
UDI-28™ User Manual

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Omer Industrial Park, Omer 84965, Israel

Form: UTC0002	Rev.: 0.1	Date:12.11.14	Page 2 of 1

List of Changes

Open High priority Bugs:

Date	Description	Change	Comment and page
12.11.14	Shut down algorithm	Power off screen	15
12.11.14	SOS transmit	Transmitting limit	28

Approved by:	Title:	Signature:	Date:
			12.11.14

Disclaimers

LIABILITY DISCLAIMER

As is true of every device of diving equipment, underwater navigation systems and other underwater equipment, the Underwater Digital Interface™ (UDI-28™) abilities are not limitless. There are certain limitations and restrictions of which you must be aware and certain precautions you must take when using the UDI-28™. Please read carefully all warnings in this document and disclaimers in each specific chapter of the user manual.

The UDI-28™ is a computation hardware device combined with software applications that implements a digital compass, depth measurements, navigation or tracking after acoustical signals, text messages, gauge mode computations and alert signal communication. The UDI-28™ combines all these applications in one unit.

The UDI-28™ is not a primary device but only an aid to send and receive text messages, to be used as an aid in navigation or tracking after an acoustical signal, as an aid for digital compass and as an aid to send and receive emergency signals. **The UDI-28™ is not a device of life support gear.** As such, it is unlikely that you will be hurt by the instrument itself any more than you might be hurt by any other object of similar shape, size and weight. **The main danger** in the use of UDI-28™ over-reliance on the information it provides. As an electronic system it might fail spontaneously and unexpectedly due to component, batteries or software failure. As an acoustical device based system, it can fail at any time due to changing environmental (acoustic) conditions or internal damages of the acoustical antenna.

By purchasing or using the UDI-28™ system, it is agreed and understood that in no event will Underwater Technologies Center Ltd (UTC) or any of their representatives be held liable for any personal injuries or death or damages to property resulting from its operation, or for any other damages whether direct, indirect, or consequential even if UTC has been advised of such actual or potential damages. UTC products are authorized for use only by certified, professional divers who have maintained a sufficient level of knowledge and high-skill proficiency through a combination of formal training, ongoing study and experience. The user must understand that the product is liable to sudden failure.

Underwater operations are inherently dangerous, and proper safety procedures demand that **you never rely solely on just the UDI-28™** or any other single instrument, method or mechanism for human safety or the safety of property.

REMEMBER - YOU ARE RESPONSIBLE FOR YOUR OWN SAFETY.

BOTTOM TIMER COMPUTER DISCLAIMER

As you probably know and it is true for every device of diving equipment, and other underwater equipment, the Underwater Digital Interface™ (UDI-28™) abilities are not limitless. There are certain limitations and restrictions of which you must be aware and certain precautions you must take when using the UDI-28™ as a Bottom Timer instrument. Please read carefully all warnings in this chapter and this disclaimer.

The UDI-28™ is a computation hardware device combined with software ("**SOFTWARE**") applications. The Bottom Timer is implemented with software and sensors (such as digital depth sensor and related electronic components).

The UDI-28™ is not a primary device but only an aid to calculate along the dive the time and depth. **The UDI-28™ is not a device of life support gear and should not be used as a device for life support.**

Bottom Timer - Time and depth are presented on the screen only for assistance, thus the diver should take into considerations that he/she must use a diving computer or diving tables.

The main danger in the use of UDI-28™ is over reliance on the information provided by it. As lies in an electronic system it might fail spontaneously and unexpectedly due to component, batteries, incorrect charging or software failure. In addition the UDI-28™ also contains acoustical functions; hence, as an acoustical device, it can fail at any time due to changing environmental (acoustic) conditions.

THE SPECIFICATIONS AND INFORMATION REGARDING THE COMPUTERIZED UNIT IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCT.

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Underwater operations are inherently dangerous, and proper safety procedures demand that **you never rely solely on just the UDI-28™** or any other single instrument, method or mechanism for human safety or the safety of property.

BATTERIES DISCLAIMER

Lithium Ion Batteries can catch on fire. The UDI-28™ uses Lithium Ion batteries; therefore it should NOT be left unattended while being charged as THEY CAN CATCH ON FIRE. Proper precautions should be taken before charging Lithium ion batteries such as having a fire extinguisher ready and placing the batteries in a fire safe container.

THE UDI-28™ IS NOT A TOY AND SHOULD BE HANDLED WITH GREAT CARE.

Lithium Polymer Charging, Handling, Safety Information

Charging:

Lithium Polymer and Lithium Ion batteries have specific charging requirements and ONLY the chargers rated for these cells may be used. The best charger for the UDI-28™ is provided in the pack that you purchased. Other chargers may alter the settings and can damage cells or cause a fire due to over-voltage charging of cells. We recommend that you use only the charger that was provided with the UDI-28.

Lithium Polymer Lithium Ion cells are a tremendous advance in battery technology for electronic devices. However, due to the chemistry of lithium cells, there is a possibility of fire if charging is not properly done. It is unavoidable due to the nature of lithium itself. This is no different from many things we use in daily life – knives, kitchen cleaners, automobiles, for a few examples – which are inherently dangerous, but which can be used very safely by adhering to simple rules and precautions.

Care should be taken to charge on a fireproof surface, such as brick or in a hot (warm) environment. Do not charge the UDI-28™ when lying on an ignitable surface. If you left the UDI-28™ in a warm environment or open to sun light, DO NOT CHARGE IT, wait until it will be cooled to a temperature of less than 30 centigrade. Do not charge batteries near flammable items or liquids. Keep a dry fire extinguisher nearby - or a large bucket of dry sand, which is a cheap and effective extinguisher. Do not charge inside an automobile, especially while driving. The UDI-28™ should NEVER be left unattended while charging.

Handling Cautions:

New cells may have a high initial charge, and care must always be taken to insure that the cap of the UDI-28™ is completely sealed. DO NOT REPLACE BATTERIES. If the batteries performances are low, please send it to the authorized dealer for repair or replacement.

Charging cycles:

The Batteries should work in good condition for approximately 500 charging cycles. We strongly recommend that every year you'll send the UDI-28™ for batteries test in order to measure their stability and charging cycles. Please remember, every charging cycle shorten the batteries lifetime and there is an ageing process with the Lithium chemistry, thus, it is important to safely dive with batteries that will enable you to complete the dive.

COMPASS DISCLAIMER

The UDI-28 contains 3-D Magneto Impedance sensor. Combined with software, it generates the North magnetic direction. Common sense must be used at all times when navigating, therefore it should only be considered as aids to navigation. The UTC' policy of continuous improvement may result in changes to product specification without prior notice. It is advised to visit www.utc-digital.com from time to time and to download updates for new algorithm and compensation factors for this sensor.

This compass is intended for professional dive use only; It should not be used for industrial or professional measurements. The compass' accuracy is highly dependent on the environment, for example, soft or hard metal will highly alter the real measurement. Thus, it is advised not to use the compass in the vicinity of any metals. UTC does not assume any responsibility for losses or claims by third parties that might arise through the use of this compass.

PRESET LISTS DISCLAIMER - TABLE TAG

Please ensure that prior to any dive, all UDI-28™ devices and boat units, in the same network, include the same user list and messages list. Text messaging communications will only function properly if those lists are identical.

To ensure that the lists are identical, each UDI-28™ has a Table Tag value, which is a unique code for each specific UDI-28™ lists.

Make sure that each UDI-28™ device and boat unit has the same Table Tag value.

The Table Tag value is displayed in the About UDI screen.

OPERATION, RANGE AND CONFLICT

UTC provides communication means by using different configurations. Please note that a SYSTEM that generates two Networks (i.e., NET 1 and 2) includes at a minimum, two U28 wrist units or one wrist U28 unit and a boat units. Each U28 is capable to receive signals from up to 1000m (depending on sea and environmental conditions). Therefore, it is critical to properly define the lists of users and messages so two different SYSTEMS will not intersect or coincide. In order to eliminate such event, all U28 that belong to a SYSTEM must use the same table tag value. It is advised to check if other SYSTEM already exist in the same diving area. If by mistake, in the same area (i.e. a radius of 1000meter), two SYSTEMS operate, then there is a chance that mistaken messages (wrong message that belong to other system or characters that have no meaning) will be received by the end user.

License to use the Software

Notwithstanding anything herein to the contrary, the purchaser and/or user of the UDI-28™ system shall not obtain any intellectual property right in any the UDI-28™ system or any part thereof, other than the limited right to use it. The purchaser and/or user of the UDI-28™ system shall not have, and shall not acquire, in any way, any intellectual property right in the UDI-28™ system. The UDI-28™ system shall not be deemed to have been produced as work for hire and any intellectual property right with respect thereto shall remain exclusively with UTC. For the purpose hereof, intellectual property includes, inter alia, any property in and rights under copyright, patents, conceptual solutions and inventions (whether patentable or not), circuit layout rights, design rights, designs, database rights, trade names, trademarks, service marks, methodologies, ideas, processes, methods, tools and know-how, and/or any other types of intellectual property rights. The purchaser and/or user of the UDI-28™ system may not and shall not permit, abet or aid others to translate, reverse engineer, decompile, disassemble, update or modify all or any part of the UDI-28™ system.

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Introduction

Congratulations on your purchase of the UTC – Underwater Digital Interface 28 System. UDI-28™ is a device that contains several functions used for diver safety, communication and computation. Throughout this manual we will use the term UDI-28™ instead of Underwater Digital Interface (UDI-28) System. UDI-28™ is a device that contains several functions that were implemented to increase safety, enable underwater communication and reliable computation. The UDI-28™ version was derived from the celebrated UDI-14™ while taking into consideration years of experience, feedback from users, field measurements and specific requirements by professional organizations. This version supports extended number of messages, two large networks, state of the art error corrections code that increases communication reliability, extended range (without extending the power) for communication, high capacity batteries, seamless connection process to other systems (for example Passive Acoustical Diving Radar), OLED, enhanced compass, new acoustical antenna with improved performances, support for different languages and more. The company is grateful to the so many users and organizations that contributed for this version.

The system consists of the UDI-28™ diving unit, an optional UDI-28™ PRO boat unit with an active antenna, and the UDI28-MANAGER PC software. Each item can be purchase separately.

The UDI-28™ contains the following functions:

- Text messages communication device
- SOS signal transmission and reception
- Navigation unit and homing device
- Dive Information
- Compass

The UDI28-MANAGER PC software can be used in conjunction with only the UDI-28™ to be used to update text message and names (users) lists and groups and to update the firmware.

The UDI-28™ text messaging system links divers through transmission of pre-set messages with ease and reliability. Depending on environmental conditions, it is possible to receive signals from up to 1000 meters.

Upon receiving a message signal, the UDI-28™ unit sounds an audible alert and lights up to show the message (if these features were enabled).

The SOS signal can be activated by a diver in distress, or remotely by any diver who suspects that his buddy is in distress. Upon activation of an SOS signal, the UDI-28™ transmits information required to locate the SOS sender.

Each UDI-28™ includes a homing device to help the diver locate other divers or the dive boat.

The UDI-28™ can be worn on the lower arm or attached to the Buoyancy Compensator (BC).

The UDI-28™ permits a diver to communicate with any other diver in the network without distractions or potential discomforts.

Safety

Read and understand this user guide prior to using the UDI-28. We strongly recommend that prior to using in in real environment you will gain experience with the device.



Pay close attention to all cautions and warnings listed. Make sure that you fully understand the use, displays and limitations of the UDI-28™ prior to diving. Improper use of this device may cause a diver to commit actions that could lead to serious injury or death.

The UDI-28™ has a battery saving mode. After the UDI-28™ unit is turned on:

- If no button is pressed on the UDI-28™ or 10 minutes elapsed, the UDI-28™ goes to standby, and the screen displays the word Standby.
- After 60 minutes of no activity, the UDI-28™ turns off.

The UDI-28™ unit contains a water sensor. When the UDI-28™ unit that has been turned on or is in standby comes in contact with water, the bottom timer becomes active.

A dive is considered if the UDI-28™ is at a depth of 2 meters for at least 10 seconds.

Before every dive

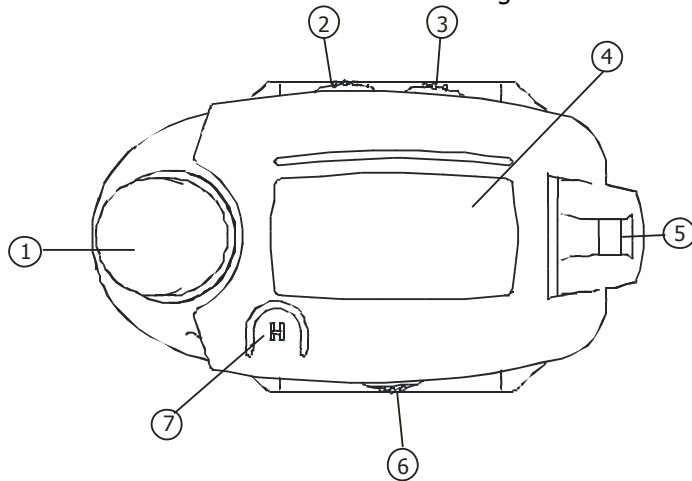
To ensure your safe use of the UDI-28™ before every dive, you must check:

- UDI-28™ battery is charged
- The preset messages list and the users list (names) in the dive group are the same. This means that the same table tag is same in all devices in the dive group.
- The network used between you and your buddy or group.
- Check communications by sending a message to your buddy and receiving a message back.

UDI-28™ unit

Unit Description

The UDI-28™ unit consists of the following:



- | | |
|-----------------------|------------------------------------|
| 1. Antenna | 4. OLED display, plastic protector |
| 2. Up scroll button | 5. Attachment buckle |
| 3. Down scroll button | 6. Enter button |
| | 7. Emergency (SOS) button |

The UDI-28™ contains the following functions:

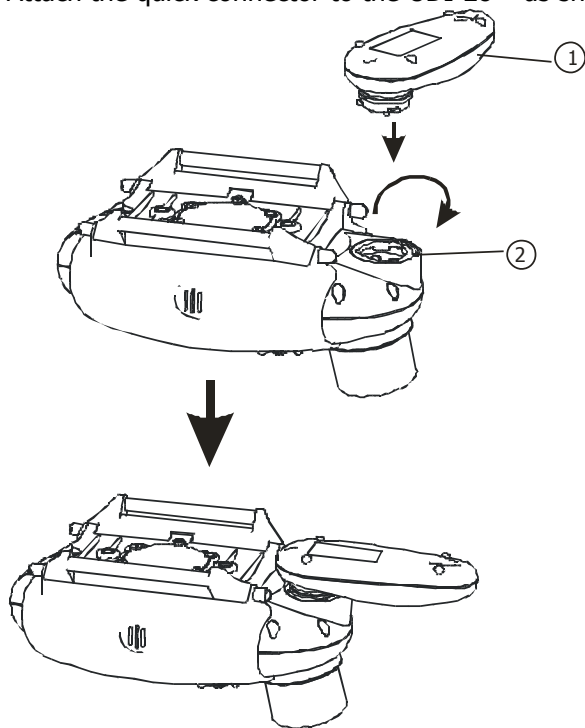
- Bottom timer
- Electronic compass
- Message sending/receiving
- Homing device
- Emergency signaling

Use of these functions is explained below.

Using the quick connector

A quick connector is used connect the UDI-28™ unit to a power supply or to a PC.

Attach the quick connector to the UDI-28™ as show below, ensure the contacts are dry.



1. Quick Connector

2. Connector bracket on UDI-28

Charging the UDI-28

UDI-28™ uses a rechargeable internal Li battery. This battery can be recharged only with the UDI-28™ charger.



NOTE: Read *Lithium Polymer Charging, Handling, Safety Information* on page 3.



WARNING: The UDI-28™ is a completely sealed unit. It may stop functioning if opened. The warranty will be void if the unit is disassembled or the seal is broken.

Ensure that the UDI-28™ is fully charged before your dive.

Charge the battery for 12 hours prior to the first time you use the UDI-28.

To charge the UDI-28:

1. Ensure that your hands, the UDI-28™ and the charger are dry!
2. Connect the quick adapter to the UDI-28™
3. Connect the power charger to the quick connector.
4. Connect the power charger to a power supply. The green LED will turn on.
5. The charge is complete when the green light on the quick connector turns off.



NOTE: A steady or flashing red LED indicates a problem with the charger or the battery. Disconnect the charger and repeat steps 2 to 4. If this does not resolve the problem, return the unit for service

Connecting the UDI-28™ to the PC

You can connect the UDI-28™ to the PC to perform data transfers, using the UDI28-MANAGER application. For information see UDI28-MANAGER Software User Manual.

To connect the UDI-28™ to the PC:

1. Connect the quick connector to the UDI-28
 2. Connect the USB cable to the quick connector.
 3. Connect the USB cable to the computer.
-



NOTE: Ensure that you have properly installed the UDI28-MANAGER software to be able to use this function.

To activate the connection to the PC, you must enable this option on the UDI-28. See page 16.

Using the UDI-28

Turning UDI-28™ On and Off

To turn the UDI-28™ on:

1. Press and hold the **Enter** button for about 5 seconds. The UTC Proprietary screen opens. (If pushing the Enter button for a short time, a message on the screen will appear mentioning the need for a longer push)



NOTE: The UTC Proprietary screen contains a disclaimer. Clicking on the **Enter** button signifies that you accept responsibility for use of the UDI-28, and that you accept the terms of the disclaimer. If you do not agree, please do not dive with the UDI-28™.

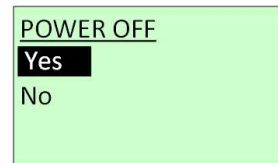
2. Press the **Enter** button again. The current settings screen opens.
3. Press the **Enter** button again. The main menu opens. After a few seconds, the dive info displays.

Standby mode:

- The UDI-28™ unit goes into Standby mode after 10 minutes of inactivity on the surface.
- The UDI-28™ unit goes from Standby to 'Off' after 1 hour of inactivity on the surface.
- When in Standby mode, the UDI-28™ unit instantly returns to use upon contact with water, or when a button is pushed for 2 seconds.

To turn UDI-28™ off:

1. Press and hold the **Enter** button for about 6 seconds.
2. Press **Yes** button.
3. The UDI-28™ turns off.



WARNING: Power **cannot** be turned off during a dive.

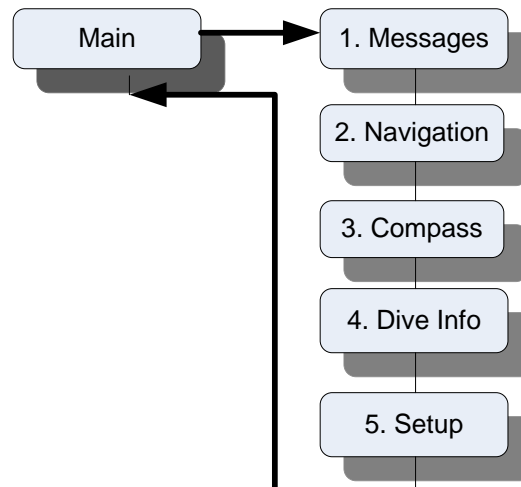
Scrolling the menus

To scroll through the menu options, press the **Up** or **Down** buttons.

To select an option, press the **Enter** button.

UDI-28™ main menu

The main UDI-28™ menu allows you to access UDI-28™ functions. The main menu flowchart is shown below.



Use of the various functions is described in detail as follows:

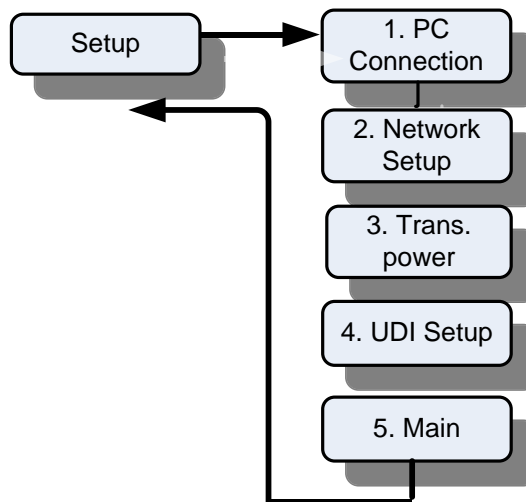
- Setup – see page 15
- Dive Info – see page 21
- Messages – see page 24
- Navigation – see page 26
- Compass – see page 23

Setting up the UDI-28™

Use the Setup menu to set up the UDI-28™ for the following features:

- PC Connection – Connect to a PC for use with the UDI28-MANAGER software.
- Network Setup – Set network for communication with buddy.
- Trans. Power – Set the transmission power of the UDI-28™ units.
- UDI-28™ Setup – Set UDI-28™ parameters – clock, audio, led, units, etc.
- Main – Back to the Main menu.

The Setup menu flowchart is shown below.



1. From the Dive Info display, double-click of the **Enter** button will open the **Main** menu.
2. Use the **Up/Down** buttons to scroll to Setup.
3. Press **Enter** to choose the selection.

To exit the **Setup** menu and return to the **Main** menu, select **Main**, and press **Enter**.

Bottom timer



WARNING: the UDI-28™ works as bottom timer; it only measures the time and depth and doesn't function as a diving computer that calculates any Nitrogen levels. User must be aware that in this mode of operation, there are no alerts that are related to the diving.

PC Connection

Use the PC Connection option to connect UDI-28™ to your PC and use it with the UDI28-MANAGER application. For information see the UDI28-MANAGER Software user manual.



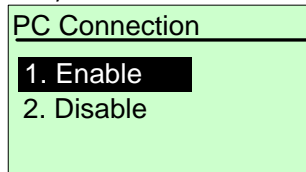
WARNING: Do not enter the water with the UDI-28™ when the "PC connection" is active. This will damage your UDI-28.



NOTE: When the PC connection has not been used for 2 minutes, it becomes disabled to prevent any damage to the UDI-28™.

To use PC Connection:

1. Connect the quick connector to the UDI-28
2. Connect the USB cable to the quick connector.
3. Connect the USB cable to the PC computer.
4. On the UDI-28™ **Setup** menu, select **PC Connection**.
5. Select **Enable** press **Enter** to enable the PC Connection. A **PC** indication appears at the bottom right corner of the display while the UDI-28™ is connected to the PC.



NOTE: Communication with the UDI-28™ is done using the UDI28-MANAGER software provided with your system. For information see the UDI28-MANAGER Software user manual.

Network Setup

Use this option to select User and Buddy numbers; and a network.



NOTE: You and your buddy must be properly defined on your UDI-28™ and your buddy's UDI-28™ respectively, and you must both be on the same network to be able to communicate using the UDI-28.

1. Select **Net** to define a network to use, and press **Enter**.

NETWORK SETTING
4. Setup
1. Net
2. User

2. Select a network from 1 or 2, and press **Enter**.

NETWORK
1. Net 1
2. Net 2

3. Select **User** to define the user name/number for the UDI-28™ and press **Enter**.

NETWORK SETTING
1. Net
2. User
3. Buddy

4. Select a User (named or numbered) from the 28 users, and press **Enter**.

USER
1. User 1
2. Brad
3. Jen

5. Select **Buddy** to define your buddy number and press **Enter**.

NETWORK SETTING
2. User
3. Buddy
4. Setup

6. Select a User (named or numbered) from up-to 28 individual users, boat, or all users and press **Enter**. This will be your default for sending a message to.

BUDDY
3. Jen
4. Bob
5. Armin

Transmission power

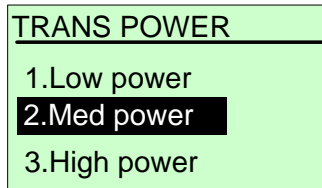
UDI-28™ has the ability to adjust the transmission power. This feature enables the diver to select from 3 transmission power levels:

- Low power
- Med power
- High power

Working with low power level increases the battery lifetime while high power level shorten battery lifetime.

The diver is advised to maintain a low or medium level except in extreme cases where it is important to send communication for long range. This feature also serves for next update to identify out of range capabilities.

Select a power level **and** press Enter



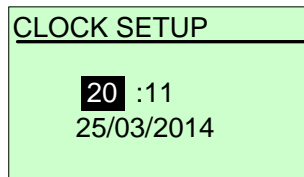
UDI-28™ Setup

Use the UDI-28™ Setup menu options to set the time, volume, led and units on your UDI-28.

Clock

Use this option to set the time and date.

1. Press **Enter** to select a time unit.
2. Use the **Up/Down** buttons to set the appropriate value.
3. Press **Enter** to move to the next time unit on the list.
4. Repeat.
5. When you have set the year value, press **Enter** to return to the **UDI-28™ Setup** menu.



AUDIO SETUP

Use this option to select an audio alert volume. Audio alerts sound when a message is received, when the battery meets low level.

There are five levels of alert:

- High
- Med-High
- Med
- Low
- Off

Select a ring level and press **Enter**

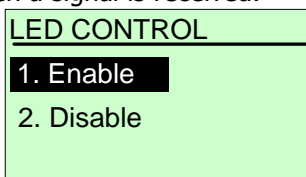


LED Control

Use this option to turn on or off the Green LED control which allows the LED on the UDI-28™ to blink when there is an audible alarm or when a signal is received.

Select Enable or Disable and press **Enter**.

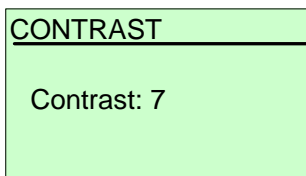
The Default: Enable



Contrast

Use this option to select a contrast level for the OLED display. .
The contrast interval ranges from 1 (very little contrast) to 7 (high contrast).

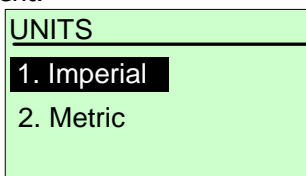
Use the **Up/Down** buttons to define a contrast value and press **Enter**. Make sure there are no strips seen on the screen.



Units

Use this option to select Metric units (meters, degrees C) or Imperial units (Feet, degrees and Fahrenheit) as your unit of measurement.

Select Imperial or Metric and press **Enter**. All units displayed on the UDI-28™ will now conform to the unit type chosen.

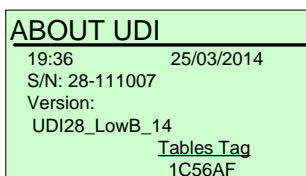


NOTE: The temperature displays according to your units selection – When you select Feet, Fahrenheit degrees are shown, when you select Meters, centigrade degrees are shown.

About UDI-28

Use this option to view the UDI-28™ serial number and software version installed. Use this information when contacting UTC about your UDI-28.

In addition the **About UDI** screen presents the table tag value, which is a unique code for each specific UDI-28™ list of users and messages. Make sure that every UDI-28™ device and boat unit (in the same network) has the same Table Tag value. For more information see page 4.



Revert to factory settings:

In case you would like to revert to the original UDI-28™ factory settings, press the **Up, Down** and **Enter** buttons simultaneously to start the UDI-28™ on. Wait for the UDI-28 to turn on and for the message "set default" appears on the screen. All customizations and settings you have done will be erased, and UDI-28 will turn on with the original factory settings.

Using the Bottom Timer

The dive Info display contains a current and maximum depth indicator, a battery indicator and compass.


From the dive Info display, you can:

- Press the **Up** button to return to main menu.
- Press the **Down** button once to get compass, press another one and a Timer will be activated.
- Press the **Enter** button twice to go to the **Main** menu.

The dive info display is different when the UDI-28™ is on the surface, and when the UDI-28™ is in an underwater environment.

Surface display

On the surface, the dive Info display shows the following:

①	②
Depth 0.0 Dmax 32.0	Net : 1  Buddy: User 1
183°	UDI 28 User 4
③	④

1. Current Depth and maximum depth


2. Network & Buddy indicator

3. Azimuth compass

4. User name

Underwater display

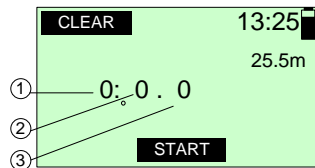
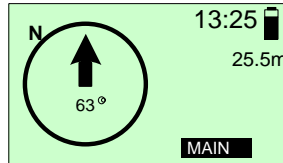
In an Underwater environment, the window (2) is changed to the dive time counter.

②	
Depth 0.0 Dmax: 0.0	Dive 2  Time:
62°	UDI28

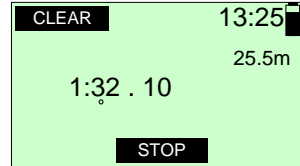
Timer and reviewing additional data

- Press the **Up** button to jump to the main menu.

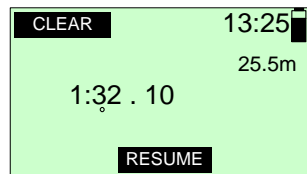
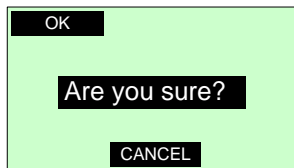
- Press the **Down** button.
- once to see the compass.
- Press the **Down** button again to review a Timer.
- 1- Presents hour
- 2- Presents minutes
- 3- Presents seconds



- The initial screen shows "START" button to begin counting from ZERO.
- Selecting "STOP" will hold the Time counter.
- Selecting "RESUME" will continue the Time counter.
- Selecting "CLEAR" will end with a confirmation screen.
- Selecting OK will set the time counter back to Zero.
- Selecting "CANCEL" will return to the last counter screen.



- Press the DOWN button to return to the compass screen.



Abnormal conditions



WARNING: The UDI-28™ may turn itself off during the dive.

Low battery

When the battery contains less than 3 hours charge, UDI-28™ will display a warning message and sound an alert tone. Click **Enter** to return to the dive info display.

When the battery contains less than 2 hours charge, UDI-28™ will display an additional warning message and sound an alert tone. Click **Enter** to return to the main display.

When the battery contains less than 1 hours charge, UDI-28™ will display yet another warning message and sound an alert tone. Click **Enter** to return to the main display.


Each transmission is shortening the battery tome of operation.



WARNING: In all cases of low battery alert, start ascent immediately, according to safe diving practice, and recharge the UDI-28™ after you reach the surface.

Empty battery during dive

If the battery status becomes empty during a dive, the battery icon starts to flash in addition to the UDI-28™ sounding an alert tone. This indicates that the UDI-28™ can continue to work for a half hour with 1 transmission every 4 minutes.

depth	15.4	25	
max	32.0	dive time	
	124°	UDI28	

Using the Compass

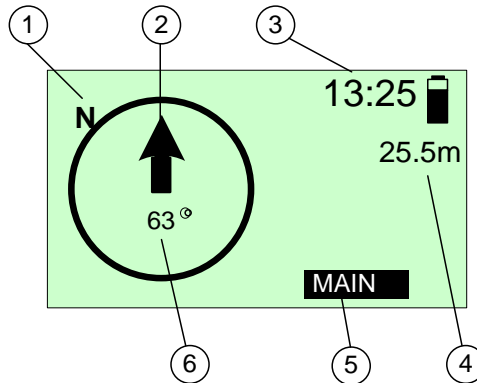
The electronic compass display can be used to navigate and orient yourself underwater. This compass is accurate within $\pm 2^\circ$ from the magnetic North.

The electronic compass accuracy is influenced by the presence nearby metal bodies and may be biased dramatically.

See *Care and maintenance* on page 29 for information on periodic recalibration of the electronic compass.

To see the compass display:

- From the **Main** menu, select **Compass**.



- | | |
|----------------------|--------------------------|
| 1. Magnetic North | 4. Depth |
| 2. Heading direction | 5 Back to Main menu |
| 3. Time | 6 Your heading (Degrees) |

To exit the compass display:

- Select **Main** and click **Enter**.

Sending and receiving text messages

Messages are pre-set using the PC connection and UDI28-MANAGER software. To modify the pre-set message list, please review the UDI28-MANAGER manual.

You can send messages to your buddy or other UDI-28™ users on the same network using the **Send Message** function.

To enter the Message menu:

- From the **Main** menu, select **Messages** and press **Enter**.

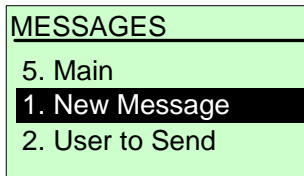
To exit the **Messages** menu and return to the **Main** menu, select **Main**, and press **Enter**.

Sending a message

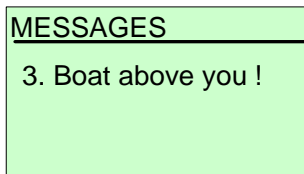
The UDI-28™ unit can send one of up to 28 user-preset text messages to other UDI-28™ users and to the boat unit.

To send a text message:

1. In the **Messages** menu, select **New Message**, and then click **Enter**.



2. In the Message list, choose a message by scrolling with the **Up/Down** buttons. Click **Enter**.



- In the **Messages** menu, **User to Send** is selected.
Click **Enter**

MESSAGES
5. Main
1. New Message
2. User to Send

- In the **Send To** menu, choose a user by scrolling with the **Up/Down** buttons.
Click **Enter**.

SEND TO
2. Bob

- In the **Messages** menu, **Send** is selected.
- Click **Enter**. The message is sent. You are automatically returned to the **Main** menu.

MESSAGES
1. New Message
2. User to Send
3. Send

Viewing last message

- In the Messages menu, select **Last Msg Rcv**,
- Click **Enter**. The last message received is shown, and identifies the sender and network used.
- Use the **Up/Down** buttons to scroll the last five messages received.

MESSAGES
3. Send
4. Last Msg Rcv
5. Main

Receiving a message

When you receive a text message from your buddy or another UDI-28™ user, your UDI-28™ sounds an audible signal and blinks light (if enabled), the message is automatically displayed.

The received message identifies the message sender.

Only if the message is an SOS:

The depth of the diver sending the message is also displayed in the message.

In the example on the right, the sender is Brad.

Click **Enter** to turn off the sound signal and automatically transmit an acknowledgement signal to the sender. After a short while, the UDI-28™ returns to the dive info display.

MSG FROM
Brad 15:21
Boat above you !

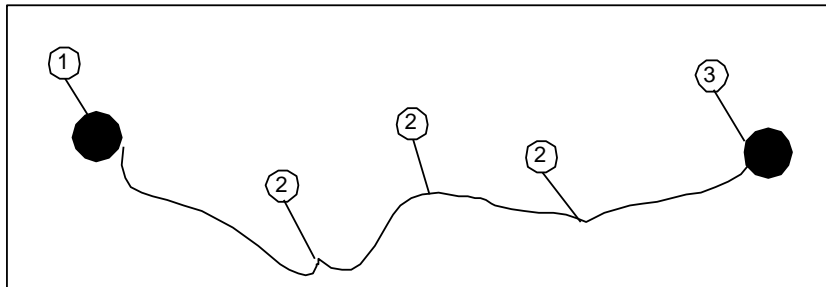
Navigation to a target

UDI-28™ can be used to track an SOS beacon or a Homing beacon. A homing beacon transmits a homing signal from the boat unit on a specific dedicated frequency. An SOS beacon transmits a homing signal on a specific frequency, received on all networks used with UDI-28.

Navigation using the UDI-28™ can be done only while the diver or beacon is moving in relation to each other. In other words, the UDI-28™ diver, the beacon, or both must be moving, since the navigation beacon relies on the Doppler Effect.

Navigation method for tracking:

Correct navigation as you dive showing the adjusted direction of the target beacon on the UDI-28. Choose a random initial direction to start diving, and then adjust as you go.



1. Starting location of diver
2. Course adjustments
3. Beacon location

To enter Navigation mode:

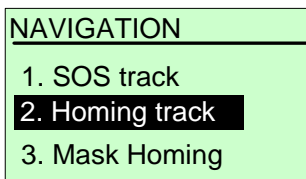
- From the UDI-28™ **Main** menu, select **Navigation** and press **Enter**.

To exit the **Navigation mode** and return to the **Main** menu, select **Main**, and press **Enter**.

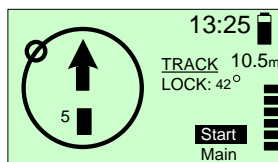
Navigation mode

Navigation is used to dive to a homing beacon, or to a unit transmitting an SOS signal to provide assistance.

1. From the **Navigation** menu, select **SOS track** to track an SOS beacon, or **Homing track** to track a Homing beacon.



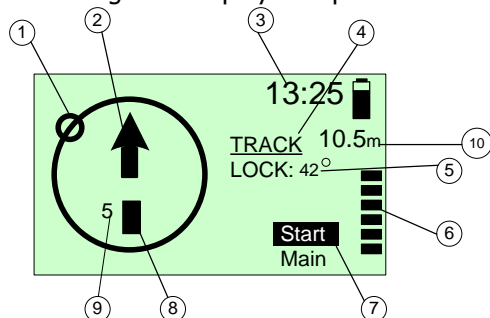
2. Press **Enter**.
3. The **Navigation** display opens.



Using the Navigation display

The display shows the **track to your target**. Keep an eye on the track to navigate to your target. You should dive in a slight zigzag direction to allow for more accurate navigation towards your target.

The navigation display is explained below:



1. Beacon direction (relative to your heading). Will appear in the first time only if the Doppler value (see 9.) is greater or equal 4).

2. Swim direction (your heading).

3. Time.

4. Track – current track direction.

5. Lock – the course you need to follow to arrive at the beacon.

6. Ascent bar – shows you the limits of your ascent rate.

7. Start – restart tracking. This is useful if you suddenly loose the beacon.

8. Doppler value bar – shows that you are approaching (getting closer to) the target.

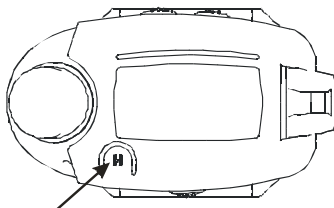
9. Doppler value - shows how quickly you are approaching (positive numbers) or moving away (negative numbers) from the target.

10. Depth indicator- present diver depth.

SOS Signals

Unlike other UDI-28™ signals, SOS signals are activated across all network channels, and have a longer range than ordinary communications signals.

In the event of an emergency, you can activate your SOS signal by pressing the red H (Help) button on your UDI-28™ twice. An SOS signal is sent to all UDI-28™ and boat unit users in the area.



EMERGENCY (HELP) BUTTON

Other UDI-28™ users can navigate to your location using the Navigation feature of their units.

If you receive an SOS signal, your UDI-28™ unit sounds an audible signal, and the SOS message is automatically displayed.

The SOS message identifies the user sending the SOS, the network, and the depth of the sender.

In the example on the right, the sender is User 1, at a depth of 32 meters.

SOS DETECTED
User 1
Net :2
Depth: 32 m

Click **Enter** to turn off the audible signal. UDI-28™ displays the Navigation Mode screen. Navigate to the diver in distress as described on page 26.

Remote homing

UDI-28™ contains the ability to send a remote homing signal to the boat unit. The remote homing signal takes the form of a message that cannot be modified or deleted from the message list.

To activate the remote homing:

1. In the **Message** menu, select Remote Homing from the list by scrolling with the **Up/Down** buttons, and then click **Enter**.
2. Click **Send**. The message is sent

MESSAGES
30. Remote Homing

Remote SOS

UDI-28™ contains the ability to send a remote SOS signal to another user. Failure to respond to the request within 15 seconds by the user receiving a remote SOS causes the UDI-28™ to start sending SOS signal to the entire network. You will receive an SOS signal and navigate to the diver in distress.

The remote SOS signal takes the form of a message that cannot be modified or deleted from the message list.

To activate the remote SOS:

1. In the **Message** menu, select Remote SOS from the list by scrolling with the **Up/down** buttons, and then click **Enter**.

MESSAGES
29. Remote SOS

Click **Send**. The message is sent

Mask Homing

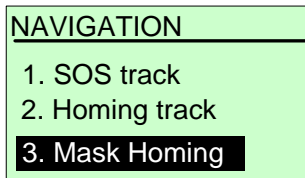
You can temporarily mask the navigation homing beacon to prevent your UDI-28™ from sounding a homing alarm when a homing signal is transmitted. This allows you temporarily disregard the homing signal until the time you need it to return to the boat unit.



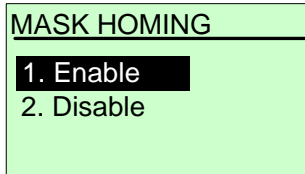
NOTE: Masking the homing beacon *does not* mask any SOS beacons that may be activated during a dive.

To mask a homing beacon:

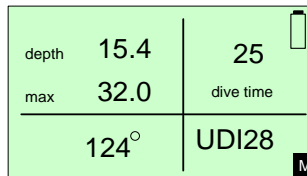
1. From the **Navigation** menu, select **Mask Homing** and press **Enter**.



2. In the **Mask Homing** menu, select **Enable** to mask the beacon and press **Enter**.



3. When you enable **Mask Homing**, a small **M** is shown in the lower right corner of the display.



Transmitting a distress signal when the UDI is on the surface is limited to 10 minutes.

Care and maintenance

UDI-28™ requires very little care or maintenance.

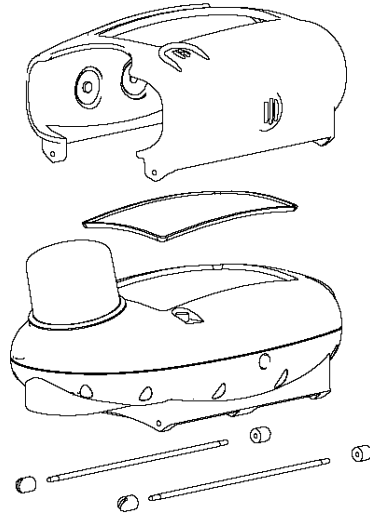
After every dive: wash and wipe down the UDI-28™ and make sure that the contacts are dry prior to connecting the UDI-28™ to the charger or the PC.

Do not use a water jet or pressure from hose to clean the UDI-28, to prevent damage to the UDI-28™ mechanism.

Periodically the UDI-28™ may need to be serviced at an authorized laboratory for calibration and battery replacement (at least once a year). Consult the UDI-28™ webpage for information or with your dealer.

The UDI-28™ display protective sticker may get scratched and can be replaced. The UDI-28™ can be removed from its housing for display housing replacement as shown in the diagram below.

Remove the cover by unscrewing the tops from the two hinge screws, and pulling the hinges out of the housing. This frees the housing and allows you to remove it from the UDI-28™ unit. You can then pop the protective cover out, and replace it with a new cover.



Revert to factory setting

In case you need to revert to the original UDI-28 factory settings, press the **Up**, **Down** and **Enter** buttons simultaneously (when the UDI-28™ is off). Wait for the UDI-28 to turn on.

All customizations and settings you have done will be erased, and UDI-28 will turn on with the original factory settings.

Base [boat] unit

The boat unit is an optional component of the UDI-28™ system. It is used for text message communication with the underwater divers, and its homing capabilities allow divers to navigate their way back to the boat. In addition, pending to sea conditions, the Boat unit can send transmissions by using its Active Antenna up to 2000 meters.

The boat unit is shown below:



1. OLED display, glass protector
2. Up and Down scroll buttons
3. Enter button
4. Alarm light
5. Antenna connector
6. Network selection buttons and lights
7. Power charge connector
8. USB connector
9. Active Antenna

Active Antenna

UDI-28™ boat unit uses state of art acoustical antenna. This antenna is ACTIVE by means of electronics and materials that support better gain, low noise, digital signal formats, enhanced matching to underwater environment which results better communication to main boat unit.

Please ensure that the active antenna is used properly. Do not use the antenna for any other application except with the UDI-28™ Boat unit. This antenna also serves for other systems. It is critical to hook the antenna with another metal cable (not the communication cable) to support its weight.

Functions of UDI-28™

The UDI-28™ boat unit contains the following functions:

- Electronic compass
- Message sending/receiving
- Communication with 2 Networks ("NET")
- Homing beacon

Use of these functions is explained below.

Charging the UDI-28™ boat unit

UDI-28™ uses a rechargeable internal battery. You can use the boat unit running on a battery, or connected to a power supply.

Connect the power adapter to the power connector on the UDI-28™ boat unit to recharge the battery or to use the unit.



NOTE: Read *Lithium Polymer Charging, Handling, Safety Information* on page 3.



WARNING: The UDI-28™ boat unit is a completely sealed unit and meets IP67 standard. It may stop functioning if opened. The warranty will be void if the unit is disassembled or the seal is broken.

Connecting the UDI-28™ boat unit to the PC

You can connect the UDI-28™ boat unit to the PC to perform data transfers (messages list, users list), using the UDI28-MANAGER application.

To connect the UDI-28™ boat unit to the PC:

Connect the USB cable to the computer.



NOTE: Ensure that you have properly installed the UDI28-MANAGER software to be able to use this function.

Turning UDI-28™ boat unit On and Off

To turn the UDI-28™ boat unit on:

1. Press and hold the **Enter** button for about 5 seconds. The UTC Proprietary screen opens, the buzzer is heard and the LED is blinking.
2. Press the **Enter** button again. The current settings screen opens.
Press the **Enter** button again. The main menu opens.

To turn UDI-28™ boat unit off:

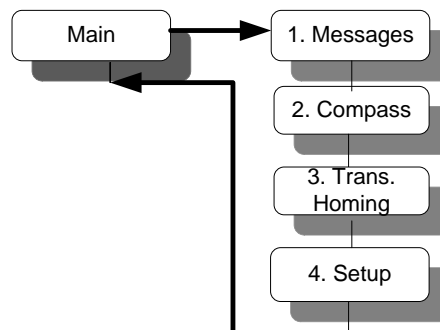
Press and hold the **Enter** button for about 5 seconds. The UDI-28™ turns off.

Scrolling the menus

To scroll through the menu options, press the **Up** or **Down** buttons.
To select an option, press the **Enter** button.

UDI-28™ Boat unit main menu

The main UDI-28™ menu allows you to access UDI-28™ functions. The main menu flowchart is shown below.



The various functions are described in detail as follows:

- Messages – see page 33
- Compass – see page 36
- Transmit homing – see page 37
- Setup – see page 37

Sending and receiving text messages

Messages are pre-set using the PC connection and UDI-28™ software. To modify the pre-set message list, See the UDI28-MANAGER user manual.



WARNING: When transmitting messages, the antenna cable must be plugged into the boat unit.



NOTE: The Boat unit sends and receives messages to/from the active network only.
When the Boat unit is configured to "NET1" it **does not** send and receive messages from "NET2" and vice versa
In the case that two groups of divers are located in the same area and they share one Boat unit, then we advise that the Boat unit user will change NETS button from time to time to control both NTES. (for example send message "are you OK?" and receive "OK" from each diver in NET1 and NET2,.

When SOS signal is transmitted, the signal will be received by any device that belongs to any SYSTEM in the operation range. Only devices that contain same table tag as the SOS sender, will be able to receive full information, i.e, NET and name of user.

To enter the Message menu:

- From the **Main** menu, select **Messages** and press **Enter**.

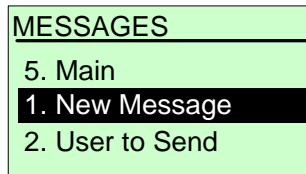
To exit the **Messages** menu and return to the **Main** menu, select **Main**, and press **Enter**.

Sending a message

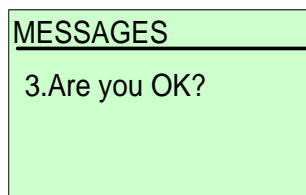
The UDI-28™ unit can send any message from the preset text messages to other UDI-28™ users.

To send a text message:

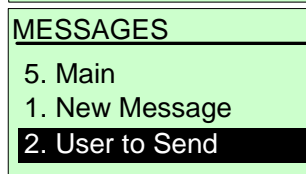
1. In the **Messages** menu, select **New Message**, and then click **Enter**.



2. In the Message list, choose a message by scrolling with the **Up/Down** buttons. Click **Enter**.



3. In the **Messages** menu, **User to Send** is selected. Click **Enter**



-
4. In the **Send To** menu, choose a user by scrolling with the **Up/Down** buttons. Click **Enter**.

SEND TO
2. Bob

5. In the **Messages** menu, **Send** is selected.

MESSAGES
1. New Message
2. User to Send
3. Send

6. Click **Enter**. The message is sent. You are automatically returned to the **Main** menu.

Viewing last message

1. In the **Messages** menu, select **Last Msg Rcv**, Click **Enter**. The last message received is shown, and identifies the sender and network used.
2. Use the **Up/Down** buttons to scroll the last five messages received.

MESSAGES
3. Send
4. Last Msg Rcv
5. Main

Receiving a message

When you receive a text message from another UDI-28™ user, your UDI-28™ unit sounds an audible signal, and the message is automatically displayed.

The received message identifies the message sender and the receiving time.

MSG FROM
Brad 15:21
Are you OK?

Click **Enter** to turn off the audible signal and return to the main display.

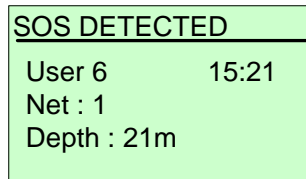
Receiving SOS Signals

Unlike other UDI-28™ signals, SOS signals are activated across all network channels, and have a longer range than ordinary communications signals.

If you receive an SOS signal, your UDI-28™ boat unit sounds an audible signal, and the SOS message is automatically displayed.

The SOS message identifies the user sending the SOS, the network, and the depth of the sender.

In the example on the right, the sender is user 6, at a depth of 32 meters.



Click **Enter** to turn off the audible signal.

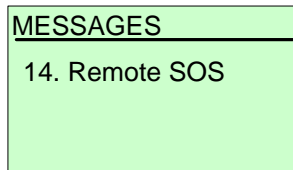
Remote SOS

The boat unit contains the ability to send a remote SOS signal to a UDI-28™ user.

Failure to respond within 15 seconds by the user receiving a remote SOS causes the receiving user UDI-28™ to start sending SOS.

To activate the remote SOS:

In the **Message** menu, select Remote SOS or Remote Homing from the list by scrolling with the **Up/Down** buttons, and then click **Enter**.



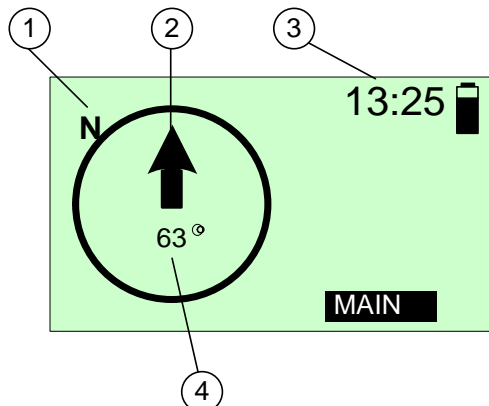
Click **Send**. The message is sent

Using the Compass

The UDI-28™ boat unit contains an electronic compass display. This compass is accurate within $\pm 2^\circ$. The electronic compass accuracy is influenced by the presence nearby metal bodies and may be biased dramatically.

To open the compass display:

- From the **Main** menu, select **Compass**.



- 1. Magnetic North
- 2. Swim direction
- 3. Time
- 4. Your heading (Degrees)

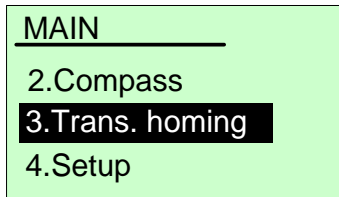
To exit the compass display:

- Select **Main** and click **Enter**.

Transmit homing

The boat unit has the ability to transmit homing signal to a UDI-28™ user. By selecting this option, the UDI-28™ wrist unit user receives a homing signal that allows the user to track and locate the UDI boat unit.

The UDI-28™ wrist unit user can also use mask homing option (see page 36).

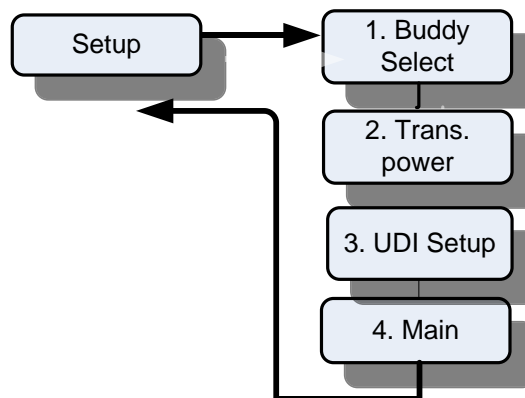


Setting up the UDI-28 Boat Unit

Use the Setup menu to set up the UDI-28 Boat Unit for the following features:

- Buddy Select
- Trans. Power – select between 3 power levels
- UDI-28™ Setup - Set parameters – clock, audio, led.

The Setup menu flowchart is shown below.



To enter the Setup menu:

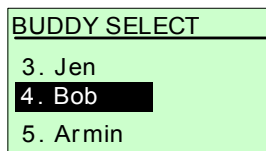
1. From the **Main** menu, use the **Up/Down** buttons to scroll to Setup.
2. Press **Enter**.

To exit the **Setup** menu and return to the **Main** menu, select **Main**, and press **Enter**.

Buddy Select

Select a User (named or numbered) from the 28 individual users or all users and press **Enter**.

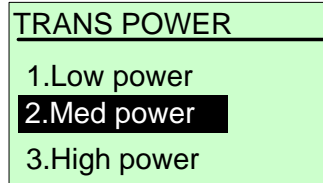
This will be the user to whom you send a message by default.



Transmission power

UDI-28™ boat unit has the ability to adjust the transmission power. This feature enables the user to select from 3 transmission power levels:

- Low power
- Med power
- High power



Working with low power level increases the battery lifetime while high power level shorten battery lifetime.

This feature also serves for next update to identify out of range capabilities.

Select a power level **and** press Enter

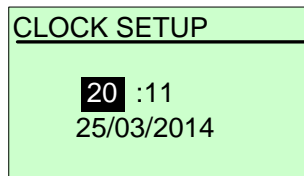
UDI-28 Boat unit setup

Use the UDI-28™ Boat unit Setup menu options to set the time, ring volume, and backlight duration on the UDI-28™ boat unit.

Clock

Use this option to set the time and date.

1. Select a time unit.
2. Use the **Up/Down** buttons to set the appropriate value.
3. Press **Enter** to move to the next time unit on the list.
4. Repeat.
5. When you have set the year value, press **Enter** to return to the **UDI-28™ boat unit Setup** menu.



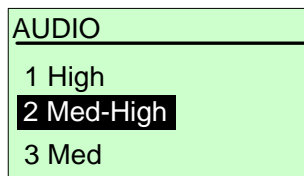
AUDIO

Use this option to select an audio alert volume. The Audio alerts sound to get your attention.

There are five levels of alert:

- High
- Med-High
- Med
- Low
- Off

Select a ring volume and press **Enter**



An external siren and flashing light can also be connected to the unit external connectors.

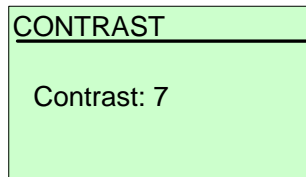
LED Control

Use this option to define the **Alarm LED** light intensity. In day time – you may want higher intensity than in the night. The default value is 50% intensity.

Display Contrast

Use this option to select a contrast level for the OLED display. .
The contrast interval ranges from 1 (very little contrast) to 7 (high contrast).

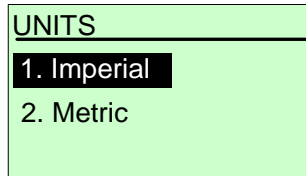
Use the **Up/Down** buttons to define a contrast value and press **Enter**. Make sure there are no strips seen on the screen.



Units

Use this option to select Metric units (meters, degrees C) or Imperial units (Feet, degrees Fahrenheit) as your unit of measurement.

Select Imperial or Metric and press **Enter**. All units displayed on the UDI-28™ boat unit will now conform to the unit type chosen.

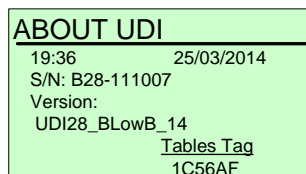


NOTE: The temperature displays according to your units selection – When you select Feet, Fahrenheit degrees are shown, when you select Meters, centigrade degrees are shown.

About UDI-28

Use this option to view the UDI-28™ boat unit serial number and software version installed. Use this information when contacting UTC about your UDI-28 Boat unit.

In addition the **About UDI** screen presents the table tag value which is a unique code for each specific UDI-14™ list of users and messages. Make sure that every UDI-14™ device and boat unit (in the same network) has the same Table Tag value. For more information see page 4



Care and maintenance

The UDI-28™ boat unit requires very little care or maintenance.

After every dive: wash the antenna and antenna cable. Wipe down the UDI-28™ boat unit and make sure that the connectors are well covered (using caps) and are dry prior to connecting the UDI-28™ to the charger or the PC.

Do not use a water jet or pressure from hose to clean the UDI-28™ boat unit, to prevent damage to the UDI-28™ boat unit mechanism.

Periodically the UDI-28™ boat unit may need to be serviced at an authorized laboratory for calibration and battery replacement (at least once a year) . Consult the UDI-28™ webpage for information or your dealer.

Revert to factory setting:

In case you would like to revert to the original UDI-28™ boat unit factory settings, turn on the UDI28 boat unit by pressing the **Up**, **Down** and **Enter** buttons simultaneously. the message "set default" appears on the screen. All customizations and settings you have done will be erased, and UDI28 boat unit will turn on with the original factory settings.