DST CTD &
DST Logic CTD

Troubleshooter

STAR ODDI

Logging Life Science

Contents

1 Connecting to the Recorder

In order to be able to communicate with the recorder, the three diodes on the communication box need to be lit. POWER (red) diode shows that power is fed from the power supply to the Communication Box. PC COM (yellow) diode shows that SeaStar has connected with the box and that the correct COM port has been selected. DST COM (green) shows that the recorder is in a correct position for seeking connection.

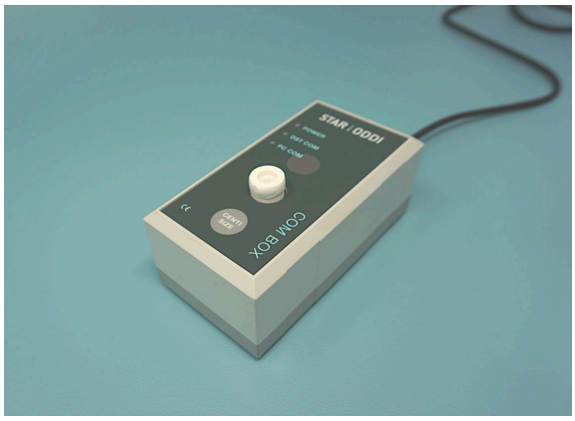

Figure 1.1: Communication Box with recorder inserted.

1.1 No POWER Light

If the red POWER diode does not turn on:

1. Check if the USB cable is connected to your PC.

   For older versions of Communication boxes, using RS-232C serial interface:

2. Check if the power supply is plugged in.
3. Check if the polarity of the connector is correct. The plus should be on the inside and the minus on the outside, +O)-

1.2 No PC COM Light

If the yellow PC COM diode does not turn on:

1. Check if the correct recorder type has been selected in **File** > **Recorder Type**.
2. Check if the red POWER light is on.
3. Check the cable connection between the PC and the Communication Box.
4. Check if the correct COM port has been selected (see chapter 3).
5. Check if the power on (PowOn) indication is shown at the bottom of the SeaStar window.
6. If the USB driver is missing, install it manually (see section 1.2.2).

1.2.1 Defining the Com Port for USB Serial Converter

The easiest way to find the correct Com Port is to use the **Connection Wizard**, which can be found under the **Wizards** menu in the software.

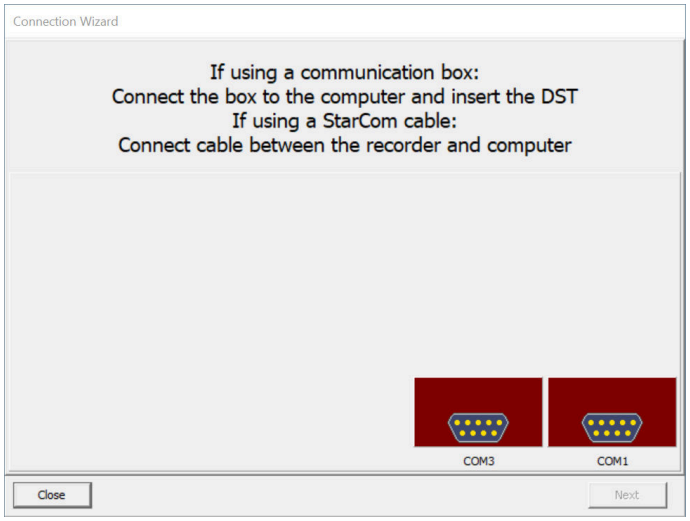

Figure 1.2: Connection Wizard.

The wizard will display all the com ports available. Plugin the USB cable, and the selected com port will turn green.

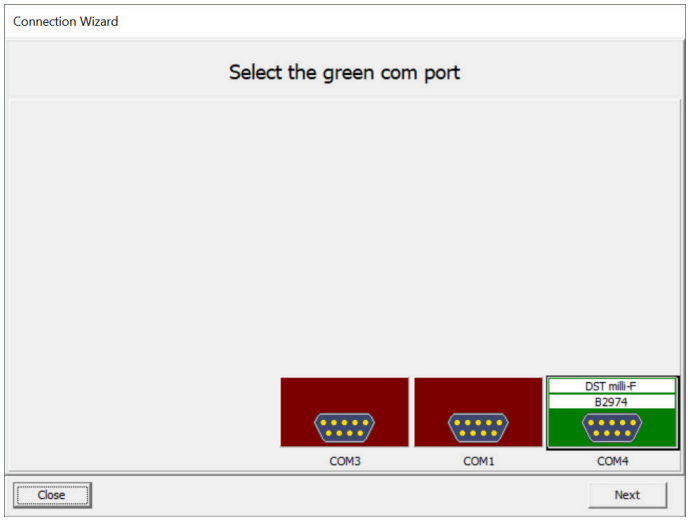

Figure 1.3: Connection Wizard with green USB port showing the recorder connected via the Communication Box.

NOTICE: If no connection can be established with the logger using the USB connection cable, the following procedure should be performed.

After you plug in the USB cable, you will see a new communication port in your device manager, called **USB Serial Port**. Make sure that the port is enabled and select the appropriate port in SeaStar.

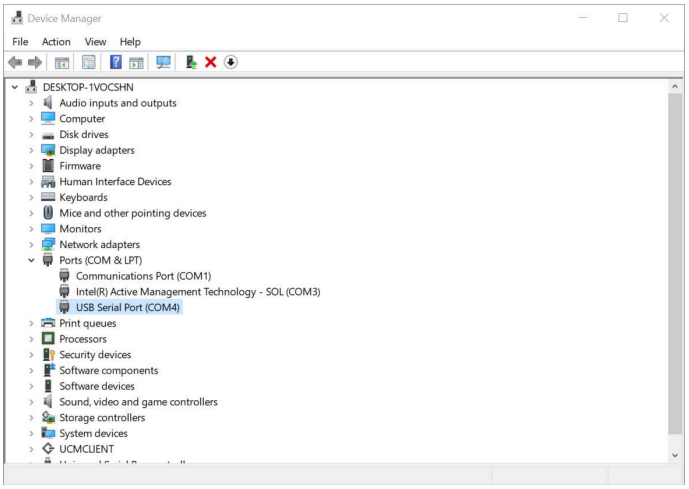

Figure 1.4: USB Communication Port in Device Manager

To check which communication ports are available on your computer, open your Device Manager. On Windows 10 you can do the following: **Control Panel** > **Hardware and Sound** > **Device Manager**, or go to **Search** and type **Device Manager**.

Under **Ports** you can view all available ports. Ensure that the port you intend to use is enabled: right-click on the appropriate port and select properties. Under **Device status** it should state **"This device is working properly"**.

If the connection is still not enabled, double click on USB Serial Port in Device Manager and select **Port Settings**. Click the **Advanced button** and the following window appears:

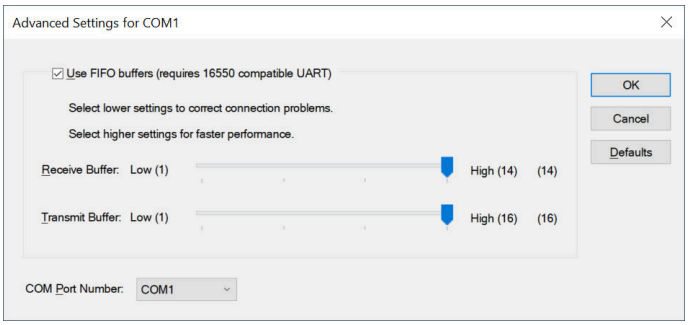

Figure 1.5: Advanced Port settings

Under **COM Port Number** you can define a com port for the USB serial converter. After having selected the COM Port Number, make sure to close SeaStar. When reopening SeaStar, the COM port should become active in SeaStar and can be viewed either under the Connection Wizard or **Settings** > **Communication** > **Serial Ports**. If the COM port number does not become active in SeaStar please try another COM port number. Even though the Device Manager of the computer reports that a COM port number is 'in use', it might be possible to define and use those COM ports for the USB.

There is no "one" solution here, as it varies between computers, and the user may have to try several times to define a few different COM port numbers. It might also be necessary for the user to shift the USB plug between different USB inputs on the computer. If the USB cable is switched to another port, the computer may not find it at first, but it is likely to be found if it is unplugged and re-plugged.

1.2.2 Manual installation of USB drivers

Star-Oddi uses FTDI usb to serial converters both external dongles and internal ones built into the Communication box (usb only), in cases where the COM port is not recognized and the previous steps have been

followed we recommend to install the 3rd party USB drivers manually by either running this executable file or downloading the newest VCP driver from ftdi homepage https://ftdichip.com/drivers/vcp-drivers/.

1.3 No DST COM Light

If the green DST COM diode does not turn on:

1. Check if the red and yellow lights are on.
2. Check if the logger is inserted correctly into the hole in the box. The spherical end should face down.
3. If the recorder has been recording in water, please wipe it dry before inserting it into the box.

1.4 Unstable DST COM Light

1. If using a laptop, make sure that the DC power supply for the laptop is kept as far away as possible from the Communication Box.
2. If the logger comes with a plastic tube attached, make sure that the tube goes all the way through the hole on the bottom of the box so that the logger is placed on the correct level for communication.

1.5 Communication Errors

If all three light diodes on the Communication Box are on:

1. If using a laptop, please make sure that the power cable/DC power supply is located as far as possible away from the Communication Box and the communication cable.
2. Make sure that no electrical devices/power sources are close to the communication cable/box.
3. Check the cable connection between the PC and the Communication Box.
4. If a Device Error is reported upon connection, please check if the SeaStar program has been opened more than once. This error can also occur if a different program is open and is using the same communication port as SeaStar.

1.5.1 CRC Error

The CRC test is a safety check performed by the software when retrieving the Recorder Information Data (RID). The CRC is a register in the RID file, which is calculated and **placed in the recorder's RID** when starting up a new measurement sequence. When retrieving the RID from the recorder, SeaStar calculates the CRC **from the retrieved and matches it against the recorder's CRC** register. If they do not match, a CRC error is reported.

The reason why a CRC error occurs is most likely due to poor communication. Check section 1.5.

It is possible to disable the CRC check while connecting. This is done under **Settings** > **Connection** in the software. Usually, the CRC should not be disabled, but the following scenarios are an exception where CRC check can be disabled:

a) A communication error occurred while connecting. Please check section 1.5 before disabling the CRC check.

b) A communication error occurred while initiating a new measurement sequence.

c) A communication error occurred after data retrieval while updating status in the recorder.

d) A communication error occurred while putting the recorder to sleep.

e) A communication error occurred while updating status in the recorder upon POR (Power-on Reset) error detection. When connecting to the recorder and POR error is detected, new status is initiated in the recorder, and the RAM data is reset.

f) Repeated CRC error occurs, and the above does not apply/has been checked. This may, though, produce errors in the RID file, which again may produce errors in data conversion.

Disable CRC Check

1. Go to **Settings** > **Connection** and disable **Perform CRC test when retrieving RID**.
2. Try connecting to the recorder in **Recorder** > **Connect**.
3. If the connection is OK, then examine the RIT file for possible errors. These possible errors may manifest themselves as very high (>E20) or very low (<E-20) calibration constants. Other errors may be abnormal times/dates and abnormally high measurement sequence numbers in the RIT file. Usually, SeaStar will come up with a warning if the calibration constants or time/date is not regular. If the RIT shows these errors, please request a recorder backup file (RBD) from Star-Oddi.
4. If the recorder has been measuring data, try to retrieve the data (**Recorder** > **Retrieve Data**). If data cannot be retrieved, there is a fault with the PC com port, the Communication Box/cable, or the recorder. If this is the case, please contact Star-Oddi.
5. Make a short measurement test and start the recorder with a new measurement sequence in **Recorder** > **Start New Measurement Sequence**.
6. Connect to the recorder after the short measurement test, **Recorder** > **Connect**. The CRC check is automatically enabled. If a communication/CRC error occurs, there is a fault with the PC com port, the Communication Box /cable, or the recorder. If this is the case, please contact Star-Oddi
7. Retrieve data from the short test **Recorder** > **Retrieve Data**. Analyze the data and verify that the values are correct.

1.5.2 Updating Settings to Recorder Fault

If there is an existing communication problem while using a USB serial converter, the user can disable the **Check Data Echo in the SNMS** option. This option will bypass data echo checks, resulting in less restriction on the communication protocol.

By choosing the **Settings** menu and the **Connection** option command, the following window appears:

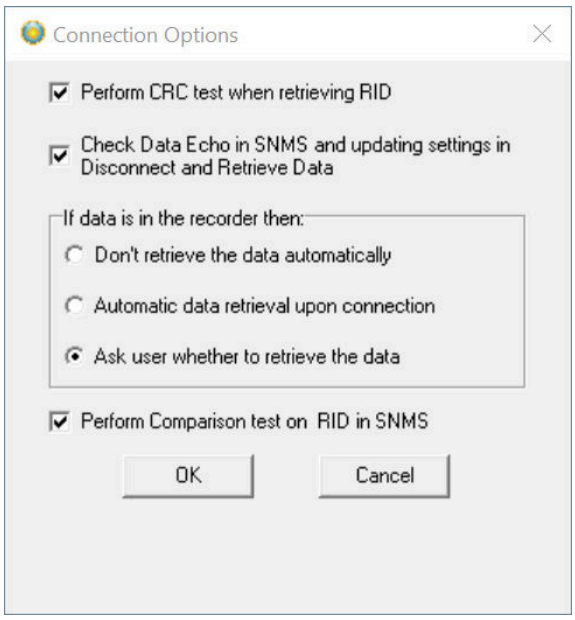

Figure 1.6: Connection Options

Disable **Check Data Echo in SNMS**. Press **OK** and try to connect again.

1.5.3 Comparison Test Error

The comparison test takes place when the PC has sent all the settings data to the recorder, and it reads the whole file back and compares it to what was sent. Bad communication can cause errors in the information file when read back. If the data echo check is enabled, it is guaranteed that the information file was transferred correctly to the recorder. Therefore it is OK to disable the comparison test.

1.6 Communication Problems

When there is much electromagnetic noise, communication problems between the logger and the Communication Box might be experienced.

Try the following:

1. Move the Communication Box further away from other electronic equipment if possible.
2. On older Communication boxes that have a serial connector and a power supply use the In-the-field Power Supply. The power supply is a 9v battery with a connector to the Communication Box that can be used in the field with a Laptop when there is no grid available.

2 Starting a New Measurement Sequence

2.1 Communication Errors

1. Timeout on command echo (no response from recorder).
   a) This may happen because the logger has been removed (and inserted again into the hole). The recorder is off-line. Please try to connect again.
   b) If using RS-232C and AC/DC adaptor (older versions of ComBox), check if the voltage selection on the AC/DC adaptor is set to 9V or higher.
2. Other communication errors.
   Other communications problems can occur although the logger is still on-line. The user is prompted to try starting the logger again in a new measurement sequence. If the user chooses to connect to the logger again, a CRC error will most likely occur. In that case, the user should disable the **CRC** check (in **Settings** $>$ **Connection**).

3 Retrieving data

3.1 Communication Errors

1. No data retrieved.
   This is likely to happen if the battery is depleted or has failed. This means that the logger has not taken measurements. To verify if the battery is dead, the following can be carried out:

   a) Insert the logger into the box so that all lights are on.

   b) In SeaStar, choose **Settings** > **Communication** > **Serial Ports** and set the **Port Enable**/**Power** as OFF. Before pressing the OK button to observe the yellow (DST COM) and green (PC COM) lights:

      i. Press OK. If the green light goes off ca. two seconds later than the yellow light, there is still battery life remaining.

      ii. If the green and yellow lights go off at the same time when the OK button is pressed, the battery is dead. Remember to go back to **Settings** > **Communication** > **Serial Ports** after these steps and set the **Port Enable**/**Power** to ON.

2. Timeout on command echo.
   There is no response from the logger. This may happen because the logger has been removed (and inserted again into the hole). The recorder is off-line. Please try to connect again and retrieve data.

3. Other communication errors while retrieving data.
   The result of the retrieval can be viewed in the MIT file. Usually, if the communication is in order and all the data is retrieved correctly, SeaStar will automatically convert the data from the decimal values (.DAD) to the unit values (*.DAT). If this is not the case, then SeaStar may drop the conversion part, and it is up to the user to either retrieve the data again or manually convert the data, depending on the retrieval status. If a communication error occurs in the middle of data retrieval, the logger goes off-line. The user must connect to the logger again and retrieve the data again.

4. Communication errors while updating logger status.
   If a communication error occurs while updating the status in the logger, i.e., after retrieving the data, the CRC register in the logger is probably corrupt. Thus when connecting again to the logger, a CRC error will likely occur. If so, please disable CRC check as described under CRC error in chapter 1.5.

3.2 Incorrect Salinity Measurement Results

There are several reasons why the salinity recordings might show incorrect measurement values. The most common reasons are listed below.

3.2.1 Air

Air bubbles in the cells (sensor plates in the cup) can drastically change the results. Therefore it is essential to ensure that no bubbles are caught inside the cup when deploying the recorder. This is especially problematic in shallow waters, where waves can capture much air. Changes in the water temperature - especially in shallow, calm waters - or the difference in temperature between recorder and water when deploying can cause a release of oxygen that can cling to the cells. Often this is a gradual build-up in a calm environment.
Sudden jumps in the measurements indicate this problem, showing the time of the release of the bubbles from the cells. Air bubbles attached to the cells usually lower the conductivity measurements.

3.2.2 Oil

Oil can attach to the cells and cause changes in reading. This can create a thin film on the cells giving rise to an offset in the readings that will stay with the recorder until the cells are cleaned.

Measurements can be corrected in SeaStar by applying an offset value to the measurements.

3.2.3 Algae

Algae can attach to the cells and change the measurements gradually, usually lowering the conductivity measurements. To correct the measurements, the user can apply a linear adjustment over the time period in SeaStar (see under **salinity linear adjustment**.)

3.2.4 Corrosion

High salinity, high mineral and metal content in the sea, and unusually high temperature will lead to fouling and corrosion. The cells themselves are highly resistant to corrosion, but under extreme conditions, this may change the cell´s characteristics similarly to algae.

3.2.5 Aging

The measurement circuitry changes gradually with time (over the years). This can be seen as an offset in the measurements.

3.2.6 Cleaning the Cells with Strong Solvents

Applying solid solvents on the cells can change the cell´s characteristics from the way they were calibrated. This can be seen as an offset, usually with a shift to higher values. SeaStar offers a solution to this problem by applying an offset value to the measurements (see **Salinity Offset Adjustment**).

3.2.7 Leakage

Small cracks and holes in the housing may introduce moisture in the recorder, resulting in erroneous measurements. Usually, the pressure and conductivity measurements are most vulnerable to moisture.

3.2.8 Circuitry Damage in Recorder

Shock and hard bumps can give rise to cracking of soldering points on the circuitry board and/or the sensors' connection. This can be seen as an offset, usually with extreme measurement values.

Despite the risk of biofouling, we do not recommend using any anti-biofouling products because they can harm the marine environment and cause damage to the sensors.

