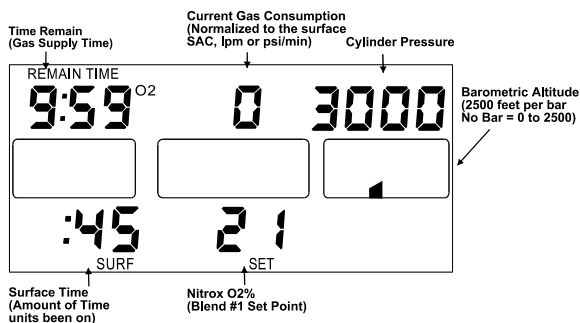


Figure 02a Surface Mode, No Nitrogen, FO<sub>2</sub>, Primary Screen

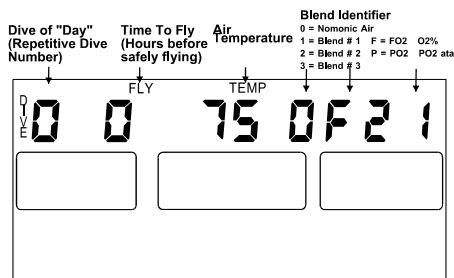


Figure 03 Surface Mode, No Nitrogen, Alternate Screen

After completion of the Self-Diagnostic mode or after the Post Dive Interval following a dive, the GEMINI enters the Surface Interval. This period has two screens, a Primary and an Alternate. To switch to the Alternate Screen just tap once firmly on the face of the unit. The Primary Screen displays, if applicable; current Surface Time, the previous dive's Maximum Depth, the Current FO2 (normal Blend) oxygen percentage, Cylinder Pressure, Gas Supply Time, Current Gas Consumption, and Altitude. The Alternate Screen displays the previous dive's Bottom Time, Dive of Day number; current Time to Fly, current calculated CNS and OTU value bar graphs. Figure 2 & 2a shows the display with no residual Nitrogen (a clean Dive). Figure 4 & 4a shows the display with residual Nitrogen (a repetitive dive). Figure 3 shows the alternate screen with no residual Nitrogen and Figures 5 & 5a with residual nitrogen.

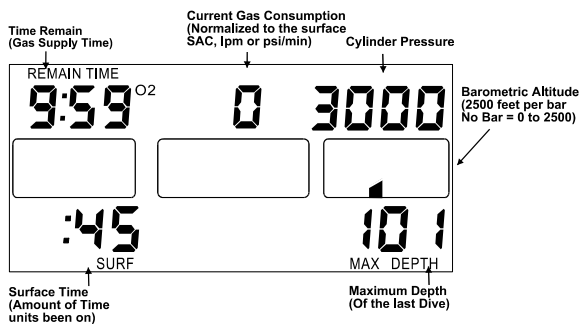


Figure 04 Surface Mode, With Nitrogen, Air Only, Primary Screen

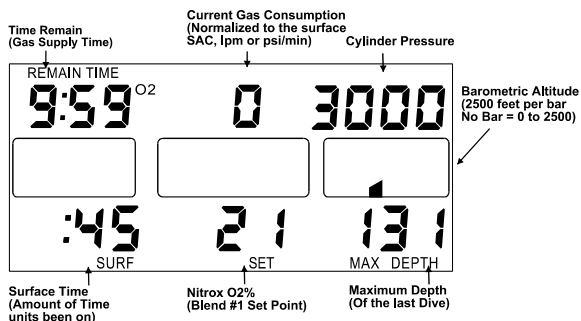


Figure 04a Surface Mode, With Nitrogen, FO2, Primary Screen



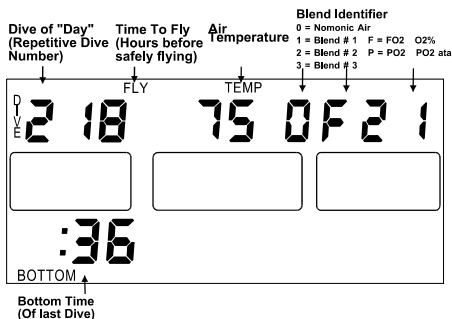


Figure 05 Surface Mode, With Nitrogen, Air Only, Alternate Screen

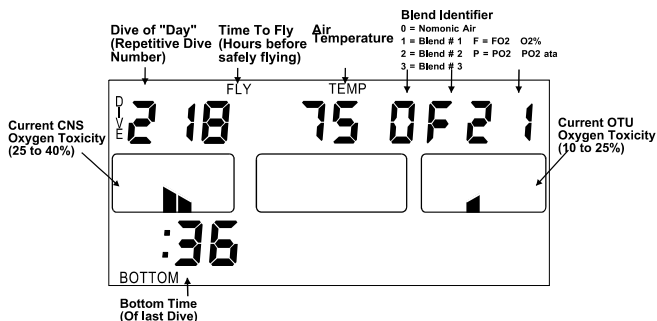


Figure 05a Surface Mode, With Nitrogen, FO2/PO2, Alternate Screen

The "Blend Identifier" displays the Oxygen percentage that the computer is using in its no-decompression / decompression calculations. When the unit is on the surface it will display 'OF21' to indicate that the computer is calculating out-gassing using normal (Nomonic) air (21%).

"Surface Time" starts at zero after a dive and begins counting minutes. If the computer shuts off and is turned on with Nitrogen residual left, the Surface Time continues to count. If the computer shuts off and is turned on with no Nitrogen residual left, the Surface Time will be zero.

"Dive of Day" starts at zero and increments after each dive regardless of the calendar day. When there is no remaining Nitrogen residual, the Dive of Day is set to zero and the computer is referred to as a 'clean' system.

"Time to Fly" is displayed as the number of hours remaining until the nitrogen residual reaches zero plus a twelve-hour safety factor. Flying is not recommended until Time to Fly reaches zero.

"Barometric Altitude" is indicated in six ranges via the Ascent Rate Bar Graph as follows (Altitude compensation is seamless up to 15,000 feet above sea level). The six ranges are for display purposes only: The GEMINI actually senses and computes extremely small altitude changes and hence, is called "Seamless". The term "Barometric Altitude" is used instead of just "Altitude" because the GEMINI measures Barometric Pressure to determine Altitude. Barometric Altitude can vary from actual Altitude by over +/- 1000 feet! What is important to the body when diving is Barometric Altitude.

0 Bars sea level to 2,500 feet	1 Bar	2,500 to 5,000 feet
2 Bars 5,000 to 7,500 feet	3 Bars	7,500 to 10,000 feet
4 Bars 10,000 to 12,500 feet	5 Bars	12,500 to 15,000 feet

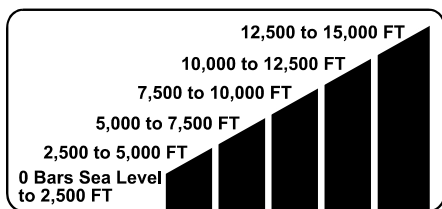
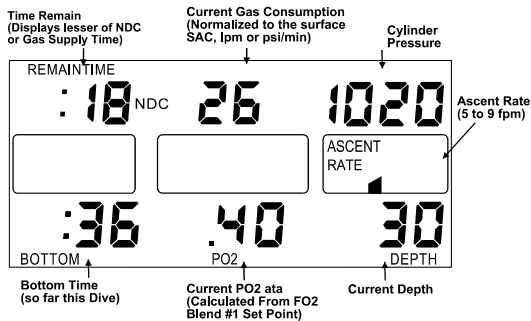
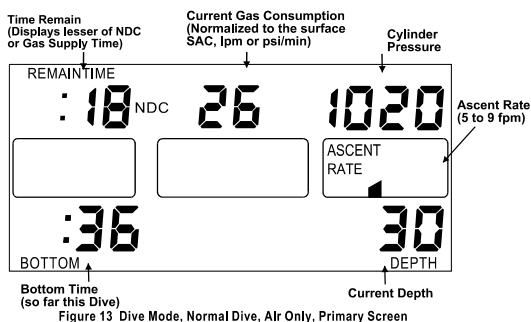


Figure 20 Altitude Bar Graph

The altitudes indicated are for reference only.  
They do not appear on the WU display.

## DIVE MODE – AIR ONLY/SINGLE GAS NITROX:



Whether in the Surface Mode, PreDive Prediction Mode, Programming Mode or the Logbook Mode, The GEMINI will automatically enter the Subsurface Mode when the dive computer senses a depth greater than five feet and is exited when the dive computer senses a depth less than five feet.

**NOTE:** Remember do not start a dive while the “SERVICE” legend is illuminated.

On the Primary Screen the Surface time will be replaced with the current bottom time, Blend #1 set point is replaced with the calculated  $PO_2$  value. Maximum Depth will be replaced with current Depth, displayed in one-foot increments. Bottom Time will begin once the GEMINI senses that the diver has descended below five feet and continues until the diver has ascended above three feet. The maximum Bottom Time displayed is 9 hours 59 minutes.

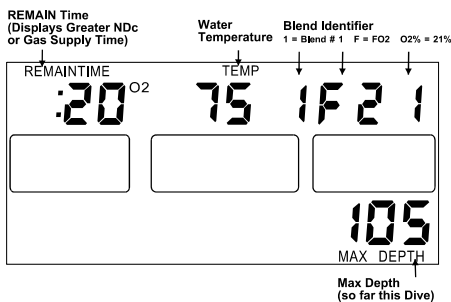


Figure 14 Dive Mode, Normal Dive, Air Only, Alternate Screen

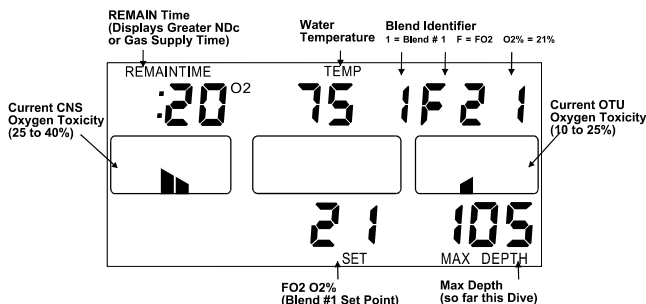


Figure 14a Dive Mode, Normal Dive, FO2 Mode, Alternate Screen

The Alternate Screen will display the current FO<sub>2</sub> value that the unit is using in its NDC calculations, the current CNS and OTU values and the Maximum Depth. (Figure 14 & 14a)

A Depth Alarm, which can be set to warn the diver should a certain depth be exceeded, is set at 130 feet from the factory. The Depth Alarm issues an audible alarm and the "WARNING" legend and Depth Digits will flash on and off for five seconds and be repeated ever two minutes while below the user set depth. The depth alarm is disabled if in the Decompression Mode since flashing depth digits have another meaning in this Mode.

The maximum depth achieved on the current dive is shown as "MAX DEPTH". This is updated once per second.

"REMAIN TIME" (NDC) is the remaining time (in hours and minutes) that the diver can stay at the current depth without requiring decompression. A "Two Minute Warning" will be issued when this time reaches two minutes or less. An audible alarm will be issued and the "WARNING" legend and "REMAIN TIME" digits will flash. By immediately ascending to a shallower depth, the diver may avoid a required decompression stop.

"REMAIN TIME" (O<sub>2</sub>) is the time remaining (in hours and minutes) that the diver's Gas supply will last until the User Set Reserve is reached (normally 500 psi). A "Warning" will be issued when this time reaches zero. An audible alarm will be issued and the "WARNING" legend and "REMAIN TIME" digits will flash.

Temperature is measured for two purposes. One is to compensate the Depth Transducer for Temperature variations. The other is to compensate the Nitrogen algorithm for changes in Temperature that may affect the body. Both of these purposes require that the Temperature be very slow reacting, just like the Depth Transducer and the body. This slow-reacting Temperature is what is displayed. For Temperature effects on the body, if the diver is using a good dry-suit in cold water the amount of compensation can be set from

NORMAL to REDUCED with the Analyst® PC software Interface. Temperature compensation starts at 75 degrees F and gets progressively more conservative as the temperature decreases. There is no compensation above 75 degrees F.

Bottom Time will begin once the GEMINI senses that the diver has descended below five feet (see Training Mode) and continues until the diver has ascended above three feet. The maximum Bottom Time displayed is 9 hours 59 minutes.

**ASCENT RATE BAR GRAPH:**

The Ascent Rate bar graph and alarms are active in both the Dive Mode and Decompression Mode. The five-segment bar graph is used to display the diver's rate of ascent.

Via the Analyst® PC Interface, the Ascent Rate Alarms and Bar Graph can be set to the users preferences.

The first option is a VARIABLE-BY-DEPTH Ascent Rate. When on, the Ascent Rate Alarm is determined by depth. As the diver ascends to shallow depths, the Maximum Ascent Rate is lowered. The Maximum Ascent Rates and their associated depth are:

60 feet or deeper	60 feet per minute
60 to 30 feet	feet per minute equal to the depth
Less than 30 feet	30 feet per minute

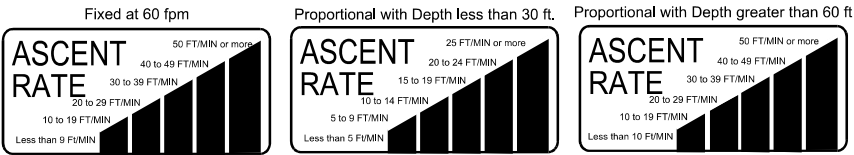
If VARIABLE-BY-DEPTH is off, the Maximum Ascent Rate Alarm and Bar Graph is specified by the user and can be from 20 to 60 fpm, in one-foot increments.

Another selection is the bar graph itself. The two selections are either FIXED or PROPORTIONAL.

With FIXED, each of the five bars indicates an additional 10 feet per minute of Ascent Rate regardless of the Maximum Ascent Rate selected.

With PROPORTIONAL, each of the five bars indicates 20% (one-fifth) of the selected Maximum Ascent Rate.

For FIXED, the maximum ascent rate is 60 feet per minute. With this setting, the ASCENT RATE legend will illuminate but no bars will be illuminated if a diver is ascending at a rate less than 10 feet per minute.



**Figure 17 Ascent Rate Bar Graph**

If the diver has an Ascent Rate that exceeds the selected maximum, the tallest Ascent Rate Bar Graph will flash, and the audible alarm will sound once per second, and the WARNING legend will illuminate.

The sensitivity or responsiveness of the Ascent Rate may be selected via the Analyst®, eight different levels of sensitivity are available.

**NOTE:** Customizing the Ascent Rate and Ascent Rate Bar Graph are among many of the additional programmable features available when using the Analyst® PC Interface. Available features are described in the section “USER CONFIGURABLE OPTIONS”.

**As shipped from the factory, the Ascent Rate is set for VARIABLE-BY-DEPTH AND PROPORTIONAL.**

DECOMPRESSION MODE – AIR ONLY/SINGLE GAS NITROX:

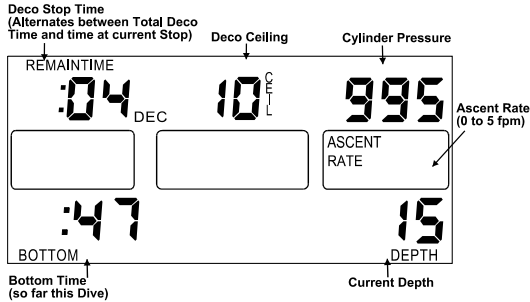


Figure 15 Dive Mode, Deco Dive, Air Only, Primary Screen

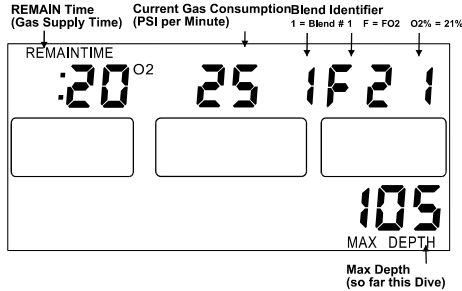


Figure 16 Dive Mode, Deco Dive, Air Only, Alternate Screen

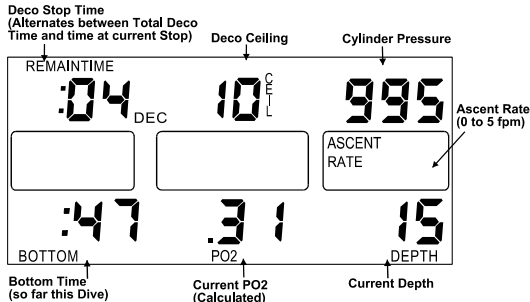


Figure 15a Dive Mode, Deco Dive, FO2 Mode, Primary Screen

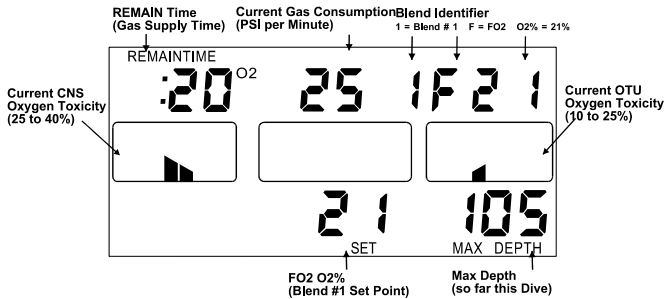


Figure 16a Dive Mode, Deco Dive, FO2 Mode, Alternate Screen

Should a no-decompression limit be overstayed, the GEMINI will enter the Decompression Mode. In this mode, the Ceiling digits will display the depth at which the diver must stop and not ascend above during final ascent. The "TEMP" legend and two digits will be replaced with the "CEIL" legend and two digits. The Ceiling will start at 10 feet and increase in ten-foot increments as the diver remains at a relatively deep depth. If a Ceiling of greater than 90 feet is calculated the Ceiling display will flash to indicate that the displayed Ceiling is divided by 10, i.e. 10 flashing = 100 feet, 11 flashing = 110 feet, etc.

The Remaining No-decompression Time and "NDC" legend will be replaced with Decompression Time and "DEC" legend (Figure 15). Both STOP time and TOTAL time are displayed in the upper left hand three digits of the screen in hours and minutes. STOP and TOTAL time will alternate at the rate of once every two seconds. In this way, the diver can view the time to spend at a particular STOP depth, and the TOTAL time it will take to complete all STOPS. Clearly, the larger of the two alternating numbers is the Total Decompression Time of all stops, and the smaller of the two numbers is the time required at the current stop. At the ten-foot stop, the TOTAL and STOP times may be the same and therefore appear to not alternate.

When at a specific stop, the required decompression time at that stop is as shown, and will appear to count down as it is recomputed every second, based on the divers exact current depth. The Decompression times (both Stop and Total) are accurate only if the divers depth is exactly the same as the required Ceiling. However, it is not necessary to be precisely at that specified Ceiling. Appropriate In-gassing or Out-gassing will be computed regardless of the divers current depth.

A small margin shallower than the Ceiling also exists. Should a Ceiling be 'violated' (diver is shallower than Ceiling), the "WARNING" legend will illuminate and flash along with the Depth and Ceiling digits. An Audible alarm will sound once every two seconds. This warning will continue until the Depth has been corrected. Out-gassing will continue even though the diver is shallower than the Ceiling. There is no 'Gauge' mode or 'Lockout' on the GEMINI.

The Total Decompression time forecast at depth is based on the User Configured 'Ascent Rate for Deco Prediction value' the factory setting is 60 fpm. If the diver ascends faster or slower than this value the actual deco forecast times could vary. Regardless of the effects of the ascent rate, the decompression time forecasted at the deepest stop is accurate.

If the diver surfaces before satisfying his decompression obligation, the GEMINI will continue to give out-gassing credit as if it were in a dive, but at a depth of zero feet and will satisfy the decompression time requirements of the required stops using an FO<sub>2</sub> of 21%. The unit will continue to log data and perform as if actually in a dive. When the decompression obligation is finally satisfied, the ten-minute "PostDive Interval" will begin.

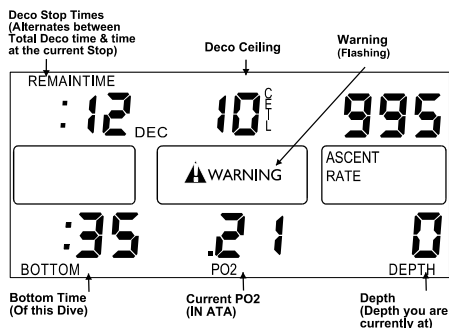


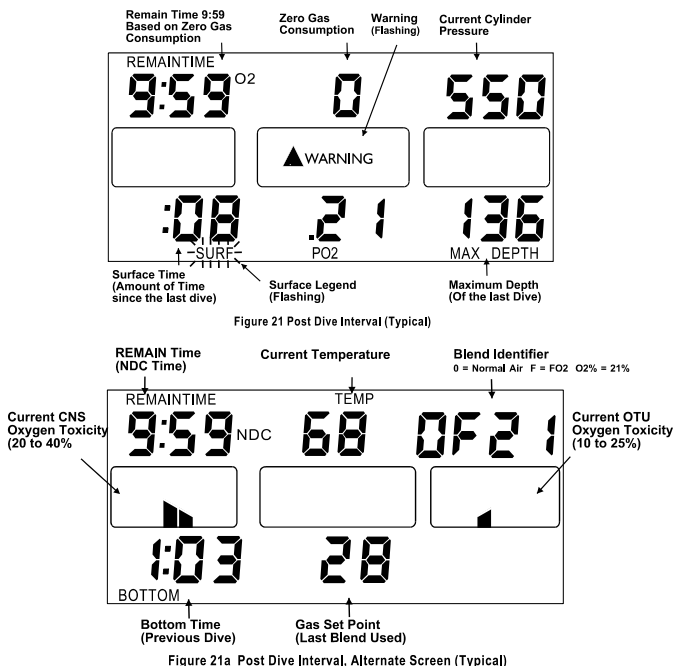
Figure 15c Decompression Mode, At Zero Depth

**NOTE:** COCHRAN does not intend for this instrument to be used for deliberate Decompression diving.

### POST DIVE INTERVAL:

During the first ten minutes (or up to thirty if the unit is in the Training Mode) after a dive, the GEMINI is in the Post Dive Interval. The flashing "SURF" legend and a Surface Time of less than ten minutes indicate this. Should another dive be commenced before the completion of the Post Dive Interval, the dive will be considered an extension of the previous dive. In this case, Bottom Time will NOT include the time spent on the surface in this Post Dive Interval. However, when reviewing the profile with the Analyst®, the time spent on the surface in this period will be shown.

**CAUTION:** To ensure that the dive information is stored accurately in the Logbook, the WU should be kept in communications with the TU. If the WU is not in communications with the TU during the Post Dive Interval when the Post Dive Interval has elapsed it could store the incorrect dive time in the Logbook.



**CONFINED WATER PROTOCOL (Training Mode):** The GEMINI is one of the first dive computers to offer an operating mode designed to record and store data from training dives. That is, dives performed in shallow water environments (swimming pools, shallow lakes, lagoons, etc.) or calm open water environments that have less than 1-foot seas. In the Training Mode, the GEMINI enters the Dive Mode at a depth of 2 feet instead of 5 feet and will exit the Dive Mode at 1 foot instead of 3 feet. Also the Post Dive Surface Interval may be extended, via the Analyst® from 10 minutes up to a maximum of 30 minutes in 1-minute increments after which the dive data is stored in the computer's memory. These changes permit the Instructor to record the complete training session, including in-water surface periods, as a single dive. **The Training Mode can only be enabled/disabled via the Professional Edition of the Analyst® PC Interface.**

**TACLITE™:** The GEMINI is equipped with the TACLITE™ tactical low-light fiber-optic backlight display. The standard TACLITE™ color is night vision safe red, but it is also available in yellow for those individuals who have vision difficulties with the color red. The TACLITE™ can be activated on demand. To turn the TACLITE™ on, tap the face of the GEMINI and the TACLITE™ will turn on for the preprogrammed number of seconds (1 to 98), then turn off. By tapping the face again the TACLITE™ will turn on again. In this fashion the TACLITE™ can be kept on for as long as wanted. If 0 is entered, the TACLITE™ will never turn on. If 99 is entered the TACLITE™ will stay on continuously and only turn off when the GEMINI does. The number of seconds that the TACLITE™ stays on can be set via the Programming Mode, factory setting is 10 seconds. The TACLITE™ will turn off when the GEMINI turns off. If the batteries get too low, the TACLITE™ will turn off and cannot be turned back on until fresh batteries are installed.

**NOTE:** The TACLITE™ may not activate when the WU is in the programming mode or if all three touch contacts are wet and the unit is not in a dive.

**CLOCK MODE:** The Clock operating mode of the GEMINI TU is NOT enabled when shipped from the factory. It can be enabled via the Analyst® P.C. Interface or at an Authorized Cochran Dealer. The WU Clock mode is enabled as shipped from the factory.

**TOUCH PROGRAMMING MODE:** The Tank Unit and/or Wrist Unit can only be Touch Contact Programmed when the unit(s) are in the Surface Interval and have zero cylinder pressure. Touch Contact Programming allows the user to view or program into the:

Tank Unit:

- Setting the TU Clock Time
- Select the PO<sub>2</sub> or FO<sub>2</sub> Operating Mode
- The PreDive Prediction Mode
- Displaying Mode, mode value, CNS, OTU, TU battery voltage
- A Maximum Depth Alarm
- An Added degree of Conservatism from 0 to 50%
- Setting oxygen percentage of blend 1 in the Constant FO<sub>2</sub> Mode
- Setting the Normal PO<sub>2</sub> set point in the Constant PO<sub>2</sub> Mode
- Setting the Blend #2 FO<sub>2</sub> oxygen percentage
- Setting the Deco Blend FO<sub>2</sub> oxygen percentage
- Setting the Deco PO<sub>2</sub> set point in the Constant PO<sub>2</sub> Mode
- Setting the Deco Bottom Time Benchmark
- Setting the Deco Depth Benchmark
- Programming TU/WU address code

Wrist Unit

- Selecting the "Slave" or "Independent" Mode
- Displaying Mode, mode value, CNS, OTU, WU & TU battery voltages
- Programming the On Time for the TACLITE™
- Access the Logbook Mode
- Programming TU/WU address code

**NOTE:** For Programming the GEMINI WU in the Independent Mode refer to the 'Cochran GEMINI WU Independent Mode Owner's Manual'.

**NOTE:** While all GEMINI configurations share certain programming features others are dependent upon the specific configuration of the unit. Refer to the appropriate manual section for the relevant programming menu items.

**TOUCH PROGRAMMING - TU CLOCK:** When the GEMINI is placed into the Clock mode



it will display the time of day in a 24-hour format. The Clock will continue to run when the GEMINI is in the Dive Computer Mode. The GEMINI can be placed into the Clock Mode from the Dive Computer Mode when the unit is in the Normal Surface Interval.

**NOTE:** This Time of Day clock is the same clock that is used to time stamp dives. Modifying the Time of Day clock will affect the Local Time as viewed via the Analyst®.

### TU CLOCK PROGRAMMING PROCEDURE:

TU Contacts 1, 2, & 3 are for programming sequences.

To begin the programming sequence:

1. Turn the Tank Unit and Wrist Unit on;
2. Using a coin or other conductive metal object, briefly bridge Contacts 1 and 2 on the TU until a short beep is heard and the CLoCk Menu is seen on the display.
3. Using a coin or other conductive metal object, bridge Contacts 1 & 2 to access the CLoCk Time screen.
4. Shorting Contacts 1 & 2 with a coin will cause the first digit of the minutes to flash.
5. Shorting Contacts 2 & 3 with a coin will increment the numeric value, continue until the required value is displayed. A confirmation beep will sound with each increment.
6. Next using wetted finger, bridge Contacts 1 & 2 to select the next digit, once selected the digit will flash to identify that it is being programmed. Bridge Contacts 2 & 3 till the desired value is displayed.
7. To select Hours short Contacts 1 & 2 with a coin, increment as in step 6 and 7.
8. Repeat step 5 through 7 until all digits have been programmed.
9. To save the changes that have been made bridge Contact 1 & 2 with a coin or other conductive metal object. Once the next programming option is displayed the changes have been saved.

The Dive Computer will exit the Clock Mode after 5 minutes and will return to the Dive Computer Mode's Surface Display.

**NOTE:** Ensure that the GEMINI is in the Surface Mode before commencing a dive.

Figures 50a & 54a show how the Clock display screens appear.

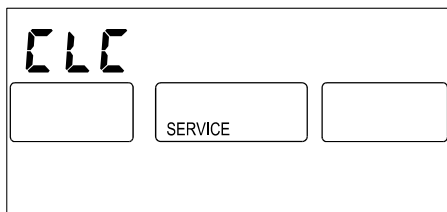


Figure 50a Programming Mode, TU Clock Menu

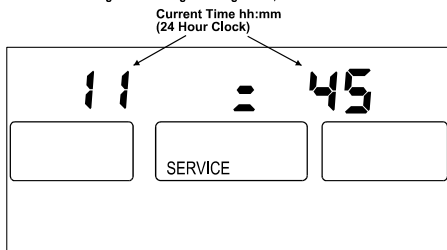


Figure 54a Programming Mode, TU Clock, Setting Time

**TOUCH PROGRAMMING – WU CLOCK:** When the GEMINI WU is placed into the Clock mode it will display the time of day in a 24-hour day format. The clock will continue to run when the GEMINI is in the Dive Computer Mode. The GEMINI WU **MUST** be in the Independent mode before being placed into the Clock Mode and the WU unit displaying the Normal Surface Interval display.

The WU Clock Mode can be selected with or without an Alarm. If the Alarm option is selected the unit will display the alarm set time as well as the current time.

When the alarm time is displayed the alarm is activated and at the programmed time the alarm will sound once every 24 hours. When the alarm is activated the unit will issue a medley of all the audible warning tones that the GEMINI WU utilizes and the TACLITE™ will flash for one minute, this audible alarm cannot be turned off, it will sound for the full one-minute period.

**NOTE: This Time of Day clock is the same clock that is used to time stamp dives. Modifying the Time of Day clock will affect the Local Time as viewed via the Analyst®.**

**NOTE: The Wrist Unit MUST be in the Independent Mode.**

#### **WU CLOCK PROGRAMMING PROCEDURE:**

Contacts 1, 2, & 3 are for programming sequences.

To begin the programming sequence:

1. Turn the unit on;
2. Using a coin or other conductive metal object, briefly bridge Contacts 1 and 2 until a short beep is heard and the CLoCk Menu is seen on the display.
3. To enter the Clock submenu, bridge Contacts 1 & 2 with wetted fingers. This will cause the unit to display the CLoCk Alarm selection – On or OFF. To Toggle the selection, bridge contacts 1&2 with wetted fingers.
4. Using a coin or other conductive metal object, bridge Contacts 1 & 2 to access the CLoCk Time or Alarm setting screen.
5. Shorting Contacts 1 & 2 with a coin will cause the first digit of the minutes to flash.
6. Shorting Contacts 2 & 3 with a coin will increment the numeric value continue until the required value is displayed. A confirmation beep will sound with each increment.
7. Next using wetted finger, bridge Contacts 1 & 2 to select the next digit, once selected the digit will flash to identify that it is being programmed. Bridge Contacts 2 & 3 till the desired value is displayed.
8. To select Hours short Contacts 1 & 2 with a coin, increment as in step 6 and 7.
9. Repeat step 5 through 7 until all digits have been programmed.
10. To save the changes that have been made bridge Contact 1 & 2 with a coin or other conductive metal object until two beeps are heard. Once the next programming option is displayed the changes have been saved.

To exit the Clock Mode Bridge contacts 1 & 2 with wetted fingers and the computer will return to the Dive Computer Mode's Surface Display.

**NOTE:** Ensure that the GEMINI WU is displaying the normal Surface Mode screen before commencing a dive.

**NOTE:** Once the GEMINI WU is placed in Clock Mode the unit will remain in that mode until exited by the diver.

**NOTE:** The Alarm function is only active when the GEMINI WU is in Clock Mode.

Figures 50, 51, 52, 53 and 54 show how the Clock display screens appear.

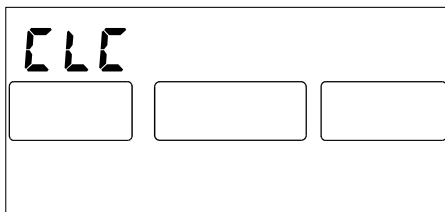


Figure 50 Programming Mode, Clock Menu

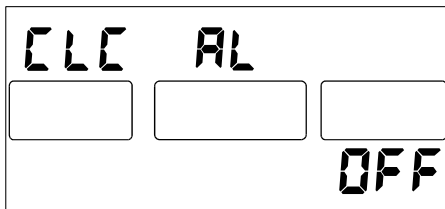


Figure 51 Programming Mode, Clock Alarm On/Off, Showing Off

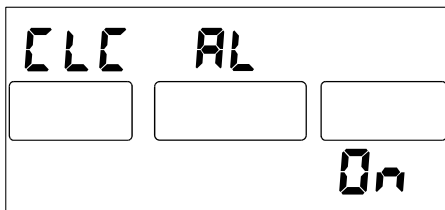


Figure 52 Programming Mode, Clock Alarm On/Off, Showing On

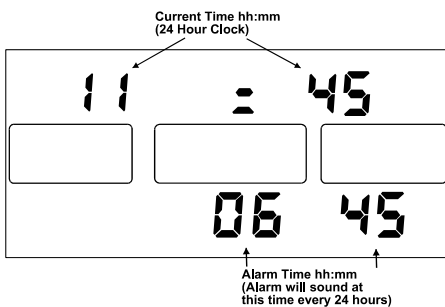


Figure 53 Programming Mode, Clock with Alarm, Setting Alarm

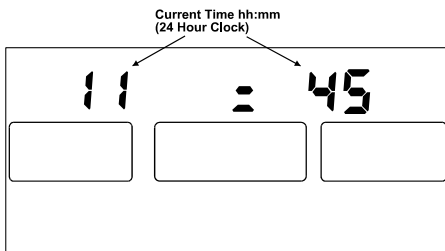


Figure 54 Programming Mode, Clock without Alarm, Setting Time

## TOUCH PROGRAMMING MODE:

**NOTE:** To enable the Programming Mode, the GEMINI must be on the Surface, not in the Post Dive Interval and cylinder pressure must be zero.

**NOTE:** All audible and visual alarms are suspended while the GEMINI is in the Programming Mode. Upon exiting the Programming Mode all alarms are reactivated.

**NOTE:** Once a value has been changed and the next menu option selected, the new value is stored.

**NOTE:** It is strongly recommended that the Programming Mode is activated again and a complete review of what was stored is accomplished.

**NOTE:** If the GEMINI is left in the Programming mode for five minutes without the contacts being touched, the unit will automatically exit the Programming Mode and return to the Surface Interval. Once this occurs the GEMINI will retain the modified programmed settings that have been stored. Options that have not been modified will retain their previous settings.

**NOTE:** If the Gemini Wrist Unit will not recognize the shorting of contacts 1 & 2 with a coin, it will be necessary to "reset" the Wrist Unit. To perform a WU "reset", remove the WU battery cap, remove the top battery, reinsert the battery backwards and reinstall the battery cap. After 5 to 10 seconds, remove the battery cap, remove the top battery, reinstall it correctly, install the battery cap and turn on the Wrist Unit.

## TOUCH PROGRAMMING MODE - PROCEDURE:

TU and WU contacts 1, 2, & 3 are for programming sequences.

Regardless if programming the GEMINI Tank Unit or the Wrist Unit the procedure is the same.

To begin the programming sequence:

1. Analyze the gas blend(s) using a calibrated Oxygen Analyzer (for Nitrox enabled units).
2. Turn the Tank Unit and Wrist Unit on.
3. Using a coin or other conductive metal object, briefly bridge Contacts 1 and 2 until a short beep is heard and the Programming Menu is seen on the display. The Programming Menu options depend on whether the unit is activated for Clock, Nitrox, the number of Gas Blends, and if the unit is in the PO2 or FO2 mode. The Menu options are displayed in sequence, incrementing to the next selection each time that Contacts 1 & 2 are bridged with a **coin**. The program option is displayed on the upper row of the display. The current setting for this option is displayed in the lower right of the display.
4. To reprogram the displayed menu values, bridge Contacts 1 & 2 with wetted fingers. This will cause the current setting to flash or in the case of multi-digit numbers, the least significant digit will flash. The clock will toggle between on and off.
5. Using a coin or other conductive metal object, bridge Contacts 2 & 3 to increment the numeric value. A confirmation beep will sound with each increment.
6. Next using wetted finger, bridge Contacts 1 & 2 to select the next digit, once selected the digit will flash to identify that it is being programmed. Bridge Contacts 2 & 3 till the desired value is displayed.
7. Repeat step 5 until all digits have been programmed.
8. To save the changes that have been made bridge Contact 1 & 2 with a coin or other conductive metal object. Once the next programming option is displayed the changes have been saved.

All programming sequences use the same routine of using Contacts 1 and 2 to **SELECT** the next programming sequence and Contacts 2 and 3 to **INCREMENT** the specified value.

**PROGRAMMING MENU - WRIST UNIT:**

The following table lists the various programming choices with their display identification and figure number, it should be noted that the Wrist Units programming choices are always the same regardless of how the GEMINI is configured.

Identification	Description	Figure	Page
<b>SLA</b>	Toggles between Independent & Slave modes	84	19
<b>InF</b>	Misc. Information	89	48
<b>TAc</b> <b>dL</b>	TACLITE™ On Time. Allowed value 00 to 99.	98	48
<b>LOG</b>	Logbook	99	48
<b>Add</b> <b>Cd</b>	TU/WU Address code. Allowed values 31000 to 63000	100	49

**TOUCH PROGRAMMING - WU - INDEPENDENT/SLAVE MODE:**

This programming selection allows the diver to toggle the GEMINI Wrist Unit between its' Independent configuration and its' Slave Mode Configuration. Figure 84 shows Independent and Figure 85 shows the Slave.

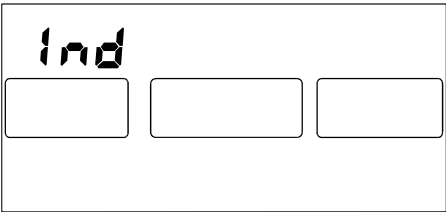


Figure 84 Programming Mode, WU, Independent/Slave Mode

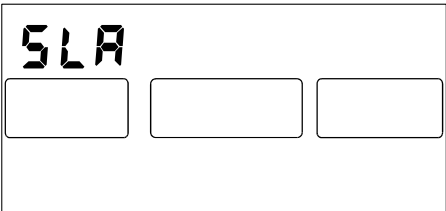


Figure 85 Programming Mode, WU, Independent/Slave Mode

**TOUCH PROGRAMMING - WU - INFORMATION DISPLAY:**

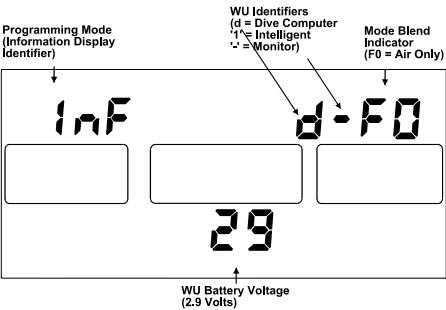
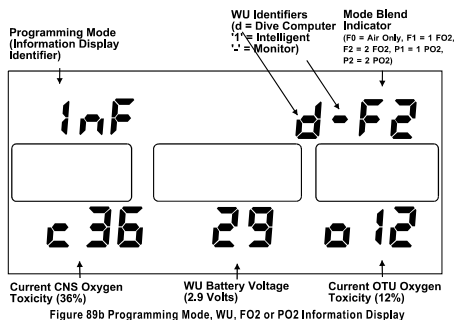


Figure 89a Programming Mode, WU, Air Only Information Display



The InFormation display is accessed via the Programming Mode. The information presented will depend on the configuration of the dive computer. The information in the upper right of screen indicates whether unit is in the Constant FO2 or PO2 Mode and the number of gas blends the unit is enabled for. The following table lists the identification and the description.

#### Identifier Description

F0	Air only
F1	Single Blend Nitrox, 21 to 50%
F2	Two Blend Nitrox, 21 to 50% and 21 to 99.9%
F3	Three Blend Nitrox, 21 to 50% and two 21 to 99.9%
P1	Single Blend PO2, 0.5 to 1.5 ata
P2	Dual Blend PO2, 0.5 to 1.5 ata and 0.5 to 1.5 ata

The WU Battery voltage is displayed in the lower center of the screen as a two-digit number with a decimal point. If the unit is configured for Constant FO2 (Nitrox) or Constant PO2, the screen will display CNS, OTU and battery voltage. The CNS exposure level is displayed on the lower left as a two-digit number preceded by a lower case "c". The OTU value is displayed on the lower right again as a two-digit number but preceded by a lower case "o". Both the CNS and OTU values are expressed as percentages. Figure 89a displays an Air Only InFormation screen while Figure 89b displays a typical InFormation screen for a unit that is enabled for two nitrox blends.

**TOUCH PROGRAMMING - WU - LOGBOOK MODE:** The Logbook of the GEMINI WU has two screens, a Primary Screen and an Alternate Screen. Tapping firmly on face of the unit will switch it to the Alternate Screen. The Logbook is accessed via Touch Contact Programming (see page 16). This enables the diver to view dive statistics; the GEMINI WU has the ability to provide diving data for the most recent 12 dives. The most recent dive will be displayed first. To view the next dive, touch the contacts 1 & 2 with wetted finger after pausing for a few seconds. Do not use a metal object such as a coin or knife-blade once in the Logbook since it will cause the unit to exit the Logbook and return to the Surface Interval.

Information contained in the Logbook will include:

Overall Dive Number	Date & Time of the Dive
Minimum NDC Time	Fastest Rate of Ascent
Minimum Water Temperature	Bottom Time
Surface Interval Before Dive	Maximum Depth
Ending Battery Voltage	Oxygen % of Blend #1
Maximum DEC Time (Deco Dive)	Maximum Ceiling (Deco Dive)
Ending CNS Value (Bar Graph)	Ending OTU Value (Bar Graph)

It is not necessary to exit the Logbook Mode prior to initiating a dive.

**NOTE:** While the WU will appear to present more than 12 dives only the dive data for the most recent 12 is shown. When the apparent 13<sup>th</sup> dive is shown it is in reality the most recent dive, the 14<sup>th</sup> will be the 2<sup>nd</sup> most recent, etc.

**NOTE:** The overall Dive Number that is displayed on the Logbook Menu screen (Figure 99a) permits the diver to identify the total number of dives made with that GEMINI WU. If the logbook example shown is the most recent dive made, it can be readily identified that 9 dives have been made with this specific unit and the 9<sup>th</sup> dive was made on 18 December 2000 at 11:28 AM.

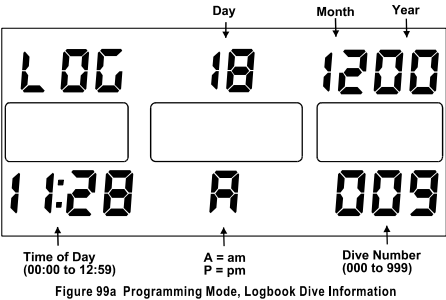
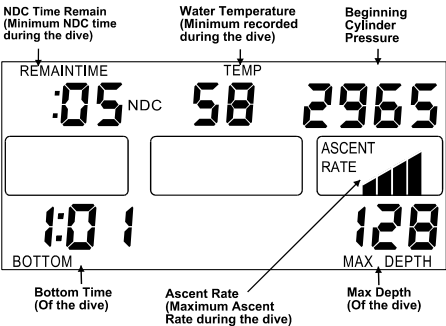
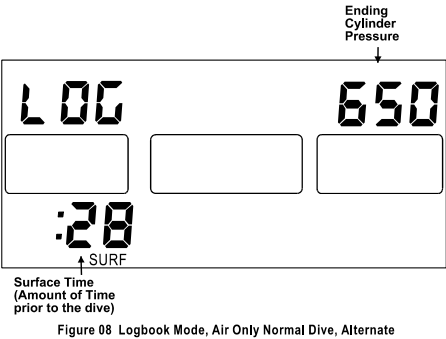


Figure 07 displays a typical Primary Screen of the Logbook of a Normal Dive.



Figures 08, 8a & 8b display the Alternate Screen for an Air Only, a Nitrox and a PO<sub>2</sub> Normal Dive.



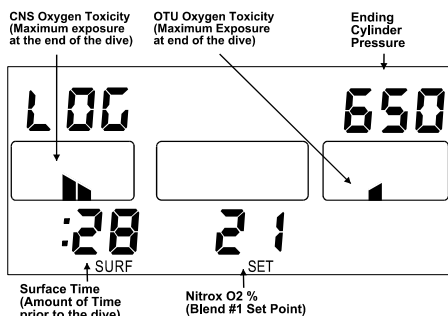


Figure 08a Logbook Mode, F02 Normal Dive, Alternate

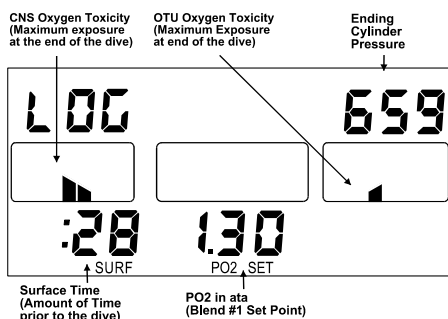


Figure 08b Logbook Mode, PO2 Normal Dive, Alternate

Figure 09 displays a typical Primary Screen of the Logbook of a Decompression Dive.

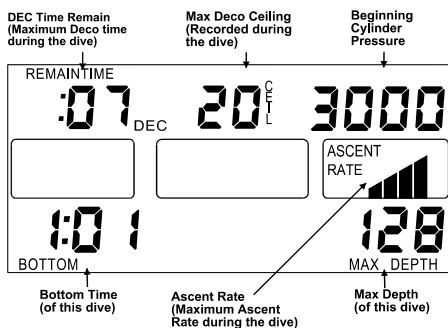


Figure 09 Logbook Mode, Deco Dive, Primary Screen



Figures 10 & 10a displays the Alternate Screen for an Air Only, a Nitrox and PO<sub>2</sub> Deco Dive.

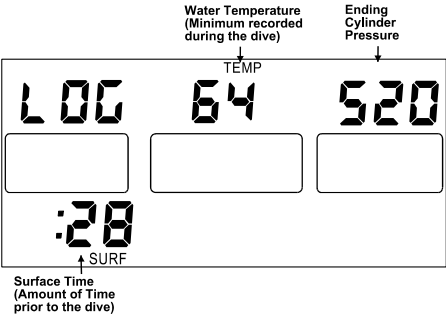


Figure 10 Logbook Mode, Air Only Deco Dive, Alternate

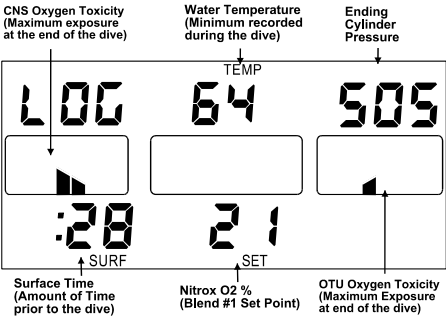


Figure 10a Logbook Mode, FO2 Deco Dive, Alternate

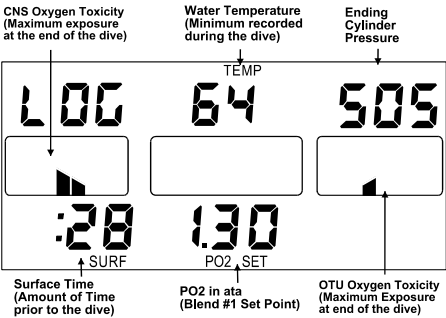


Figure 10b Logbook Mode, PO2 Deco Dive, Alternate

**TOUCH PROGRAMMING – SETTING TU ADDRESS CODE:** The Address Code that the GEMINI WU uses to identify the TU can be programmed from 31,000 to 63,000. The user must ensure that if the Address Code is changed in the WU it must also be changed in the TU. If the user is going to change the address code, they should change the TU code first and then the WU code.

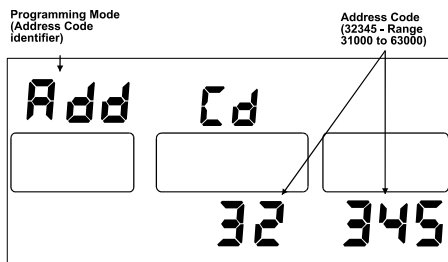


Figure 100a Programming Mode, WU, Setting Address Code

## PROGRAMMING MENU - TU - AIR ONLY:

The following table lists the various programming choices with their display identification and figure number.

Identification	Description	Figure	Page
<b>CLC</b>	Clock – if enabled	50	17
<b>PdP</b>	PreDive Prediction	35	49
<b>InF</b>	Misc. Information	36	50
<b>dEP</b> <b>AL</b>	Depth Alarm, Max value is 320 feet.	37	50
<b>Con</b>	Added Conservatism, Max allowed value is 50%.	38	50
<b>Ltr</b>	Cylinder Size in liters, Allowed value 00 to 99.	39	50
<b>Add</b> <b>Cd</b>	TU/WU Address code. Allowed values 31000 to 63000	47	52

## TU PROGRAMMING MENU - TU - SINGLE GAS NITROX:

The following table lists the various programming choices with their display identification and figure number.

Identification	Description	Figure	Page
<b>CLC</b>	Clock – if enabled	50	17
<b>PdP</b>	PreDive Prediction	35	49
<b>InF</b>	Misc. Information	36	50
<b>dEP</b> <b>AL</b>	Depth Alarm, Max value is 320 feet.	37	50
<b>Con</b>	Added Conservatism, Max allowed value is 50%.	38	50
<b>Ltr</b>	Cylinder Size in liters, Allowed value 00 to 99.	39	50
<b>EAn</b> <b>1</b>	Oxygen percentage of Blend, Allowed value 21 to 50	40	50
<b>Add</b> <b>Cd</b>	TU/WU Address code. Allowed values 31000 to 63000	47	52

## TOUCH PROGRAMMING - TU - PREDIVE PREDICTION:

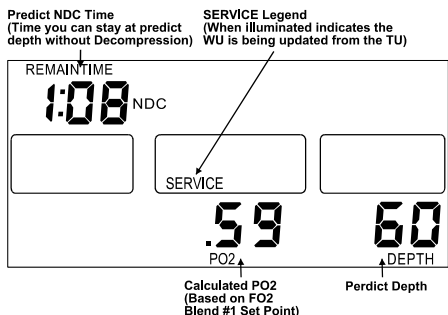
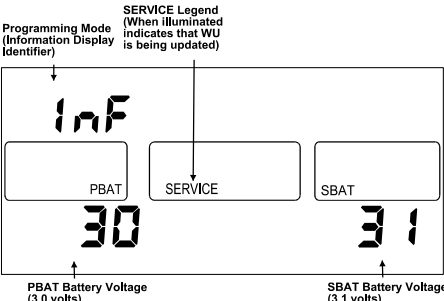
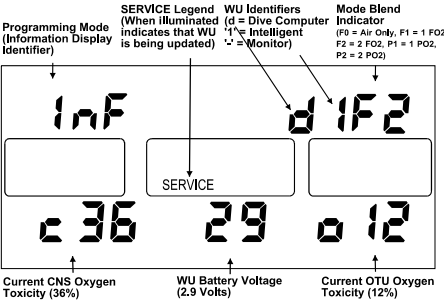
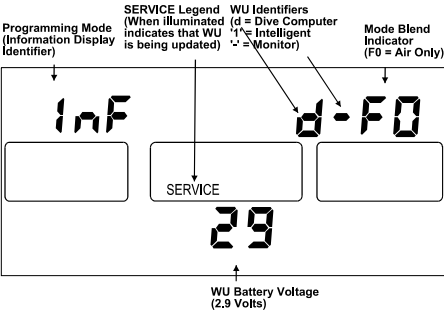


Figure 06 PreDive Prediction, Air or FO2 Mode

PreDive Prediction is accessed via the Touch Contact Programming Menu. This enables the diver to view the PreDive Prediction information at the touch of the Contacts. The PreDive Prediction of the GEMINI starts at 30 feet and increases in 10 feet increments. PreDive Predictions will terminate when the No-Decompression (NDC) time prediction reaches two minutes or a maximum depth of 320 feet is reached. Additional Conservatism, Residual Nitrogen, blend #1 oxygen percentage and Barometric Altitude can effect PreDive Predictions. During the PreDive Prediction Mode, the unit will compute and display the maximum safe time and the calculated PO<sub>2</sub> value at that depth. Once the maximum PreDive Prediction depth has been reached the unit will return to the Surface Interval.

**TOUCH PROGRAMMING - TU - INFORMATION DISPLAY:**



The InFormation display is accessed via the Programming Mode. The InFormation display contains two screens, to switch between the two screens bridge Contacts 1 & 2 with wetted

fingers. The information presented will depend on the configuration of the dive computer. The information in the upper right of first screen indicates whether unit is in the Constant FO2 or PO2 Mode and the number of gas blends the unit is enabled for. The following table lists the identification and the description.

**Identifier Description**

F0	Air only
F1	Single Blend Nitrox, 21 to 50%
F2	Two Blend Nitrox, 21 to 50% and 21 to 99.9%
F3	Three Blend Nitrox, 21 to 50% and 21 to 99.9%
P1	Single Blend PO2, 0.5 to 1.5 ata
P2	Dual Blend PO2, 0.5 to 1.5 ata and 0.5 to 1.5 ata

WU Battery voltage is displayed in the lower center of the first screen as a two-digit number with a decimal point. If the unit is configured for Constant FO2 (Nitrox) or Constant PO2, the screen will display the current CNS, OTU and battery voltage. The current CNS exposure level is displayed on the lower left as a two-digit number preceded by a lower case "c". The current OTU value is displayed on the lower right again as a two-digit number but preceded by a lower case "o". Both the CNS and OTU values are expressed as percentages. TU Battery voltage is displayed on the second screen under the PBAT and SBAT legends. Figure 36a displays an Air Only InFormation screen while Figure 36b displays a typical InFormation screen for a unit that is enabled for two nitrox blends. Figure 36c displays a typical second screen.

**TOUCH PROGRAMMING - TU - DEPTH ALARM:** The Depth Alarm allows the diver to select a maximum depth below, which the diver does not wish to descend before an alarm is issued. This depth can be set from 0 to 320 feet in one-foot increments.

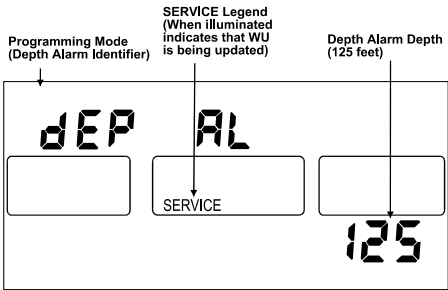


Figure 37a Programming Mode, TU, Setting Depth Alarm

**TOUCH PROGRAMMING - TU - CONSERVATISM:** This programming function allows the diver to input an added degree of Conservatism into the GEMINI's nitrogen algorithm. Via Touch Programming the Conservatism can be set from 0 to 50%.

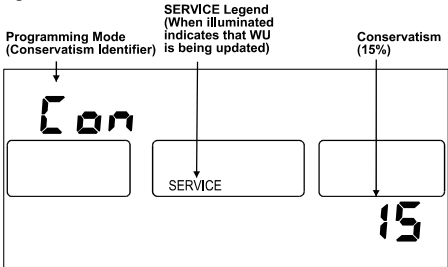


Figure 38a Programming Mode, TU, Setting Conservatism

**TOUCH PROGRAMMING - TU - CYLINDER SIZE:** This programming function allows the diver to input the size of the all of the connected cylinders into the Workload portion of the GEMINI's nitrogen algorithm. Via Touch Programming the Cylinder Size can be set from 0 to 99.

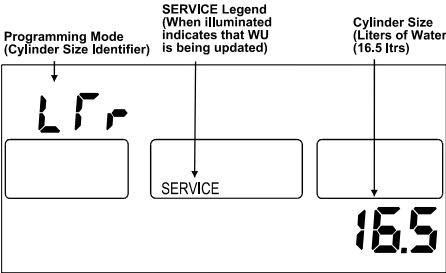


Figure 39a Programming Mode, TU, Setting Cylinder Size

**TOUCH PROGRAMMING - TU - BLEND #1:**

The oxygen percentage of Blend #1 can be programmed from 21.0% to 50.0%. Once programmed the oxygen percentage will remain at the value programmed until changed by the user.

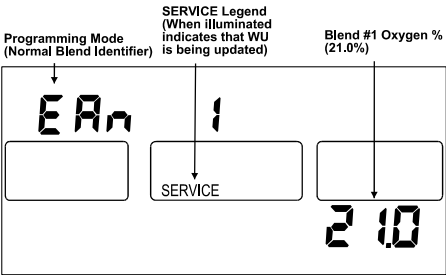


Figure 40a Programming Mode, TU, Setting Normal Blend O2%

**TOUCH PROGRAMMING - TU - SETTING TU ADDRESS CODE:** The Address Code that the GEMINI TU uses to identify the WU can be programmed from 31,000 to 63,000. The user must ensure that if the Address Code is changed in the TU it must also be changed in the WU. If the user is going to change the address code, the TU code should be changed first and then the WU code.

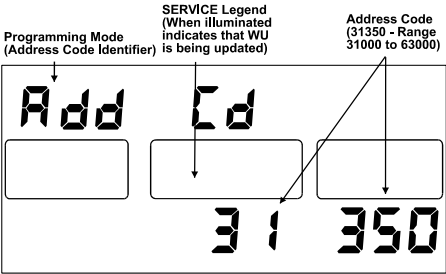


Figure 47a Programming Mode, TU, Setting Address Code

**WARNING INDICATIONS:** Failure to observe audible and/or visual warnings and take corrective action may result in injury or death.

- If the diver is ascending faster than the selected maximum ascent rate, then the top bar of the ascent bar graph will flash and the "WARNING" legend will illuminate. The unique high to low audible sweep alarm will continue to sound once per second until the situation is corrected.
- If the diver descends below the user set Depth Alarm, the Depth digits will flash. A single beep audible alarm will sound once per second for five seconds and will repeat every two minutes. The Depth alarm is not active in the Decompression Mode to avoid confusion with the "Shallower Than Ceiling" alarm.
- If the TU battery voltage goes below 2.1 volts, the "PBAT" and/or "SBAT" legends will illuminate.
- If the WU battery voltage goes below 2.2 volts, both the "PBAT" and "SBAT" legends will illuminate.
- If the cylinder pressure approaches the user set minimum pressure (300 psi to 1500 psi) the "WARNING" legend will illuminate and the Cylinder Pressure digits will flash. A single beep audible alarm will sound once per second for five seconds and will repeat every two minutes.  
If the divers Gas Consumption Rate is greater or lower than the user set limits the "WARNING" legend will illuminate and flash along with the Gas Consumption Digits. A single beep audible alarm will sound once per second for five seconds and repeat every two minutes until the Gas Consumption Rate is back within the specified range. The Gas Consumption Alarm is only active when the computer is using blend #1, once the switch is made to blend #2 or #3 the alarm is disabled.
- If the diver has less than two minutes of No-Decompression Time (NDC) remaining, the "WARNING" legend will illuminate and flash along with the Remaining NDC time digits. A single beep audible alarm will sound once per second for five seconds and repeat every two minutes.
- If the diver enters the Decompression Mode, a single audible alarm will sound once per second for five seconds.
- During a Decompression Dive, if the Depth is less than the CEILING, the "WARNING" legend will illuminate and flash along with the Depth and Ceiling digits. A unique high to low audible sweep alarm will continue to sound once every two seconds until the situation is corrected.
- During a Decompression Dive, if based on the current Gas Consumption Rate there is less gas in the cylinder than that required to complete five minutes of decompression, the "WARNING" legend will illuminate and flash along with the Cylinder Pressure and DEC REMAIN time digits. A single beep audible alarm will sound once per second for five seconds and repeat every two minutes.
- If the dive computer determines that either the Depth, Temperature or High Pressure sensor is malfunctioning. The "WARNING" legend will illuminate, the computer will also issue a 5-beep two-tone audible alarm once every two minute to alert the diver to this condition. On the Appropriate Screen the Maximum Depth will be replaced with "S-C" to indicate the high-pressure transducer, "S-" to indicate the low-pressure transducer or "S-T" for the temperature transducer.
- For High PO<sub>2</sub>, see "**OXYGEN TOXICITY FACTORS**" on page 30.
- For High CNS, see "**OXYGEN TOXICITY FACTORS**" on page 30.
- For High OTU, see "**OXYGEN TOXICITY FACTORS**" on page 30.

**SENSOR WARNING:** The GEMINI TU & WU have the capability of monitoring the integrity of its' sensors both the low-pressure (depth/altitude), the temperature and the high-pressure (cylinder pressure). When the computer detects an error in one of the transducers, the diver is alerted to this condition by the illumination of the "WARNING" and "SENSOR" legends. The computer will also issue a 5-beep two-tone audible alarm once

every two minute to alert the diver to this condition. In the case of a sensor failure the Maximum Depth will be replaced with “S--” to indicate the low-pressure transducer or “S-t” for the temperature transducer or “S-C” to indicate the high-pressure transducer. The “WARNING” legend, along with the Temperature digits, or the Depth digits or the Cylinder Pressure digits and the error code will flash once per second. In the highly unlikely situation were two or more sensors are detected as having errors, the display will alternate between the error codes. This warning will be issued whether the computer is in the Surface Interval, Dive Mode, Decompression Mode or Post Dive Interval. The sensor error code will always replace the Max Depth Digits. In the unlikely case that your computer issues one of these warnings the unit should be returned to the factory for evaluation and/or repair.

Figure 28 & 29 show a TU Sensor Warning, in this case a temperature Sensor, as it would be displayed in the Dive Mode. If the Sensor Warning is for the depth sensor it would display “S--” or if it was for the high-pressure sensor it would display “S-C”.

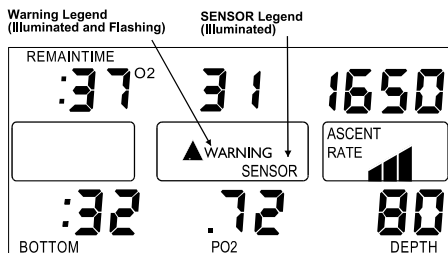


Figure 28 Dive Mode, Sensor Warning, Typical, Primary Screen

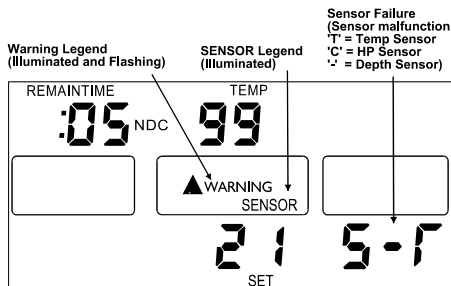


Figure 29 Dive Mode, Sensor Warning, Typical, Alternate Screen

**OXYGEN TOXICITY FACTORS:** The GEMINI has the ability to track Oxygen Toxicity levels for the Central Nervous System (CNS) as well as the Mission Oxygen Tolerance Units Dose (OTU). In addition, a maximum Partial Pressure of Oxygen (PO<sub>2</sub>) warning alarm can also be set. While most other audible alarms of the dive computer consist of five long beeps, the CNS, OTU, and PO<sub>2</sub> have a distinctive audible alarm that consists of short double-beeps that sound once per second for five seconds.

As long as one or more of these three parameters is outside its limits, the “O2TOX” legend will be illuminated and the “WARNING” legend will continue to flash and the audible alarm will be repeated once every two minutes.

These three functions are not active if the NITROX capability is disabled.

**PARTIAL PRESSURE OF OXYGEN (PO<sub>2</sub>):** High levels of PO<sub>2</sub> can cause severe Oxygen poisoning. Widely different levels of PO<sub>2</sub> can affect individual divers. The user via the Analyst<sup>®</sup> can set the PO<sub>2</sub> alarm to any level between 0.50 ATA and 1.59 ATA. As shipped

from the factory, this is set to 1.40 ATA. Should the PO<sub>2</sub> be above the alarm set point, the "WARNING" legend will illuminate, the audible alarm sounds and the PO<sub>2</sub> value will flash.

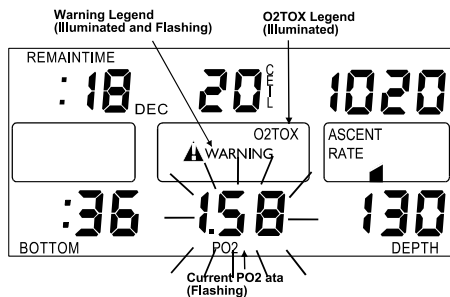


Figure 25 Dive Mode, Deco Dive, FO<sub>2</sub> Mode, PO<sub>2</sub> Warning, Primary Screen

**CENTRAL NERVOUS SYSTEM (CNS) TOXICITY:** The user via the Analyst<sup>®</sup> can set the CNS Toxicity alarm to any level between 40% and 80% of the maximum allowable limit. As shipped from the factory, this is set to 50%. Should the CNS Toxicity reach 50% of the maximum allowable, the "WARNING" legend will illuminate and the audible alarm will sound and on the Alternate Screen the CNS display graph will be flashing along with the "WARNING" legend.

By the accepted definition of CNS toxicity, should a PO<sub>2</sub> value of greater than 1.6 ATA be measured; the CNS Toxicity will be 100%. When the CNS exposure graph is viewed via the Analyst<sup>®</sup> it will show what the CNS exposure would have been if the diver had not exceeded a PO<sub>2</sub> of 1.60. The ending statistics for the dive will show a 100% CNS exposure. The CNS beginning statistic for the following dive will be based on the recovery time from 100%. The beginning value on the CNS graph and the statistical value will be based on this value. During the Surface Interval, this percentage will decrease as the CNS declines toward zero. Whatever the current CNS Toxicity level, it can also be viewed on the Surface Interval Alternate Screen or on the InFormation screen in the Programming Mode.

**OXYGEN TOLERANCE UNITS (OTU):** An issue with long term breathing of higher partial pressures of Oxygen above 0.5 ATA is Pulmonary Oxygen Toxicity or sometimes called WHOLE BODY, which must be tracked properly. The GEMINI tracks OTU based on Dr. Bill Hamilton's 'REPEX' method of oxygen exposure management. The OTU Dose is an exponential function of oxygen partial pressure and time.

The time-dependent limit varies with length of time (days) that the diver continues to dive without full recovery to zero OTU. The Mission OTU Clock tracks the OTU, which is a running clock that tracks long-term Oxygen exposure. This clock may run for several weeks if frequent dives are made using high levels of PO<sub>2</sub>. The current Mission Clock, CNS, and OTU can be seen via the Analyst<sup>®</sup> PC interface or the current CNS and OTU values can be viewed on the Alternate Screen while in the Surface Interval, Dive Mode, Decompression Mode or Post Dive Interval. The current CNS and OTU values can also be viewed via the Touch Contact Programming mode by selecting the InFormation option. The recovery portion of the OTU algorithm is a linear reduction of OTU over time. The Mission OTU clock is reset to 0:00 when the OTU Dose reaches zero.

The user via the Analyst<sup>®</sup> can set the OTU Toxicity alarm to any level between 40% and 80% of the maximum allowable limit. As shipped from the factory, this is set to 50%. Should the OTU Dose reach 50% of the maximum allowable, the "WARNING" legend will illuminate and the audible alarm will sound and on the Alternate Screen the displayed OTU value graph will be flashing along with the "WARNING" legend.



Symptoms of Pulmonary Oxygen Toxicity include burning in the throat and chest, coughing, and shortness of breath. Discontinue diving and consult a Physician should any of these, or other, symptoms appear.

Figure 25a & 26 show a CNS & OTU exposure over the alarm set point (50%).

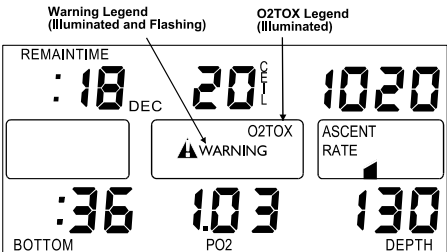


Figure 25a Normal Dive, FO2 Mode, CNS/OTU Warning, Primary Screen

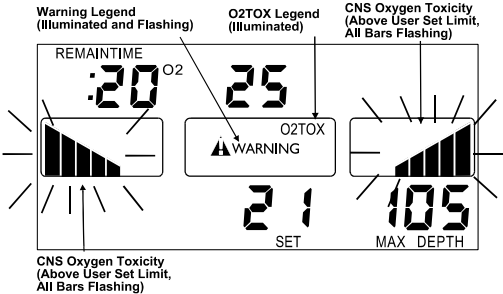


Figure 26 Deco, FO2/PO2 Mode, CNS/OTU Warning, Alternate Screen

### CNS BAR GRAPH:

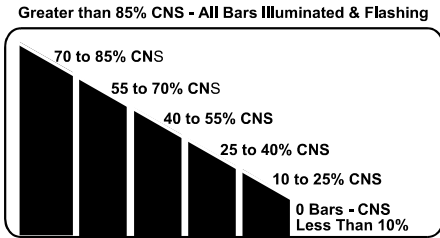


Figure 18 CNS Bar Graph

The percentages indicated are for reference only. They do not appear on the WU display.

## OTU BAR GRAPH:

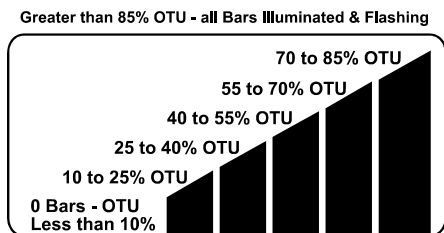


Figure 19 OTU Bar Graph

The percentages indicated are for reference only.  
They do not appear on the WU display.

## GEMINI - TWO GAS NITROX

**OVERVIEW:** This configuration of the GEMINI is capable of being used for two different Nitrox mixtures on the same dive. The first gas or Normal Blend is programmable from 21% to 50% Oxygen in 0.1% increments while Blend #2 can be programmed from 21% to 99.9% Oxygen again in 0.1% increments. Both Blends are set at the factory to 21% Oxygen and use this in its decompression algorithm. PRIOR to diving an Enriched Air Nitrox gas blend, the unit must be programmed accordingly. This can be done via the Touch Contacts or via the Analyst<sup>®</sup> PC Interface.

**GAS BLEND SWITCHING:** This configuration of the GEMINI is capable of FO<sub>2</sub> to FO<sub>2</sub> gas Blend switching. While most other Nitrox dive computers limit the diver to the use of a single gas blend or percentage of oxygen, the GEMINI allows the diver to use two different gas blends during a dive. These two gas blends are commonly referred to as the Normal or Bottom Gas Blend and the Decompression Gas Blend. Commonly, the Bottom Gas Blend is used from initial entry into the water and for most of the time spent during the dive. The Normal Gas Blend is restricted to a maximum of 50% oxygen. The Decompression Gas Blend (Deco Blend) is used only for decompression purposes and can go to 99.9% oxygen content.

Typically, the Deco Blend is in a cylinder that is suspended at some relatively shallow depth beneath the surface.

The automatic gas switching occurs:

1. With the TU attached to the cylinder containing Blend #1, the TU continually "senses" a drop in cylinder pressure until the diver is prepared to switch to the cylinder contain Blend #2.
2. Once the diver is breathing from the Blend #2 cylinder, the TU no longer senses a drop in cylinder pressure from the Blend #1 cylinder and automatically changes its algorithm to the Blend #2 O<sub>2</sub> percentage.
3. If the diver returns to breathe from the Blend#1 cylinder the TU will automatically switch back to the Blend #1 O<sub>2</sub> percentage.

If Blend switching is NOT desired, it may be disabled via the Analyst<sup>®</sup>. Setting both Blends to the same percentage of Oxygen is the same as disabling the second Blend.

**NOTE:** If the diver is using large capacity cylinders and is supplying inflation gas from the Mix1 cylinder for the BC and Dry Suit, and is breathing on Mix 2 or 3. It is possible to cause the dive computer to momentarily perform a mix switch when the BC or Dry Suit is inflated. It is highly recommended that the diver carry a separate gas supply for Dry Suit inflation or have the gas supplied from the second mix cylinder.

## **SURFACE INTERVAL - TWO GAS NITROX:**

The Surface Interval for the Two Gas Nitrox configuration is the same as the Single Gas Nitrox, refer to page 5.

## **DIVE MODE - TWO GAS NITROX:**

The Dive Mode for the Two Gas Nitrox configuration is the same as the Single Gas Nitrox, refer to page 8.

In the Dive Mode the Alternate Screen will display the current oxygen percentage that the computer is using in the NDC calculations, therefore after a gas switch the unit will display Blend #2 oxygen percentage.

## **DECOMPRESSION MODE - TWO GAS NITROX:**

The Decompression Mode for the Two Gas Nitrox configuration is the same as the Single Gas Nitrox, refer to page 11.

If the diver surfaces before satisfying his decompression obligation, the GEMINI will continue to give out-gassing credit as if it were in a dive, but at a depth of zero feet. The unit will continue to log data and perform as if actually in a dive. The unit will actually decompress as if it were actually at the various required decompression stops using an FO<sub>2</sub> of 21%. When the decompression obligation is finally satisfied, the ten-minute "Post Dive Interval" will begin and the dive will terminate in ten minutes.

If the Deco Forecast with Deco Blend has been 'enabled' via the Analyst® P.C. Interface, the Total Deco Time will be calculated using the Deco Blend to calculate nitrogen out-gassing for the deco stops shallower than the blend switch depth. If this option is not enabled, the Forecast will be based on the Normal Blend, but if a Gas switch does occur the dive computer will update the decompression times to reflect the change in breathing gas.

Several seemingly ambiguous situations may occur with the Deco Forecast 'enabled', they are:

- Satisfying Deco Stops during ascent.
- The Deco Gas Switch may occur early or late.
- Forecast Deco Stop time & depths may switch up/down/up/down as the diver ascends due to the in-gassing and out-gassing of the different 'controlling' tissue group.

**NOTE:** This function should NOT be 'Enabled' if the Diver is not performing a Gas switch.

## **POST DIVE INTERVAL - TWO GAS NITROX:**

The Post Dive Interval is the same as in the Single Gas Nitrox, refer to page 13 for detailed information, except that if the unit has performed a gas switch. While in the Post Dive Interval the Alternate Screen will display the Oxygen percentage of the Deco Gas Blend. If the diver re-enters the Dive mode the unit will perform its' calculations based on the 2<sup>nd</sup> Gas Blend Oxygen percentage until the diver descends and begins using the Blend #1 gas supply. The unit will then revert to the Normal Gas Blend for the NDC calculations.

## **PROGRAMMING MODE - TWO GAS NITROX**

The programming procedure is the same as Single Gas Nitrox, refer to page 18.

## **PROGRAMMING MENU - TWO GAS NITROX**

The following table lists the various programming choices with their display identification and figure number.

Identification	Description	Figure	Page
CLC	Clock – if enabled	50	17
PdP	PreDive Prediction	35	49
InF	Misc. Information	36	50
dEP	AL Depth Alarm, Max value is 320 feet.	37	50
Con	Added Conservatism, Max allowed value is 50%.	38	50
Ltr	Cylinder Size in liters, Allowed value 00 to 99.	39	50
EAn	1 Oxygen percentage of Blend, Allowed value 21 to 50.	40	50
EAn	2 Deco Oxygen percentage, Allowed value 21 to 99.9.	41	51
Add	Cd TUWU Address code. Allowed values 31000 to 63000	47	52

**NOTE:** If the GEMINI is left in the Programming mode for five minutes without the contacts being touched, the unit will automatically exit the Programming Mode and return to the Surface Interval. Once this occurs the GEMINI will retain the modified programmed settings that have been stored. Options that have not been modified will retain their previous settings.

**TOUCH PROGRAMMING - CLOCK - TWO GAS NITROX:** The Clock Programming Procedure for the Two Gas Nitrox is the same as the Single Gas Nitrox, refer to page 14.

**TOUCH PROGRAMMING - PREDIVE PREDICTION - TWO GAS NITROX:** The PreDive Prediction for the Two Gas Nitrox is the same as the Single Gas Nitrox, refer to page 24.

**TOUCH PROGRAMMING - INFORMATION DISPLAY - TWO GAS NITROX:** The InFormation display for the Two Gas Nitrox is the same as the Single Gas Nitrox, refer to page 25.

**TOUCH PROGRAMMING - DEPTH ALARM - TWO GAS NITROX:** The Depth Alarm Programming Procedure is the same as the Single Gas Nitrox, refer to page 26.

**TOUCH PROGRAMMING - CONSERVATISM - TWO GAS NITROX:** The added Conservatism Programming Procedure is the same as the Single Gas Nitrox, refer to page 26.

**TOUCH PROGRAMMING - CYLINDER SIZE:** The Cylinder Size Programming Procedure is the same as the Single Gas Nitrox, refer to page 27.

**TOUCH PROGRAMMING - BLEND #1 - TWO GAS NITROX:** The Blend #1 Programming Procedure is the same as the Single Gas Nitrox, refer to page 27.

**TOUCH PROGRAMMING - BLEND #2 - TWO GAS NITROX:** The oxygen percentage of Blend #2 can be programmed from 21.0% to 99.9%. Once programmed the oxygen percentage will remain at the value programmed until changed by the user.

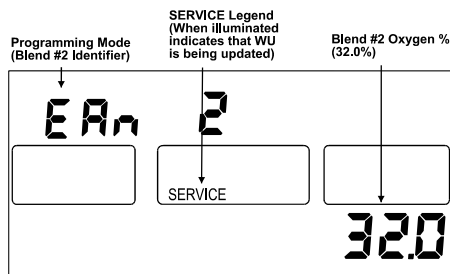


Figure 41a Programming Mode, TU, Setting Blend #2 O2%

**TOUCH PROGRAMMING - SETTING TU ADDRESS CODE - TWO GAS NITROX:** The Address Code Programming Procedure is the same as the Single Gas Nitrox, refer to page 27 for details.

**WARNING INDICATIONS - TWO GAS NITROX:**  
Refer to Warning Indications on page 28.

**SENSOR WARNING - TWO GAS NITROX:**  
Refer to Sensor Warning on page 28.

## **GEMINI - THREE GAS NITROX**

**OVERVIEW:** This configuration of the GEMINI is capable of being used for three different Nitrox mixtures on the same dive. The first gas or Normal Blend is programmable from 21% to 50% Oxygen in 0.1% increments while Blend #2 and Blend #3 can be programmed from 21% to 99.9% Oxygen again in 0.1% increments. All three Blends are set at the factory to 21% Oxygen and use this in its decompression algorithm. PRIOR to diving an Enriched Air Nitrox gas blend, the unit must be programmed accordingly. This can be done via the Touch Contacts or via the Analyst<sup>®</sup> PC Interface.

**GAS BLEND SWITCHING:** This configuration of the GEMINI is capable of FO<sub>2</sub> to FO<sub>2</sub> gas Blend switching. While most other Nitrox dive computers limit the diver to the use of a single gas blend or percentage of oxygen, the GEMINI allows the diver to use three different gas blends during a dive. These two blends are commonly referred to as the Normal or Bottom Gas Blend and the First and Second Decompression Gas Blends. Commonly, the Bottom Gas Blend is used from initial entry into the water and for most of the time spent during the dive. The Normal Gas Blend is restricted to a maximum of 50% oxygen. The First Decompression Gas Blend (Blend #2) is used only for initial decompression purposes and the Second Decompression Gas Blend (Deco Blend) is used for the final decompression obligation. Both Decompression Gas Blends can go to 99.9% oxygen content.

Typically, the Final Deco Blend is in a cylinder that is suspended at some relatively shallow depth beneath the surface.

Since the depth of the Final Deco Blend switch is known ahead of time, and the expected duration of the dive is also known. These two factors can be used to automatically switch the computer to the Deco Blend or back to the Second Blend should the diver descend again. This is accomplished prior to starting a dive by specifying both the Normal Gas Blend Oxygen percentage and the Two Deco Gas Blend Oxygen percentages. The depth of the Deco switch is also specified. Depending on surface swells a few feet may be added to this depth to ensure that when the diver is shallower than the depth the Deco Blend will actually be in use. If the diver subsequently descends below this depth, the #2 Blend is again assumed to be in use. The other important factor that must be specified is the Bottom Time that must elapse before Blend Switching is enabled. The purpose of this factor is to ensure that the switch to the Deco Blend does not occur prematurely should the diver ascend early and not require use of the Deco Blend, the setting of this factor must be carefully considered. The Deco Blend switch is enabled when the diver descends below the switch depth and satisfies the time requirements and then ascends to the programmed switch depth. If the diver does not exceed the programmed switch depth the unit will not switch to the Deco Blend. All of these factors can be set by either the touch contact programming method or via the Analyst<sup>®</sup> PC interface. If switching to the Deco Blend is NOT desired, it may be disabled via the Analyst<sup>®</sup>. Setting all three Blends to the same percentage of Oxygen is the same as disabling the Deco Blends.

The automatic gas switching occurs:

1. With the TU attached to the cylinder that contains Blend #1. The TU continually “senses” a drop in cylinder pressure until the diver is prepared to switch to the cylinder contain Blend #2.
2. Once the diver is breathing from the Blend #2 cylinder, the TU no longer senses a drop in cylinder pressure from the Blend #1 cylinder and automatically changes its algorithm to the Blend #2 O<sub>2</sub> percentage.
3. For Blend #3, once the diver is breathing from the Blend #2 cylinder and the Time & Depth Benchmarks are satisfied, the unit automatically changes its algorithm to the Blend #3 O<sub>2</sub> percentage.
4. If the diver returns to breathe from the Blend#1 cylinder the TU will automatically switch back to the Blend #1 O<sub>2</sub> percentage.
5. If the diver descends below the mix switch depth and is not breathing from the Blend #1 cylinder. The unit will switch back to the Blend #2 O<sub>2</sub> percentage.

If Blend switching is NOT desired, it may be disabled via the Analyst<sup>®</sup>. Setting both Blends to the same percentage of Oxygen is the same as disabling the second Blend.

**NOTE:** If the diver is using large capacity cylinders and is supplying inflation gas from the Mix1 cylinder for the BC and Dry Suit, and is breathing on Mix 2 or 3. It is possible to cause the dive computer to momentarily perform a mix switch when the BC or Dry Suit is inflated. It is highly recommended that the diver carry a separate gas supply for Dry Suit inflation or have the gas supplied from the second mix cylinder.

#### **SURFACE INTERVAL - THREE GAS NITROX:**

The Surface Interval for the Three Gas Nitrox configuration is the same as the Single Gas Nitrox, refer to page 5.

#### **DIVE MODE - THREE GAS NITROX:**

The Dive Mode for the Three Gas Nitrox configuration is the same as the Single Gas Nitrox, refer to page 5.

In the Dive Mode the Alternate Screen will display the current oxygen percentage that the computer is using in the NDC calculations, therefore after a gas switch the unit will display the current Blend oxygen percentage.

#### **DECOMPRESSION MODE - THREE GAS NITROX:**

The Decompression Mode for the Three Gas Nitrox configuration is the same as the Single Gas Nitrox, refer to page 11.

#### **POST DIVE INTERVAL - THREE GAS NITROX:**

The Post Dive Interval is the same as in the Single Gas Nitrox, refer to page 13 for detailed information, except that if the unit has performed a gas switch. While in the Post Dive Interval the Alternate Screen will display the Oxygen percentage of the Deco Gas Blend. If the diver re-enters the Dive mode the unit will perform its' calculations based on the 3<sup>rd</sup> Gas Blend Oxygen percentage until the diver descends and begins using the Blend #1 gas supply. The unit will then revert to the Normal Gas Blend for the NDC calculations.

#### **PROGRAMMING MODE - THREE GAS NITROX**

The programming procedure is the same as Single Gas Nitrox, refer to page 18.

#### **PROGRAMMING MENU - THREE GAS NITROX**

The following table lists the various programming choices with their display identification and figure number.

Identification	Description	Figure	Page
CLC	Clock – if enabled	50	17
PdP	PreDive Prediction	35	49
InF	Misc. Information	36	50
dEP	AL Depth Alarm, Max value is 320 feet.	37	50
Con	Added Conservatism, Max allowed value is 50%.	38	50
Ltr	Cylinder Size in liters, Allowed value 00 to 99.	39	50
EAn	1 Oxygen percentage of Blend, Allowed value 21 to 50.	40	50
EAn	2 Deco Oxygen percentage, Allowed value 21 to 99.9.	41	51
EAn	3 Deco Oxygen percentage, Allowed value 21 to 99.9.	42	51
dEC	b Bottom Time Benchmark for Deco FO2 switching, Allowed value 10 to 999 minutes.	43	51
dEC	d Depth Benchmark for Deco FO2 switching, Max value is 99 feet.	44	51
Add	Cd TU/WU Address code. Allowed values 31000 to 63000	47	52

**NOTE:** If the GEMINI is left in the Programming mode for five minutes without the contacts being touched, the unit will automatically exit the Programming Mode and return to the Surface Interval. Once this occurs the GEMINI will retain the modified programmed settings that have been stored. Options that have not been modified will retain their previous settings.

**TOUCH PROGRAMMING - CLOCK - THREE GAS NITROX:** The Clock Programming Procedure for the Three Gas Nitrox is the same as the Single Gas Nitrox, refer to page 15.

**TOUCH PROGRAMMING - PREDIVE PREDICTION - THREE GAS NITROX:** The PreDive Prediction for the Three Gas Nitrox is the same as the Single Gas Nitrox, refer to page 24.

**TOUCH PROGRAMMING - INFORMATION DISPLAY - THREE GAS NITROX:** The InFormation display for the Three Gas Nitrox is the same as the Single Gas Nitrox, refer to page 25.

**TOUCH PROGRAMMING - DEPTH ALARM - THREE GAS NITROX:** The Depth Alarm Programming Procedure is the same as the Single Gas Nitrox, refer to page 26.

**TOUCH PROGRAMMING - CONSERVATISM - THREE GAS NITROX:** The added Conservatism Programming Procedure is the same as the Single Gas Nitrox, refer to page 26.

**TOUCH PROGRAMMING - CYLINDER SIZE:** The Cylinder Size Programming Procedure is the same as the Single Gas Nitrox, refer to page 27.

**TOUCH PROGRAMMING - BLEND #1 - THREE GAS NITROX:** The Blend #1 Programming Procedure is the same as the Single Gas Nitrox, refer to page 27.

**TOUCH PROGRAMMING - BLEND #2 - THREE GAS NITROX:** The Blend #2 Programming Procedure is the same as the Single Gas Nitrox, refer to page 27.

**TOUCH PROGRAMMING - BLEND #3 - THREE GAS NITROX:** The oxygen percentage of Blend #3 can be programmed from 21.0% to 99.9%. Once programmed the oxygen percentage will remain at the value programmed until changed by the user.

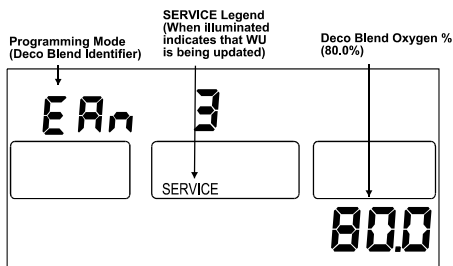


Figure 42a Programming Mode, TU, Setting Deco Blend O2%

### TOUCH PROGRAMMING - BLEND #3 - TIME BENCHMARK - THREE GAS NITROX:

The Blend #3 (Deco) Time Benchmark can be programmed from 10 to 999 minutes. Once programmed the setting will remain at the value programmed until changed by the user.

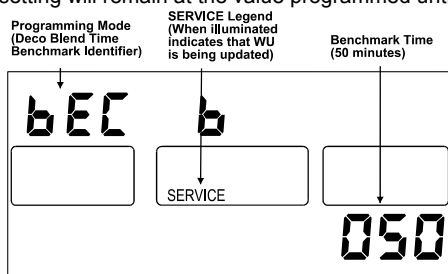


Figure 43a Programming Mode, TU, Setting Deco Time Benchmark

### TOUCH PROGRAMMING - BLEND #3 - DEPTH BENCHMARK - THREE GAS NITROX:

The Blend #3 (Deco) Depth Benchmark can be programmed from 10 to 999 minutes. Once programmed the setting will remain at the value programmed until changed by the user.

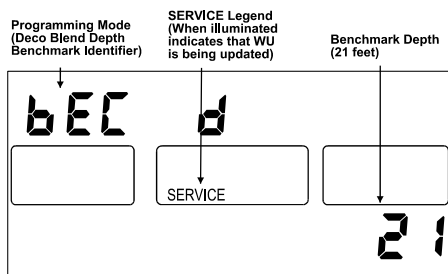


Figure 44a Programming Mode, TU, Setting Deco Depth Benchmark

**TOUCH PROGRAMMING - SETTING TU ADDRESS CODE - THREE GAS NITROX:** The Address Code Programming Procedure is the same as the Single Gas Nitrox, refer to page 27 for details.

### WARNING INDICATIONS - THREE GAS NITROX:

Refer to Warning Indications on page 28.

### SENSOR WARNING - THREE GAS NITROX:

Refer to Sensor Warning on page 28.



## CONSTANT PO<sub>2</sub> OPERATING MODE

**CONSTANT PO<sub>2</sub> & FO<sub>2</sub> MODES:** Almost all other dive computers only compute using air or enriched air (Nitrox), which is referred to as "Constant FO<sub>2</sub>" and is commonly found in open-circuit systems and in semi-closed circuit rebreathers. The GEMINI has this capability, but also computes using a "Constant PO<sub>2</sub>" as commonly found in closed-circuit rebreathers. The user can select which of these two modes, or combination of these two modes is desired by using the Analyst® PC Interface.

If the user selects CONSTANT PO<sub>2</sub> mode, the Partial Pressure of Oxygen (PO<sub>2</sub>) can be selected between 0.5 and 1.5 ata.

Regardless if the GEMINI is in CONSTANT PO<sub>2</sub> mode or the CONSTANT FO<sub>2</sub> mode when the unit is on the Surface after a dive, nitrogen out-gassing is based on Air (21% Oxygen).

## GEMINI - SINGLE GAS PO<sub>2</sub>

**SURFACE INTERVAL - SINGLE GAS PO<sub>2</sub>:** The Surface Interval is the same as in the Single Gas Nitrox configuration; refer to page 5 for a detailed discussion. The exception is that the Alternate Screen displays the Current PO<sub>2</sub> set point value, current calculated CNS and OTU values. Figure 02b shows the display with no residual Nitrogen (a clean Dive).

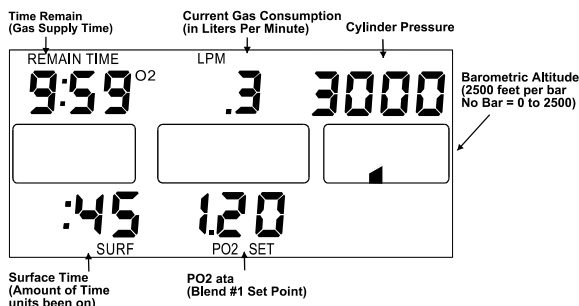


Figure 02b Surface Mode, No Nitrogen, PO<sub>2</sub>, Primary Screen

Figure 04b shows the display with residual Nitrogen (a repetitive dive), figure 05a shows the alternate screen with residual nitrogen.

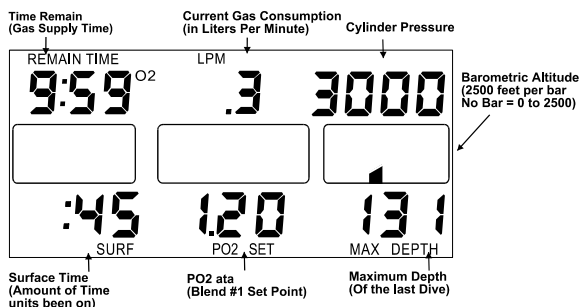


Figure 04b Surface Mode, With Nitrogen, PO<sub>2</sub>, Primary Screen

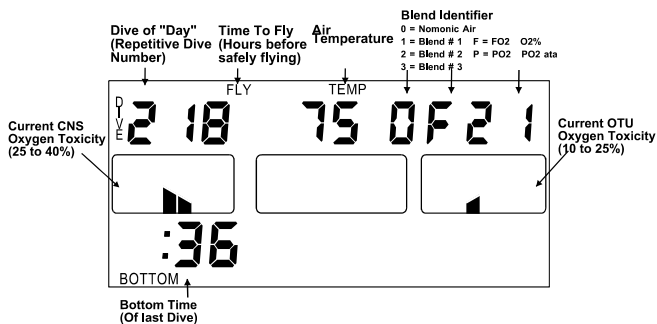


Figure 05a Surface Mode, With Nitrogen, FO2/PO2, Alternate Screen

**DIVE MODE - SINGLE GAS PO2:** The Dive Mode for the PO<sub>2</sub> configuration is the same as the Single Gas Nitrox. The Primary Display Screen will display the current Calculated FO<sub>2</sub> of the Breathing Gas, in the lower center of the display, based on the Depth and PO<sub>2</sub> Setting. (Figure 13b)

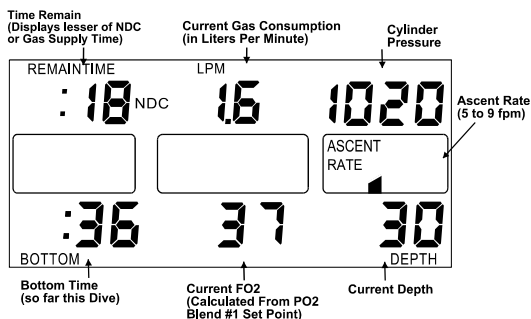


Figure 13b Dive Mode, Normal Dive, PO2 Mode, Primary Screen

The Alternate Screen in the PO<sub>2</sub> Mode will display the current PO<sub>2</sub> set point that the unit is using in its NDC calculations, the current CNS and OTU values and the Maximum Depth reached so far on this dive. (Fig. 14b)

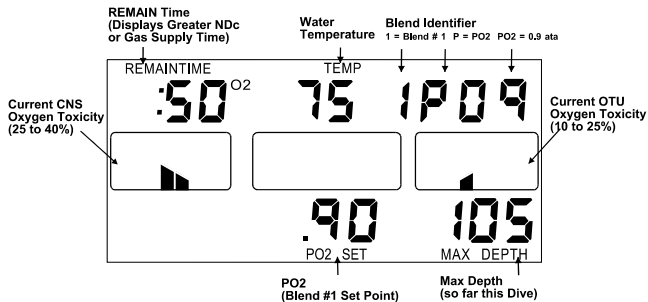


Figure 14b Dive Mode, Normal Dive, PO2 Mode, Alternate Screen

**DECOMPRESSION MODE - SINGLE GAS PO2:** The Decompression Mode for the PO<sub>2</sub> Mode configuration is the same as the Single Gas Nitrox, refer to page 11.

Figures 15b & 16b shows the GEMINI in the PO<sub>2</sub> mode at the Decompression Stop.

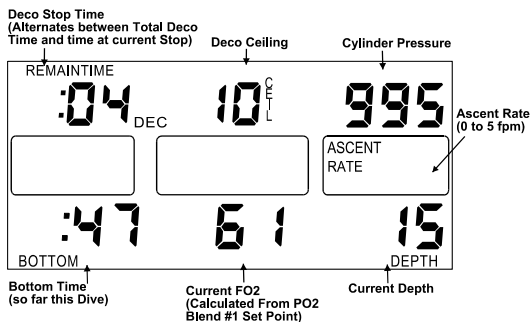


Figure 15b Dive Mode, Deco Dive, PO2 Mode, Primary Screen

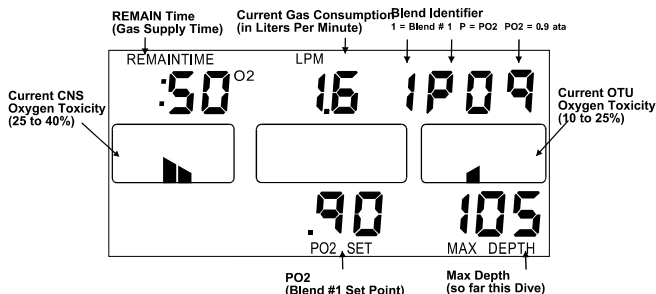


Figure 16b Dive Mode, Deco Dive, PO2 Mode, Alternate Screen

If the diver surfaces before satisfying his decompression obligation, the GEMINI will continue to give out-gassing credit as if it was in a dive, but at a depth of zero feet. The unit will continue to log data and perform as if actually in a dive. When the decompression obligation is finally satisfied, the ten-minute "Post Dive Interval" will begin and the dive will terminate in ten minutes.

Figure 15c shows the primary display at a depth of Zero feet.

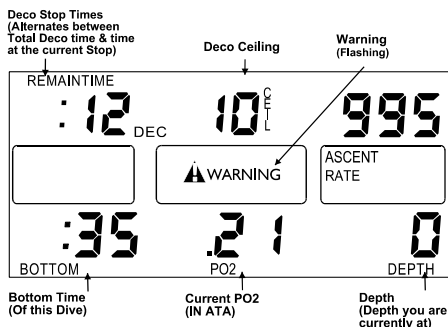


Figure 15c Decompression Mode, At Zero Depth

It should be noted that in the Constant PO<sub>2</sub> mode the shallower the decompression stop the shorter the stop decompression time. This is a result of higher FO<sub>2</sub>s in the breathing gas as the depth decreases.

**POST DIVE INTERVAL MODE - SINGLE GAS PO2:** The Post Dive Interval is the same as in the Single Gas Nitrox, refer to page 13 for detailed information.

## **TOUCH PROGRAMMING - SINGLE GAS PO2**

The programming procedure is the same as Single Gas Nitrox refer to page 18, except that there is an additional programming choice that selects the FO<sub>2</sub> or PO<sub>2</sub> mode. The first table shows the programming sequence with PO<sub>2</sub> selected as the operating mode and the second table shows the menu as it appears with FO<sub>2</sub> selected.

### **TOUCH PROGRAMMING MENU - FO2/PO2 - PO2 SELECTED**

The following table lists the various programming choices with their display identification and figure number. The Programming sequence and choices are determined by the selection of PO<sub>2</sub> or FO<sub>2</sub> Mode. This table assumes programming choice #1 is PO<sub>2</sub>.

Identification	Description	Figure	Page
<b>CLC</b>	Clock – if enabled	50	17
<b>PO2 / FO2</b>	Toggles between PO2 Mode and FO2 Mode.	34	49
<b>PdP</b>	PreDive Prediction	35	49
<b>InF</b>	Misc. Information	36	50
<b>dEP</b> <b>AL</b>	Depth Alarm, Max value is 320 feet.	37	50
<b>Con</b>	Added Conservatism, Max allowed value is 50%.	38	50
<b>Ltr</b>	Cylinder Size in liters, Allowed value 00 to 99.	39	50
<b>PO2</b> <b>1</b>	PO2 value. Allowed value 0.5 to 1.50.	45	51
<b>Add</b> <b>Cd</b>	TU/WU Address code. Allowed values 31000 to 63000	47	52

### **TOUCH PROGRAMMING MENU - FO2/PO2 MODE - FO2 SELECTED**

The following table lists the various programming choices with their display identification and figure number. The Programming sequence and choices are determined by the selection of PO<sub>2</sub> or FO<sub>2</sub> Mode. This table assumes programming choice #1 is FO<sub>2</sub>.

Identification	Description	Figure	Page
<b>CLC</b>	Clock – if enabled	50	17
<b>PO2 / FO2</b>	Toggles between PO2 Mode and FO2 Mode.	33	49
<b>PdP</b>	PreDive Prediction	35	49
<b>InF</b>	Misc. Information	36	50
<b>dEP</b> <b>AL</b>	Depth Alarm, Max allowed value is 320 feet.	37	50
<b>Con</b>	Added Conservatism, Max allowed value is 50%.	38	50
<b>Ltr</b>	Cylinder Size in liters, Allowed value 00 to 99.	39	50
<b>EAn</b> <b>1</b>	Oxygen percentage of Blend, Allowed value 21 to 50.	40	50
<b>Add</b> <b>Cd</b>	TU/WU Address code. Allowed values 31000 to 63000	47	52

**NOTE:** If the GEMINI is left in the Programming mode for five minutes without the contacts being touched, the unit will automatically exit the Programming Mode and return to the Surface Interval. Once this occurs the GEMINI will retain the modified programmed settings that have been stored. Options that have not been modified will retain their previous settings.

**TOUCH PROGRAMMING - CLOCK - ONE GAS PO2:** The Clock Programming Procedure for the Single Gas PO2 is the same as the Single Gas Nitrox, refer to page 14.

**TOUCH PROGRAMMING – PO2/FO2 - ONE GAS PO2:** The selection of PO2 or FO2 determines the operating mode of the computer. The selection will toggle between PO2 and FO2. Figure 86 shows the Programming displays with FO2 selected and figure 87 with PO2.

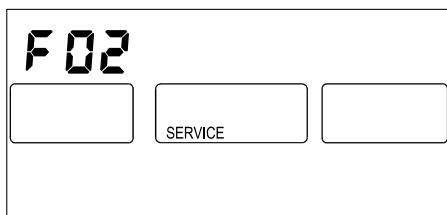


Figure 33 Programming Mode, TU, FO2/PO2, Showing FO2

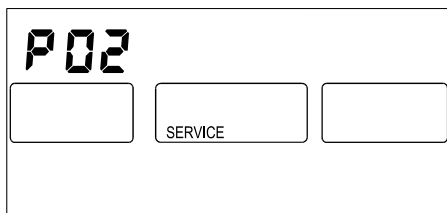


Figure 34 Programming Mode, TU, FO2/PO2, Showing PO2

**TOUCH PROGRAMMING - PRE-DIVE PREDICTION - SINGLE GAS PO2:** PreDive Prediction is accessed through the Touch Contact Programming Menu (See Programming, page 24). This enables the diver to view the PreDive Prediction information at the touch of the Contacts. The GEMINI PreDive Prediction starts at 30 feet and increases in 10 feet increments. PreDive Predictions will terminate when the No-Decompression (NDC) time prediction reaches two minutes or a maximum depth of 320 feet is reached. During PreDive Prediction the current PO2 setting that the unit is programmed for is used to compute the NDC time remaining and will be displayed in the lower center of the display. Additional Conservatism, Residual Nitrogen and apparent Altitude can also effect PreDive Predictions.

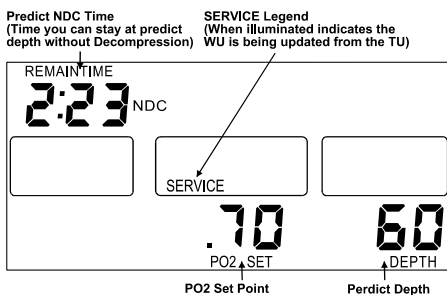


Figure 06b PreDive Prediction, PO2 Mode

**TOUCH PROGRAMMING - INFORMATION DISPLAY - SINGLE GAS PO2:** The InFormation display for the Single Gas PO2 is the same as the Single Gas Nitrox, refer to page 25.

**TOUCH PROGRAMMING - DEPTH ALARM - SINGLE GAS PO2:** The Depth Alarm Programming Procedure is the same as the Single Gas Nitrox, refer to page 26.

**TOUCH PROGRAMMING - CONSERVATISM - SINGLE GAS PO2:** The added Conservatism Programming Procedure is the same as the Single Gas Nitrox, refer to page 26.

**TOUCH PROGRAMMING - CYLINDER SIZE:** The Cylinder Size Programming Procedure is the same as the Single Gas Nitrox, refer to page 27.

**TOUCH PROGRAMMING - BLEND #1 - SINGLE GAS PO<sub>2</sub>:** The Blend #1 Programming Procedure is the same as for the Single Gas Nitrox except the diver is programming a constant PO<sub>2</sub> value between 0.5 and 1.5 ata, refer to page 27.

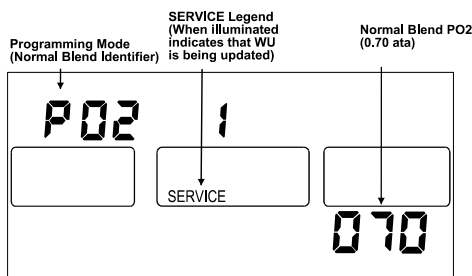


Figure 45a Programming Mode, TU, Setting Normal Blend PO<sub>2</sub>

**TOUCH PROGRAMMING - SETTING TU ADDRESS CODE - SINGLE GAS PO<sub>2</sub>:** The Address Code Programming Procedure is the same as the Single Gas Nitrox, refer to page 27 for details.

#### **WARNING INDICATIONS - SINGLE GAS PO<sub>2</sub>:**

Refer to Warning Indications on page 28.

#### **SENSOR WARNING - SINGLE GAS PO<sub>2</sub>:**

Refer to Sensor Warning on page 28.

#### **GEMINI - TWO GAS PO<sub>2</sub>:**

**CONSTANT PO<sub>2</sub> & FO<sub>2</sub> MODES:** Almost all other dive computers only compute using air or enriched air (Nitrox), which is referred to as "Constant FO<sub>2</sub>" and is commonly found in open-circuit systems and in semi-closed circuit rebreathers. The GEMINI has this capability, but also computes using a "Constant PO<sub>2</sub>" as commonly found in closed-circuit rebreathers. The user can select which of these two modes, or combination of these two modes is desired by using the Analyst<sup>®</sup> PC Interface.

If the user selects CONSTANT FO<sub>2</sub> mode, the Oxygen content of the Nitrox blends can be selected from 21.0 to 50.0 percent on the normal blend and 21.0 to 99.9 percent on the Deco.

If the user selects CONSTANT PO<sub>2</sub> mode, the Partial Pressure of Oxygen (PO<sub>2</sub>) for the Normal and Deco blends can be selected between 0.5 and 1.5 ata.

Via the Analyst<sup>®</sup> PC Interface, the user can specify when, or if the unit should change from CONSTANT PO<sub>2</sub> mode to CONSTANT FO<sub>2</sub> mode at or near the surface.

**BLEND SWITCHING:** Depending on the configuration of the GEMINI 'BLEND' refers to Constant FO<sub>2</sub> Nitrox gas blends or Constant PO<sub>2</sub> gas blends. The GEMINI is capable of O<sub>2</sub> to FO<sub>2</sub>, PO<sub>2</sub> to FO<sub>2</sub>, or PO<sub>2</sub> to PO<sub>2</sub> Blend switching.

For a detailed description of blend switching, refer to page 32.

**SURFACE INTERVAL - TWO GAS PO<sub>2</sub>:** The Surface Interval for the Two Gas PO<sub>2</sub> configuration is the same as the Single Gas Nitrox, refer to page 5.

**DIVE MODE - TWO GAS PO2:** The Dive Mode for the Two Gas PO2 configuration is the same as the Single Gas Nitrox, refer to page 8.

**DECOMPRESSION MODE - TWO GAS PO2:** The Decompression Mode for the Two Gas PO2 configuration is the same as the Two Gas Nitrox, refer to page 11

If the diver surfaces before satisfying the decompression obligation, the GEMINI will continue to give out-gassing credit as if it were in a dive, but at a depth of zero feet. The unit will continue to log data and perform as if actually in a dive. The unit will decompress as if it were actually at the various required decompression stops using an FO<sub>2</sub> of 21%. When the decompression obligation is finally satisfied, the ten-minute "Post Dive Interval" will begin and the dive will terminate in ten minutes.

If the Deco Forecast with Deco Blend has been 'enabled' via the Analyst® P.C. Interface, the Total Deco Time will be calculated using the Deco Blend to calculate nitrogen out-gassing for the deco stops shallower than the blend switch depth. If this option is not enabled the Forecast will be based on the Normal Blend, but if a Gas switch does occur the dive computer will update the decompression times to reflect the change in breathing gas.

It should be noted that in the Constant PO<sub>2</sub> mode the shallower the decompression stop the shorter the stop decompression time. This is a result of higher FO<sub>2</sub>s in the breathing gas as the depth decreases.

If the Deco Forecast with Deco Blend has been 'enabled' via the Analyst® P.C. Interface, the Total Deco Time will be calculated using the Deco Blend to calculate nitrogen out-gassing for the deco stops shallower than the blend switch depth. If not 'enabled' the Deco Forecast will be based on the Normal Gas Blend.

**NOTE:** This function should not be 'Enabled' if the Diver is not performing a Gas switch.

**POST DIVE INTERVAL MODE - TWO GAS PO2:** The Post Dive Interval is the same as in the Air only Mode, refer to page 13 for detailed information, except that if the unit has performed a gas switch. While in the Post Dive Interval the Alternate Screen will display the Oxygen percentage of the Deco Gas Blend and if the diver re-enters the Dive mode the unit will perform its' calculations based on the Deco Gas Blend Oxygen percentage until the diver descends below the Gas switch Depth. Below this depth the unit will revert to the Normal Gas Blend for the NDC calculations.

## **TOUCH PROGRAMMING - THREE GAS FO2/TWO GAS PO2**

The programming procedure is the same as for the Single Gas Nitrox, refer to page 18. The table below shows the programming sequence with FO<sub>2</sub> selected as the operating mode, on page 41 the table shows the programming menu as it appears with PO<sub>2</sub> selected.

## **TOUCH PROGRAMMING MENU - THREE GAS FO2/2-PO2 - FO2 TO FO2 GAS SWITCH**

The following table lists the various programming choices with their display identification and figure number. The Programming sequence and choices are determined by the selection of PO<sub>2</sub> or FO<sub>2</sub> Mode. This table assumes programming choice #1 is FO<sub>2</sub> with an FO<sub>2</sub> to FO<sub>2</sub> gas blend switch.

Identification	Description	Figure	Page
CLC	Clock – if enabled	50	17
PO2 / FO2	Toggles between PO2 Mode and FO2 Mode.	33	49
PdP	PreDive Prediction	35	49
InF	Misc. Information	36	50
dEP	Depth Alarm, Max value is 320 feet.	37	50
Con	Added Conservatism. Max value is 50%.	38	50
Ltr	Cylinder Size in liters, Allowed value 00 to 99.	39	50
EAn	Oxygen percentage of Blend, Allowed value 21 to 50.	40	50

<b>EAn</b>	<b>2</b>	Blend #2 Oxygen percentage, Allowed value 21 to 99.9.	41	51
<b>EAn</b>	<b>3</b>	Deco Oxygen percentage, Allowed value 21 to 99.9.	42	51
<b>Add</b>	<b>Cd</b>	TU/WU Address code. Allowed values 31000 to 63000	100	52

## **TOUCH PROGRAMMING MENU - TWO GAS FO2/PO2 - PO2 TO FO2 GAS SWITCH**

The following table lists the various programming choices with their display identification and figure number. The Programming sequence and choices are determined by the selection of PO<sub>2</sub> or FO<sub>2</sub> Mode. This table assumes programming choice #1 is PO<sub>2</sub> with a PO<sub>2</sub> to FO<sub>2</sub> gas blend switch.

<b>Identification</b>		<b>Description</b>	<b>Figure</b>	<b>Page</b>
<b>CLC</b>		Clock – if enabled	50	17
<b>PO2 / FO2</b>		Toggles between PO2 Mode and FO2 Mode.	34	49
<b>PdP</b>		PreDive Prediction	35	49
<b>InF</b>		Misc. Information	36	50
<b>dEP</b>	<b>AL</b>	Depth Alarm, Max value is 320 feet.	37	50
<b>Con</b>		Added Conservatism, Max value is 50%.	38	50
<b>Ltr</b>		Cylinder Size in liters, Allowed value 00 to 99.	39	50
<b>PO2</b>	<b>1</b>	PO2 value. Allowed value 0.5 to 1.50.	45	51
<b>EAn</b>	<b>2</b>	Deco FO2 Oxygen percentage, Allowed value 21 to 99.9	41	51
<b>dEC</b>	<b>b</b>	Bottom Time Benchmark for Deco switching. Allowed Value 10 to 999 minutes.	43	51
<b>dEC</b>	<b>d</b>	Depth Benchmark for Deco switching Max value is 99 feet.	44	51
<b>Add</b>	<b>Cd</b>	TU/WU Address code. Allowed values 31000 to 63000	47	52

## **TOUCH PROGRAMMING MENU - TWO GAS PO2 - PO2 to PO2 GAS SWITCH**

The following table lists the various programming choices with their display identification and figure number. The Programming sequence and choices are determined by the selection of PO<sub>2</sub> or FO<sub>2</sub> Mode. This table assumes programming choice #1 is PO<sub>2</sub> with a PO<sub>2</sub> to PO<sub>2</sub> gas switch.

<b>Identification</b>		<b>Description</b>	<b>Figure</b>	<b>Page</b>
<b>CLC</b>		Clock – if enabled	50	17
<b>PO2 / FO2</b>		Toggles between PO2 Mode and FO2 Mode.	34	49
<b>PdP</b>		PreDive Prediction	35	49
<b>InF</b>		Misc. Information	36	50
<b>dEP</b>	<b>AL</b>	Depth Alarm, Max value is 320 feet.	37	50
<b>Con</b>		Added Conservatism, Max allowed value is 50%.	38	50
<b>Ltr</b>		Cylinder Size in liters, Allowed value 00 to 99.	39	50
<b>PO2</b>	<b>1</b>	PO2 value. Allowed value 0.5 to 1.50.	45	51
<b>PO2</b>	<b>2</b>	Deco PO2 value. Allowed value 0.5 to 1.50.	46	52
<b>dEC</b>	<b>b</b>	Bottom Time Benchmark for Deco switching, Allowed value 10 to 999 minutes.	43	51
<b>dEC</b>	<b>d</b>	Depth Benchmark for Deco switching, Max allowed value is 99 feet.	44	51
<b>Add</b>	<b>Cd</b>	TU/WU Address code. Allowed values 31000 to 63000	47	52

**TOUCH PROGRAMMING - CLOCK - TWO GAS PO2:** The Clock Programming Procedure for the Two Gas PO2 is the same as the Single Gas Nitrox, refer to page 14.

**TOUCH PROGRAMMING - PREDIVE PREDICTION - TWO GAS PO2:** The PreDive Prediction for the Two Gas PO2 is the same as the Single Gas Nitrox, refer to page 24.

**TOUCH PROGRAMMING - INFORMATION DISPLAY - TWO GAS PO2:** The InFormation display for the Two Gas Nitrox is the same as the Single Gas Nitrox, refer to page 25.



**TOUCH PROGRAMMING - DEPTH ALARM - TWO GAS PO2:** The Depth Alarm Programming Procedure is the same as the Single Gas Nitrox, refer to page 26.

**TOUCH PROGRAMMING - CONSERVATISM - TWO GAS PO2:** The added Conservatism Programming Procedure is the same as the Single Gas Nitrox, refer to page 26.

**TOUCH PROGRAMMING - CYLINDER SIZE:** The Cylinder Size Programming Procedure is the same as the Single Gas Nitrox, refer to page 27.

**TOUCH PROGRAMMING - BLEND #1 - TWO GAS PO2:** The Blend #1 Programming Procedure is the same as the Single Gas PO2, refer to page 42.

**TOUCH PROGRAMMING - BLEND #2 - TWO GAS PO2:** The Blend #2 Programming Procedure is the same as the Two Gas Nitrox, except the PO<sub>2</sub> value can be programmed from 0.50 to 1.50 ata. Once programmed the oxygen percentage will remain at the value programmed until changed by the user.

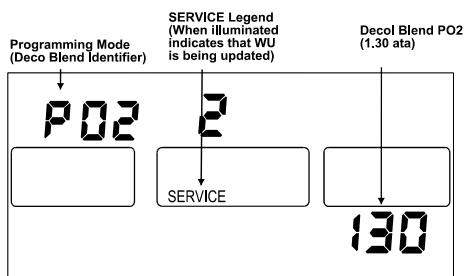


Figure 46a Programming Mode, TU, Setting Deco Blend PO2

**TOUCH PROGRAMMING - BLEND #2 - TIME BENCHMARK:** The programming procedure for the Blend #2 Time Benchmark is the same as Three Gas Nitrox, refer to page 37.

**TOUCH PROGRAMMING - BLEND #2 – DEPTH BENCHMARK:** The programming procedure for the Blend #2 Depth Benchmark is the same as Three Gas Nitrox, refer to page 37.

**TOUCH PROGRAMMING - SETTING TU ADDRESS CODE - TWO GAS PO2:** The Address Code Programming Procedure is the same as the Single Gas Nitrox, refer to page 27 for details.

#### **WARNING INDICATIONS - TWO GAS PO2:**

Refer to Warning Indications on page 28.

#### **SENSOR WARNING - TWO GAS PO2:**

Refer to Sensor Warning on page 28.

**TOUCH CONTACT PROGRAMMING SCREENS:** The following are all of the screens that the GEMINI WU is capable of presenting in the Touch Programming Mode. Refer to the particular configuration for appropriate screens.

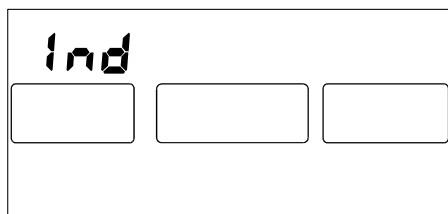


Figure 84 Programming Mode, WU, Independent/Slave Mode

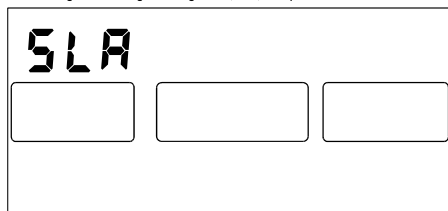


Figure 85 Programming Mode, WU, Independent/Slave Mode

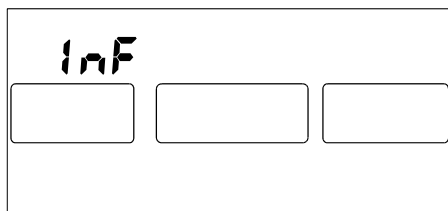


Figure 89 Programming Mode, WU, Information Display Menu

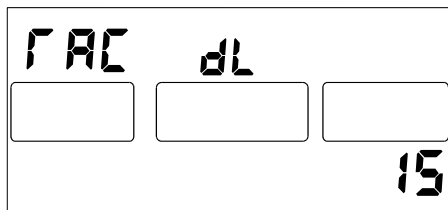


Figure 98 Programming Mode, WU, TACLITE On Time Menu

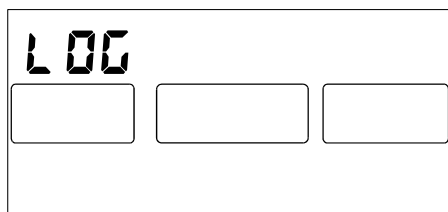


Figure 99 Programming Mode, Logbook Menu

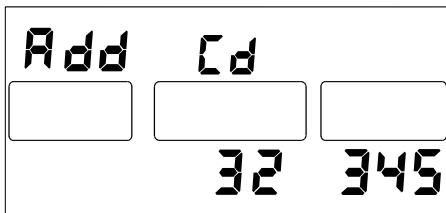


Figure 100 Programming Mode, WU, Address Code Menu

**TOUCH CONTACT PROGRAMMING SCREENS:** The following are all of the screens that the GEMINI TU is capable of presenting in the Touch Programming Mode. Refer to the particular configuration for appropriate screens.

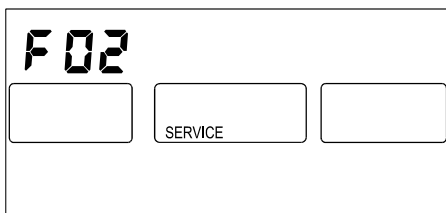


Figure 33 Programming Mode, TU, FO2/PO2, Showing FO2

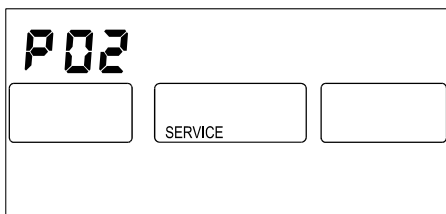


Figure 34 Programming Mode, TU, FO2/PO2, Showing PO2

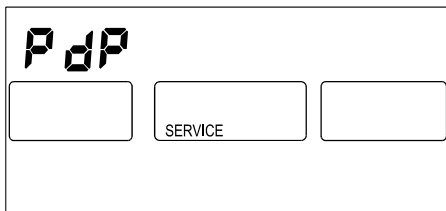


Figure 35 Programming Mode, TU, PreDive Prediction Menu

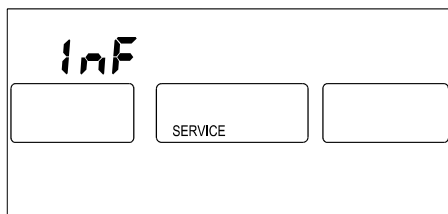


Figure 36 Programming Mode, TU, Information Display Menu

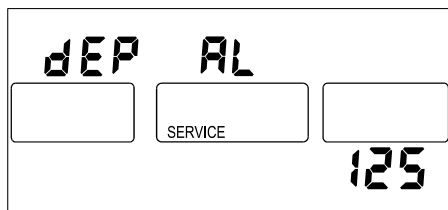


Figure 37 Programming Mode, TU, Depth Alarm Menu

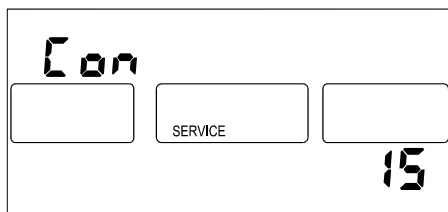


Figure 38 Programming Mode, TU, Conservatism Menu

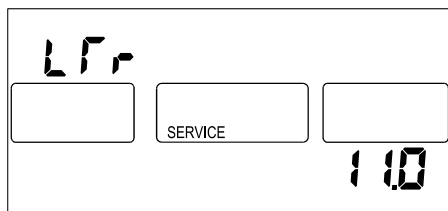


Figure 39 Programming Mode, TU, Cylinder Size Menu

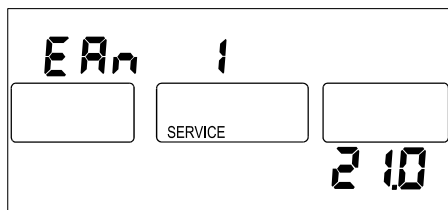


Figure 40 Programming Mode, TU, Normal Blend O2% Menu

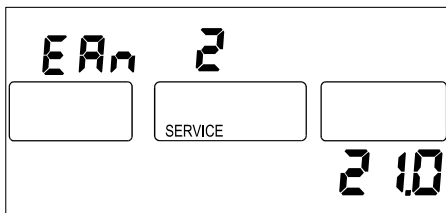


Figure 41 Programming Mode, TU, Blend #2 O2% Menu

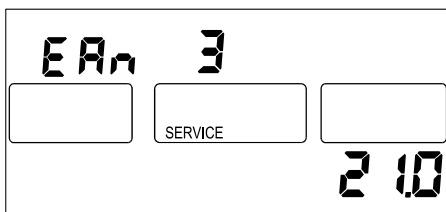


Figure 42 Programming Mode, TU, Deco Blend O2% Menu

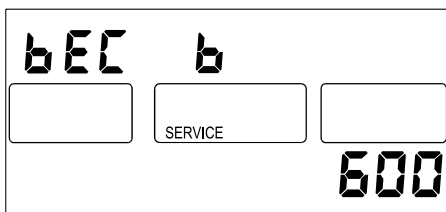


Figure 43 Programming Mode, TU, Deco Time Benchmark Menu

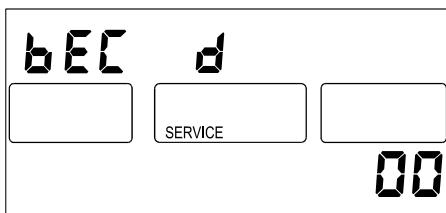


Figure 44 Programming Mode, TU, Deco Depth Benchmark Menu

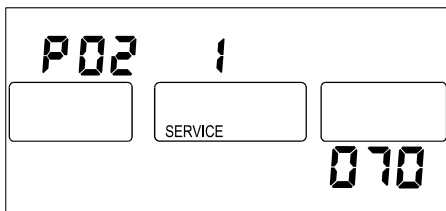


Figure 45 Programming Mode, TU, Normal Blend PO2 Menu

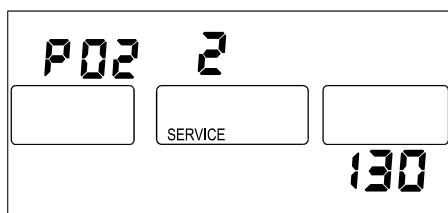


Figure 46 Programming Mode, TU, Deco Blend PO2 Menu

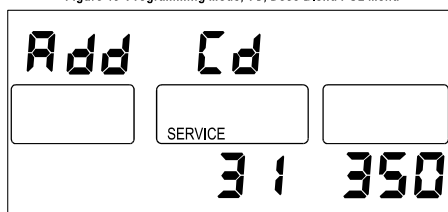


Figure 47 Programming Mode, TU, Address Code Menu

**WRIST UNIT AUTOMATIC SLAVE TO INDEPENDENT MODE SWITCHING:** The Gemini's Intelligent WU is capable of switching from its normal Slave Mode Configuration to an Independent stand alone dive computer. This automatic switching will only occur when the unit is in the Dive or Decompression mode.

In the normal course of a dive the WU is constantly updated with information from the TU. Such information is current Depth, Max Depth, NDC/Deco times, Oxygen Toxicity numbers, all user configurable options and other dive related data. In the remote situation that the WU loses communications with the TU for 90 seconds, the WU will automatically switch to its Independent Mode and take over all calculations that were being performed by the TU. Due to the fact that the TU and WU have different depth and temperature measuring devices, when this switch is made there may be a slight change in these two values.

Once the dive is completed the WU can continue to be used as a dive computer, this is only recommended as a method to complete a dive trip. The WU does not contain any Profile Storage capability. The WU must be programmed by the diver back into the Slave mode.

The resulting configuration of the WU when it is switched to the Independent mode is dependent upon the configuration of the TU and in the case of multi-gas configurations which gas blend is in use when the switch occurs.

The following table lists the different configurations for the Gemini and the resulting configuration for the WU after a switch is made.

TU MODE	#Blends	Identifier	Using	Identifier	WU
					SLA to Ind
FO2	Air	0F21	Air	0F21	Air
FO2	1	1FXX	EAn 1	1FXX	EAn 1

FO2	2	1FXX	EAn 1	1FXX	EAn 1
		2FXX	EAn 2	2FXX	EAn 2
FO2	3	1FXX	EAn 1	1FXX	EAn 1
				3FXX	EAn 3
		2FXX	EAn 2	2FXX	EAn 2
				3FXX	EAn 3
		3FXX	EAn 3	1FXX	EAn 1
				3FXX	EAn 3
PO2	1	1PXX	PO2 1	1PXX	PO2 1
PO2	2	1PXX	PO2 1	1PXX	PO2 1
		2PXX	PO2 2	2PXX	PO2 2
PO2/FO2	2	1PXX	PO2 1	1PXX	PO2 1
		2FXX	EAn 3	2FXX	EAn 3

**DATA STORAGE TYPES & CAPACITY:** The GEMINI has the following internal distinct data storage activities that can be recalled, viewed, and stored with the Analyst® PC computer interface:

- **Current Variable Information:** Local Time, CNS toxicity, OTU dose, OTU Mission Clock, Barometric Altitude, PBAT Battery voltage, SBAT Battery voltage, Time to Fly remaining, Current Unit Temperature, 16 tissues loading.
- **Current Configuration Data:** As can be seen in USER CONFIGURABLE ITEMS, below.
- **Historical Totals Summaries:** Dive Time, Number of Dives, Number of Marginal Dives, Number of Violated Dives, Number of Warnings, Decompression Dives, and Decompression Time, Maximum Depth and Ceiling, Maximum Depth and Ceiling Dive Number.
- **Each Dive Beginning Statistics:** 16 tissues loading, Local Time Clock, Dive of Day, Dive Number, Surface Time, CNS Toxicity, OTU Dose, OTU Mission Clock, Barometric Altitude, Time to Fly, PBAT Battery voltage, SBAT Battery voltage, Surface Gas Consumption, Cylinder Pressure, Cylinder Size. Capacity is the most recent 512 dives (dependent upon memory configuration).
- **Each Dive Ending Statistics:** 16 tissues loading, Bottom Time, Max Depth, Average Depth, Min Remaining NDC Time, Time Remaining Min NDC occurred, Max Deco Time, Max Deco Ceiling, Max Deco Bottom Time, Missed Ceiling, Missed Deco Time, CNS Toxicity, OTU Dose, OTU Mission Clock, Max Ascent Rate, Max A/R Depth, Blend #3 Switch Depth, Blend #3 Switch Time, Min Temperature, Average Temperature, Max Temperature, Min PBAT Battery Voltage, Min SBAT Battery Voltage, Time to Fly, number of Warnings, Max PO<sub>2</sub>, Min PO<sub>2</sub>, Average PO<sub>2</sub>, Dive PO<sub>2</sub> Set Point, High PO<sub>2</sub> Alarm, Cylinder Pressure, Min Remaining Gas Time, Min Gas

Consumption, Time Min Gas Consumption occurred, Max Gas Consumption, Surface Gas Consumption. Capacity is the most recent 512 dives (dependent upon memory configuration).

- **Each Dive Configuration Data:** Full and complete configuration of the system, including Blend #1 Oxygen %, Blend #2 Oxygen %, Blend #3 Oxygen %, Deco Blend Activate Time, Deco Blend Activate Depth, User Conservatism. Capacity is the most recent 512 dives (dependent upon memory configuration).
- **Profile Graphical Information:** Depth Graph, Ascent Rate Graph, Temperature Graph, PO<sub>2</sub> Graph, O<sub>2</sub> % Graph, CNS Graph, OTU Graph, Cylinder Pressure Graph, and Gas Consumption Graph. Capacity is 550 hours at one second sampling (dependent upon memory configuration).
- **Inter-Dive Events:** Number of Initializations, Unit Activation, Altitude Changes of 500 Feet, Low Batteries, Sensor Malfunction, Analyst® Interface with Dive Computer.

**INTER-DIVE EVENTS:** The GEMINI stores important information between dives, even when the unit is not turned on. The information is stored as acquired and is called an "Inter-Dive Event". These events can be viewed via the Professional Version of the Analyst® P.C. Interface version 3.06 or higher. Some Inter-Dive events are:

Initialization of the unit.	The unit is turned on
Low batteries	Altitude Changes of over 500 feet
Sensor Malfunction	Analyst® P.C. Communication

**GAS CONSUMPTION:** Gas Consumption (GC) is a measure of your breathing efficiency. The more you dive, the more efficient your breathing becomes. With your dive computer, you will be able to monitor and log your progress. The number displayed is the amount of gas you breathe per minute in psi normalized to the surface (one atmosphere). This data is sometimes referred to as Surface Gas Consumption (SGC). Gas Consumption is displayed in psi per minute when the computer is configured for imperial calculations and in liters per minute (lpm) when in metric or PO<sub>2</sub> operating mode. Via the optional Analyst® Personal Computer Interface, you can also select Gas Consumption to display in either psi per minute or liters per minute when in Imperial or BAR per minute or liters per minute when in Metric. . If liters per minute is selected when in the FO<sub>2</sub> mode, the high and low alarm point values should be changed to reflect the lpm gas flow values.

In the FO<sub>2</sub> mode depth is eliminated as a variable. You will easily be able to compare your breathing rate from depth to depth and dive to dive. As you know, the amount of actual gas you breathe per minute varies proportionate with depth even if your gas consumption rate remains unchanged. By normalizing your gas consumption rate to the surface, an immediate comparison of the rates can be made. For example, let's say that you made two dives, the first to 99 feet and the second to 66 feet. Lets also assume that your gas consumption rate was the same on both dives; and using the previous example, lets say your GC displayed 23, indicating your breathing rate as 23 psi per minute normalized to the surface. If depth entered the equation, your 99-foot dive would display a SGC of 92 (23 x 4ATM's = 92) while the dive to 66 feet would display a SGC of 69 (23 x 3ATM's = 69). With your dive computer, you can immediately see that your rate remained unchanged from the first to second dive. If the actual psi per minute breathed at depth were displayed, you would have seen two very different numbers, 92 and 69, and you would then have to calculate further to achieve a comparison.

Since GC is computed by monitoring the drop in tank pressure, a larger volume tank will show a more efficient GC while the GC of a smaller tank will be less efficient. For normal, casual sport SCUBA diving on a 10-liter (80 cubic foot tank), a GC of between 18 and 35 is considered normal. If you are diving with a cylinder configuration where the connected cylinders have a volume greater than 25 liters, it is recommended that the Breathing Parameter Units be set to "lpm" (liters per minute)." In the PO<sub>2</sub> mode, regardless if in the Imperial or Metric Mode, the computer displays the volume of gas per minute that you are



consuming in liters per minute (lpm). Gas Consumption in lpm is not normalized to the surface.

The following table shows the units of measure, display indication, and the range for the units of measure for gas consumption in both Imperial and Metric in both the FO2 and PO2 modes.

Units	FO2 MODE				PO2 MODE	
	Imperial		Metric		Imperial	Metric
	psi/min	lpm	bar/min	lpm	lpm	lpm
Display indicator	none	LPM	none	LPM	LPM	LPM
Range	0 - 99	0 - 99	0 - 9.9	0 - 99	0 - 9.9	0 - 9.9

In the FO<sub>2</sub> mode Gas Consumption is computed and updated only after 1 minutes of dive time. After cylinder pressure is applied the GEMINI will display “-.-” for the SGC value, if the system is not being breathed on after one-minute the value will show “0”. Once the diver has been breathing for an additional one minute the SGC value will start to display the divers SGC value.

In the PO<sub>2</sub> mode Gas Consumption is computed and updated after cylinder pressure is applied, the GEMINI will display “-.-” for the GC value, after one-minute the display will show the current GC (O<sub>2</sub> flow rate) value in lpm.

Rebreather divers should ensure that the flow rate is stabilized before beginning a dive.

**USER CONFIGURABLE ITEMS:** The number of and which of the configurable options are viewed is determined by the configuration of your GEMINI.

**Caution: Items that can be changed via Touch Contact Programming may be different from their factory settings.**

By using the optional Analyst<sup>®</sup> Personal Computer Interface, the user has the ability to change the following items:

**Dive Time/Date Stamp:** This is the internal clock setting that is used by the system to time-stamp each individual dive as it occurs. Due to changes in battery voltage and temperature, the internal Time-of-day clock may slowly drift from the ideal. It is recommended that this clock be periodically set to your local time via the Analyst<sup>®</sup>.

**Metric or Imperial:** The diver may select whether the data is computed and displayed in Metric or Imperial units. The GEMINI may be ordered either way as shipped from the factory.

**Cylinder Pressure Metric Measurement Units:** If the computer is set to display in the metric mode, either BAR or kg/cm<sup>2</sup> may be selected to determine the units in which pressure is displayed. The GEMINI may be ordered either way as shipped from the factory.

**Selectable Ascent Rate Bar Graph (Fixed or Proportional):** This option determines whether the Ascent Rate bar graph indicates the speed of ascent or the percentage of the selected maximum ascent rate. The GEMINI is shipped from the factory as PROPORTIONAL.

**Selectable Type of Ascent Rate Alarm (On or Off):** This option gives the diver the ability to utilize a fixed ascent rate warning or a warning based on depth. Should the diver prefer the fixed ascent rate warning, the diver can select the maximum ascent rate limit can be selected in one-foot increments from 20 to 60 feet per minute (See next topic). As shipped from the factory, this is set to FIXED. If the VARIABLE rate is selected then the warning will illuminate based on the following table:

DEPTH	AVERAGE ASCENT RATE
60 feet and deeper	60 feet per minute
59 to 30 feet	same as depth
Shallower than 30 feet	30 feet per minute

**Selectable Fixed Ascent Rate Alarm Limit:** If Variable-By-Depth Ascent Rate alarm was set to OFF from the above topic, the user may enter the desired Ascent Rate for the alarm to sound.

**Ascent Rate for Deco Predictions (20 to 60):** This option allows the diver to select the ascent rate to be used in the forecasting of the displayed Total Decompression time. The GEMINI is shipped from the factory with this option set to 60.

**Ascent Rate Responsiveness (0 to 7):** This option determines the responsiveness or sensitivity of the Ascent Rate Bar Graph. Zero is highly responsive and seven is very slow. This feature is set to three as shipped from the factory.

**Remaining Time Responsiveness (0 to 7):** This option determines the responsiveness or sensitivity of the Remaining Time that is displayed. Zero is highly responsive and seven is very slow. This feature is set to three as shipped from the factory.

**Gas Consumption Responsiveness (0 to 7):** This option determines the responsiveness or sensitivity of the Gas Consumption information that is displayed. Zero is highly responsive and seven is very slow. This feature is set to three as shipped from the factory.

**Max Depth Alarm (0 to 320):** This option allows the diver to select a maximum depth below which, the diver does not wish to descend before an alarm is sounded. This function is disabled when in the Decompression Mode. The option may also be set via the Touch Contact Programming Method. From the factory, the Depth Alarm is set for 130 feet.

**Select Decompression Time Display (Total, Stop, Both):** There are three options for the manner in which the decompression time is displayed.

If you select TOTAL, the decompression time displayed will indicate the total time you will spend in decompression, including ascent to the surface. Watch the Ceiling depth change in order to identify when to ascend to the next stop depth.

If you select STOP, the decompression time displayed will indicate the time you must remain at the current Ceiling. When this time is 0:00, the Ceiling depth will decrease and the new stop time will be displayed.

If you select BOTH, the TOTAL time and STOP time will alternate at the rate of once every 2 seconds. From the factory, the unit is set to BOTH.

**Repetitive Dive Dependent Nitrogen (Off or On):** This option allows the dive computer to consider recent dive history's effects on the nitrogen loading, particularly if the diver engages in inverted profile diving. If "On" the recent dive history is used to compensate the nitrogen loading for the current dive. The GEMINI is shipped from the factory with this feature set to 'Off'.

**Temperature Dependent NDC Computations (Normal or Reduced):** This feature compensates the decompression algorithm proportional to the ambient water temperature. See User & Environmental Adaptation, Water Temperature on page 69 for a detailed description of this function. The GEMINI is shipped from the factory with this feature set to NORMAL.

**Select Altitude <2000 feet as One Zone (Off or On):** This option provides 'actual' altitude for any given day at any diving location as explained in the previous section ALTITUDE ACCLIMATIZATION. With changes in barometric pressure due to temperature and weather systems, it is possible, even expected, to have a different apparent altitude at the same dive site from day to day.

While the seamless means of monitoring provides the most accurate decompression schedule, all altitudes less than 2,000 feet above sea level can be treated in the algorithm as sea level if so selected.

With this option OFF, the unit is calculating altitude in a seamless fashion. With this option ON altitudes less than 2,000 feet above sea level will be treated as sea level. Regardless of the selection, altitudes greater than 2,000 feet above sea level will be treated in a

seamless manner. From the factory, this is set to sense seamless altitude from sea level to 15,000 feet above sea level.

**Select Audible Beeper Alarm (On or Off):** This allows the user to enable or disable the Audible Alarms and beeper. As shipped from the factory, this is set to 'On'.

**Select Ceiling Display Divided by 10 (On or Off):** This option allows the diver to select when in the Decompression Mode the Ceilings are displayed as 1 = 10, 2 = 20, 3 = 30 etc. (On) or as 10, 20, 30 etc (Off). From the factory this option is set to 'Off'.

**Select Nitrox Computations (Enabled or Disabled):** This option enables and disables NITROX computations. If this option is disabled, mixtures other than 21.0% oxygen will be disallowed. Furthermore, if this option is selected as OFF, the GEMINI will not compute CNS Toxicity, OTU Dose, or maximum PO<sub>2</sub> alarm. The factory setting for this option is 'On'. **This option is only available with the Professional Edition of the Analyst®.** As shipped from the factory, this set to 'Enabled'.

**Select Constant Mode Computations (FO<sub>2</sub> or PO<sub>2</sub>):** This allows the user to select between the Constant PO<sub>2</sub> and Constant FO<sub>2</sub> modes. This option may also be set via the Touch Contact Programming method. As shipped from the factory, this is set to 'Constant FO<sub>2</sub>'.

**Blend #1 Cylinder Size:** This is the TOTAL water volume in liters of all the connected diving cylinders that are attached to the TU. If you were diving with twin ten-liter tanks, you would enter 20.0 for this option. If you select zero the dive computer will default to 11.0 liters. This option is set at 10.9 from the factory. To calculate an approximate water volume of a cylinder; divide Cylinder size in Cu. Ft by the working pressure and multiply by 411.

**Cylinder Pressure Alarm Set Point:** This option allows you to set the minimum cylinder pressure reserve that will cause the Low Cylinder Pressure Alarm to sound. The pressure range is from 300 psi to 1500 psi in one-psi increments. The factory setting for this option is 500 psi.

**Cylinder Pressure Reserve Set Point:** This option allows you to set the minimum cylinder pressure reserve that will be used to calculate Remaining gas time. When this value is reached the Remaining gas time will display 0:00. The range is from 300 psi to 1500 psi in one-psi increments. The factory setting for this option is 500 psi.

**Select NITROX Blend #2 Switching:** This option enables your unit to switch to Blend #2. This option is enabled from the factory.

**Select NITROX Deco Blend Switching:** This option enables your unit to switch to Blend #3. This option is enabled from the factory.

**Select Blend Switching back to Blend #1:** This option allows the algorithm to switch back to Blend #1 should you begin to breathe off your bottom mix during ascent. You may choose to disable this option if you will be using your bottom blend cylinder for filling lift bags at the end of the dive. This option is enabled from the factory.

**Enter Normal Blend Oxygen % in NITROX mixture:** This option allows you to enter the analyzed oxygen percentage for blend #1 in 0.1 % increments. Range is 21.0% to 50.0% factory setting is 21%.

**Enter Blend #2 Oxygen % in NITROX mixture:** This option allows you to enter the analyzed oxygen percentage for blend #2 in 0.1 % increments. Range is 21.0% to 99.9% factory setting is 21%.

**Enter Deco Blend Oxygen % in NITROX mixture:** This option allows you to enter the analyzed oxygen percentage for blend #3 in 0.1 % increments. Range is 21.0% to 99.9% factory setting is 21%.

**Enter Deco Blend Bottom Time activation minutes:** You will enter the bottom time benchmark for switching to Blend #3

**Enter Deco Blend Depth activation feet:** You will enter the depth benchmark that you must ascend above for switching to Blend #3

**Enter Normal Dive PO<sub>2</sub> for Constant PO<sub>2</sub> Computations (.50 to 1.50):** This allows the user to experiment with different PO<sub>2</sub>s. This option may also be set via the Touch Contact Programming method. As shipped from the factory, this is set to 0.7.

**Enter Deco PO<sub>2</sub> for Constant PO<sub>2</sub> Computations (.50 to 1.50):** This allows the user to experiment with different PO<sub>2</sub>s. This option may also be set via the Touch Contact Programming method. As shipped from the factory, this is set to 0.7.

**Gas Consumption Alarm Lower Limit:** The computer is shipped with this limit set to zero. You will need to reset a low limit below, which the alarm will sound.

**NOTE:** There are separate low limit values for the FO<sub>2</sub> mode and PO<sub>2</sub> mode.

**Gas Consumption Alarm High Limit:** The computer is shipped with this limit set to 99. You will have to reset a high limit above, which the alarm will sound.

**NOTE:** There are separate high limit values for the FO<sub>2</sub> mode and PO<sub>2</sub> mode.

**Select Breathing Parameter Units (psi/min or lpm):** This option allows you to select whether the Gas Consumption value displayed is shown in psi/min or liters per minute (lpm)

**Select Automatic PO<sub>2</sub>/FO<sub>2</sub> Switching (Enabled or Disabled):** This option enables the unit to switch from the Normal Dive PO<sub>2</sub> mode to the Deco Blend FO<sub>2</sub> mode. As shipped from the factory, this is set to 'Disabled'.

**Select Touch Contact Programming of PO<sub>2</sub>/FO<sub>2</sub> Switch (Enabled or Disabled):** This option allows the diver to switch from the PO<sub>2</sub> mode to the FO<sub>2</sub> mode and vice versa via the Touch Contacts. As shipped from the factory, this is set to 'Disabled'.

**Enter Maximum PO<sub>2</sub> Alarm Value (0.5 to 1.6):** This option allows you to set a desired maximum PO<sub>2</sub> value that if exceeded will cause an alarm that will sound once per minute. The WARNING legend and the PO<sub>2</sub> digits will flash and the O<sub>2</sub>TOX Legends will illuminate. As shipped from the factory this feature is set to 1.4 ATA.

**Selectable NDC Conservatism (0% to 50%):** This feature will allow the diver to input an added degree of conservatism to the decompression algorithm from 0 to 50 percent in one-percent increments. This may be desirable if the diver is dehydrated, tired, or has some other factor that warrants added conservatism. This option may also be set via the Programming Mode. Conservatism is set to zero as shipped from the factory.

**Enable Mix Switching In Deco Forecast (Enabled or Disabled):** This option enables the units to forecast decompression times utilizing the programmed deco gas for stops that are shallower than the switch depth. As shipped from the factory this option is enabled.

**High CNS Alarm Point (40% to 80%):** This option allows the diver to select a maximum CNS (Central Nervous System) exposure at which an alarm is sounded. Values from 40% to 80% are allowed. This is set to 50% at the factory before shipping.

**High OTU Alarm Point (40% to 80%):** This option allows the diver to select a maximum OTU (Oxygen Tolerance Units) exposure at which an alarm is sounded. Values from 40% to 80% are allowed. This is set to 50% at the factory before shipping.

**Confined Water Protocol (Training Mode) - (Enabled or Disabled):** This option enables the Training Mode for the GEMINI. In this mode the GEMINI will enter the Dive Mode at 2 feet instead of 5 feet and exit the Dive Mode at 1 foot instead of 3 feet. The Training Mode also permits the selection of an increased Post Dive Interval period from 10 to 30 minutes in one-minute increments. These changes permit the Instructor to record a complete training session, including in-water surface periods, as a single dive. As shipped from the factory, this is set to 'Disabled'. **This option is only available with the Professional Edition of the Analyst®.**

**Training Mode Post Dive Interval Period (10 to 30):** If the Training Mode is enabled this allows the user to select the duration of the Post Dive Interval period from a minimum of 10 minutes to a maximum of 30 minutes in one-minute increments. As shipped from the

factory, this is set to 10. **This option is only available with the Professional Edition of the Analyst®.**

**Select Clock Functions (ON or OFF):** This option allows the diver to enable or disable the time of day Clock. If set to ON the clock time can be set via Touch Contact Programming method. As shipped from the factory, this is set to OFF.

**Enter Clock Time:** This allows the diver to set the clock's time to that of the P.C. time.

**Enter Wrist Unit Address Code:** This option allows you to assign a different wrist unit address code number to the GEMINI.

**Restore Original Configuration Settings:** This allows the diver to restore the original factory default settings with a single command.

## **TANK UNIT SPECIFICATIONS:**

Algorithm:	16 Tissue Adaptive Modified Haldanean
Computation Period	Once every second
TU Activation	Manual and Water and High Pressure
WU Activation	Manual and Water
Depth Range*	Over 327 feet, 1-foot increments
Depth Accuracy	+/- 1% of full scale (+/- 3.3 feet)
Cylinder Pressure Range	0 - 5119 psi, 1 psi increments
Cylinder Pressure Accuracy	+/- 1% of full scale (+/- 51 psi)
Maximum Altitude	15,000 feet
Altitude Accuracy	+/- 1000 feet
Temperature Range	0 to 99 degrees F, 1 degree increments
Temperature Accuracy	+/- 2% of full scale after the unit has stabilized from a change in temperature
Surface Time	0 to 19:59 hrs/mins, 1 minute increments
Bottom Time	0 to 19:59 hrs/mins, 1 minute increments
Time To Fly	0 to 36 hours, 1 hour increment
No-Deco Time	0 to 9:59 hrs/mins, 1 minute increments
Decompression Time	0 to 9:59 hrs/mins, 1 minute increments
Decompression Ceiling	0 to 320 feet, 10-foot increments
Dive Profile Storage	up to 550 dive hours at one second sampling (depending upon configuration)
Profile Sampling	1 second increments

\* While the Gemini is capable of depths greater than 327 feet it is only rated to 327 feet.

## **MONITOR WRIST UNIT SPECIFICATIONS:**

WU Activation	Manual and Water
Depth Display	0 to 327 feet, 1-foot increments
Cylinder Pressure Display	0 - 5119 psi, 1 psi increments
Temperature Display	0 to 99 degrees F, 1 degree increments
Surface Time Display	0 to 19:59 hrs/mins, 1 minute increments
Bottom Time Display	0 to 19:59 hrs/mins, 1 minute increments
Time To Fly Display	0 to 36 hours, 1 hour increment
No-Deco Time Display	0 to 9:59 hrs/mins, 1 minute increments
Decompression Time Display	0 to 9:59 hrs/mins, 1 minute increments
Decompression Ceiling Display	0 to 320 feet, 10-foot increments
Dive Summary Storage	12 Dives

## Power

	TANK UNIT	WRIST UNIT
Battery size	4 'AA'	2 'N'
Battery type	Alkaline, Lithium, Nickel Cadmium	Alkaline
Typical battery Life	1,000 dive hours*	Over 1000 dive hours.* depending on TACLITE™ use

\* With fresh new ENERGIZER® brand alkaline batteries

**NOTE:** Specifications are an additional +/- one least significant display digit due to rounding. Specifications are subject to change without notice.

**ENHANCEMENTS:** The GEMINI is capable of having its' capabilities enhanced. It can be upgraded to a two-blend or three-blend Nitrox computer and/or a One or Two blend Nitrox/PO<sub>2</sub> computer. **The GEMINI must be returned to the factory for all upgrades.**

## CARE AND MAINTENANCE:

**The Tank Unit and Wrist Unit contain NO user serviceable components. DO not remove the lid from the Tank Unit or the Lens from the Wrist Unit, doing so WILL VOID the Limited Warranty.**

**RINSING AND CLEANING:** Your dive computer is designed to require minimum care and maintenance. Both the TU and WU are molded from fiberglass-reinforced resins that are extremely resistant to salt, chlorine, and exposure to ultraviolet light. However, both the TU and WU contain sophisticated electronic components, and therefore, require reasonable care and treatment.

- Avoid sharp impacts to the TU and WU.
- Do not expose units to extreme heat or cold.
- Replace batteries when they become discharged, or once a year, whichever should occur first.
- Rinse both units with fresh water and allow them to air-dry after each use. Take special care when rinsing the opening on the TU that is between the battery caps. DO NOT attempt to clean this area with a pointed object or with blasts of compressed air. Doing so will cause severe damage to your TU, rendering it inoperable and voiding the Warranty

You can extend the service life of your dive computer by simply rinsing it with fresh water. When using a garden hose to rinse your unit, keep the water pressure very low. No chemicals of any type should be used on your dive computer. The WU's rubber strap may be conditioned with silicone spray especially developed for use with SCUBA equipment. You will find this type of silicone spray at your local dive shop. Care should also be taken to prevent your WU's lens from becoming scratched or damaged. Minor scratches will become invisible underwater. However severe gouges or cracks in the lens would require that it be replaced.

**HIGH-PRESSURE TRANSDUCER CARE:** When installing your high-pressure transducer, use a scuba tool or a thin open-ended wrench on the transducer's hex nut to tighten, **DO NOT use tools such as vise-grips or channel lock pliers. These tools can damage the transducer and such damage is not covered by the limited warranty.** When the TU is not attached to your regulator, replace the dust cap on the high-pressure transducer to prevent contaminants from entering the opening. **NEVER** insert any object into the high-pressure transducer opening. **SEVERE DAMAGE** may result.

**BATTERY TYPE AND REPLACEMENT:** Your dive computer operates on two different sizes of user-replaceable batteries. The TU requires four 'AA' batteries while the WU requires 2 alkaline 'N' batteries. The TU may be powered by any of the following types of batteries, Alkaline (tester, non-tester, rechargeable), Lithium and Nickel Cadmium. Cochran recommends the use of ENERGIZER® brand batteries. Alkaline batteries may only power the WU. Use of old, off-brand, incorrect and/or visibly corroded batteries will also affect performance, damage the units, and void the warranty. Always replace all four AA-size TU batteries at the same time, **Do not mix new and used batteries.**

There are factors, which can significantly vary battery-operating life. These include:

- Original quality of battery as manufactured.
- Age of battery prior to installation.
- Length of time the batteries have been installed.
- Frequency and cumulative number of WARNINGS issued by the computer.
- Temperature of the battery in operation.

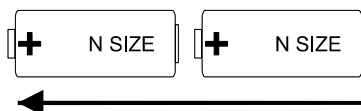
Fresh ENERGIZER® brand batteries installed in the TU or WU will read about 3 volts as viewed of the InFormation screen, accessed by Touch Contact Programming. When the TU reaches 2.1 volts the low battery alarm will cause the PBAT and SBAT legends to illuminate. At 1.6 volts, your TU will not turn on. Since the WU is equipped with the TACLITE™ backlighted display, battery life in the WU will be affected depending upon the number of times you activate the TACLITE™. On a new, fresh set of ENERGIZER® brand N-type batteries in the Wrist Unit, you should get approximately 10,000 TACLITE™ cycles.

To replace the TU batteries:

- a) Prepare four new ENERGIZER® brand alkaline batteries
- b) Double check the orientation of batteries with the picture on the bottom of the battery tubes. When installing new batteries, ensure that the positive "+" end of the battery is inserted into the battery compartment first.
- c) Using the supplied battery replacement tool, remove one battery cap; replace the batteries, re-install the battery cap carefully making sure not to cross-thread the battery cap
- d) Remove the other battery cap; replace batteries, re-install the battery cap carefully making sure not to cross-thread the battery cap

To replace the WU batteries:

- a) Prepare two new ENERGIZER brand alkaline batteries
- b) Double check the orientation of batteries with the picture at the bottom on the back of the WU case
- c) Using the supplied battery replacement tool, remove the battery cap; replace the batteries, re-install the battery cap carefully making sure not to cross-thread the battery cap
- d) When installing new batteries, ensure that the positive "+" end of the battery is inserted into the battery compartment first.



**Plus end goes in First**

**BATTERY CARE:** Two separate, sealed TU battery compartments isolate the batteries from the Primary computer. Gases given off by the chemical reaction that produces electricity within batteries react with the metal contacts of the batteries, causing corrosion. Over time, this coating accumulates and lowers the amount of power the battery can

deliver. Even though batteries that have been in the dive computer for a period of time may indicate ample voltage, the corrosion interferes with delivery of power from the battery to the dive computer. Preventive maintenance in the form of the periodic burnishing of the battery's contacts and applying a thin film of silicone grease to the battery terminals will greatly minimize this corrosion.

**NOTE:** It is always advisable to replace older or questionable TU batteries with new, fresh batteries before a long series of dives, especially if your dive computer has been inactive for an extended time.

**NOTE:** Remember, your TU cannot be manually turned off; and since the TU computes all of the diving data, if the WU turns off it will not affect your decompression information. Residual nitrogen elimination, as well as time To Fly can be viewed by turning the WU back on.

**CAUTION!!!** DO NOT ALLOW THE GEMINI TO HAVE LOW OR NO BATTERIES FOR ANY EXTENDED PERIOD OF TIME! ACCIDENTAL OR INTENTIONAL LOSS OF BATTERY POWER WILL CAUSE ALL PREVIOUS DIVE NITROGEN LOADING TO BE LOST. THIS MAY AFFECT NITROGEN CALCULATIONS ON NEAR-FUTURE DIVES. AFTER A BATTERY CHANGE, CONFIRM THAT NO-DECOMPRESSION TIME DATA IS REASONABLE DURING PRE-DIVE PREDICTION MODE. DIVE-OF-DAY NUMBER GOING TO ZERO IMMEDIATELY AFTER CHANGING BATTERIES IS ANOTHER INDICATION OF A LOSS OF NITROGEN LOADING. IF LOSS OF NITROGEN LOADING OCCURS, COCHRAN STRONGLY RECOMMENDS THAT A PERIOD OF 24 HOURS ELAPSES BEFORE MAKING ANY SUBSEQUENT DIVES.

**PRODUCT ASSISTANCE, REPAIR & MAINTENANCE:** If you suspect that your GEMINI is not operating correctly, please contact our Customer Support Department in the USA for assistance at 972.644.6284 or FAX details to 972.644.6286 or E-mail details to [service@divecochran.com](mailto:service@divecochran.com). Most problems can be resolved without returning the unit. The unit may also be returned to the place of purchase and request the dealer to contact us. If this is not possible or is inconvenient due to a change in location, contact us for the name of the nearest Team Cochran Authorized Dealer.

- **NEVER TEST OR SUBJECT THE PRODUCT TO PRESSURIZED AIR!**
- **NEVER PRESSURE POT TEST DIVE THE UNIT IN AIR!**
- **NEVER REMOVE THE LENS FROM THE WRIST UNIT!**
- **NEVER REMOVE THE LID FROM THE TANK UNIT!**
- **ONLY USE FRESH WATER TO CLEAN THE UNIT! NEVER USE SOLVENTS!**
- **DO NOT USE A SCREWDRIVER TO REMOVE THE BATTERY CAPS(s)!**
- **ALWAYS KEEP FRESH ENERGIZER® BRAND BATTERIES INSTALLED!**
- **ALWAYS USE 1.5 VOLT BATTERIES!**
- **LUBRICATE BATTERY ENDS WITH A THIN FILM OF SILICONE GREASE!**

#### **REPLACEMENT PARTS:**

High-pressure O-ring	19917
Tank Unit Battery Cap O-ring	19918
Tank Unit Battery Caps w/O-rings	19919
Wrist Unit Battery Cap O-ring	19930
Wrist Unit Battery Cap w/O-rings	19934



Mounting Clips, TU, Pkg. of Two	19924
Strap, Replacement Set, Black	19951
Pins (2), replacement	19949
Wrist Unit Lens Protector	15401
Large Retractor	15925
Large Retractor w/compass	15935

### **Analyst® Personal Computer Interface**

The Analyst® Personal Computer Interface is a complete hardware/software system that down loads data from the **GEMINI** dive computer to an IBM or compatible Personal Computer with a Windows® 95/98/NT/Millennium/2000/XP operating system. The Analyst® Personal Computer Interface allows the diver to retrieve dive data, customize the dive computer and to also enter and store additional information for each dive in a logbook database. Visit Your Team Cochran Dealer for a demonstration.

**WRIST UNIT WILL NOT WAKE-UP:** If the WU is separated from the TU, while cylinder pressure is being displayed and the WU goes to "sleep". The WU will not respond to bridging or shorting contacts 1 and 2 (will not wake-up). In order to "wake - up" the WU, a battery reset will have to be preformed. To perform a battery reset:

1. Remove the WU battery cap, using the battery replacement tool
2. Remove the top battery
3. Reinsert the battery backward (negative end in first)
4. Replace the battery cap
5. Wait +/- 15 seconds
6. Remove the battery cap
7. Remove the top battery
8. Reinsert the battery correctly (positive end in first)
9. Replace the battery cap

To prevent this WU condition, ensure that the WU is displaying zero cylinder pressure before it is separated from the TU.

### **Frequently Asked Questions**

- Q.** Should I turn my WU off when it is not in use?
- A.** Unlike previous Cochran hoseless WUs, the GEMINI WU can not be turned off. If the WU is out of communication with the TU the WU will turn off in 15 minutes.
- Q.** Shouldn't I take the batteries out of the TU when my dive computer is not going to be used for several months?
- A.** **No.** Removing the batteries, or leaving fully discharged batteries in the TU, will cause the timestamp clock to stop; it does not operate when the batteries are removed.
- Q.** When I change the batteries in my TU, will my dive computer retain data for the current dive?
- A.** Yes, providing you follow the instructions on battery replacement.
- Q.** When I manually turned the TU on, it did not issue the five confirmation beeps, WHY?
- A.** The TU may already be on. Turn your WU on to see if the TU is transmitting data. If it is not, check the batteries to see if their voltage is low. In a noisy environment such as on the boat when it is underway, it may be difficult to hear the confirmation beeps.
- Q.** At what battery voltages will my TU cease to operate?

- A.** Fully charged, the two sets of two AA batteries each provide 3.0 volts. When they discharge to below 2.0 volts, your TU will not turn on.
- Q.** Can I turn the TU on underwater?
- A.** Yes. The TU will turn on if you are underwater. Should you enter the water and begin a descent without turning the TU on, the TU will turn on when the Touch Contacts are submerged. Since the TU is also pressure activated, if the TU is not on when you enter the water you have not opened the valve on your cylinder.
- Q.** Is the transmitting range affected by the positioning of the TU and WU?
- A.** Yes, however, in normal diving situations there is sufficient operating range regardless of orientation.
- Q.** What is the proper way to tighten the TU and WU battery caps?
- A.** The caps should be tightened using the enclosed battery removal tool. The O-rings should not be visible when the caps are properly tightened, but be careful not to over-tighten the caps. Once the O-rings are seated, simply hand-snug each cap.
- Q.** What happens if the battery compartments flood?
- A.** The electronics of both the TU and WU are completely environmentally sealed. The construction of the battery compartments will not allow water to enter the electronics. If you have flooded the battery compartment(s), first rinse the compartment(s) as soon as possible with fresh water. Then fill the compartment(s) with alcohol and shake the alcohol to ensure complete rinsing. Drain the alcohol and allow the compartment(s) to air-dry 12 hours with the battery caps off. Discard the batteries. Finally, examine the battery cap, replace and lubricate the o-rings, install new ENERGIZER® brand batteries and reinstall the battery caps.
- Q.** Can I transport my dive computer in a watertight container while traveling at altitude?
- A.** No. Your dive computer continuously monitors the altitude to perform nitrogen in-gassing and out-gassing. These nitrogen levels are then used when you arrive at the dive site and intelligently applied to your dive.
- Q.** When I turn my cylinder on, sometimes it takes 10 to 15 seconds before the TU issues its' wake-up beeps. Why?
- A.** The tank unit is programmed to check for cylinder pressure every 16 seconds. If the Tank Unit detects over 200 psi, it will wake-up and beep three times. If no pressure is detected, it sleeps for another 16 seconds.
- Q.** What should I do if I have additional questions?
- A.** Call us! For your convenience, we are available Monday through Friday, 8:00 a.m. to 5:00 p.m. Central Time. Our staff of certified instructors will be glad to assist you by answering any of your questions. Our telephone number is 972.644.6284. You may also FAX questions to 972.644.6286 or E-MAIL your questions to [service@divecochran.com](mailto:service@divecochran.com).

Most problems can be resolved without returning the unit. The unit may also be returned to the place of purchase and request the dealer to contact us. If this is not possible or is inconvenient due to change in location, contact us for the name of the nearest Team Cochran Authorized Dealer.

**FCC LABEL****FCC ID: LYP744556-04**

**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.**

**INTERFERENCE STATEMENT**

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

- Reorient or relocate the receiving antenna of the affected radio or television.
- Increase the separation between the equipment and the affected receiver.
- Connect the equipment and the affected receiver to power outlets on separate circuits.
- Consult the dealer or an experienced radio/TV technician for help.

**MODIFICATIONS**

Changes or modifications not expressly approved by Cochran Consulting, Inc. could void the user's authority to operate the equipment.

**SHIELDED CABLES**

This product is designed to be used only with the Analyst® interface cable (RS-232) to maintain compliance with FCC Regulations.

**PATENT INFORMATION**

Protected under one or more Foreign or US patents.

5,899,204 5,794,616

5,617,848 5,570,688

Other patents may be pending.

All specifications subject to change without prior notice. GEMINI® and Analyst® are registered trademarks of Cochran Consulting, Inc. Energizer is a registered trademark of the Eveready Battery Co., St. Louis MO. Copyright 2002 Cochran Consulting Inc.



NORMES EMC 89/336/EEC  
EMC 89/336/EEC STANDARDS  
HOMOLOGADA EMC 89/336/EEC  
ZERTIFIZIERUNG EMC 89/336/EEC

The CE mark is used to mark conformity with the European Union EMC directive 89/336/EEC. Cochran dive instruments fulfill all the required EU directives.

**PREN 13319**

PREN 13319 "Diving accessories – Depth gauges and combined depth and time measuring devices – Functional and safety requirements test methods" is a European diving depth gauge standard draft. Cochran dive instruments are designed and tested to comply with this standard draft.

## **LIMITED WARRANTY**

To the original purchaser ("OWNER") only, Cochran Undersea Technology, a division of Cochran Consulting, Inc. ("COCHRAN"), represents this Product to be free of defects in both materials and workmanship under normal recreational SCUBA use for 24 months from the date of shipment from COCHRAN to the Authorized Dealer or Distributor. For purposes of establishing warranty eligibility, this date may be noted on the original product box, or can be determined by contacting COCHRAN.

Any defective Product, unless cause is specifically excluded in the "Warranty Conditions and Limitation" section below, will, at the sole discretion of COCHRAN, be repaired, or replaced with a new or refurbished unit of comparable or better function and/or condition. COCHRAN is not responsible for any direct, incidental, or secondary damages as a result of Product malfunction

## **WARRANTY LIMITATIONS AND EXCLUSIONS**

Product must have been obtained from a COCHRAN Authorized Dealer. Contact COCHRAN for verification of dealer status. This Warranty is not transferable.

The warranty registration card must be sent to COCHRAN within 15 days of the purchase in order to validate Limited Warranty

Failure to provide proper care for this Product will render this Limited Warranty null and void. Damages or malfunction resulting from accidental or deliberate abuse, tampering, battery leakage, exceeding maximum intended operating depth or other parameters, extreme heat or cold, or other conditions that COCHRAN deem to be outside the intended scope of this Limited Warranty are not covered. This Limited Warranty does NOT cover plastics, o-rings, batteries, battery life, and flooded battery compartments.

This Limited Warranty will be rendered null and void if an attempt is made to establish communications with the Tank Unit or the Wrist Unit with any hardware and/or software other than the Cochran approved ANALYST<sup>®</sup> Interface.

OWNER is responsible for shipping this Product to COCHRAN for service and paying all associated costs, including shipping, insurance, and import duties. OWNER may take Product to an Authorized Dealer to arrange service under terms of this Limited Warranty. COCHRAN will return Product to OWNER or Dealer via a method and carrier of its choosing. Costs for requested expedited return shipping would be the responsibility of OWNER. Product returned for service under terms of this Limited Warranty must be accompanied by a photocopy of the original sales receipt in order for warranty repair or replacement to be performed if the Warranty Registration Card is not on file.

## **STATEMENT OF LIMITED LIABILITY**

A mathematical model is used by this Product to calculate physiological effects of SCUBA diving related to the use of compressed air or other breathing mixtures while at depth. Such effects specifically relate to nitrogen absorption into and elimination from body tissues, as well as effects of oxygen used in Enriched Air Nitrox breathing mixtures.

However, because of the number of variables and the varying degrees to which they may affect individuals engaged in SCUBA diving, COCHRAN DOES NOT GUARANTEE THAT USE OF THIS PRODUCT WILL PREVENT DECOMPRESSION SICKNESS OR ANY OTHER CONDITION OR INJURY INCURRED WHILE USING THIS PRODUCT.

These influencing variables may include, but are not limited to, dehydration, obesity, age, old injuries, or other physical conditions on the part of the diver, or environmental extremes of heat or cold, or poor training, or diving practices, any of which may promote the onset of

decompression sickness or other harmful effects.

This Product is sold and intended to be used only as a guide, providing the TRAINED and CERTIFIED diver the information needed to make his own intelligent diving decisions. It is expressly understood that by buying and/or using this Product the Diver assumes ALL RISK as to its operability, reliability, quality, performance, accuracy, and suitability for his diving style. Furthermore, Diver recognizes that this Product is an electronic instrument being used in a hostile environment and is subject to failure, which may manifest itself in a number of ways. COCHRAN and its distributors and retailers will not be held liable for any personal injuries or other damages resulting from its use, even if COCHRAN has been advised of such occurrences or damages.

This product must be handled with care and properly maintained to assure the optimum performance. Users must possess the proper training for SCUBA diving activities and should be fully educated in the operation of this product. Users are encouraged to possess and utilize a redundant (backup) computer for their dive planning and execution. Divers are always encouraged to dive with a buddy at all times.

COCHRAN strongly supports and agrees with maximum depth limits of 130 feet for recreational SCUBA diving, as established by recognized training and certification agencies, and in no way encourages diving beyond these or any prudent lesser limits as may be necessitated by environmental, diver-specific, or other conditions.

THE WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHERS, WHETHER ORAL OR WRITTEN, EXPRESSED OR IMPLIED. COCHRAN UNDERSEA TECHNOLOGY SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

No Cochran Undersea Technology dealer, agent, or employee is authorized to make any modification, extension, or addition to this warranty.

**CAUTION!!!** ACCIDENTAL OR INTENTIONAL LOSS OF BATTERY POWER WILL CAUSE ALL PREVIOUS DIVE NITROGEN LOADING TO BE LOST. THIS MAY AFFECT NITROGEN CALCULATIONS ON NEAR-FUTURE DIVES. AFTER A BATTERY CHANGE, CONFIRM THAT NO-DECOMPRESSION TIME DATA IS REASONABLE DURING PRE-DIVE PREDICTION MODE. DIVE-OF-DAY NUMBER GOING TO ZERO IMMEDIATELY AFTER CHANGING BATTERIES IS ANOTHER INDICATION OF A LOSS OF NITROGEN LOADING.

IF LOSS OF NITROGEN LOADING OCCURS, COCHRAN STRONGLY RECOMMENDS THAT A PERIOD OF 24 HOURS ELAPSE BEFORE MAKING ANY SUBSEQUENT DIVES.

No Cochran Undersea Technology dealer, agent, or employee is authorized to make any modification, extension, or addition to this warranty.

**USER & ENVIRONMENTAL ADAPTATION:** The GEMINI is one of the new breed of Dive Computers that adapts its algorithm to the users diving environment and style as originally pioneered by COCHRAN. All of COCHRAN's newer dive computers incorporate this capability. The factors used for this 'Adaptation' in the GEMINI are:

Water Temperature  
Microbubble  
User Conservatism  
Workload

Salt/Fresh Water Compensation  
Altitude Acclimatization  
Previous Dive Profile

However, the GEMINI allows the diver, via the optional Analyst® P.C. Interface, to disable the Temperature compensation should the diver deem a particular diving situation would so warrant. Calculation of Central Nervous System Oxygen Toxicity (CNS), Mission Oxygen Tolerance Units (OTUs), and the Partial Pressure of Oxygen (PO<sub>2</sub>) is yet another added

feature of this algorithm. Sixteen half-time compartments ranging from 2.5 minute to 480-minute theoretical tissue groups are used. You will find that this unit is extremely user friendly and can be customized to your individual diving conditions and practices. Factors that influence the decompression algorithm of your GEMINI are detailed below.

**WATER TEMPERATURE:** Diving in cold water can lower a diver's core and skin temperature, affecting the gas exchange rate of the body's tissues. The GEMINI features two modes of Temperature compensation, Reduced or Normal, in the Normal Mode the GEMINI progressively makes its' nitrogen algorithms more conservative as the water temperature declines below 75 degrees F. Above this water temperature, there is a minimal amount of temperature compensation. In the Reduced Mode, the algorithms are made more conservative by a fixed amount regardless of water temperature. If the diver is wearing an insulated dry suit and is relatively warm even in cold water, this temperature compensation factor may be set to the Reduced Mode at the divers discretion using the Analyst<sup>®</sup> PC software.

**MICROBUBBLE:** There are several theories regarding the method by which a nitrogen bubble forms from a microbubble. Currently, the predominant theory states that more rapid ascents accelerate bubble formation. The GEMINI accounts for this by progressively increasing its compensation as the diver's ascent rate exceeds 30 feet-per minute (fpm).

**USER CONSERVATISM:** Current dive computers cannot tell if the diver is dehydrated, tired, smokes, overweight, or has some other physical issue that may require additional conservatism in the nitrogen algorithm. The GEMINI allows the diver to input an added degree of conservatism to the nitrogen algorithm from 0 to 50 percent in one-percent increments. Touch Contact programming is featured.

**PREVIOUS DIVE PROFILES:** Under some circumstances, recent dive activity can have an effect on nitrogen loading, particularly if the diver engages in inverted profile diving. This occurs when a deep dive is followed by an even deeper dive. This recent dive history is used to compensate the nitrogen loading for the current dive.

**SEA WATER/FRESH WATER RECOGNITION (High/Low Conductivity):** There is approximately three-percent difference in depth readings taken in fresh water versus seawater. Some dive computers are calibrated in feet of fresh water and some are calibrated in feet of salt water. Diving in a medium different from what the dive computer is calibrated will cause apparent depth errors. Only COCHRAN dive computers, including the GEMINI, actually determine the type of diving medium and compensate the depth reading accordingly. This is accomplished by measuring the conductivity of the water during a dive. Caution must be taken in interpreting this reading since some apparent fresh water is actually high in minerals or contaminants and is correctly compensated as salt water (High Conductivity). This commonly occurs in some caves, springs and lakes.

**ALTITUDE ACCLIMATIZATION:** Driving or flying to a dive site significantly higher in altitude requires special modifications to the sea level algorithm. The GEMINI regularly samples the ambient barometric pressure to determine these changes in altitude. Accordingly, the decompression algorithm is changed to reflect these barometric pressure changes. Note: temperature and weather systems also affect barometric pressure and hence, apparent altitude. Using the Time To Fly digits, the number of hours required to adapt to the new altitude is immediately known to the diver. If a significant altitude change occurs, a minimum of one hour should pass before diving to allow the unit to adapt to this new altitude. Rapid changes in altitude should be avoided. The dive computer may interpret a rapid change from a high altitude to a lower altitude as a dive. Should this occur, removing the batteries for ten minutes would reset the computer, however, all tissue nitrogen loading will also be lost.

Should it be desired to initiate a dive PRIOR to completing the adaptation time, the GEMINI

will treat this dive as a repetitive dive in its algorithm, taking into account the residual nitrogen present due to travel to altitude. There are two methods of compensating for altitude. Via the Analyst® P.C. Interface, ZONE or SEAMLESS compensation for altitude may be selected.

In **ZONE**, all altitudes less than 2,000 feet above sea level use the sea-level algorithm. At altitudes greater than this, altitude compensation is seamless; literally, every small fraction of gained altitude is considered in adjusting the algorithm. ZONE will reduce the occurrences of obtaining slightly different altitude readings and corresponding no-decompression (NDC) limits when diving within a given area. ZONE reduces the accuracy of altitude compensation for the first 2,000 feet above sea level, treating altitudes below 2,000 feet as sea level. The advantage in ZONE is that changes in apparent altitude (due to temperature or weather changes at sea level) will not affect NDC computations.

In **SEAMLESS**, the algorithm is adjusted for extremely small changes in altitude. A difference in altitude may be seen from day-to-day at a given dive site due to temperature or weather systems and their effect on barometric pressures. SEAMLESS will provide the most accurate altitude compensation algorithm, but normal variations in atmospheric barometric pressure may affect the no-decompression time which is more predominantly seen in the PreDive Prediction forecast.

**WARNING:** While your GEMINI will automatically adjust its no decompression algorithm for altitude, you should NOT attempt to dive at altitudes greater than 1,000 feet above sea level without first completing a sanctioned altitude diving course from a recognized training agency for recreational diving. The GEMINI Plus should not be used for this type of diving by anyone without this important training.

**WORKLOAD COMPENSATION:** When a diver's work rate or exertion level increases, he consumes more breathing gas (air) and his Breathing Mix Gas Consumption (GC)/Surface Air Consumption (SAC) increases. The diver exchanges and retains higher levels of nitrogen in his tissues at a high work rate as compared to a low work rate. As work rate increases, the GEMINI compensates by progressively increasing the conservatism of its nitrogen algorithms. The Workload Compensation starts when the diver's GC exceeds 35 psi per minute and reaches maximum compensation at 98 psi per minute. For accurate Workload Compensation the cylinder size, in liters, must be set correctly. This can be done by the Programming Mode or with the Analyst® Personal Computer Interface.

**METRIC/IMPERIAL MODES:** Most dive computers always compute in either Metric or Imperial units and merely convert the display to the other units. The GEMINI actually computes and displays in the selected units giving maximum accuracy and user familiarity. If the computer is computing and displaying in Metric, the "METRIC" legend will be illuminated when the computer is on. Metric/Imperial selection is made using the Analyst® software. Changing Modes does not affect any profiles or data stored in the computer.

**LOW BATTERY INDICATIONS:** Fresh ENERGIZER® brand alkaline batteries should read about 3.2 volts on the InFormation Screens. When the TU battery voltage drops to 2.1 volts, WU 2.2, the 'PBAT' and/or 'SBAT' legends will be illuminated. It is recommended to change the batteries at this point, but several dives might still remain possible. Once the 'PBAT' & 'SBAT' legends illuminate it is recommended that the diver monitor the battery voltage as displayed on the InFormation screen. Once the TU battery voltage declines below 1.6 volts, WU 2.0, it can not be activated until fresh batteries are installed. While there should be sufficient battery power to normally complete a dive, it is not recommended to begin a new dive until fresh ENERGIZER® brand alkaline batteries are installed. After the computer automatically turns itself off (enters Sleep Mode) 70 minutes after a dive, it cannot be turned back on if the TU battery voltage is less than 1.6 volts, WU 2.0. Fresh ENERGIZER® brand alkaline batteries must be installed. See the "BATTERY CHANGES" section of this manual for detailed information on how to change batteries.

**CAUTION!!!!** COMPLETE LOSS OF BATTERY POWER MAY CAUSE ALL PREVIOUS DIVE NITROGEN LOADING TO BE LOST. THIS WILL AFFECT NITROGEN CALCULATIONS ON NEAR-FUTURE DIVES. AFTER A BATTERY CHANGE, CONFIRM THAT NO-DECOMPRESSION TIME DATA IS REASONABLE IN THE PRE-DIVE PREDICTION MODE. DIVE-OF-DAY NUMBER GOING TO ZERO IMMEDIATELY AFTER CHANGING BATTERIES IS ANOTHER INDICATION OF A LOSS OF NITROGEN LOADING.



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# **Cochran GEMINI**

With  
**Intelligent WU  
Owner's Manual**

English – Imperial  
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