Sea-Bird Electronics, Inc.
13431 NE 20th Street
Bellevue, WA 98005
USA

Phone: (425) 643-9866
Fax: (425) 643-9954
E-mail: seabird@seabird.com
Web: www.seabird.com

APPLICATION NOTE NO. 17 **Revised February 2010**

Instructions for use of SBE 14 Remote Depth Readout

This Application Note describes the installation and use of the SBE 14 Remote Depth Readout, a large-format, 4-digit, liquid crystal display and sonic alarm in a weatherproof, plastic housing. The SBE 14 is intended for mounting at the CTD winch operator's position, and is operated in one of the following modes:

- **Connected directly to the computer**: The SBE 14 is powered by a standard RS-232 serial port on the user's computer, and is controlled via Seasave V7 (our real-time data acquisition software). The computer must have an extra RS-232 serial port to accommodate the SBE 14, in addition to the port(s) needed for the CTD and, if applicable, a Water Sampler. In this configuration, the SBE 14 can be used with a number of Sea-Bird CTDs, including the SBE 9*plus* (with SBE 11*plus* Deck Unit - original V1 **or** V2), 19, 19*plus*, 19*plus* V2, 25, or 49.
- **Connected directly to an SBE 11*plus* V2 (EPROM version 5.0 or greater) Deck Unit**: The SBE 14 is powered and controlled by the SBE 11*plus* **V2**. An extra RS-232 serial port is not needed (the SBE 11*plus* V2 requires one serial port or GPIB parallel port for data and, if applicable, one serial port for communication with an SBE 32 Carousel Water Sampler).

Installation and setup for these modes differ significantly, as described below.

Note: Cables longer than 3 meters should be installed inside an earthed metal conduit by a qualified electrician. This minimizes the potential for external signals to disrupt communication and ensures that high voltage lines (such as the sea cable) are sufficiently protected. Cables shorter than 3 meters can be used without shielding when installing or bench testing the instrument.

Drawings

Cables:
- SBE 14 to computer: 32809
- SBE 14 to SBE 11*plus* V2: 32433
- SBE 11*plus* V2 to computer (test cable, for setup only) 32799

SBE 14 Top assembly: 41269
SBE 14 PCB assembly: 41266
SBE 14 Schematic: 32813

Installation, Setup, and Testing - SBE 14 Connected Directly to Computer

Installation

1. Mount the SBE 14 where the winch operator can easily read the display.

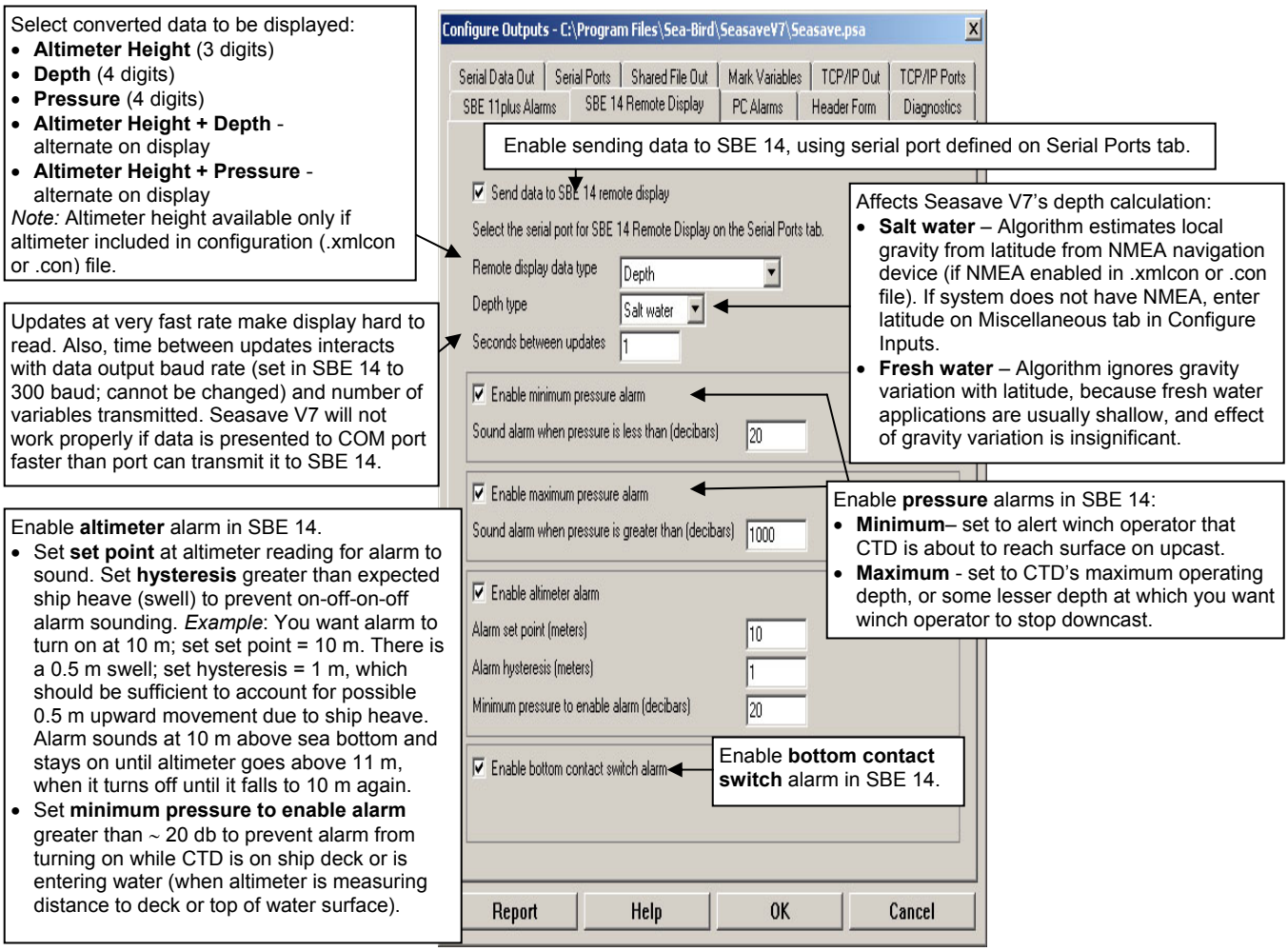
2. Wire the SBE 14 and CTD as follows:
   A. Using the 3-pin to DB-9 cable (drawing 32809), connect the SBE 14 to an RS-232 port on the computer.
   B. Connect the CTD to an RS-232 port on the computer as described in the CTD manual.

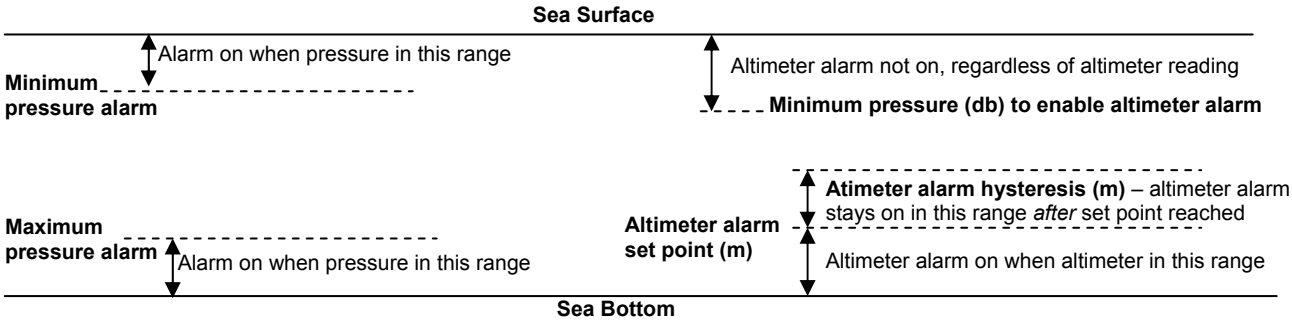
Setup

The SBE 14 is set up in Sea-Bird's **Seasave V7** software, the real-time data acquisition software in our Seasoft V2 suite. These setup instructions assume that you are running Seasave V7 **version 7.17** or greater.

Note: The SBE 14 can be used with earlier versions of Seasave (Seasave-Win32); however, setup for Seasave-Win32 is not covered in this application note. Also, Seasave-Win32 is not compatible with the SBE 19*plus* V2.

1. In Seasave V7, click *Configure Outputs*. In the Configure Outputs dialog box, click the *SBE 14 Remote Display* tab. The dialog box looks like this:





Enter the desired settings.

Notes:

- The altimeter alarm is available only for a CTD with an altimeter. The alarm's input field is grayed out if the selected configuration (.xmlcon or .con) file does not indicate a CTD with an altimeter.
- For the SBE 9*plus* CTD, the bottom contact switch alarm is always available. For all other CTDs, the alarm's input field is grayed out if the selected configuration (.xmlcon or .con) file does not indicate a CTD with a bottom contact switch.
- To view the configuration file, exit this dialog box and click *Configure Inputs*. In the Configure Inputs dialog box, click the *Instrument Configuration* tab.

2. Click the Serial Ports tab. For *SBE 14 Remote Display Serial Port,* select the COM port connected to the SBE 14. Click OK.
3. Change other settings, as desired.
4. In the File menu, select *Save Setup File* or *Save Setup File as* to save all changes.

Testing

Test the SBE 14 by running Seasave V7 using a real-time connection to a CTD system or archived data.

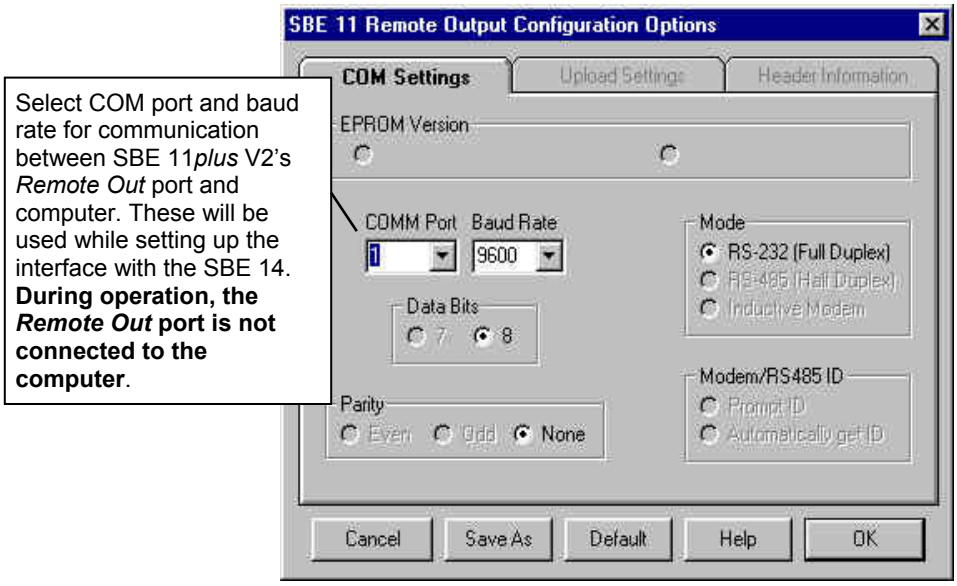
Setup, Installation, and Testing - SBE 14 Connected to SBE 11*plus* V2

Setup

Sea-Bird's terminal program (SEATERM) is used to set up the SBE 11*plus* V2 to transmit data to the SBE 14.

1. Temporarily connect the SBE 11*plus* V2's *Remote Out* port to a COM port on the computer, using the supplied test cable (drawing 32799).

2. In SEATERM, select *SBE 11 Remote Out* in the Configure menu. The following dialog box appears:



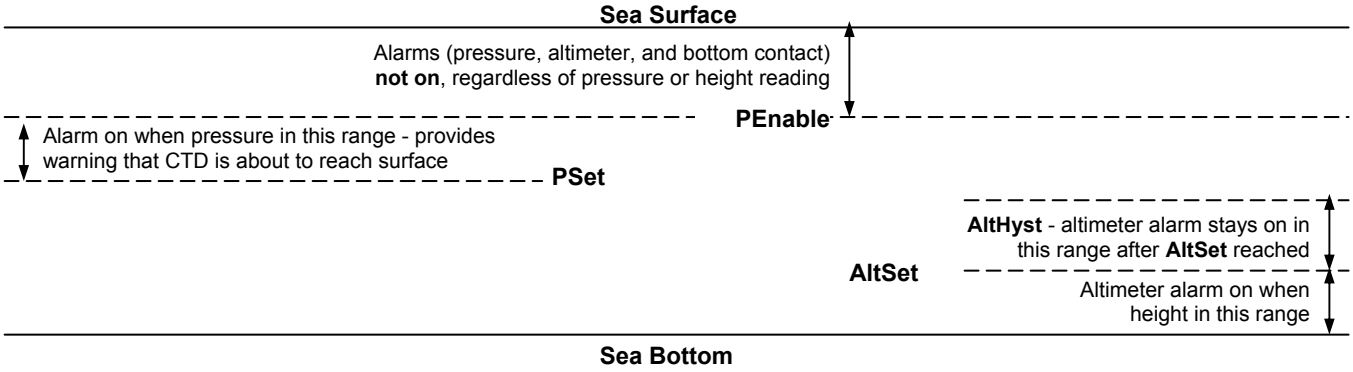
   Enter the desired COM port and baud rate and click OK or Save As to save the settings when done.

3. Turn on the power switch on the SBE 11*plus* V2.

4. Click the Connect button on the Toolbar. SEATERM returns an **S>** prompt, showing that correct communications between the computer and the SBE 11*plus* V2 *Remote Out* port have been established.

5. Send the following commands to set up the SBE 14 display and alarm parameters (see the figure below for details):

   - **Baud=300** Set baud rate for data transfer between the SBE 11*plus* V2 and SBE 14 to 300.
   - **Alarms=x** Enable/disable alarms:
     If **Alarms=0**, all alarms are disabled. Any combination of bottom contact switch, pressure, and altimeter alarm can be enabled by adding alarm value (bottom contact = 1; pressure = 2; altimeter = 4) to **x**.
     Example: To enable all alarms, set **Alarms=7** (1 + 2 + 4 = 7).
   - **Format=x** Set data type for display on SBE 14:
     x=129 Altimeter height
     x=130 Depth
     x=144 Pressure
     x=145 Pressure + Altimeter height (alternate on display)
     x=131 Depth + Altimeter height (alternate on display)
   - **PEnable=x** Set minimum pressure to enable alarms (bottom contact, pressure, and altimeter) to **x** decibars.
   - **PSet=x** (if pressure alarm enabled) Set pressure alarm to **x** decibars.
   - **AltSet=x** (if altimeter alarm enabled) Set altimeter alarm to **x** meters.
   - **AltHyst=x** (if altimeter alarm enabled) Set altimeter hysteresis to **x** meters. Alarm will remain on until CTD is above **AltSet + AltHyst**, to prevent alarm from cycling on and off due to ship heave.
   - **Lat=x** Set latitude to use for pressure to depth conversion to **x** degrees.
   - **NAvg=x** Set number of scans to average to **x** (6 or greater). With **NAvg=6**, the SBE 14 display updates every 0.25 seconds (6 scans / 24 scans/second = 0.25 seconds).



6. Send other commands to configure the remote output, if desired (see the SBE 11*plus* V2 manual for complete command listing). Send status command (**DS**) to verify setup.

7. Disconnect the SBE 11*plus* V2's *Remote Out* port from the computer COM port.

Installation

1. Mount the SBE 14 where the winch operator can easily read the display.

2. Wire the SBE 14 and SBE 11*plus* V2 as follows:
   A. Using the 3-pin to 5-pin cable (drawing 32433), connect the SBE 14 to the 5-pin *Remote Out* port on the SBE 11*plus* V2.
   B. Connect the SBE 11*plus* V2 to the computer -
      (1) Connect *SBE 11 Interface* on the SBE 11*plus* V2 to an RS-232 port or GPIB parallel port on the computer.
      (2) If applicable, connect *Modem Channel* on the SBE 11*plus* V2 to an RS-232 port on the computer.

Testing

Test the SBE 14 by running Seasave V7 using a real-time connection to an SBE 911*plus* system.