Using the NXIC CTD Autolog Feature

Introduction

The purpose of this Application Note is to explain how to successfully use the NXIC CTD Autolog feature.

User Description of NXIC CTD Autolog Feature

The NXIC CTD Autolog feature instructs the instrument to create a new file and start logging upon submersion in water. This is extremely advantageous to users as it permits logging to a new file without having to reconnect a computer to the instrument to manually instruct the instrument to start logging. Users can also save valuable battery energy when this feature is used in conjunction with TRDI's optional battery end cap switch.

More specifically, the Autolog feature will open a new file and begin logging when the conductivity rises above a threshold of 1mS/cm for more than 30 seconds. Logging will stop and the file will close approximately 30 seconds from the time that the conductivity drops below the 1mS/cm threshold. Figure 1 illustrates this behavior of the Autolog feature, which is only valid when the operating mode of the instrument is set to 'Run mode.' If the operating mode of the instrument is not set to 'Run Mode,' the Autolog feature will not work. This behavior can be viewed in the terminal window, which can be opened by following the menu path view>terminal. When the instrument senses that it is in water above the conductivity threshold for 30 seconds, the instrument streams out "Opening file: DataXX" where XX is the file number. Then when the instrument senses that it is out of the water (i.e., the conductivity is below the threshold) for 30 seconds, the instrument streams out "Closing file: DataXX" where XX is again the file number. Files are named as DATA01, DATA02 and so forth when the Autolog feature is used.

Data can only be logged continuously when using the Autolog feature. Data can not be logged periodically, as is an option when manually instructing the instrument to log to a file using the Configure and Deploy dialog box in CTDPro. The Configure and Deploy dialog box should not be used if the Autolog feature is desired. If the instrument is manually instructed to log to a file using the Configure and Deploy dialog box, then it will do so whether or not the Autolog feature is turned on or off.

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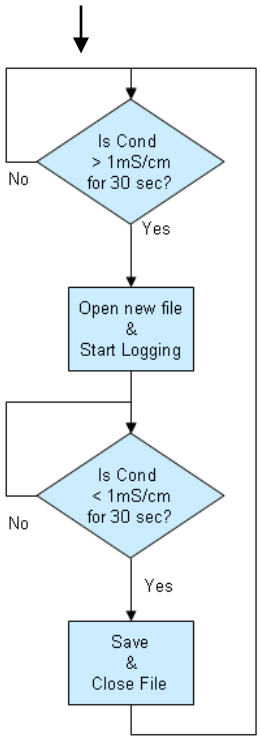

Figure 1. Flowchart for the NXIC CTD Autolog feature (assuming the instrument is in 'Run' operating mode).

⚠	**CAUTION.** The file will be lost if power is removed before the file is closed! To ensure that the data file has been saved and closed properly, wait more than thirty seconds after removing the NXIC CTD from the water before disconnecting power to the NXIC CTD. It is advisable to wait a couple of minutes to ensure that the file closes. Similarly, wait more than 30 seconds before redeployment, or else a new file will not be created, and logging will continue on the same file.

The instrument is capable of storing 22 separate files. Thus 22 such submersion events are possible while maintaining all data. The 22nd file is overwritten every subsequent time the instrument is submerged.

Selecting and Activating the Autolog Feature

To activate the Autolog feature in CTDPro go to the Advanced Setting dialog box with the menu path 'CTD>Communications>Advanced Settings.' Then, check the box that reads "Autolog on Power Up, Low Conductivity will stop logging," and click 'OK' to save this change.

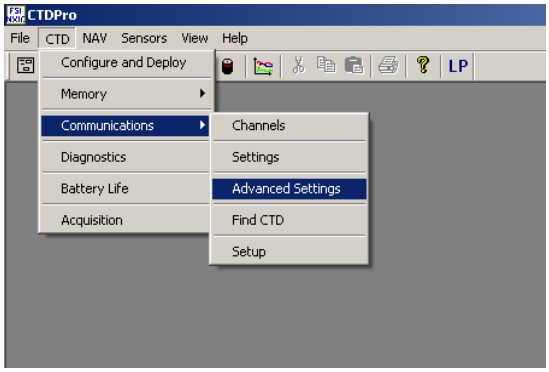

Figure 2. Path to Advanced Settings dialog box

The Autolog Feature is activated by

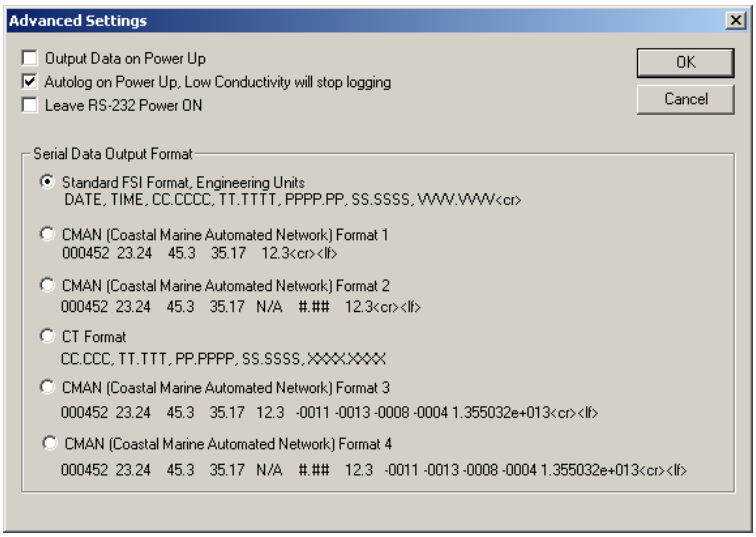

Figure 3. Activating the Autolog feature in the Advanced Settings dialog box

Alternatively, the user can use the terminal window to set the NXIC CTD to Autolog by using the 'AUTO' command. AUTO=ON turns on the Autolog feature, while AUTO=OFF turns off the Autolog feature. Store the settings to EEPROM by using the save command, '***E'.

CAUTION. Any change to the instrument's setting, such as changing the AUTO parameter from OFF to ON, must be saved or else the change will not be effected when the instrument is powered OFF.

Once the Autolog feature has been turned on by either method described above, the instrument must be placed into 'Run mode' to activate the Autolog feature. The two methods of going to 'Run mode' are to enter "***R" in the terminal program or to cycle the power to the

instrument (on power up, the instrument enters Run Mode). Cycling the power is sometimes not an option, in which case, the former method is required.

Typical Applications and Procedures

Several applications are discussed here, with the steps necessary to properly use the Autolog feature.

USING THE AUTOLOG FEATURE WITH BATTERY POWER IN CONJUNCTION WITH THE BATTERY ENDCAP SWITCH

The user can save valuable battery energy by using the Autolog feature in conjunction with TRDI's battery end cap switch option for the NXIC series. This switch breaks and makes the connection from the battery to instrument electronics. Thus, the user can set up the instrument to Autolog and then break the battery connection to the instrument to save energy. The instrument is ready at any time to deploy without any further need to connect the instrument to a personal computer. The user can simply make the battery connection to the instrument and deploy the instrument. Here are explicit steps for setting up the Autolog feature with battery power in conjunction with the battery end cap switch.

1. Install the battery inside the instrument housing
2. Connect the communications cable from the computer to the instrument. External power can be connected to save battery power.
3. Open CTDPro
4. Select the Autolog feature from the Advanced Settings dialog box
5. Close the dialog box
6. Choose the 'Sample Rate' and the 'Average Time' in the Settings dialog box.
7. Close the dialog box
8. Close CTDPro
9. Disconnect the communications cable from the instrument
10. Leave the communications port of the instrument empty or, to ensure a clean port, plug it with a dummy plug (i.e., a plug that breaks the battery connection to the instrument).
11. Wait until it is time to deploy the instrument. This can be days, months, or years.
12. Plug the communications port of the instrument with a plug that makes the connection between the battery and the instrument (i.e. shorting plug). The instrument boots up into run mode, thus Autolog feature is activated.
13. Deploy the instrument

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14. After 30 seconds in water of 1mS/cm or greater, the instrument will start to log to a new file
15. Wait to recover the instrument
16. Recover the instrument (i.e., pull it out of the water)
17. After 30 seconds out of the water, the instrument will automatically stop logging to the file, save the file and close the file. Confirm that water has flushed out of the conductivity cell, otherwise, the instrument may still be logging. **The file will be lost if power is removed before the file is closed!** To ensure that the data file has been saved and closed properly, wait more than thirty seconds after removing the NXIC CTD from the water before disconnecting the shorting plug (i.e., disconnecting power to the instrument). In fact, it is advisable to wait a couple of minutes to ensure that the file closes. Similarly, wait more than 30 seconds before redeployment, or else a new file will not be created, and logging will continue on the same file.
18. Disconnect the shorting plug
19. If the user wants to download the data, then go to step 22
20. Plug the communications port with a dummy plug (i.e., a plug that breaks the battery connection to the instrument) until the next deployment is desired.
21. Go back to step 11
22. Connect the communications cable from the computer to the instrument. External power can be connected to save battery power.
23. Open CTDPro
24. Download ctd data file by following the path CTD>Memory>View Files
25. View the data graphically in CTDPro or export to a txt for use with other analysis software.

Using the Autolog Feature with Battery Power, But Without the Battery End Cap Switch

The steps for using the Autolog feature on a battery powered instrument without the end cap switch as opposed to one with the end cap switch are a little different. First, without a way to externally break and make the connection from the battery to the instrument, the instrument will be depleting the battery from the time it is setup to the time it is deployed. If this time is short, then the end cap switch isn't greatly missed. Secondly, the user must ensure that the instrument is commanded into run mode using CTDPro's terminal window, as cycling the power is not an option with the battery enclosed in the instrument. To command the instrument to run mode type "***R" in the terminal window and hit the 'Enter' key. The user can avoid wasting battery energy and avoid having to command the instrument to run mode by installing

the battery after the instrument's Autolog feature is enabled (as well as saved) and before the instrument is to be deployed.

Using the Autolog Feature with Permanent External Power

If the instrument is externally powered and the power can not be cycled for any reason, then the user must ensure that the instrument is commanded into run mode in order to activate the Autolog feature. To command the instrument to run mode, type "***R" in the terminal window and hit the 'Enter' key.

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