Using the SAMI or AFT with external trigger and data logger/telemetry

Determine if you are using a SAMI with an 'E' board or earlier versus a 'J' board or later. 'E' board SAMIs use the SAMI Client 1.3x while 'J' board SAMIs use the SAMI Client 2.x. This is important for a few details in instructions below.

1. If you don't want any scheduled sampling and only want externally triggered measurements, you still need to *program* and *launch* the SAMI/AFT using the client software. Without configuration, the instrument doesn't have all the parameters loaded and will not function. The easiest way to do this is to set the start time for 1 year in the future. This loads all the parameters, but doesn't start the instrument. If this is a CO_2 unit and it will still be used on a regular schedule - but with external triggering - the sample interval should be set accordingly. In Figure 1, the sample interval is set to 30 minutes. This automatically schedules the blank interval. The instrument uses a counter to schedule blank measurements. The first measurement will be a blank unless otherwise specified. Periodic blanks are required to maintain accuracy and precision.

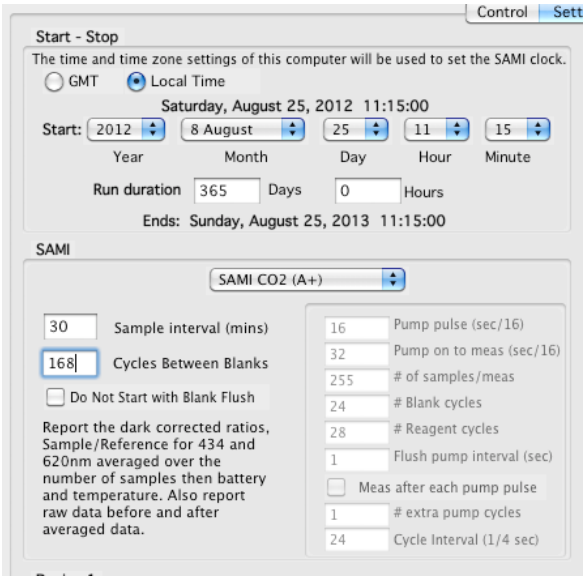

Figure 1. SAMI/AFT CO2 set to start one year in future with expected 30 minute sampling interval. Blank interval is set

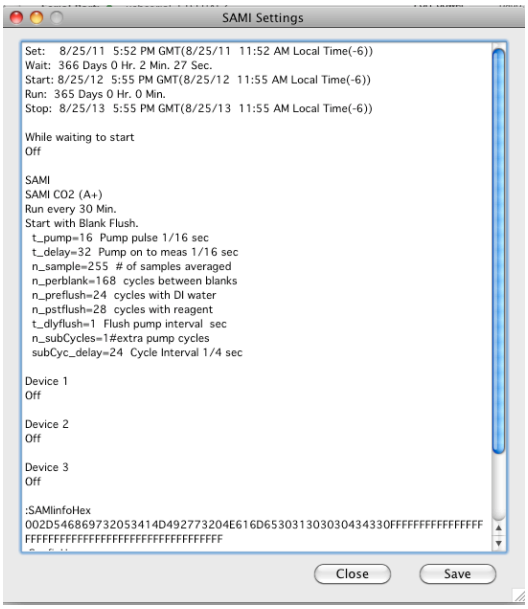

Figure 2. Configuration window that appears upon launching the instrument. Click 'Save' and keep this file for future data analysis of

2.After making these settings, go to the control panel and launch the device. The device must be downloaded and erased before it can be launched. (It can just be erased if there is no useful data on the instrument.) During launch be sure to save the configuration file when the SAMI Settings window appears (see figure 2). The default name for the file is 'SAMI Configuration' but you may want to give it a more meaningful name with the date or instrument number. This file is required to interpret the raw data coming out of the instrument.

Once the instrument is launched you can disconnect ('close serial') or quit the client.

3. For the purposes of testing and verifying operation, connect to the instrument using a terminal emulator. The SAMI/AFT communicate at 57600-8-N-1 unless you have specified 9600 in the client. (That option will not be discussed in this document.) Holding 'RTS' high turns on the instruments serial port. The instrument's serial port must be turned on to communicate with the instrument. On 'E' Board SAMIs, 'RTS' high also tells the instrument to send out a status string every second. To disable this status string, enter 'F5A (CR)'. Once the status string is disabled, note that the client software will not recognize that the instrument is connected if you try to reconnect. To turn the status string on send 'F5 (CR)'. In Figure 3, the status strings, which begin with ':' can be seen near the top of the screen. On 'E' board SAMIs each data record will begin with an asterisk '*' as shown in Figure 3. In 'J' board, data records begin with ':1' and status strings begin with ':4'.

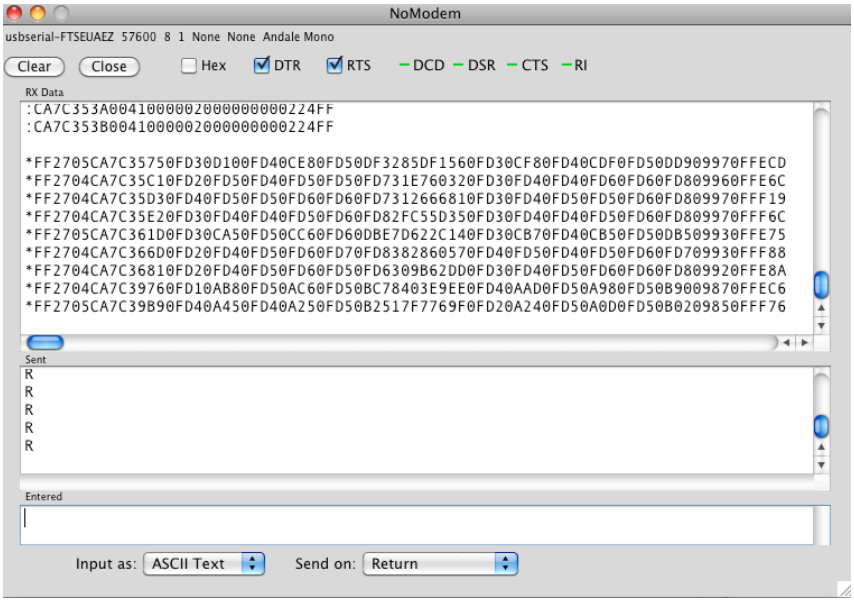

Figure 3. SAMI connected to 'NoModem' terminal emulation software. Top strings, starting with a ':' are status. The command F5A(CR) turned them off. The strings starting with '*' are data records triggered

Note: Holding 'RTS' high keeps the serial port powered on the instrument. If the instrument is running on batteries only, 'RTS' should only be held high when sending commands to preserve battery life.

4. To trigger a measurement, send 'R (CR)' for version 'E' board SAMIs. On 'J' boards use the command 'R 5A (CR)'. On CO_2 units the first measurement will be a blank (unless specified otherwise when programming) and will take ~55 seconds during which time there will be no output to the screen. Normal measurements take ~12 seconds. The data record will start with a '*' or ':1' (see above) and the 5th and 6th alphanumeric characters will be either '05' (blank) or '04' (normal measurement). (On 'J' boards these will be 6th and 7th characters.) For a more in-depth description of data records, consult the manual. On pH units the record identifying characters mentioned above are all the same - '0A' and the approximate time between start and end of measurement will be approximately 99 seconds. Wait at least one minute between sending commands.
5. Blank readings are scheduled automatically when the unit is programmed to occur approximately every 3.5 days. A counter tracks this interval using the programmed

sampling interval. So, for instance, if the unit runs every hour, the counter will be set to 86 (3.5 days = 86 hours). If for some reason you want to run a blank programmatically you can send the 'C (CR)' command ('E' boards) or 'C 5A(CR)' command ('J' and later boards.).

6. External instruments, including biofouling pump, can be triggered using 'R' or 'R 5A' command as well. This is done by adding the device # to the command. So the

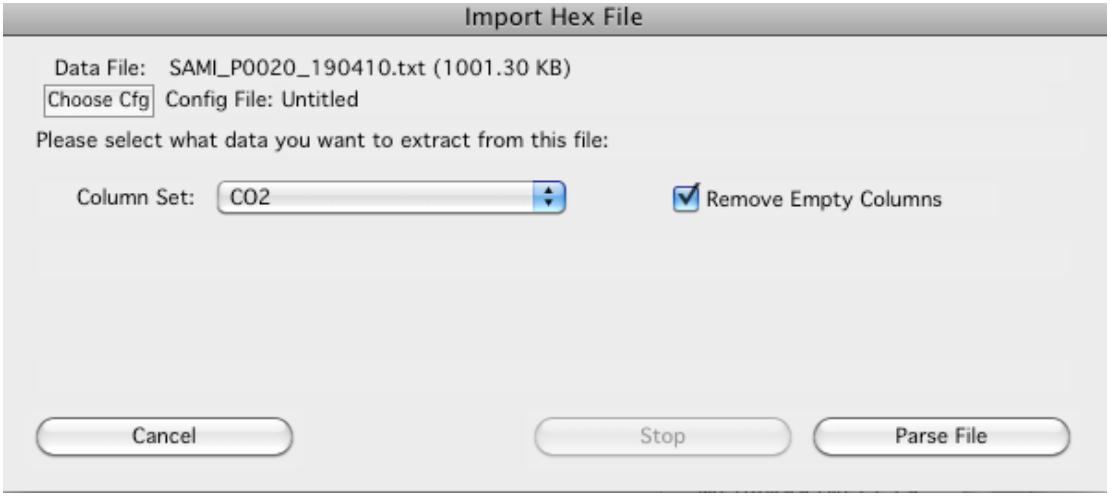

Figure 4. Import Hex File screen which appears after the data file from the logger has been selected. Hit 'Choose Cfg' to load the configuration file that was saved during launch.

command 'R1' or 'R 5A 1' would trigger whatever is connected as device 1 for example.

7. For 'J' boards and later using the SAMI Client 2.20 (and later) with firmware version 1029 (or later) you can transmit the character 'Y' to retrieve the last data record. This is useful for power conservation of the receiving unit - it doesn't need to stay powered up and 'listening' for the data record. To use this feature, program the 'Comm Settings' in the client to '57.6K - Suppress type'.

8. Presumably the end-user will automate the process described above and the output will be logged in some external text file. The SAMI-Client software will be able to process this text file as long as the record is located all on one line. It can tolerate other data being on the same line with it and should ignore non SAMI records. So if there are time-stamps or other info in the user's scheme, these will be ignored.

9. To process the data, open the client software and go to the 'File' menu and select 'Import Hex File'. The program will give a standard open dialog, and the user should select the text file from the logger. After doing so, the window shown in Figure 4 will appear. In this window, click on the 'Choose Cfg' button and select the configuration file that was saved at the time of launch (see step 2) and select the CO2 column set.

It is strongly recommended that the user bench test all the settings before deployment to ensure proper function during deployment.

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Revison History

August 2019 - Updated for ‘J’ boards and later. Clarified external instrument commands.