Profilers Samplers Flotation

mclanelabs.com

Sediment Trap & McLanePro
User Manual

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Table of contents

Included with the Sediment Trap 7
Contact McLane 8
Serial Number 9
McLanePro Introduction 10
Install McLanePro 11
System Requirements 11
Connecting Battery Power 12
Connecting to the Sediment Trap 15
Communication Error Message 17
Setting the Instrument Clock 19
The Manual Operation Tab 20
Move The Rotator 20
Set the Rotator Position Reference 21
The Schedule Tab 23
Schedule a Deployment Using a Start Time & Event Interval 23
Schedule a Deployment Using a Start Time & End Time 24
Schedule a Deployment Using an Existing Schedule & Schedule Offset 26
Exporting a Schedule 27
Importing a Schedule 28
Schedule Errors 29
The Deployment Tab 32
Starting a Deployment 32
Setting Sensor Data Interval 35
The Offload Tab 36
Event Data 36
Deployment Log 37
Exporting Deployment Data 37
Viewing and Exporting Data From Previous Deployments 38
The Admin Tab 40
Running Diagnostics 40
Update Firmware 41
The Terminal 43
The SD Card Tab 45

The Configuration Tab 46
The Activity Log 48
The Help Menu 49
Sediment Trap General Information 51
Description & Models 51
Optional Deep Controller Housing 51
Sediment Trap Mechanical Information 53
Frame 53
Cone 53
Honeycomb Baffle 53
Controller Housing 54
Top End Cap 55
O-Rings 55
End Cap Bulkhead Connectors 55
Optional High Pressure Penetrators 56
Gear Plate Assembly 56
Plastic Ball Bearings 57
Variseals 57
Drive Motor 58
Sediment Trap Electronics Information 59
Opening the Controller Housing 59
Main Battery 60
Tilt Sensor 60
Deployment Duration Estimate 61
Sediment Trap Operations 62
Deployment Preparation 62
Preparing & Attaching Sample Bottles 62
Aligning the Rotator to the Open Position 63
Filling the Sample Bottles 63
Programming the Deployment 63
Starting the Deployment 63
Sediment Trap Maintenance & Storage 65
Tilt Sensor & End Cap Orientation 65
Immediately Following Recovery 66
Rinsing the Sediment Trap 67

Back from Sea 67
Check the drive motor oil 68
Add Oil to the Drive Motor (only if Necessary) 68
Remove and Inspect controller housing internal parts 70
Align Fixed & Gear Plates, Reattach Drive Motor 70
Rotator Assembly Variseals & Bearings 70
Step 1 - Remove Components from the Frame 70
Step 2 - Clean and replace Variseals (only if needed) 72
Step 3 - Clean and replace ball bearings (only if needed) 73
Step 4 - Reassemble Rotator 74
Step 5 - Perform Leak Test 74
Reinstall Components onto Frame 75
Storage 76
Adaptive Command Reference 77
Terminal Emulators 77
Serial Connection Parameters 78
Adaptive Deployments 80
Commands 85
System Commands 85
BATTERY 86
SLEEP 86
WAKE 87
TILT 88
VERSION 89
TEMPERATURE 89
Time Commands 90
SET_TIME 90
GET_TIME 90
Rotator Commands 91
ROTATOR ? 91
ROTATOR NEXT / PREVIOUS 92
ROTATOR PORT 95
Deployment Commands 100
DEPLOYMENT SCHEDULE SENSOR_INTERVAL 101
DEPLOYMENT SCHEDULE BACKUP_INTERVAL 101

DEPLOYMENT SCHEDULE EVENT 102
DEPLOYMENT SCHEDULE RECOVERY_RELEASE 102
DEPLOYMENT OUTPUT PARAMETERS 103
DEPLOYMENT BEGIN ADAPTIVE 104
DEPLOYMENT NEXT 106
DEPLOYMENT ? 107
DEPLOYMENT END 108
DEPLOYMENT RESUME ADAPTIVE 108
DEPLOYMENT LOG_SENSORS 110
Recovery Release Commands 110
RECOVERY_RELEASE TIME_ON 110
RECOVERY_RELEASE NOW 111
RECOVERY_RELEASE ? 111
Data Offload Commands 112
OFFLOAD TILT 112
OFFLOAD TEMPERATURE 113
OFFLOAD POWER 113
OFFLOAD EVENT_SUMMARY 114
SD Card and File Commands 116
COPY 116
DEL 117
DIR 119
INPUT_FILE 121
OUTPUT_FILE 122
MKDIR 122
XMODEM 123
FILE_INFO 127
SABL Model Sediment Trap 128
Introduction 128
Removing & Installing the Rotator Assembly 129
Removing the cone & baffle for cleaning 131
Mounting the Rotator to the Frame 133
Setting up the Pop-up Buoy 135
Wet Sample Particle Divider 140
Setting up the WSD-10 140

Using the Wet Sample Divider 141
Optional Deep Sediment Trap Connectors 142
Removing Deep Motor Connector 142
Re-attaching Penetrator Locking Collar & Ring 142
Optional Temperature and Pressure Sensor 143
Sensor Mounting 143
Manual Operation 145
Setting the Pressure Offset 145
Deployment Settings 146
Offload Tab 147
Offload Files 149
Admin Tab 151

Included with the Sediment Trap

A new Sediment Trap includes a USB drive that contains the sampler firmware, User Guide, and McLanePro, the graphical user interface for samplers built with McLane Research Lab's Gen3 electronics.

Each Sediment Trap also includes a toolkit. The toolkit and contents are referred to throughout this User Guide, and should **remain with the instrument at all times.**

The Sediment Trap toolkit pictured is only an example. Actual toolkit contents may vary and are subject to change without notice.

Contact McLane

TELEPHONE SUPPORT	+1 508.495.4000
FAX	+1 508.495.3333
SKYPE	MCLANE_RESEARCH
EMAIL	MCLANE@MCLANELABS.COM
WEBSITE	www.mclanelabs.com
Mailing Address	McLANE RESEARCH LABS 121 Bernard E. Saint Jean Drive, East Falmouth, MA 02536 USA

When contacting McLane for technical support, provide the following:

- Firmware version and instrument serial number.
- Problem description including files from the onboard MicroSD card if possible.

Contact mclane@mclanelabs.com with questions about retrieving files.

McLane Research Laboratories is on the Web at http://www.mclanelabs.com or via email at mclane@mclanelabs.com.

The Sediment Trap pages on the McLane website contain links to documentation including Technical Bulletins, and papers that describe the development and use of the Sediment Trap.

Printable User Manual

Check the Sediment Trap User Manual page on the McLane website for updates and a downloadable Sediment Trap & McLanePro User Manual.

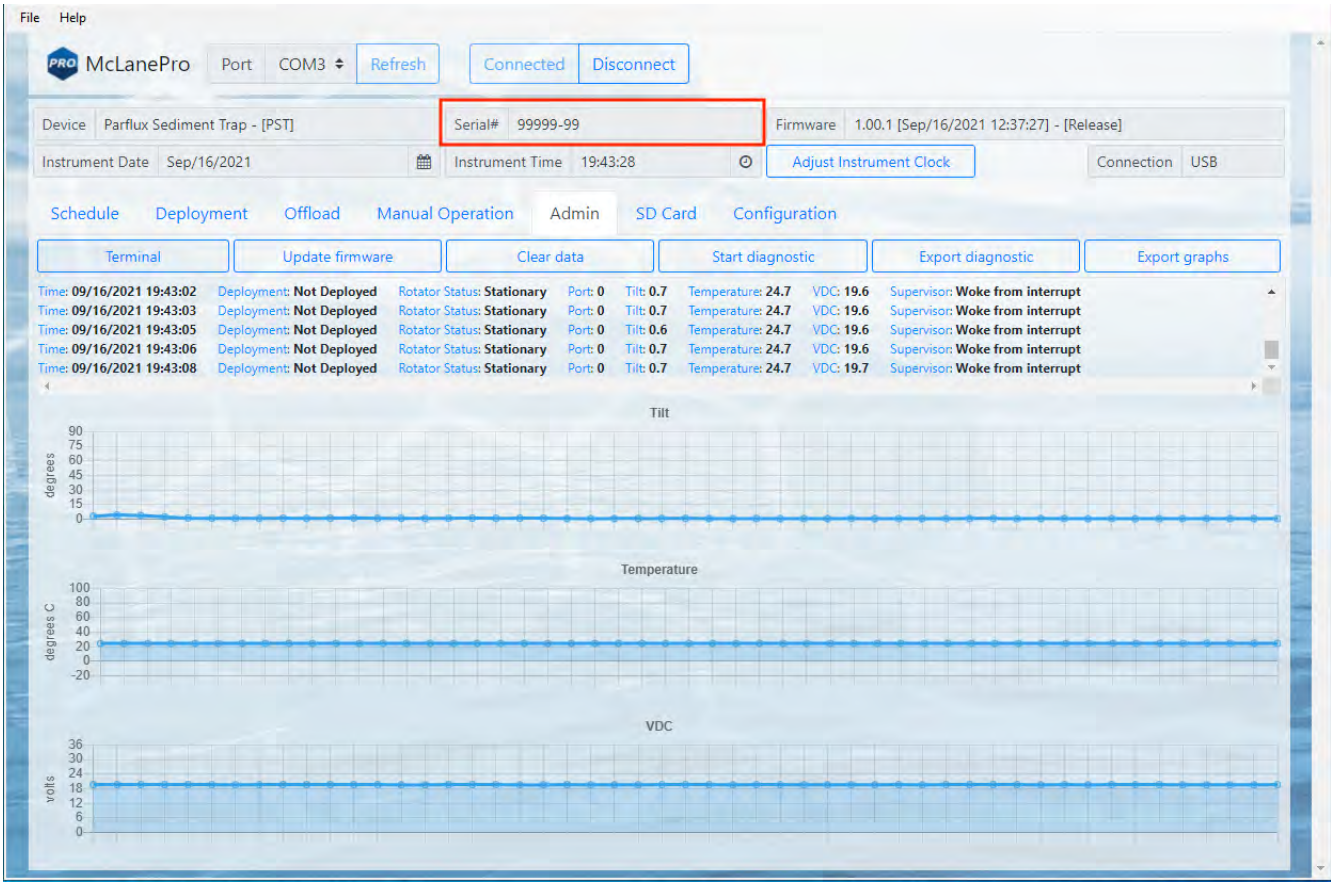
Serial Number

A McLane instrument serial number begins with 'ML' and has five numbers and a dash (-) with two more numbers.

Example: ML12345-01

This information is located in multiple places:

- On a label attached to the controller housing
- On a label on the cross channel support
- Programmed into the electronics and reflected on the McLanePro main display.



McLanePro Introduction

McLanePro is the graphical user interface for samplers built with McLane Research Lab's Gen3 electronics. This section outlines the features and functionality of McLanePro. This information will help with using McLanePro to operate McLane samplers.

McLanePro Introduction topics

Download McLanePro
Connecting Battery Power
Connecting to the Sediment Trap
Setting the Instrument Clock
The Manual Operation Tab
The Schedule Tab
The Deployment Tab
The Offload Tab
The Admin Tab
The SD Card Tab
The Configuration Tab
The Activity Log
The Help Menu

Install McLanePro

Installation

McLanePro can be downloaded from the "Software Utilities" section of the McLane website:

https://mclanelabs.com/software-utilities/
Follow the installation wizard instructions to install the program.

McLanePro Updates

McLanePro will detect available updates and prompt the user for installation when starting up the program. Follow the update wizard instructions to install the latest version of McLanePro.

System Requirements

Operating System	Windows 10 32/64 bit
Disk Space	450 MB
Memory (RAM)	4GB

Connecting Battery Power

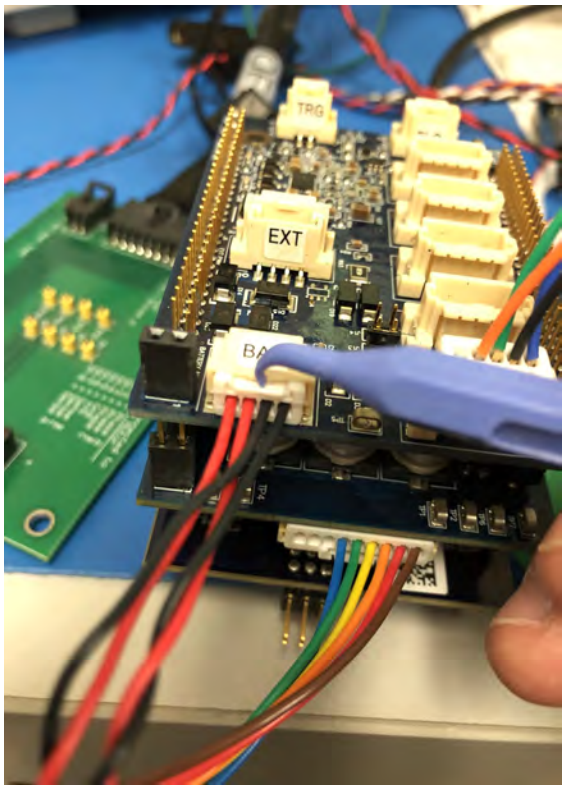
Follow these steps to connect the battery. Always use caution whenopening and closing the controller electronics housing.

Related topic

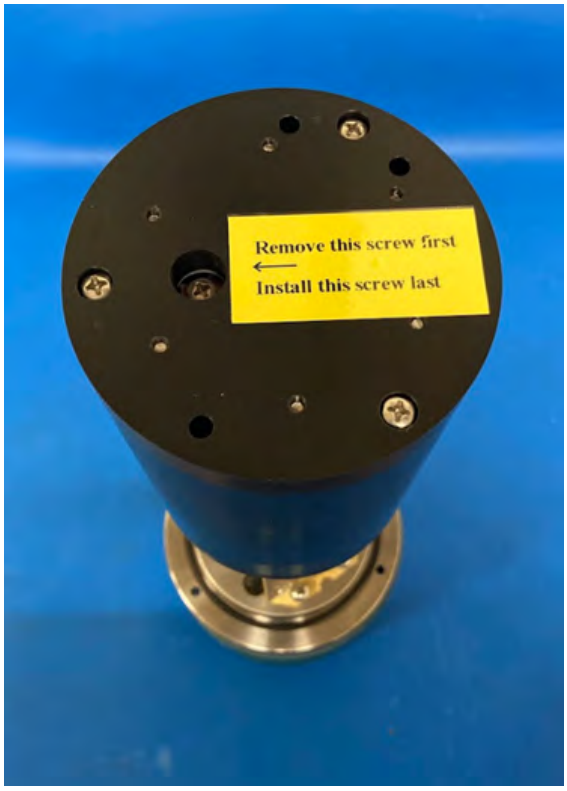
Opening the controller housing

1. Open the controller housing and remove the electronics.
2. Disconnect the battery connector from the electronics.

The battery connector uses a latch to secure the connection. Gently press on the tab to release the connector from the shell.



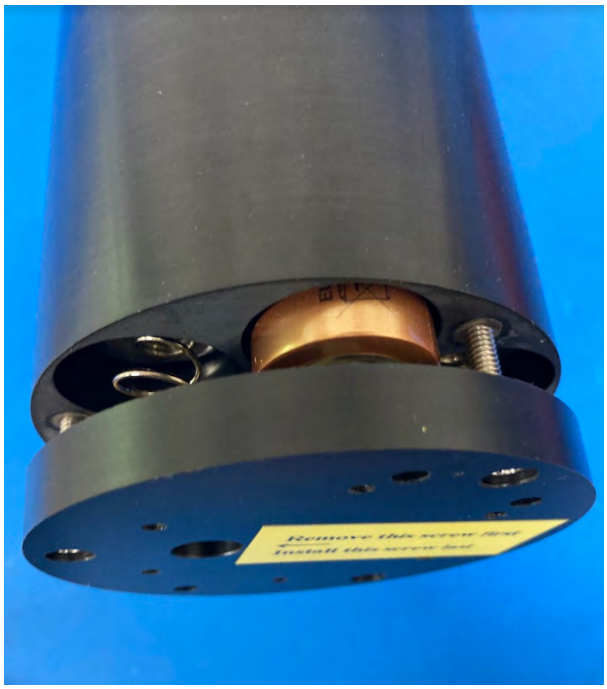
3. Remove the battery enclosure cap.



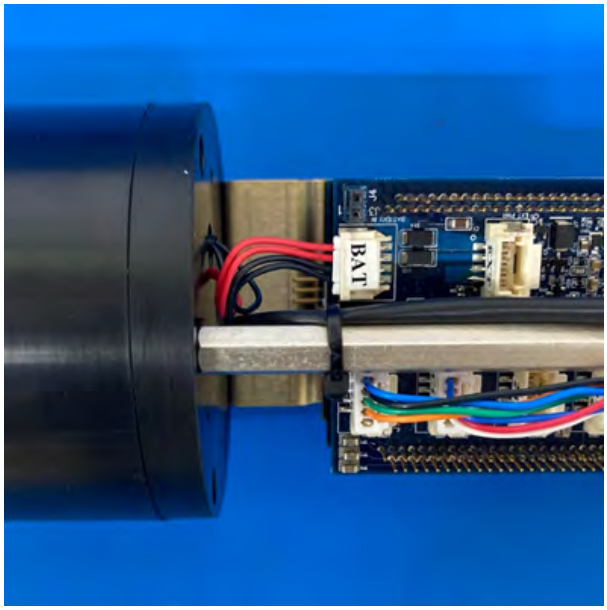
4. Load batteries into the battery holder observing correct polarity.

A video that explains correct battery placement can be downloaded from the[Sediment Trap Videos](#)page on McLane's website.

5. Reconnect the battery holder cap.

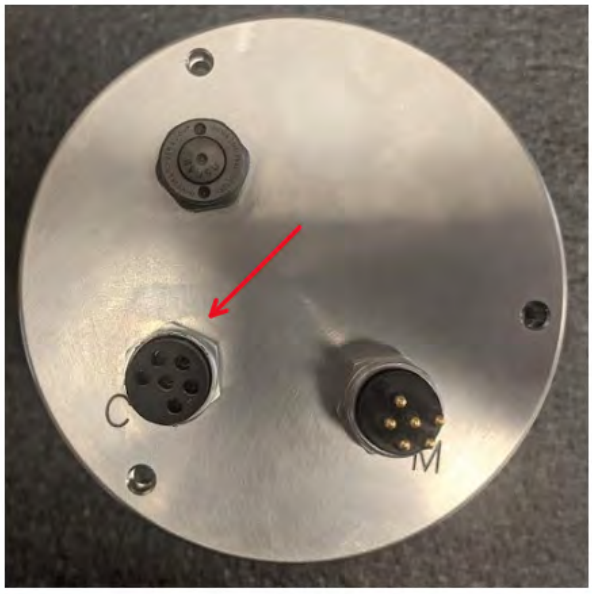


6. Reconnect the batteries to the electronics.



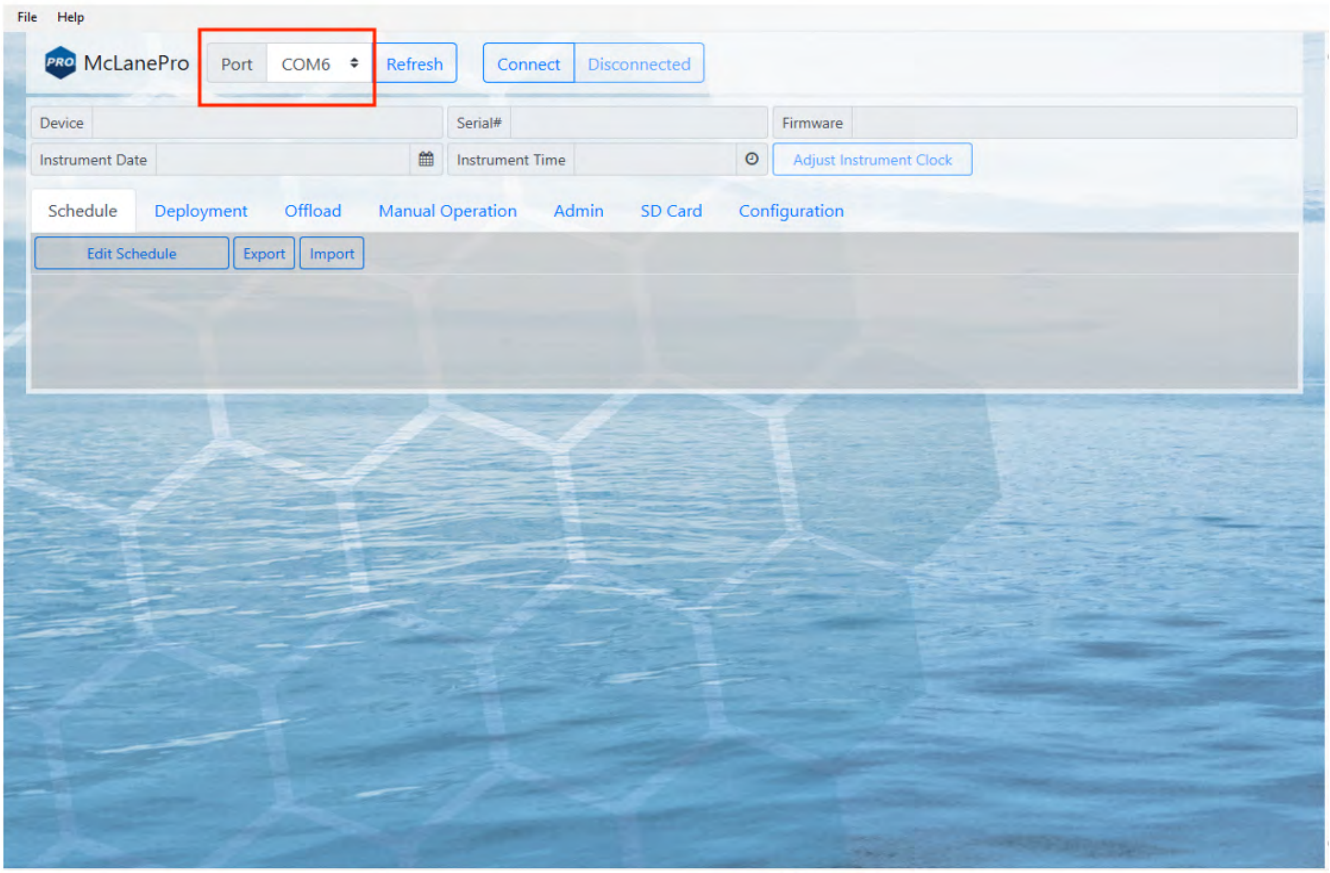
Connecting to the Sediment Trap

McLanePro is used to communicate with the Sediment Trap. McLane ships a USB cable that connects to the six pin communications connector on the housing end cap. A host computer provides the electronics with USB power, to communicate with the sampler. Battery power is required for operation of external hardware.

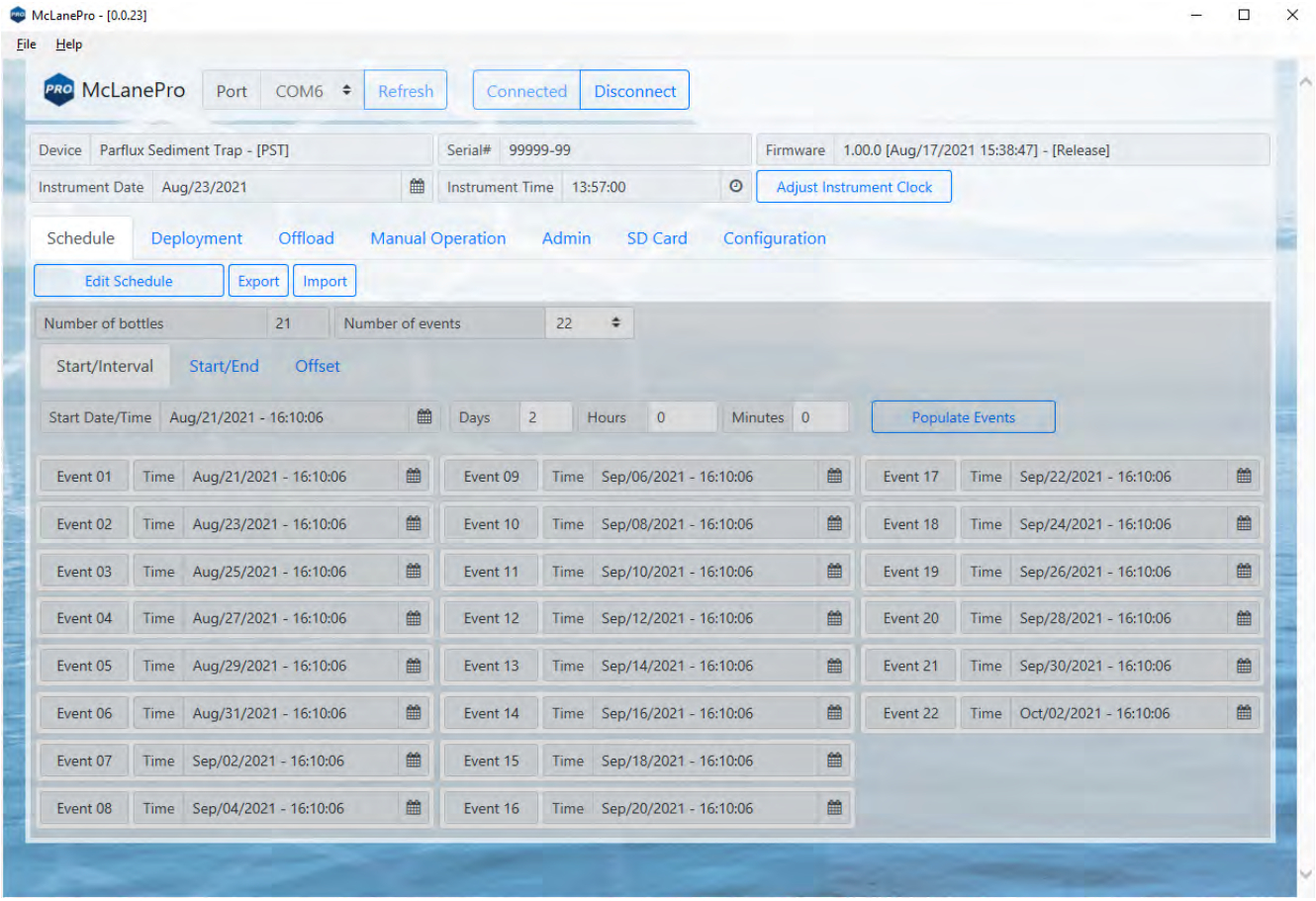


After plugging the USB cable to the Sediment Trap controller, Windows should recognize the USB connection as a virtual serial port.

1. Remove the dummy plug from the communication port on the Sediment Trap.
2. Plug the USB COM cable onto the COM bulkhead of the Sediment Trap. It is important to always plug into the Sediment Trap before plugging into the computer.
3. Plug the USB COM cable into a USB port on the host computer.
4. After plugging the USB cable into the host computer, the host computer should recognize the USB connection as a virtual serial port.
5. Open McLanePro.
6. Find and select the communication (COM) port associated with the McLane Sediment Trap in the Port window.
7. Click **Connect**.

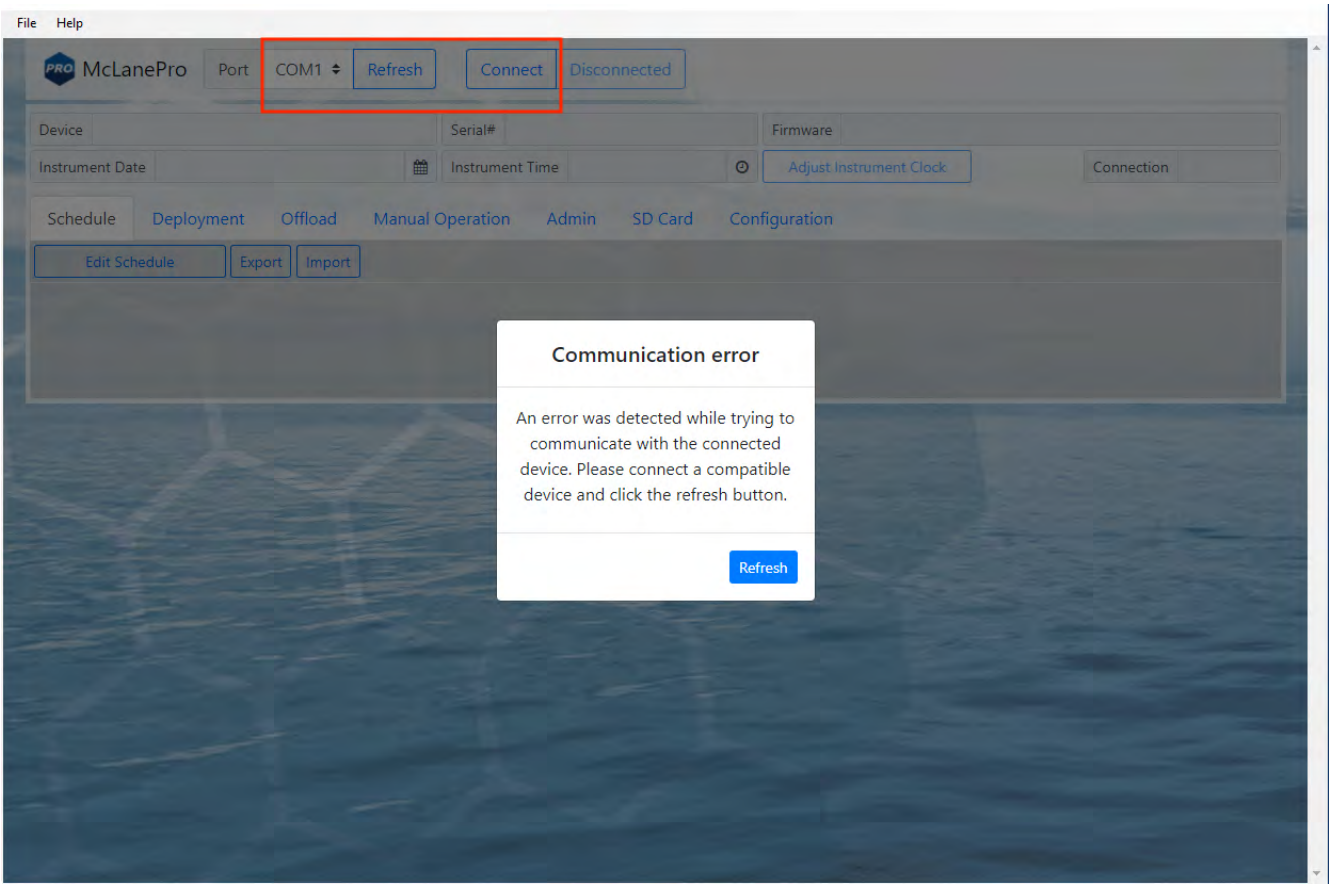


In the above example, the communication port associated with the Sediment Trap is COM 6. After succesfully connecting to the Sediment Trap, McLanePro Tabs will display data stored on the instrument.



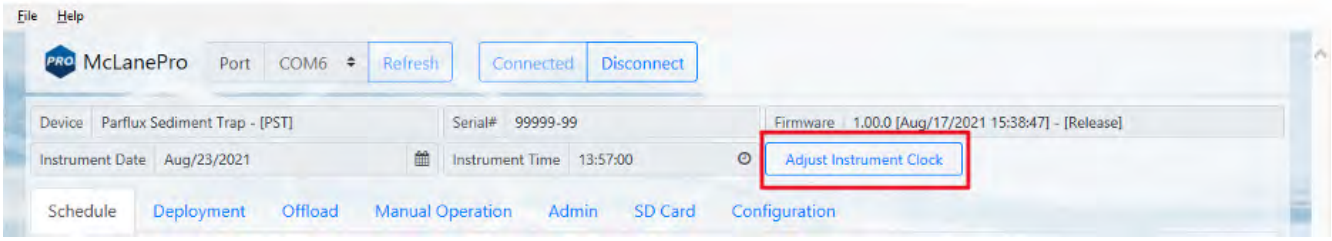
Communication Error Message

If a communication error is displayed, click Refresh and select a different COM port from the drop-down menu.

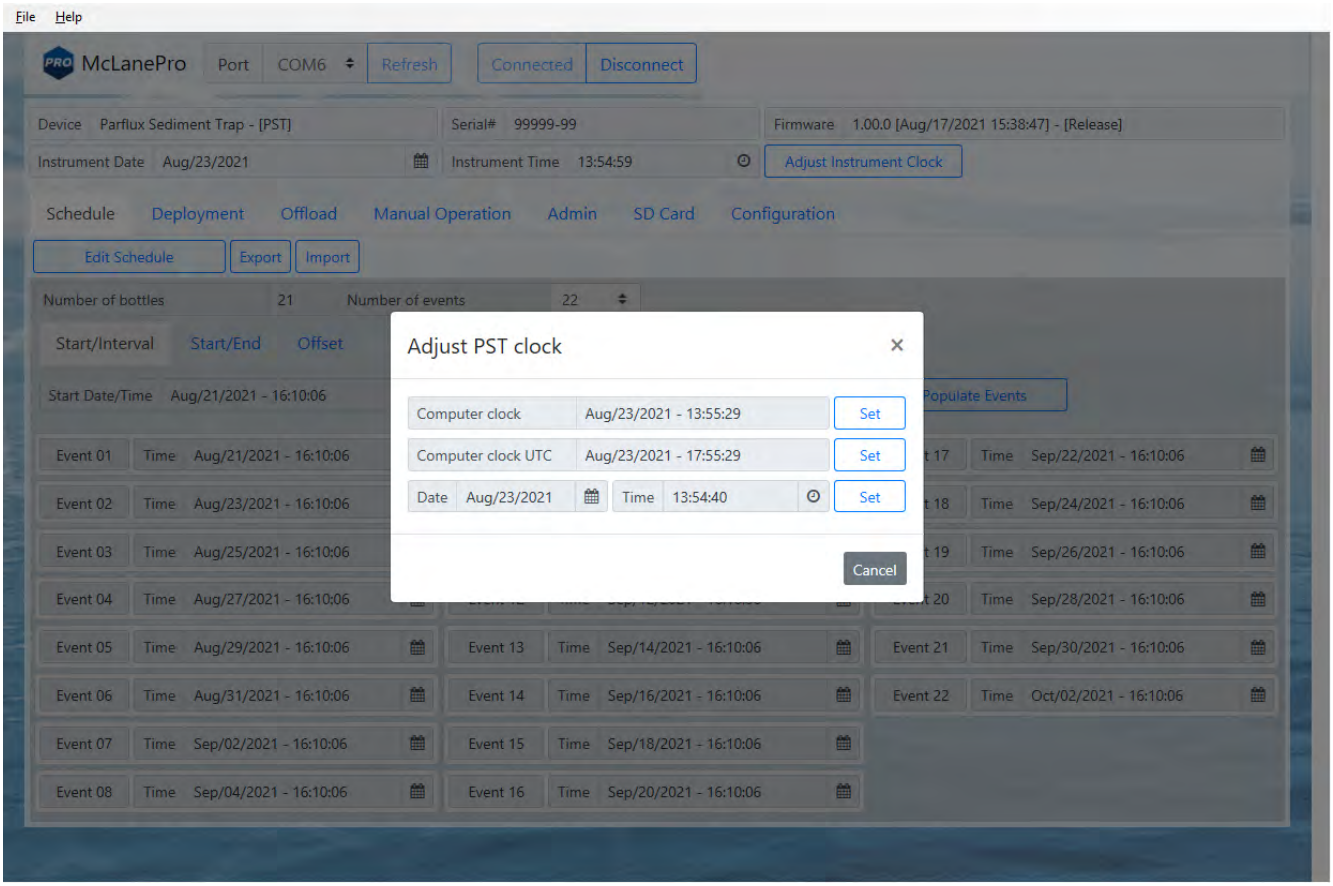

File
Help
McLanePro
Port
COM1
Refresh
Connect
Disconnected
Device
Serial#
Firmware
Instrument Date
Instrument Time
Adjust Instrument Clock
Connection
Schedule
Deployment
Offload
Manual Operation
Admin
SD Card
Configuration
Edit Schedule
Export
Import
Communication error
An error was detected while trying to communicate with the connected device. Please connect a compatible device and click the refresh button.
Refresh

Setting the Instrument Clock

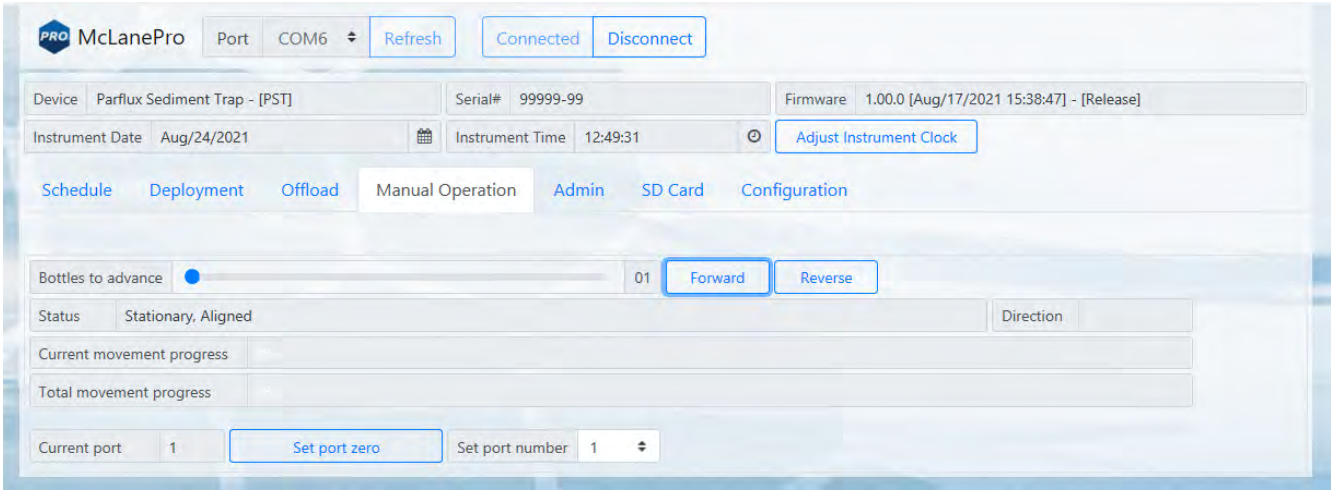
The instrument time is reset if both the USB and the batteries are disconnected. Always be sure to check the instrument time before deploying the system.
To set the instrument time press the **Adjust Instrument Clock** button.



Click the **Set** button to set any time values.



The Manual Operation Tab

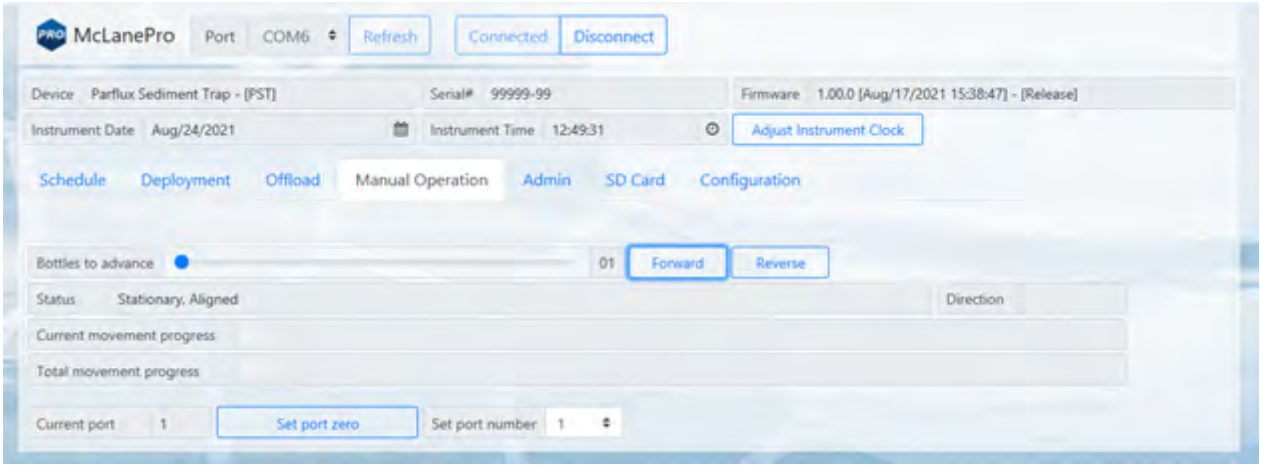


The **Manual Operation** tab allows the user to:

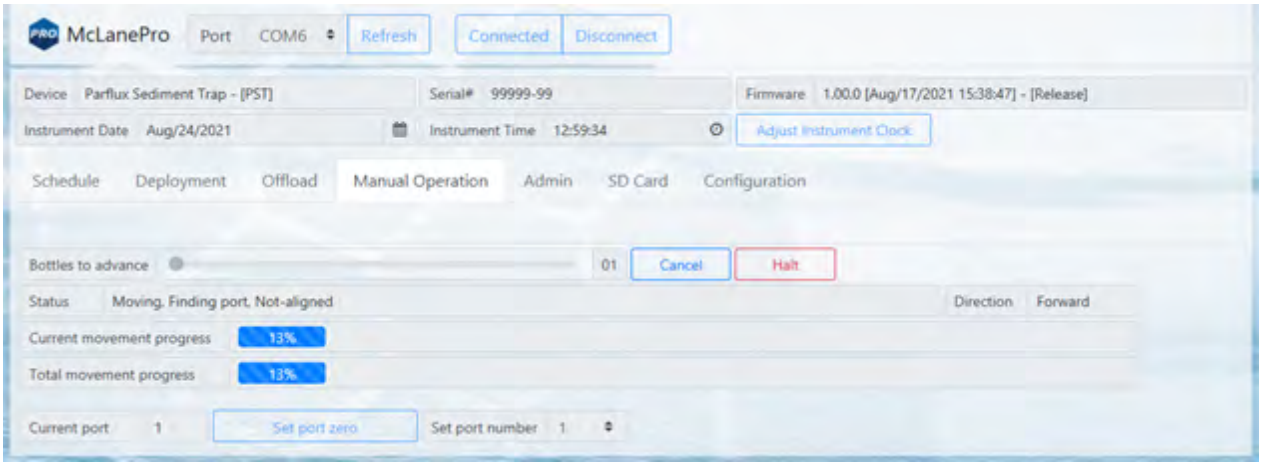
- Move the rotator forward or reverse.
- Set the rotator position.

Move The Rotator

To use the Manual Operation tab to move the rotator forward (counter-clockwise) or reverse (clockwise), select the number of bottle positions to move, and then click**Forward** or **Reverse**.



Once the rotator starts moving, a progress bar shows the progress of the move, and the **Forward** and **Reverse** buttons are replaced with **Cancel** and **Halt**.



Cancel

Canceling a rotator move aligns to the next bottle position before stopping. If executing a multiple bottle position move, the Sediment Trap will stop that move when it aligns to the next position.

Use Cancel when possible. Allowing the rotator to align to the next position retains the position reference.

Halt

Halt stops a rotator operation IMMEDIATELY. This action stops the rotator between bottle positions, and the rotator loses the port alignment. When the port alignment is lost, the rotator position reference (the aligned bottle position) must be manually set by setting the rotator position reference.

Set the Rotator Position Reference

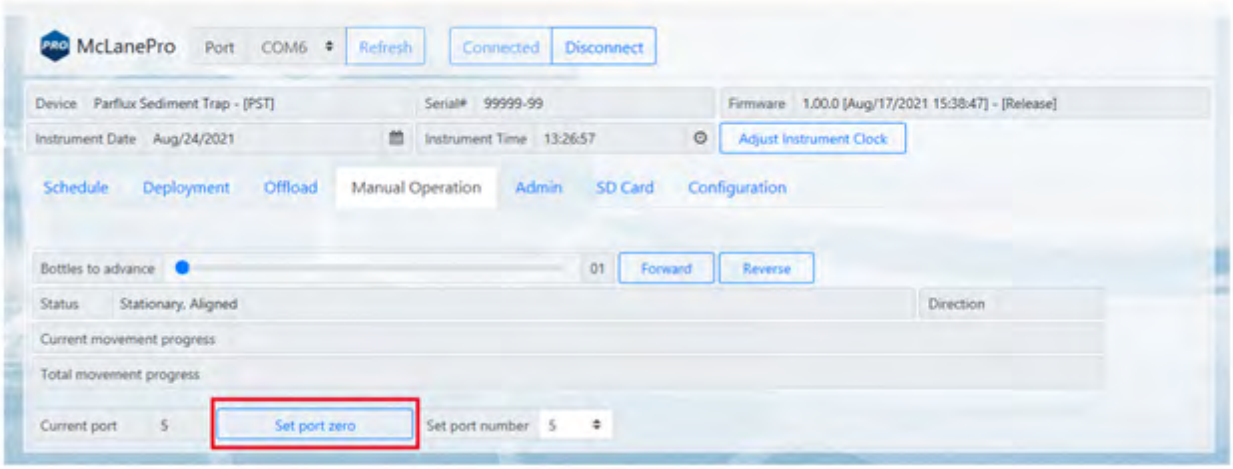
The rotator position can be lost given the following conditions:

- Rotator repairs, or physically removing the rotator from the Sediment Trap.
- Attempting rotator moves without a rotator connected.
- Halting a rotator move in the middle of a move.
- Some firmware updates.

There are two ways to set the rotator position reference.

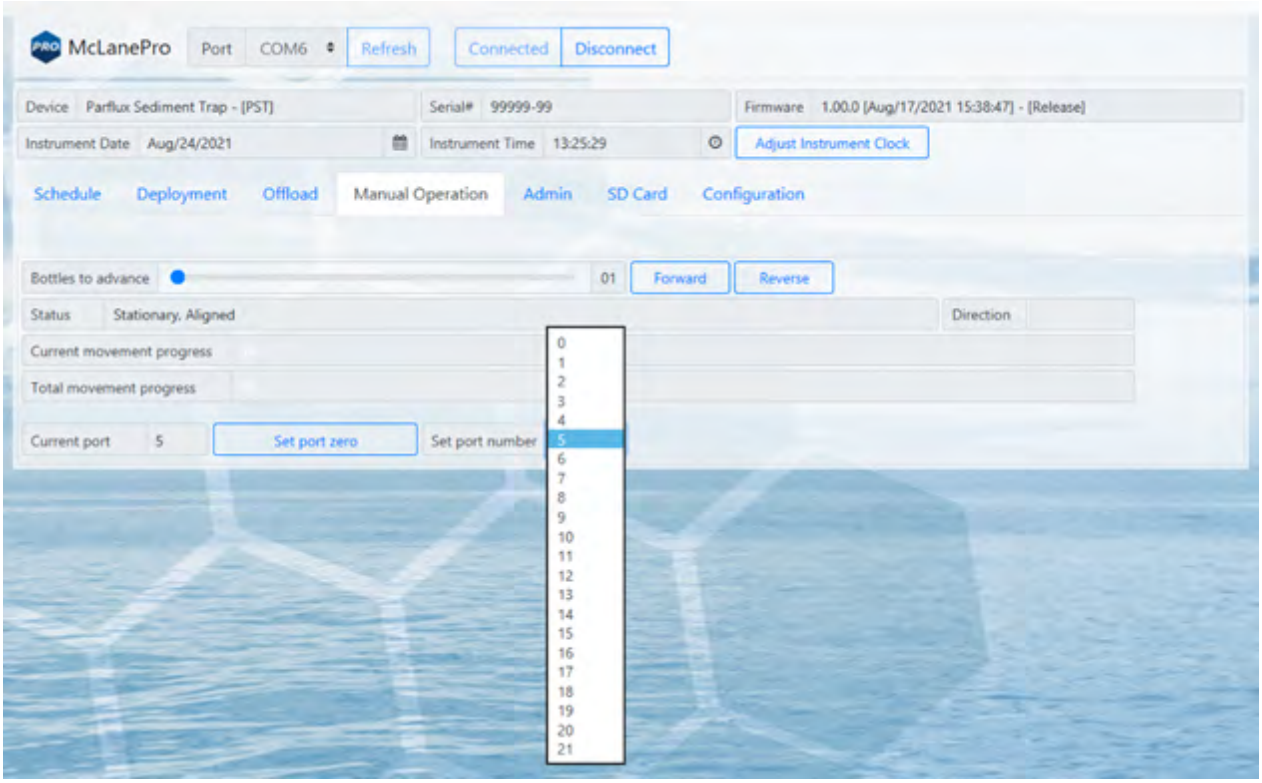
Move the rotator until it is aligned:

1. Move the rotator using the forward and reverse buttons until it is aligned to the open hole (port 0).
2. Click **Set port zero.**



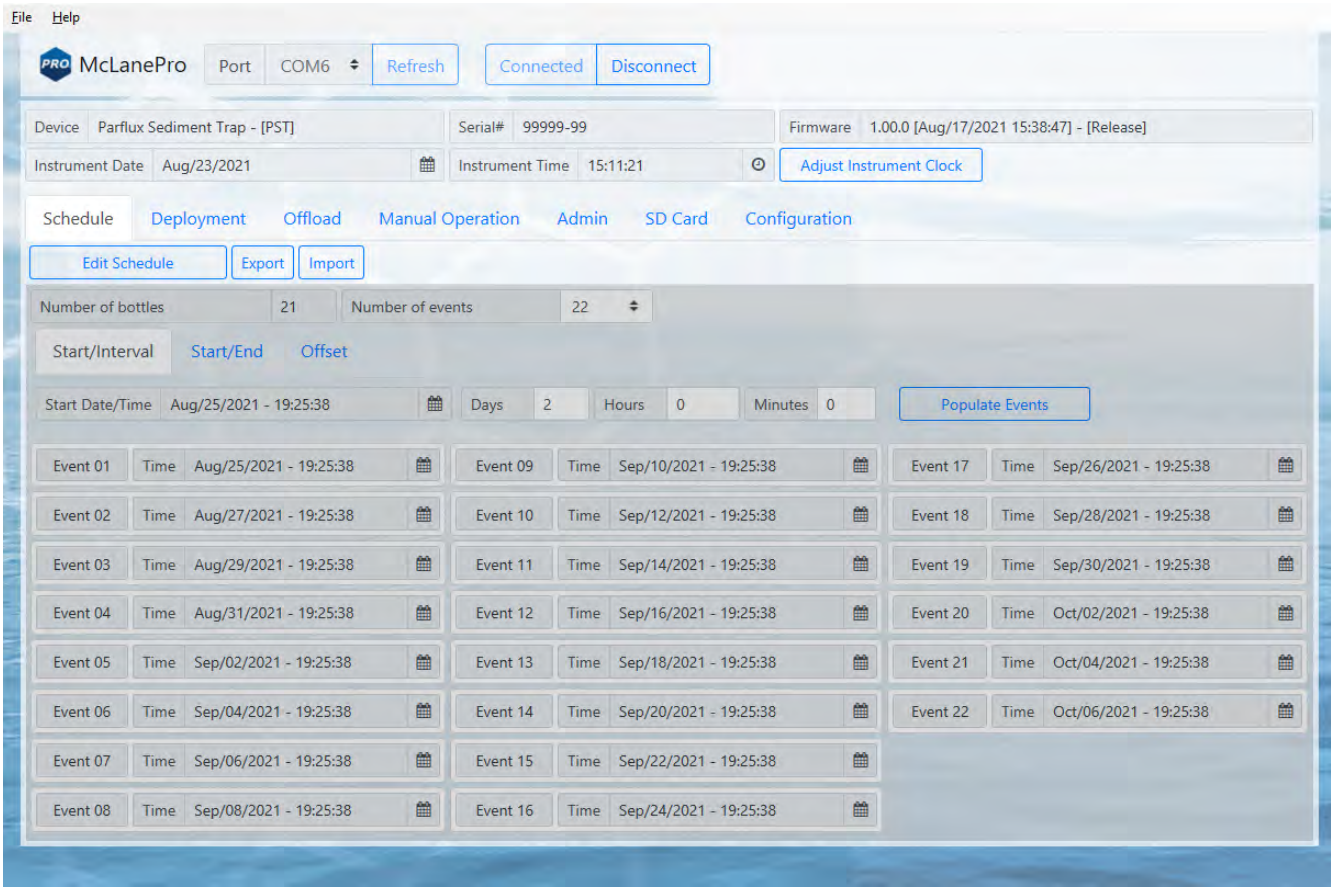
Move one position in either direction and count bottle positions:

1. Move one position in either direction.
2. Count the number of bottle positions from the open hole (port 0) to the cone opening.
3. Assign the port using the **Set port number** control of the Manual Operation tab.



The Schedule Tab

The **Schedule tab** is used to define a deployment schedule before deploying the Sediment Trap.



There are three ways to define a Sediment Trap deployment in the Schedule tab:
Start / Interval - Define a start time and an interval to wait between events.
Start / End - Define a start time, and an end time for the deployment. Events are scheduled equally between both points.

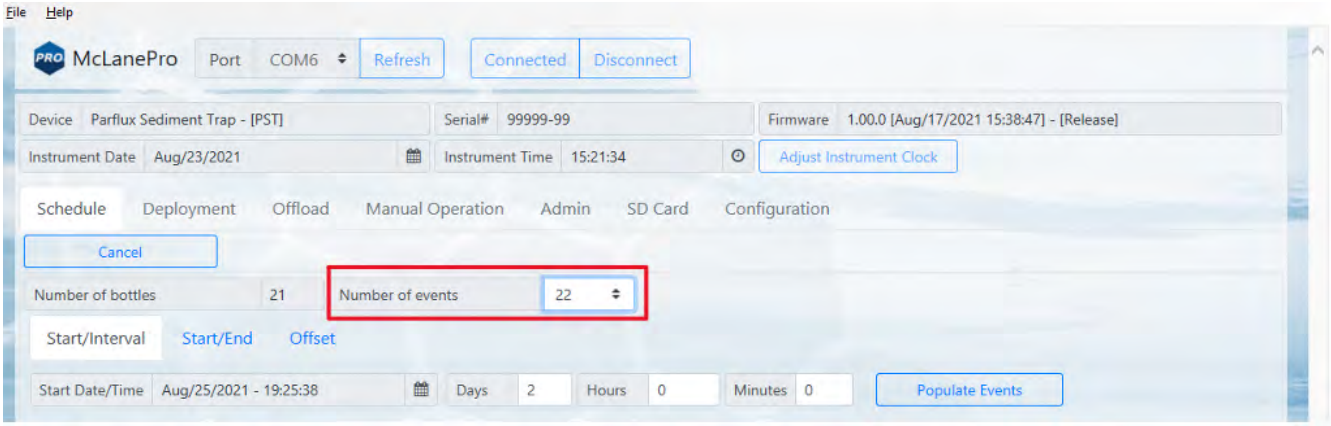
Offset - Import or take existing deployment parameters from a previous deployment, and shift the dates by an offset value.

Schedule a Deployment Using a Start Time & Event Interval

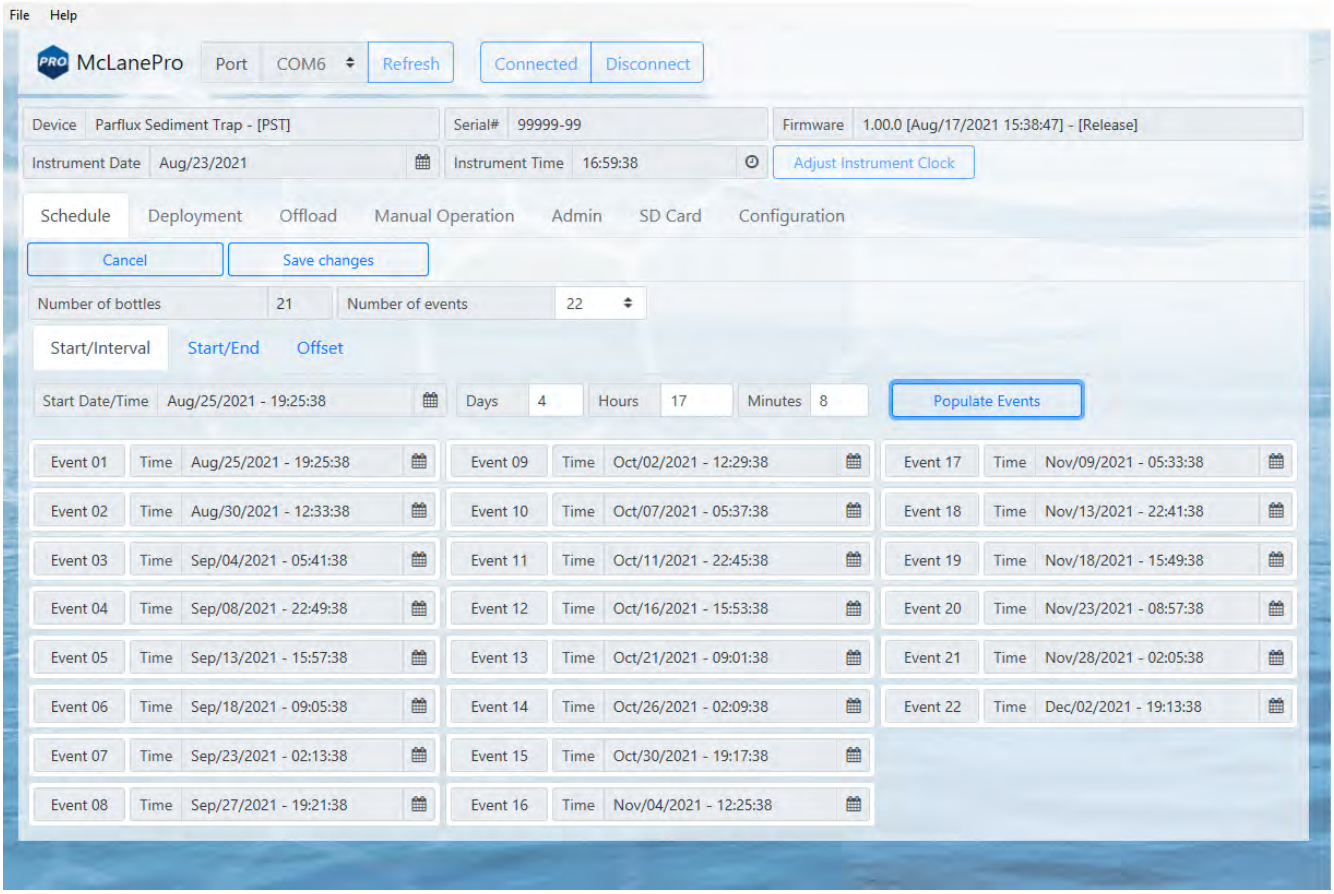
Follow these steps to define a schedule using a start time and event interval.

Before scheduling and deploying the Sediment Trap, make sure the instrument time is set!

1. Click the **Start/Interval** tab.
2. Define the number of deployment events.



3. Click the calendar next to the **Start Date/Time** field to select a start time for Event 1 of the deployment.
4. Fill in the **Days**, **Hours**, and **Minutes** event interval fields.
5. Click **Populate Events**.



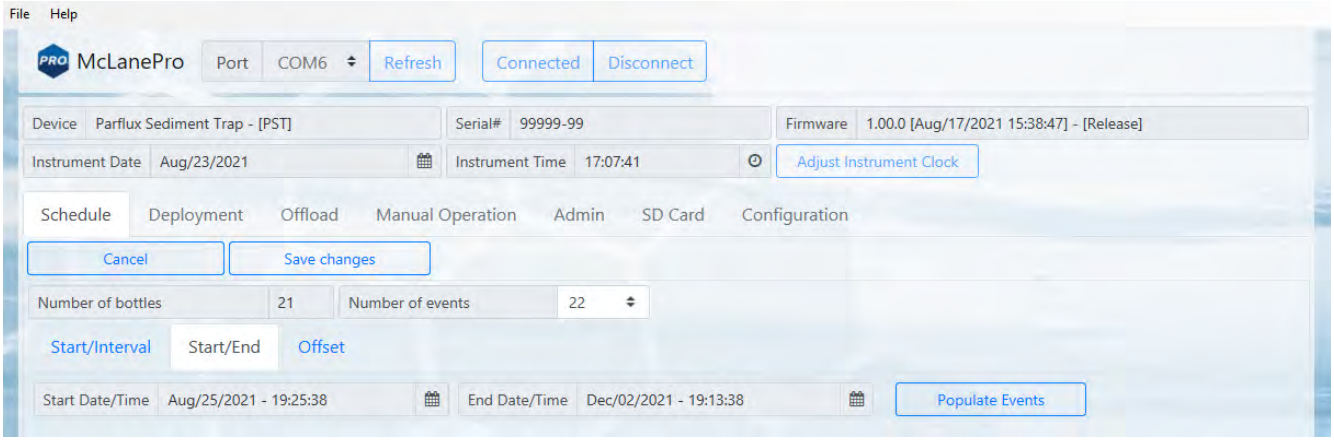
6. A schedule is created. Click the calendar next to an event number to edit the start time for any individual events if desired.
7. Once the schedule is completed, click **Save changes**.

Schedule a Deployment Using a Start Time & End Time

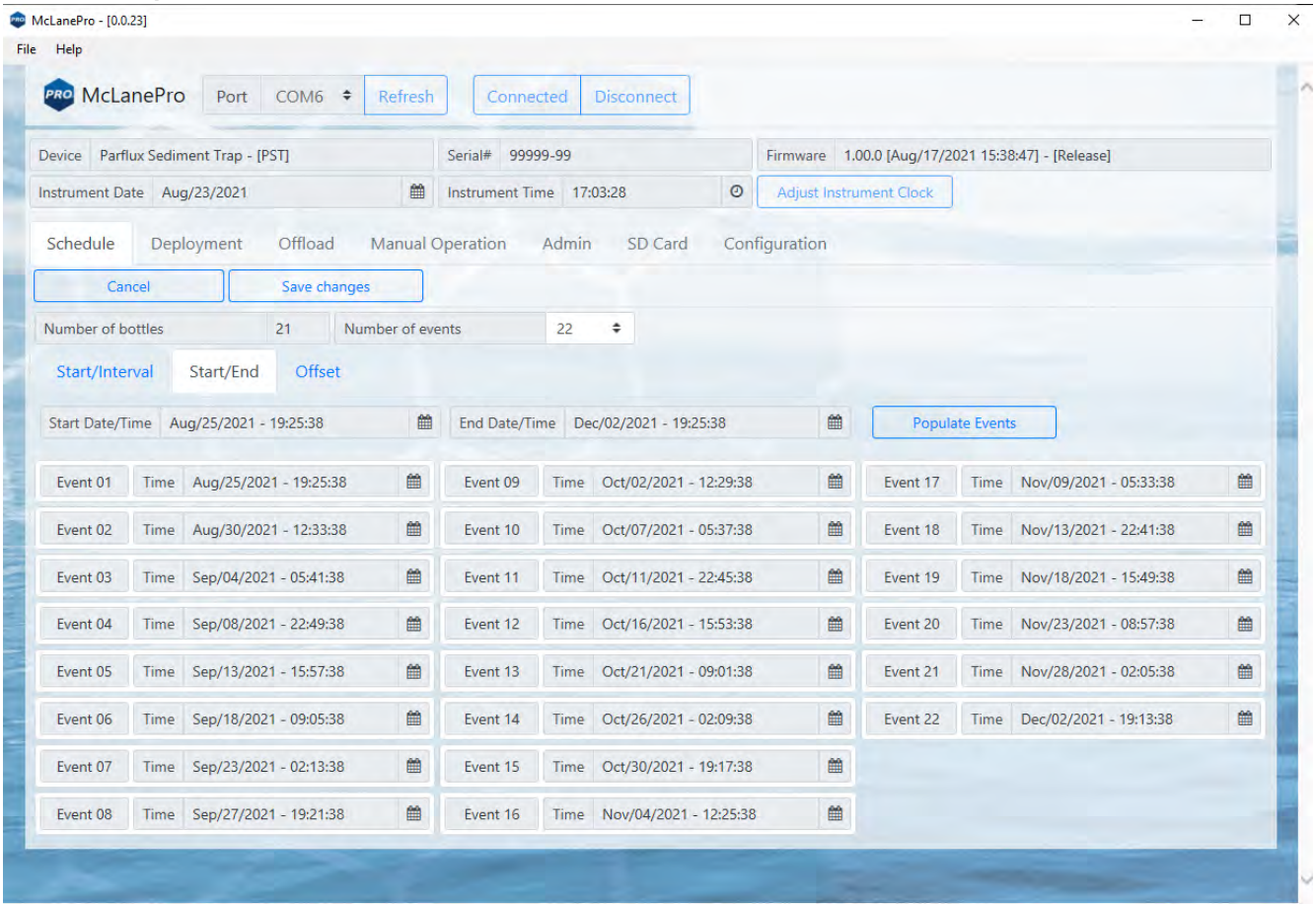
Follow these steps to define a schedule using a start time and end time.

Before scheduling and deploying the Sediment Trap, make sure the instrument time is set!

1. Click the **Start/End** tab.
2. Define the **Number of events** in the deployment.



3. Click the calendar next to the **Start Date/Time** field to select a start time for Event 1 of the deployment.
4. Click the calendar next to **End Date/Time** and select the time for the last event to start.
5. Click **Populate Events.**



6. A schedule is created. Click the calendar next to an event number to edit the start time for any individual events if desired.

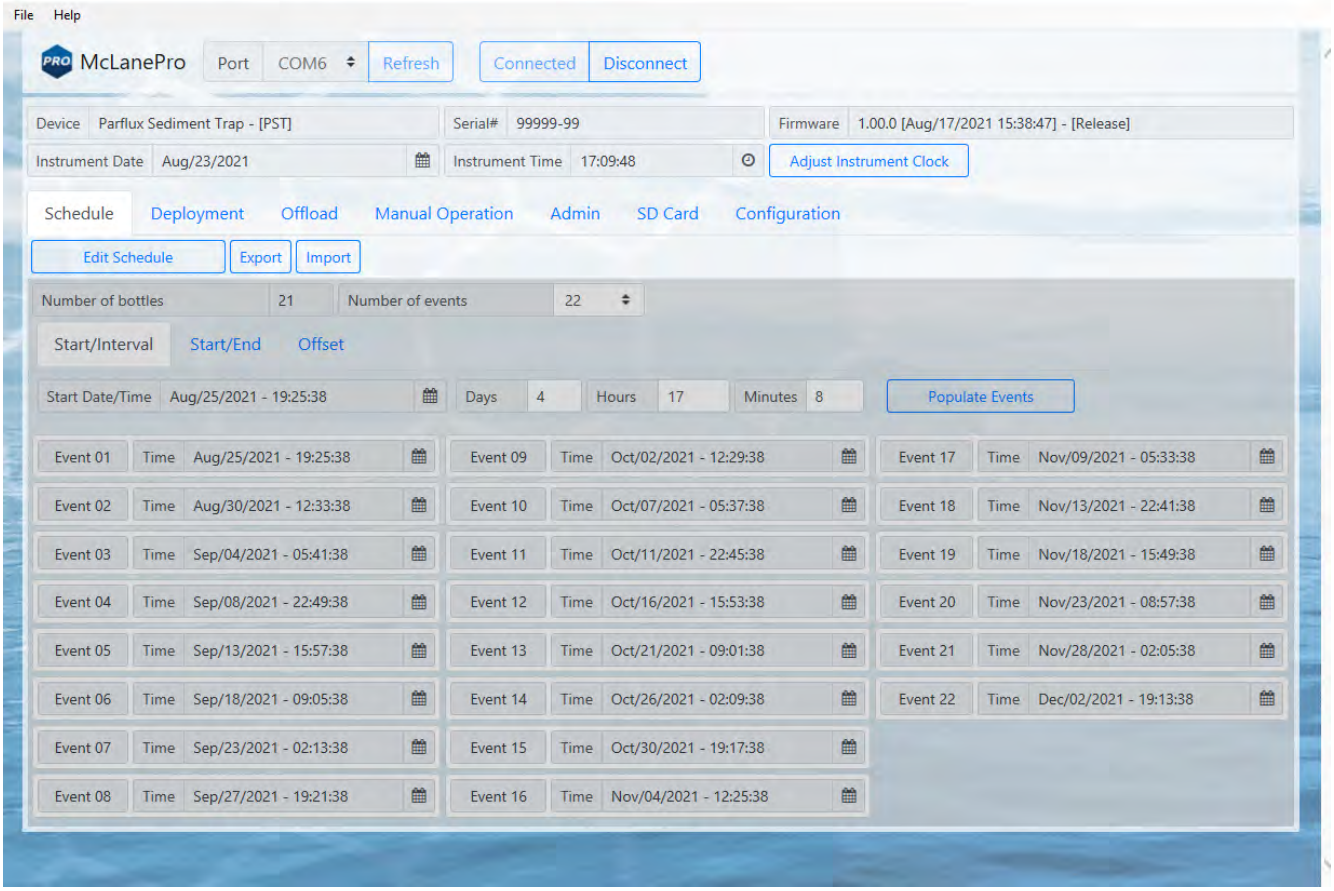
7. Once the schedule is completed, click **Save changes**.

Schedule a Deployment Using an Existing Schedule & Schedule Offset

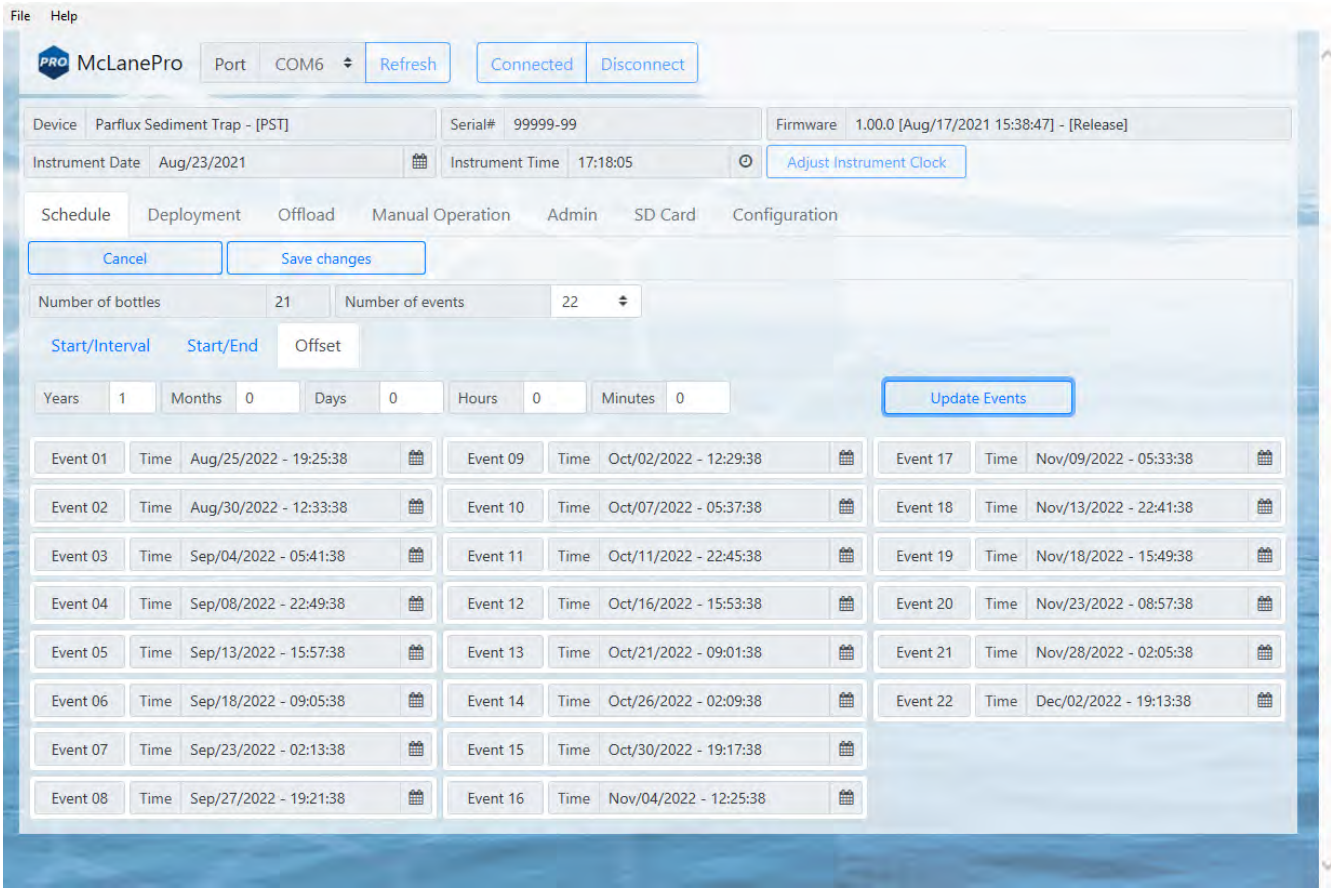
Follow these steps to import an existing schedule if one exists, or to work with the schedule from the previous deployment. Use the Offset scheduling option to offset all event times by the specified Offset value.

Before scheduling and deploying the Sediment Trap, make sure the instrument time is set!

1. Load an existing deployment schedule (using the import button), or work with an existing schedule.
2. Click the **Offset** tab.



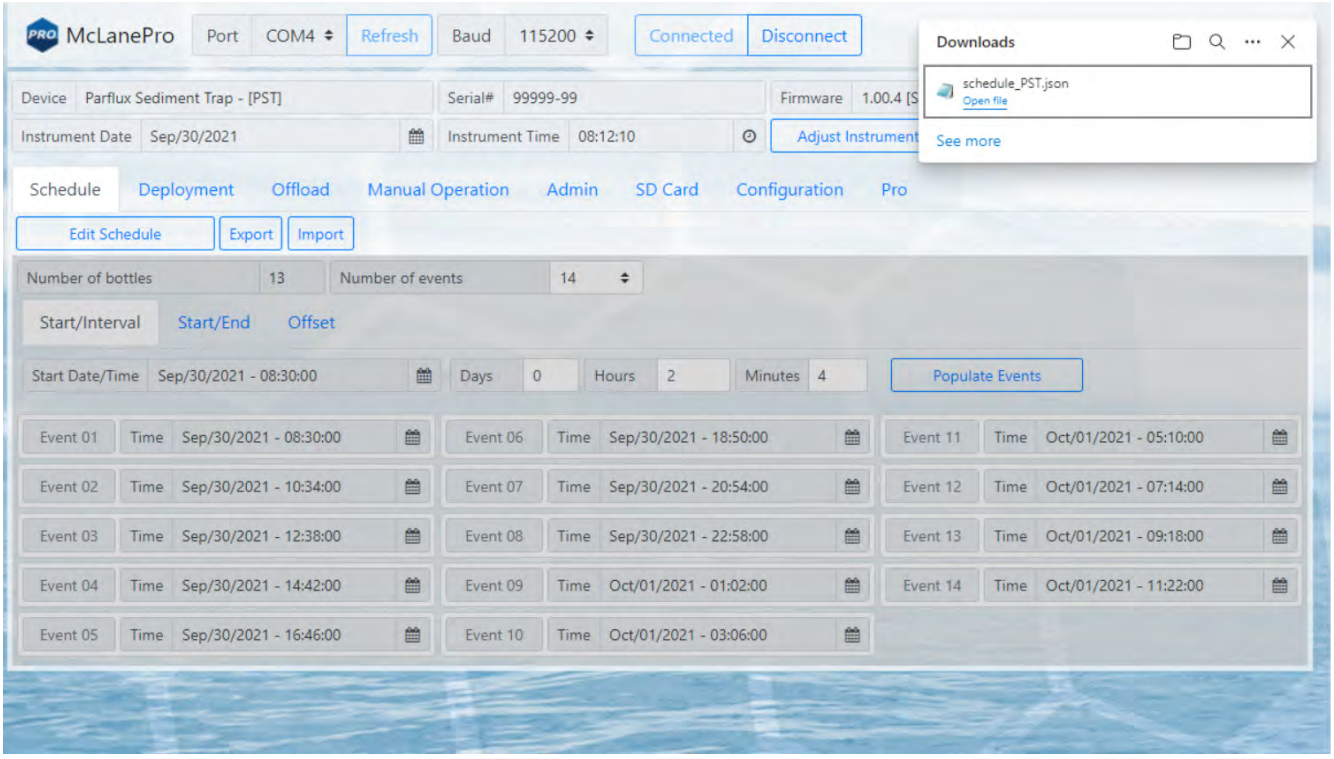
3. Define the offset value and click **Update events**.
4. Click **Save Changes**. In this example, the two schedules are exactly one year apart from each other.



Exporting a Schedule

Schedules may be saved locally by using the Export button. Exporting a schedule allows easy programming of multiple instruments, modification for later deployments or simply to keep as a record.

1. Create a new schedule.
2. Save changes to load that schedule onto the Sediment Trap.
3. Click Export to save the current schedule. The schedule is saved as a *.JSON file to a local directory.



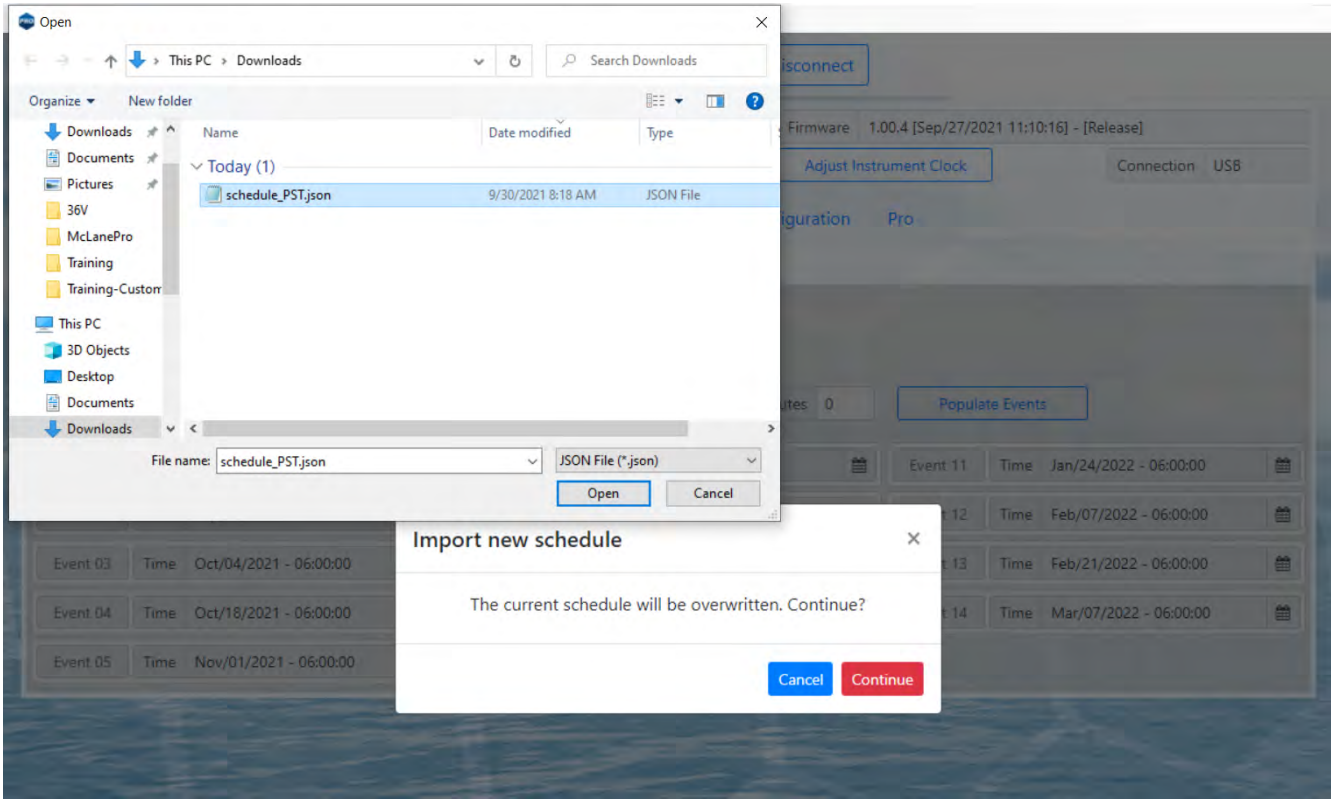
Importing a Schedule

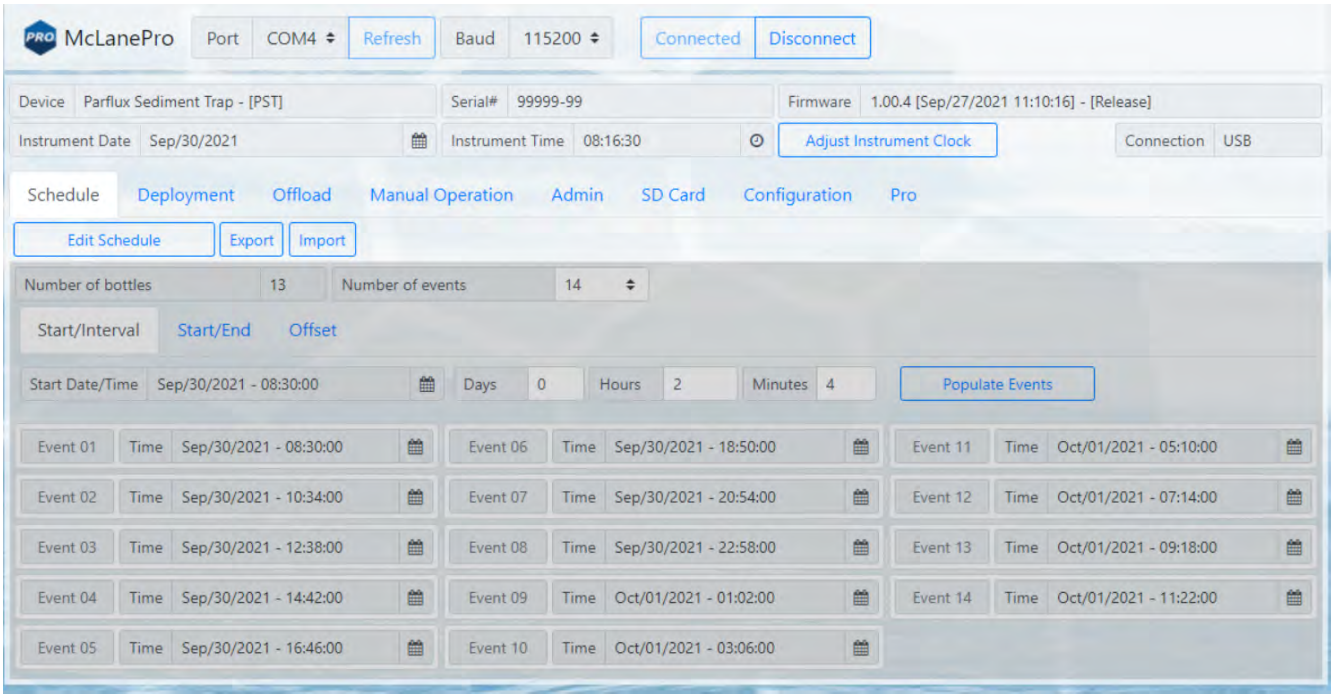
Schedules may be imported for deployment of multiple instruments or for modification and reuse.

1. Click Import to import a saved schedule.
2. A window will open in order to select the schedule to be imported.
3. Select a schedule file and click Open.

The Sediment Trap will check the schedule to confirm it is compatible with the installed hardware, model number and/or configuration. If it is compatible, the scheduler will load and display new values.

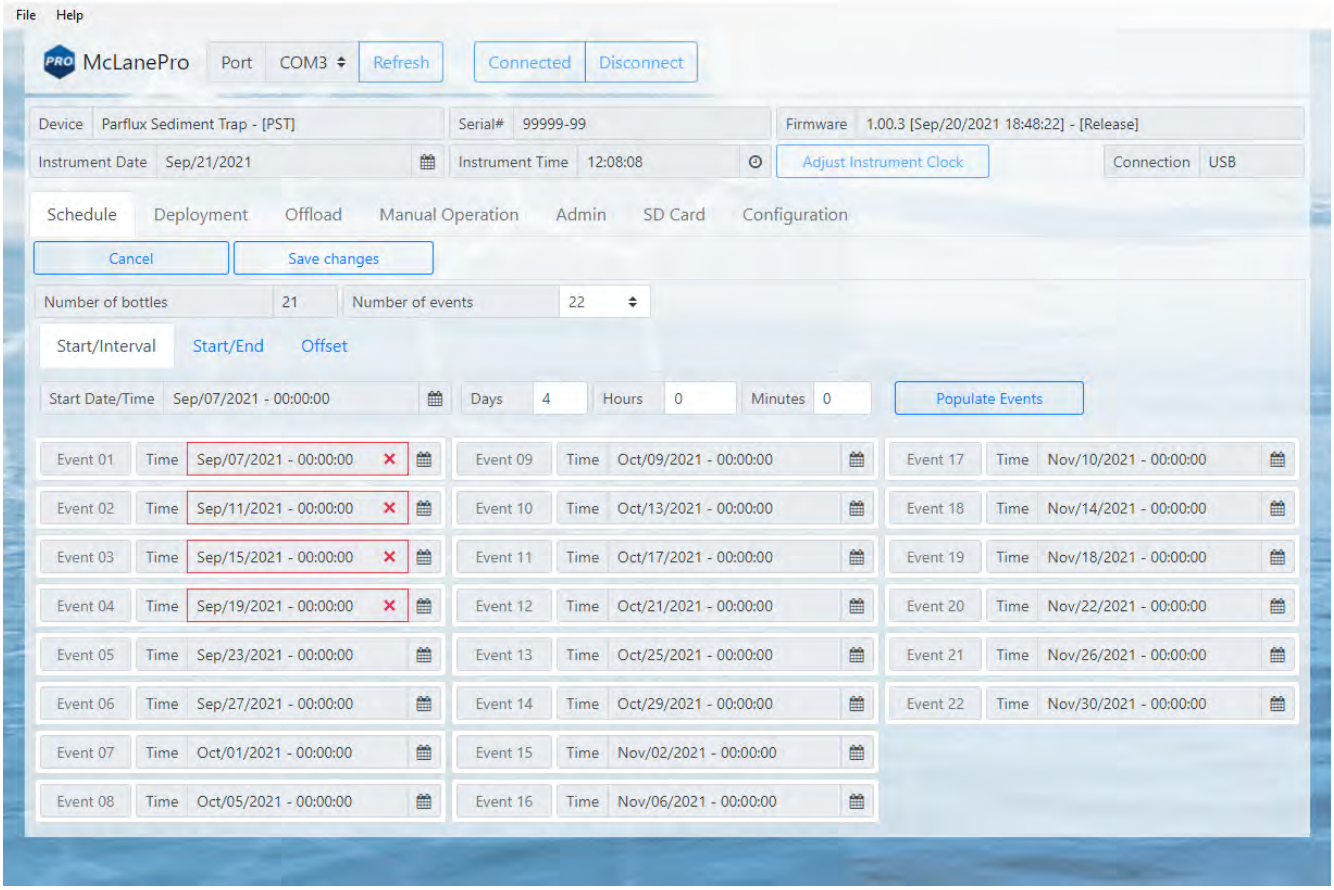
Importing a schedule immediately loads that schedule into memory. This is the schedule that will be used when deploying the instrument. Always double check event times before proceeding to deployment preparation.



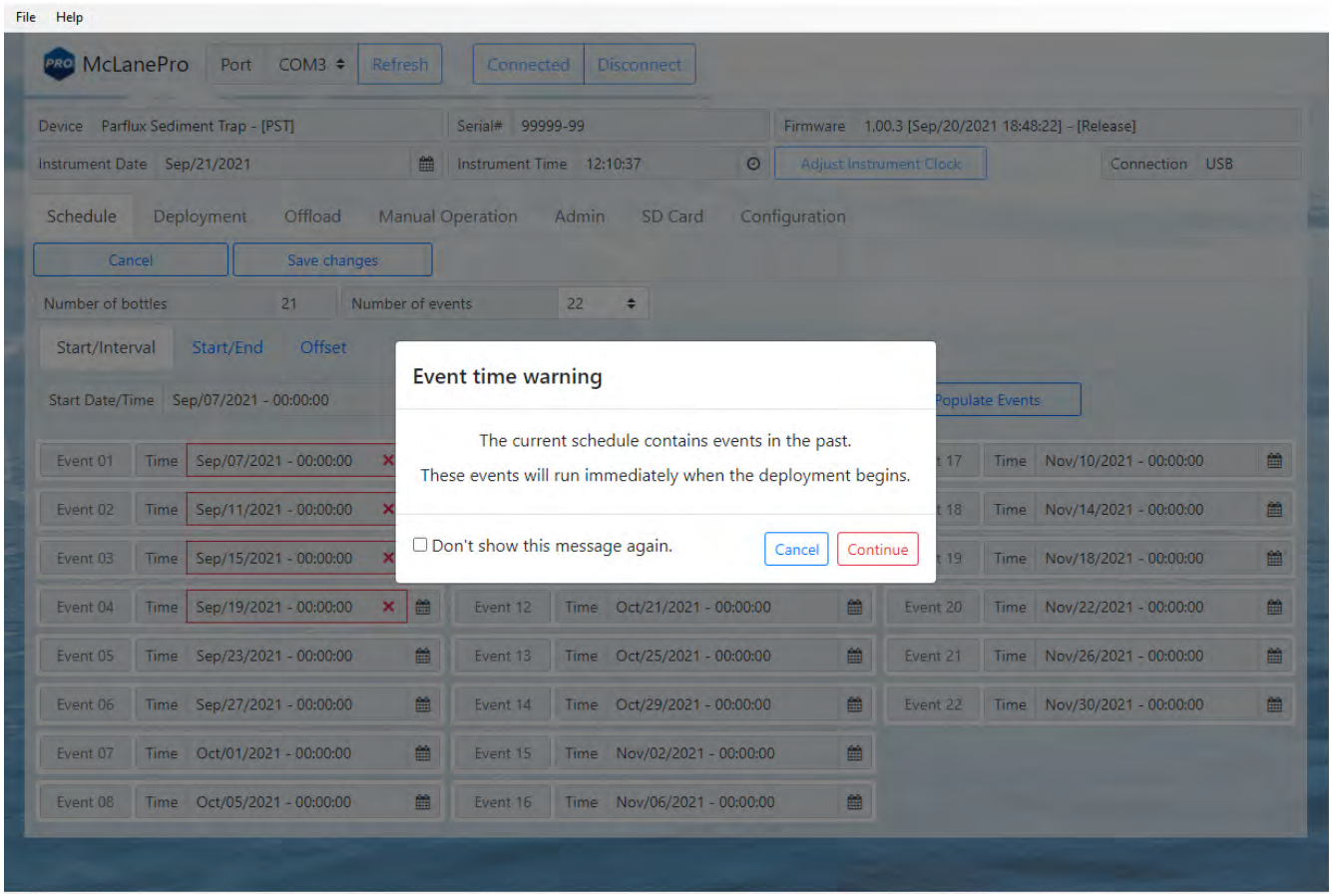


Schedule Errors

Schedules with errors (events in the past) show a red 'X'.



The user can choose to ignore the warning and continue the schedule even if an event(s) is in the past.


File Help
McLanePro
Port COM3
Refresh
Connected
Disconnect
Device Parflux Sediment Trap - [PST]
Serial# 99999-99
Firmware 1.00.3 [Sep/20/2021 18:48:22] - [Release]
Instrument Date Sep/21/2021
Instrument Time 12:10:37
Adjust Instrument Clock
Connection USB
Schedule
Deployment
Offload
Manual Operation
Admin
SD Card
Configuration
Cancel
Save changes
Number of bottles 21
Number of events 22
Start/Interval
Start/End
Offset
Start Date/Time Sep/07/2021 - 00:00:00
Populate Events
Event time warning
The current schedule contains events in the past.
These events will run immediately when the deployment begins.
Don't show this message again.
Cancel
Continue
Event 01 Time Sep/07/2021 - 00:00:00
Event 02 Time Sep/11/2021 - 00:00:00
Event 03 Time Sep/15/2021 - 00:00:00
Event 04 Time Sep/19/2021 - 00:00:00
Event 05 Time Sep/23/2021 - 00:00:00
Event 06 Time Sep/27/2021 - 00:00:00
Event 07 Time Oct/01/2021 - 00:00:00
Event 08 Time Oct/05/2021 - 00:00:00
Event 12 Time Oct/21/2021 - 00:00:00
Event 13 Time Oct/25/2021 - 00:00:00
Event 14 Time Oct/29/2021 - 00:00:00
Event 15 Time Nov/02/2021 - 00:00:00
Event 16 Time Nov/06/2021 - 00:00:00
Event 17 Time Nov/10/2021 - 00:00:00
Event 18 Time Nov/14/2021 - 00:00:00
Event 19 Time Nov/18/2021 - 00:00:00
Event 20 Time Nov/22/2021 - 00:00:00
Event 21 Time Nov/26/2021 - 00:00:00
Event 22 Time Nov/30/2021 - 00:00:00

The Deployment Tab

The **Deployment tab** is used to:

- Prepare for a deployment.
- Change the default sensor data interval.
- Start a deployment.
- Monitor a deployment (if connected via USB and running bench tests).

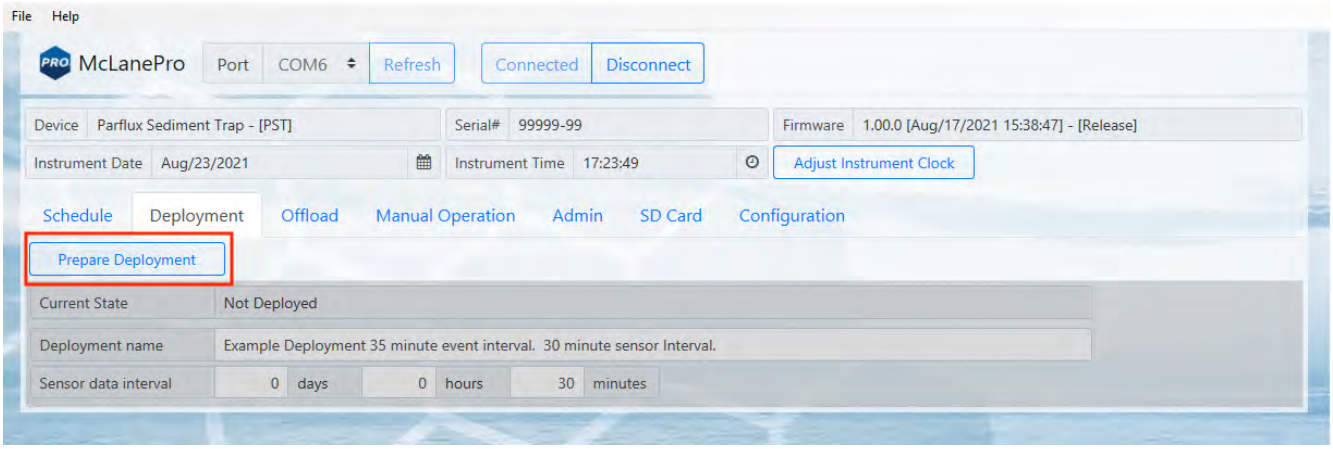
Related topic
Tilt Sensor & End Cap Orientation

Starting a Deployment

Related topic
Schedule Errors

Before scheduling and deploying the Sediment Trap, make sure the instrument time is set!

Until the sampler is deployed, the Deployment tab has only the **Prepare Deployment** option.

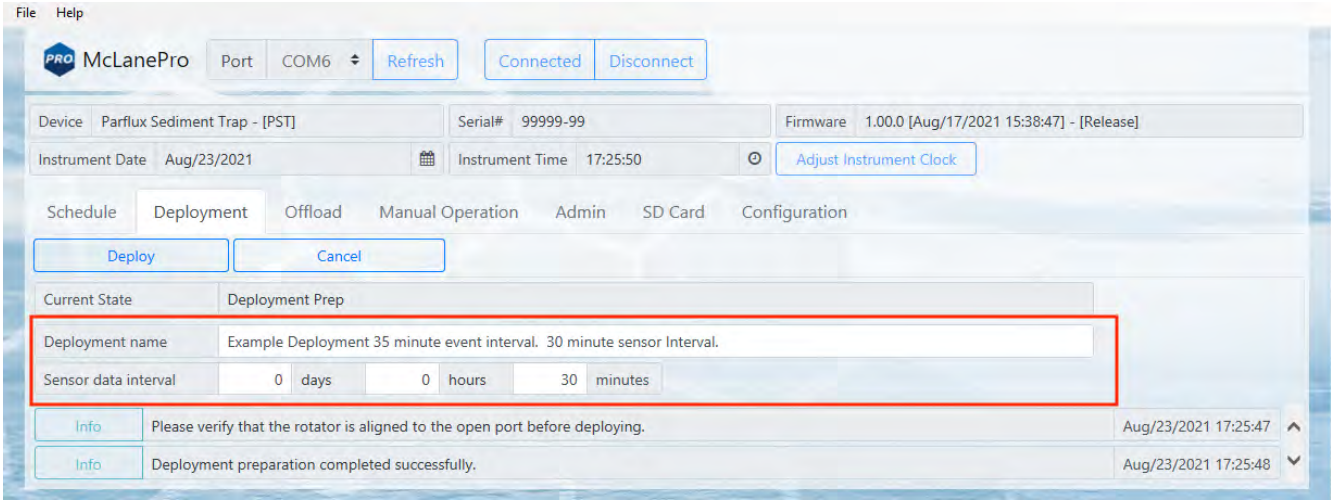


Prepare Deployment will run checks to make sure the Sediment Trap is ready for the deployment. If a problem is detected, errors will be reported. The deployment will need to be canceled in order to fix the problems and attempt to deploy the Sediment Trap again.

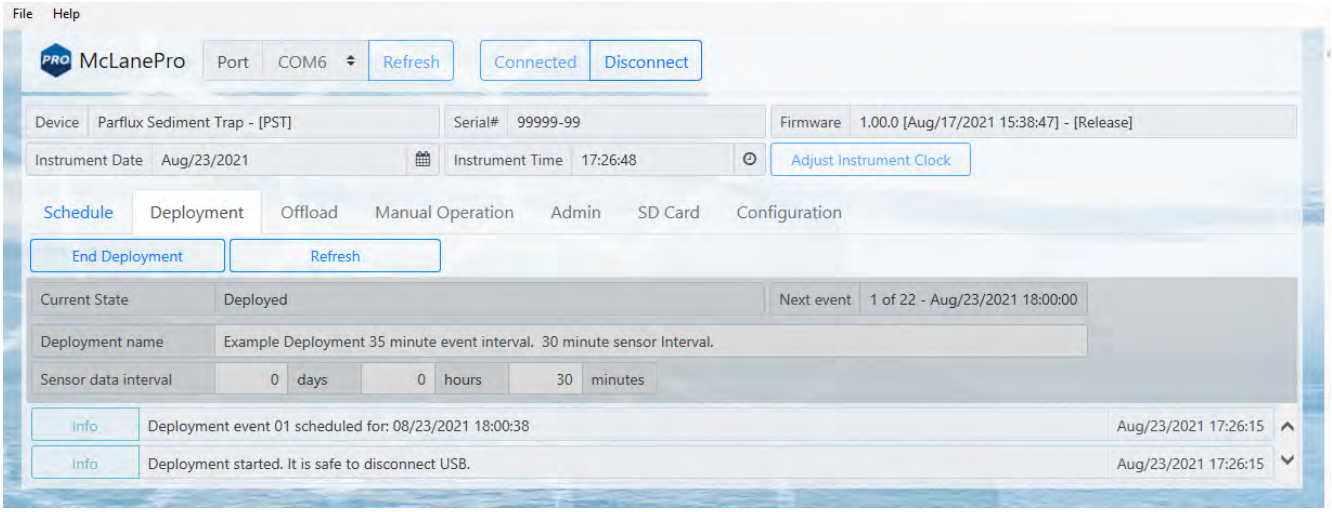
After passing the checks, the Sediment Trap allows setting of the Deployment name, and a sensor data interval may be defined.

- **Deployment name** - A brief description of the deployment.
- **Sensor data interval** - While sleeping between events, the Sediment Trap will record the battery voltage, onboard tilt sensor value, and onboard internal temperature sensor value at this interval. The minimum allowed interval is 30 minutes.

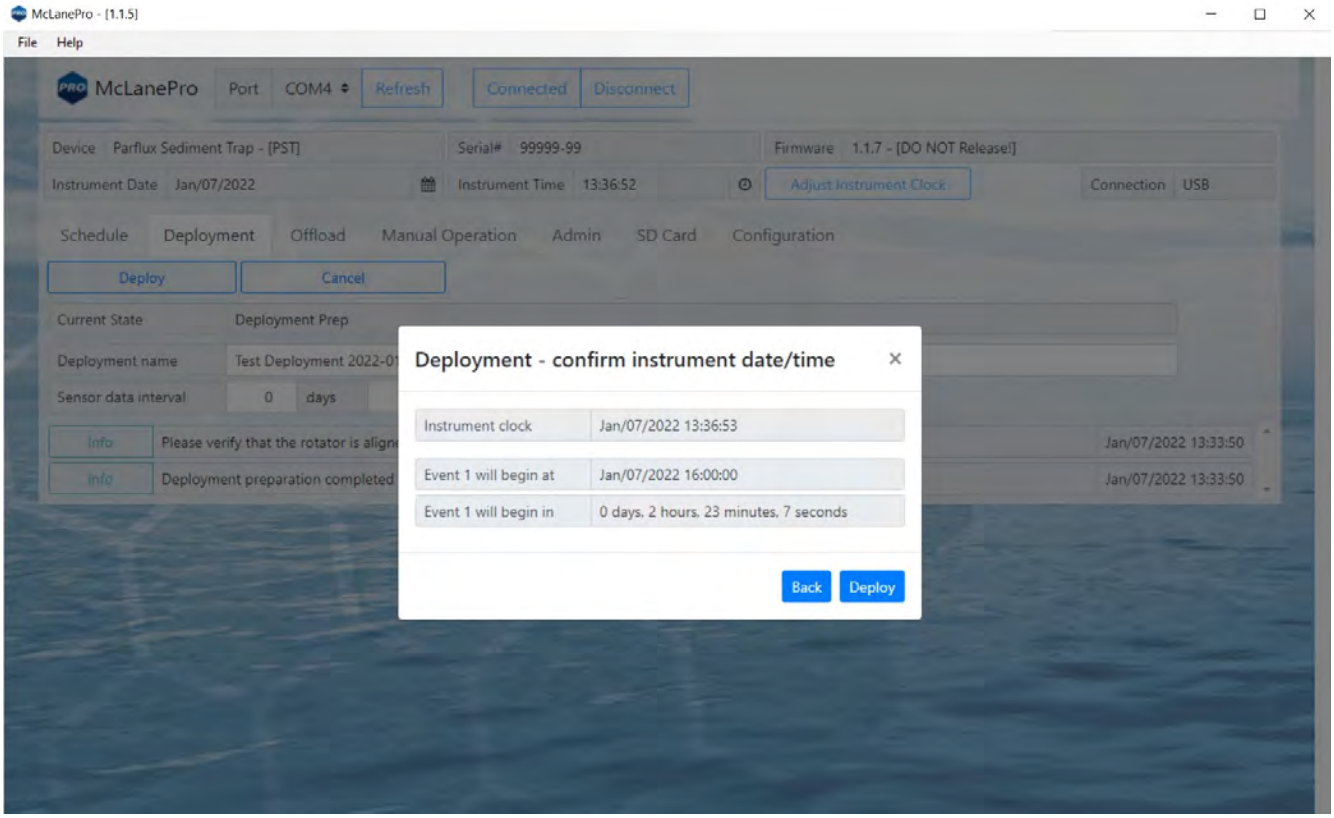
Recording sensor data interrupts low-power sleep mode and consumes power.



After deployment preparation checks are complete, the Sediment Trap may be deployed after setting the sensor data interval and deployment name.

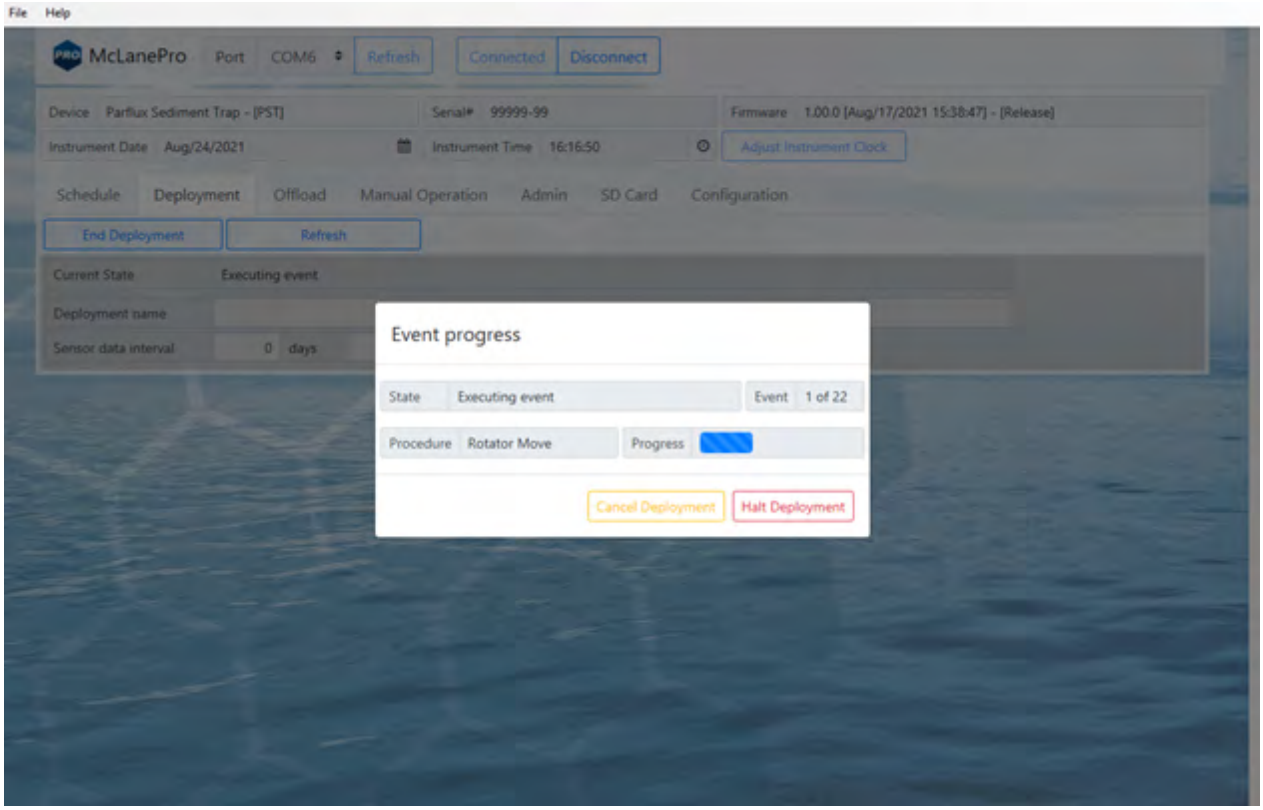


After clicking the **Deploy** button, the McLanePro displays the scheduled time for the first event, the current time according to the instrument clock, as well as a countdown timer indicating the amount of time before the first event will start. This allows the user to confirm the instrument time is correct and that the deployment will begin as scheduled.



After clicking the **Deploy** button, the Sediment Trap displays the scheduled time for the first event, and a message that confirms it is safe to disconnect the USB connection.

If left with USB connected while running a test deployment, event progress pop-up windows report the progress of events that are being executed, and the deployment log will be updated as events are executed.

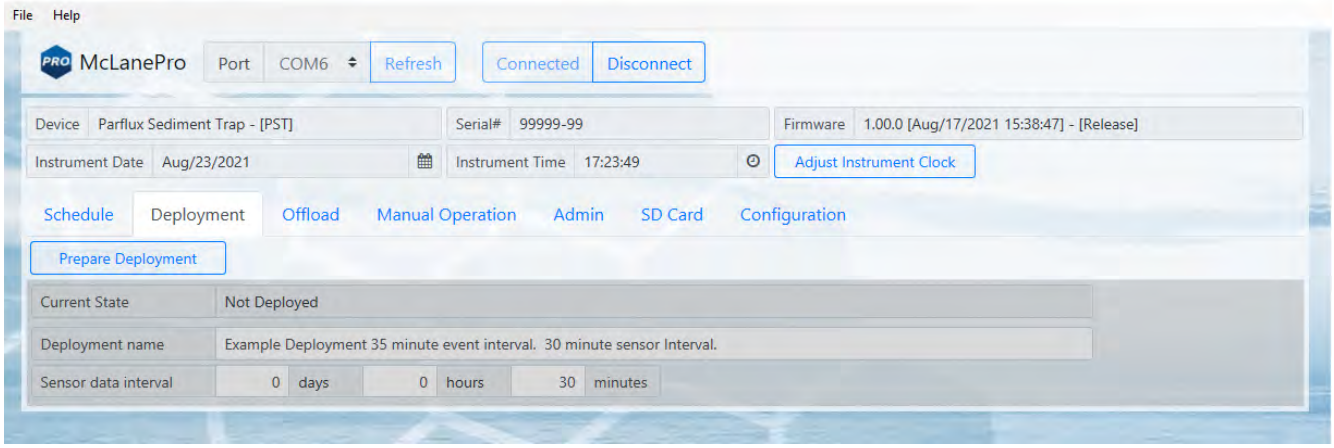


Setting Sensor Data Interval

The sensor data interval sets the sampling interval for logging tilt, internal temperature and pressure data. The value entered here sets the sample rate for all installed sensors.

The default sampling interval is 4 hours. Sensor data interval is an additional reading. Data are automatically recorded at the start and end of an event (a bottle rotation from the current sample to the next bottle). **Consider the impact the sensor data interval will have on battery drain.**

In the Deployment tab select **Prepare Deployment.**

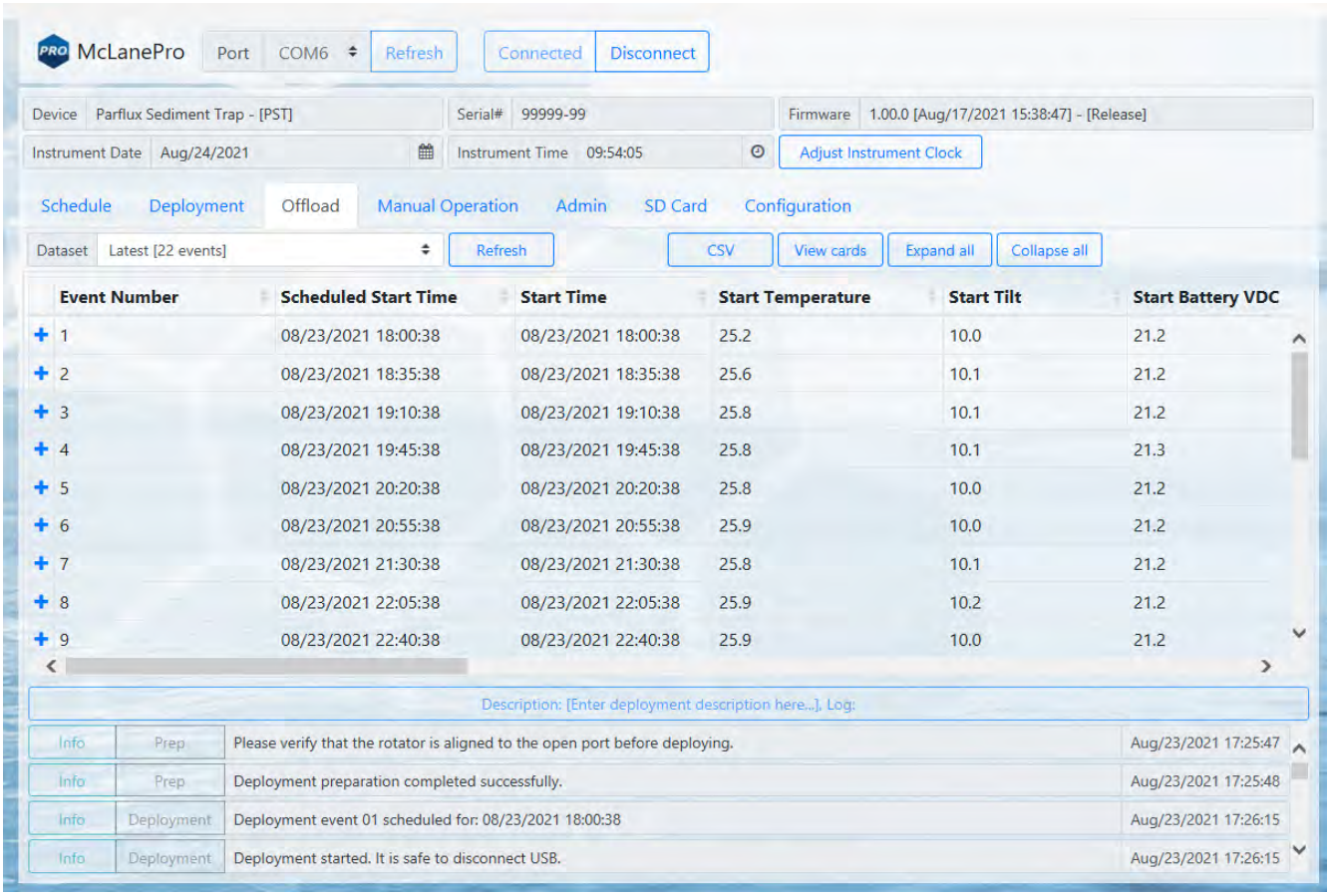


Change the sensor data interval as needed.

The Offload Tab

The **Offload tab** is used to view and export data collected during deployments.

When connecting to a Sediment Trap that has recently completed a deployment, McLanePro loads the Offload tab in order to review collected data.



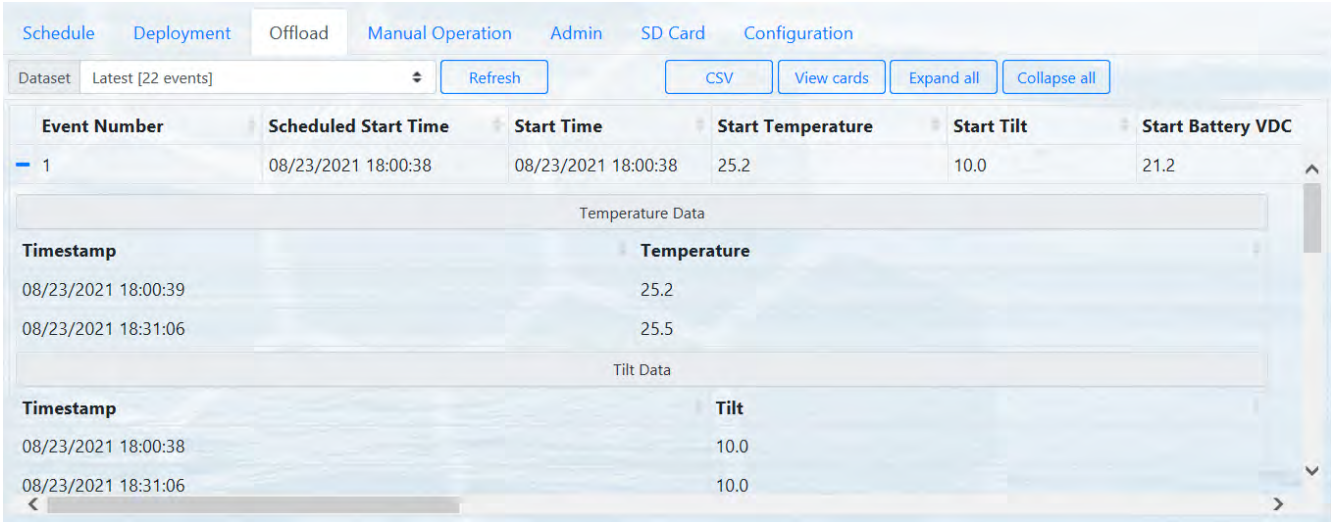
Event Data

Click the "+" of an event summary row to expand the event data and display the sensor data collected during the event.

Sensor data collected for Event 1 are data collected at the defined sensor data interval while

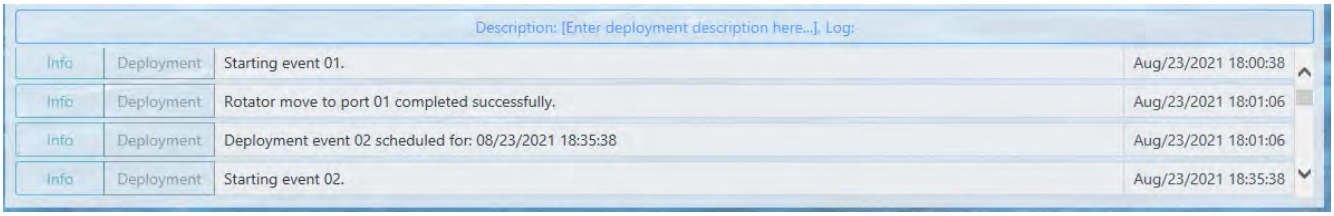
sleeping between event one and event two.

Sensor data readings are always measured at the start and end of an event (a bottle rotation from the current sample to the next bottle), except that no sensor data are collected before the first event, or after the last event.



Deployment Log

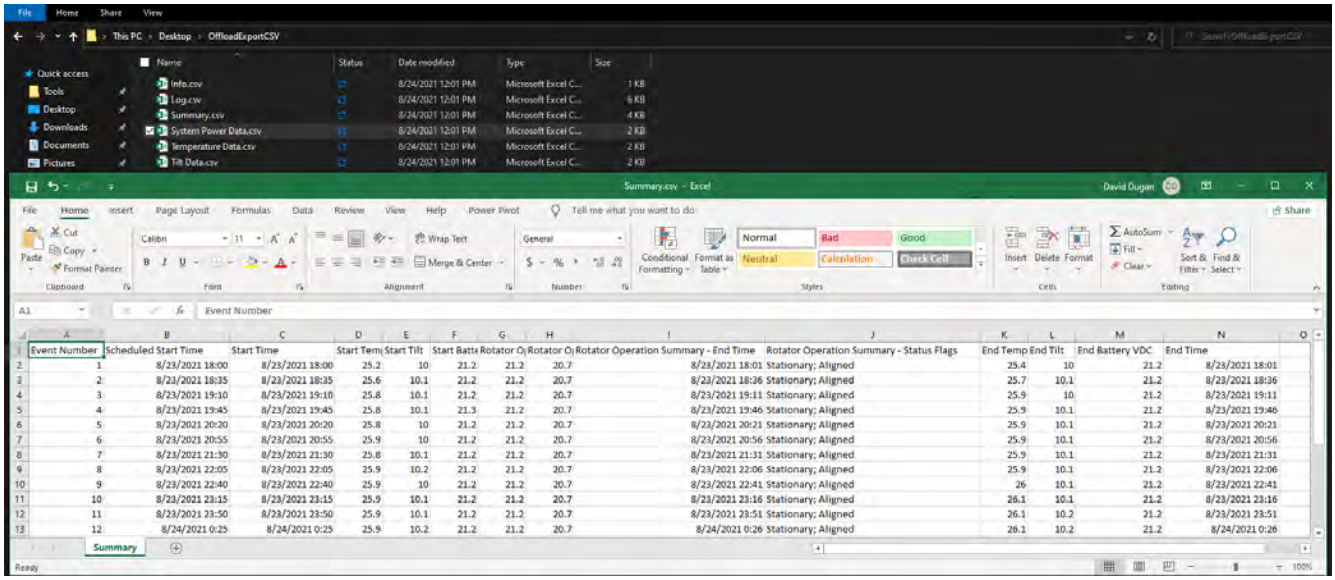
The deployment log shows a summary of deployment information. Errors are clearly marked with an error tag in the log, and the title bar is highlighted red if errors exist in the log.



Exporting Deployment Data

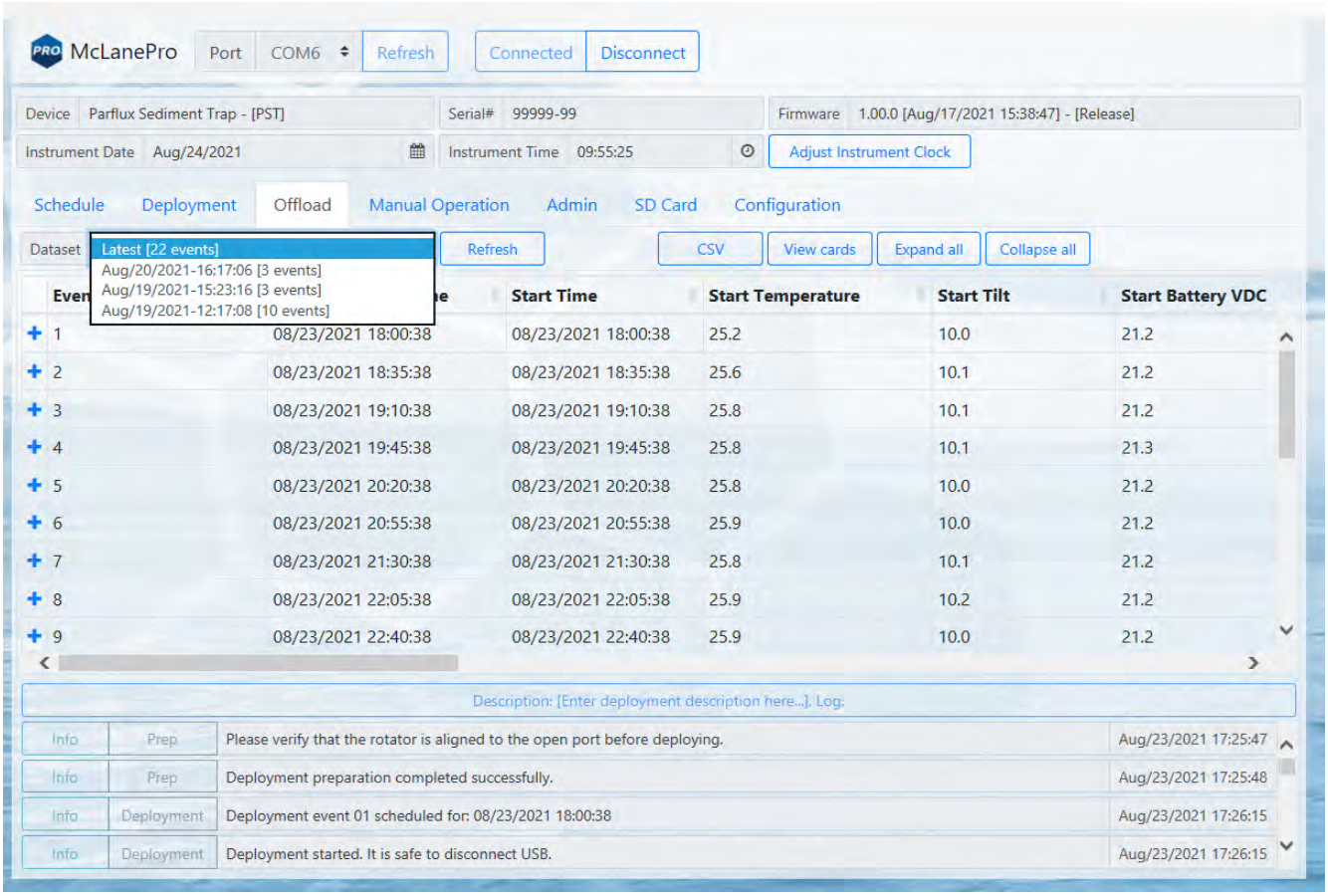
Deployment data can be exported in CSV format by clicking the CSV button and automatically downloading the compressed files to a local computer.

Once downloaded the files can be imported and viewed in various programs.



Viewing and Exporting Data From Previous Deployments

Data from previous deployments may be viewed by selecting a previous data set. To export the data, follow the instructions in Exporting Deployment Data.


McLanePro
Port
COM6
Refresh
Connected
Disconnect
Device
Parflux Sediment Trap - [PST]
Serial#
99999-99
Firmware
1.00.0 [Aug/17/2021 15:38:47] - [Release]
Instrument Date
Aug/24/2021
Instrument Time
09:55:25
Adjust Instrument Clock
Schedule
Deployment
Offload
Manual Operation
Admin
SD Card
Configuration
Dataset
Latest [22 events]
Aug/20/2021-16:17:06 [3 events]
Aug/19/2021-15:23:16 [3 events]
Aug/19/2021-12:17:08 [10 events]
Refresh
CSV
View cards
Expand all
Collapse all
Start Time
Start Temperature
Start Tilt
Start Battery VDC
1 08/23/2021 18:00:38 08/23/2021 18:00:38 25.2 10.0 21.2
2 08/23/2021 18:35:38 08/23/2021 18:35:38 25.6 10.1 21.2
3 08/23/2021 19:10:38 08/23/2021 19:10:38 25.8 10.1 21.2
4 08/23/2021 19:45:38 08/23/2021 19:45:38 25.8 10.1 21.3
5 08/23/2021 20:20:38 08/23/2021 20:20:38 25.8 10.0 21.2
6 08/23/2021 20:55:38 08/23/2021 20:55:38 25.9 10.0 21.2
7 08/23/2021 21:30:38 08/23/2021 21:30:38 25.8 10.1 21.2
8 08/23/2021 22:05:38 08/23/2021 22:05:38 25.9 10.2 21.2
9 08/23/2021 22:40:38 08/23/2021 22:40:38 25.9 10.0 21.2
Description: [Enter deployment description here...], Log:
Info Prep Please verify that the rotator is aligned to the open port before deploying. Aug/23/2021 17:25:47
Info Prep Deployment preparation completed successfully. Aug/23/2021 17:25:48
Info Deployment Deployment event 01 scheduled for: 08/23/2021 18:00:38 Aug/23/2021 17:26:15
Info Deployment Deployment started. It is safe to disconnect USB. Aug/23/2021 17:26:15

The Admin Tab

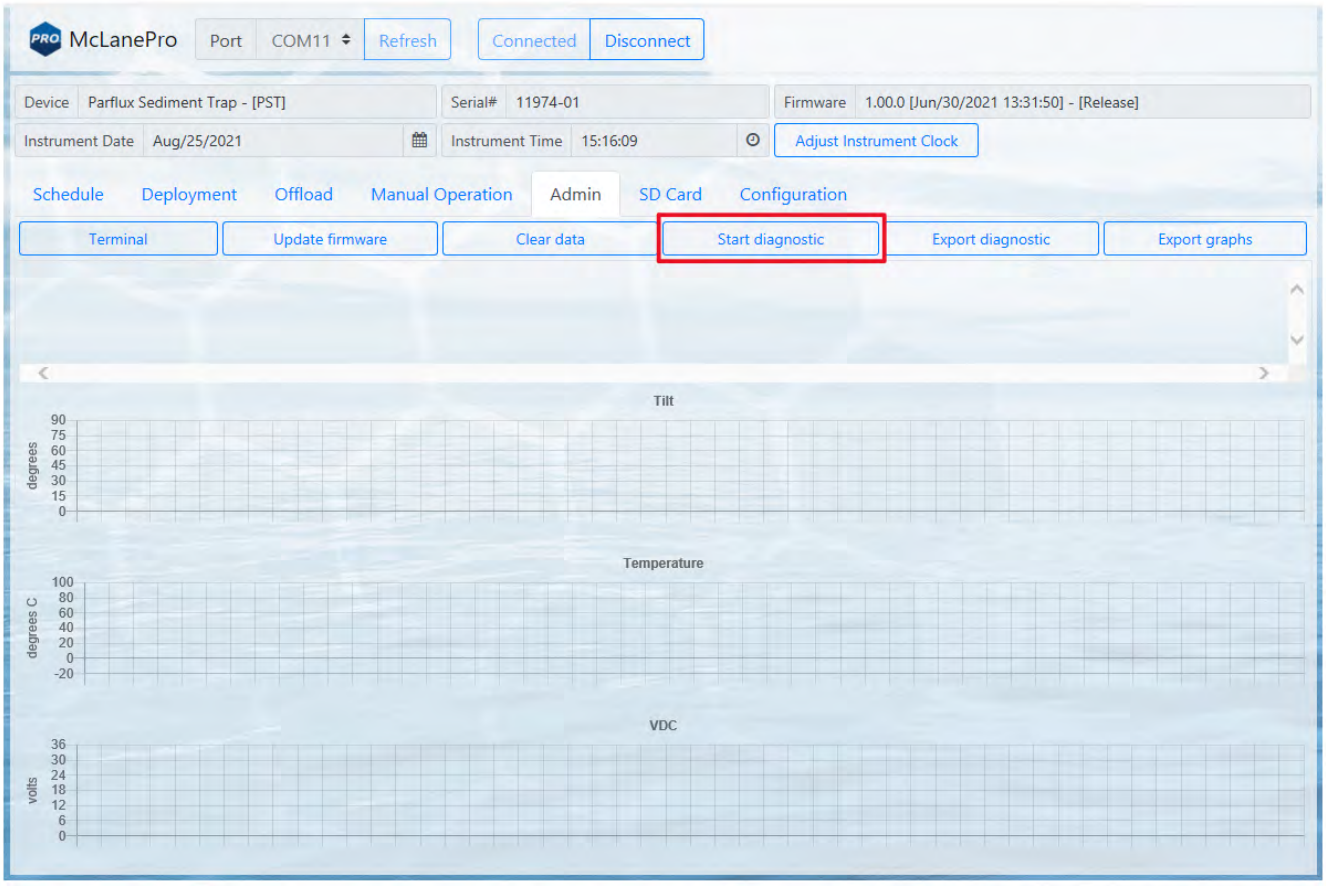
The **Admin tab** is used to:

- Run Diagnostics
- Update Firmware
- Communicate to the Sediment Trap using the terminal
- Adjust the tilt end cap orientation

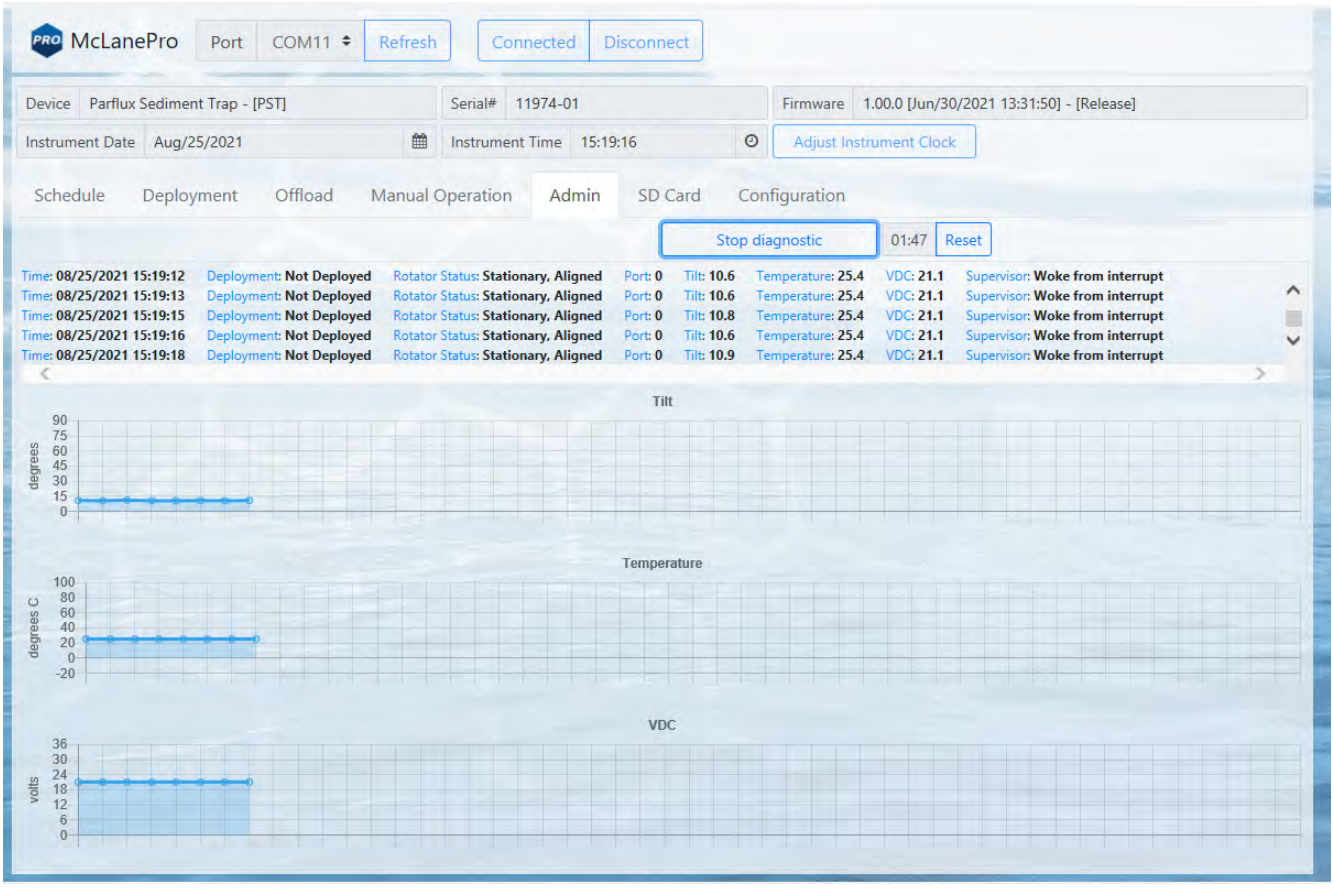
Running Diagnostics

The Admin tab contains a diagnostics utility that provides sensor and system state information.

To run diagnostics, click **Start diagnostic**. Data will begin to print to the screen, and graphs will begin to display data.



Diagnostics will run for two minutes, otherwise, click **Stop diagnostic**.



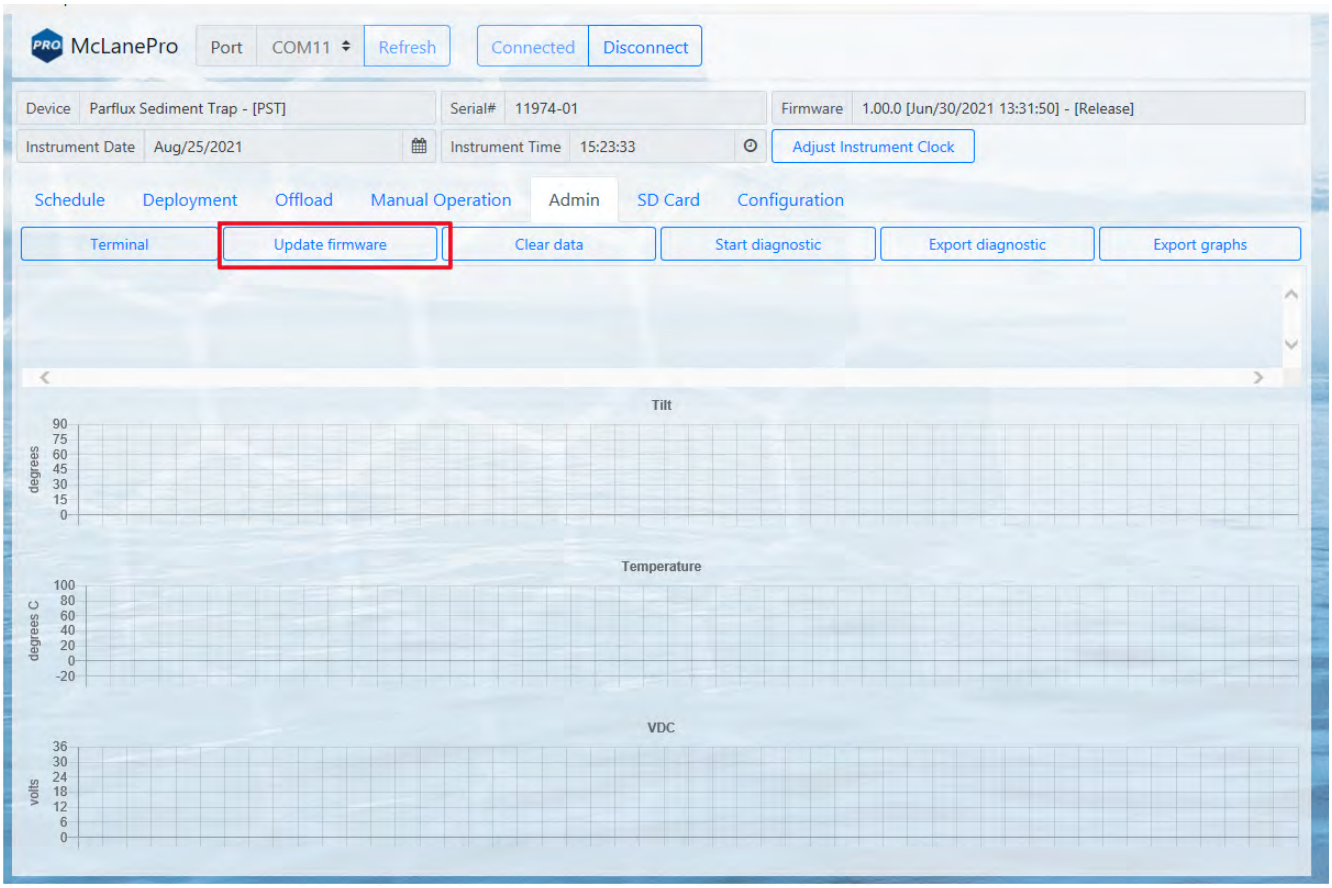
After running diagnostics, clear the data on the Admin tab by clicking the **Clear Data** button.

Related topic

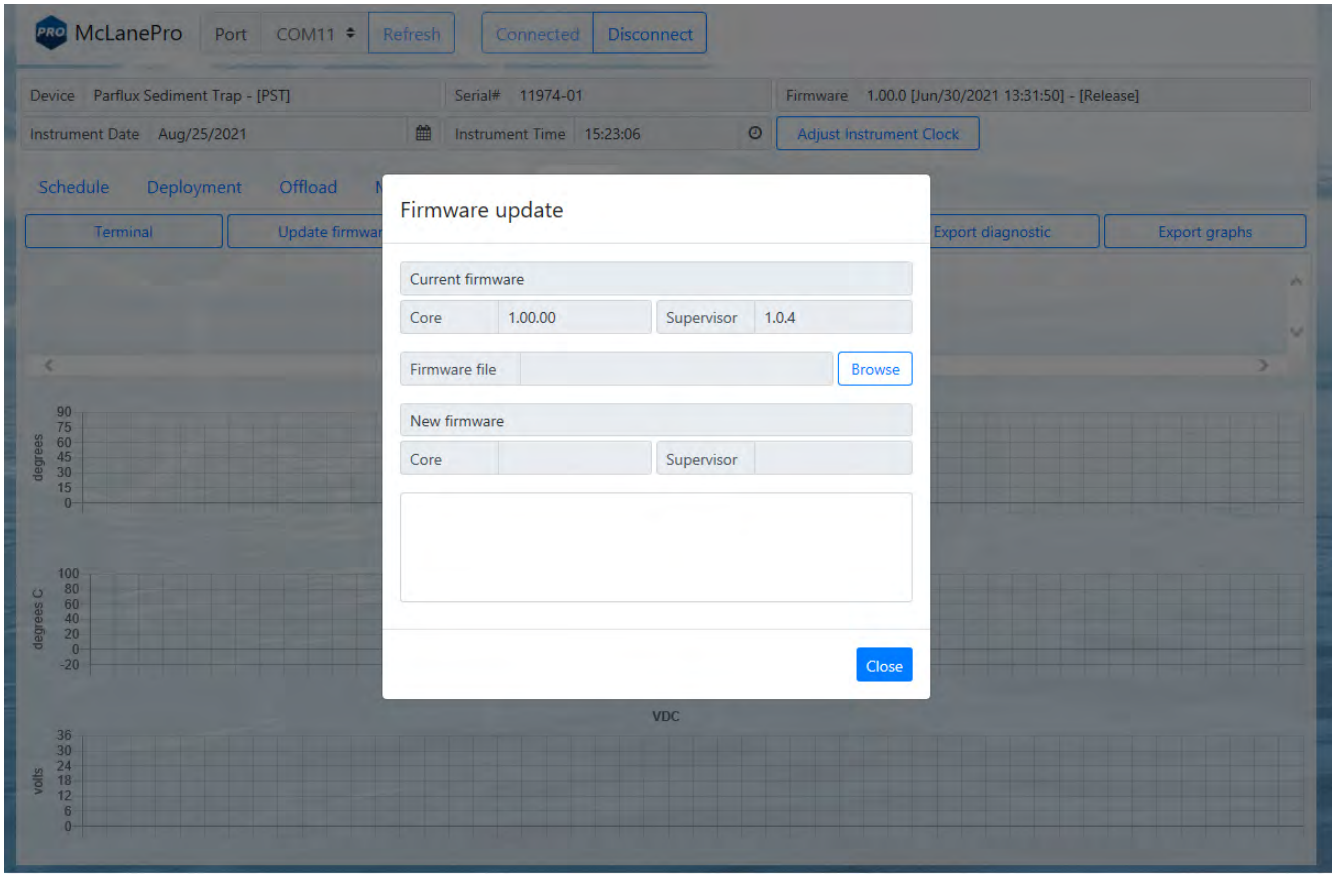
Tilt Sensor & End Cap Orientation

Update Firmware

1. To update firmware click the **Update firmware** button on the Admin tab.



2. Select a McLane **.UPD** file to upload.



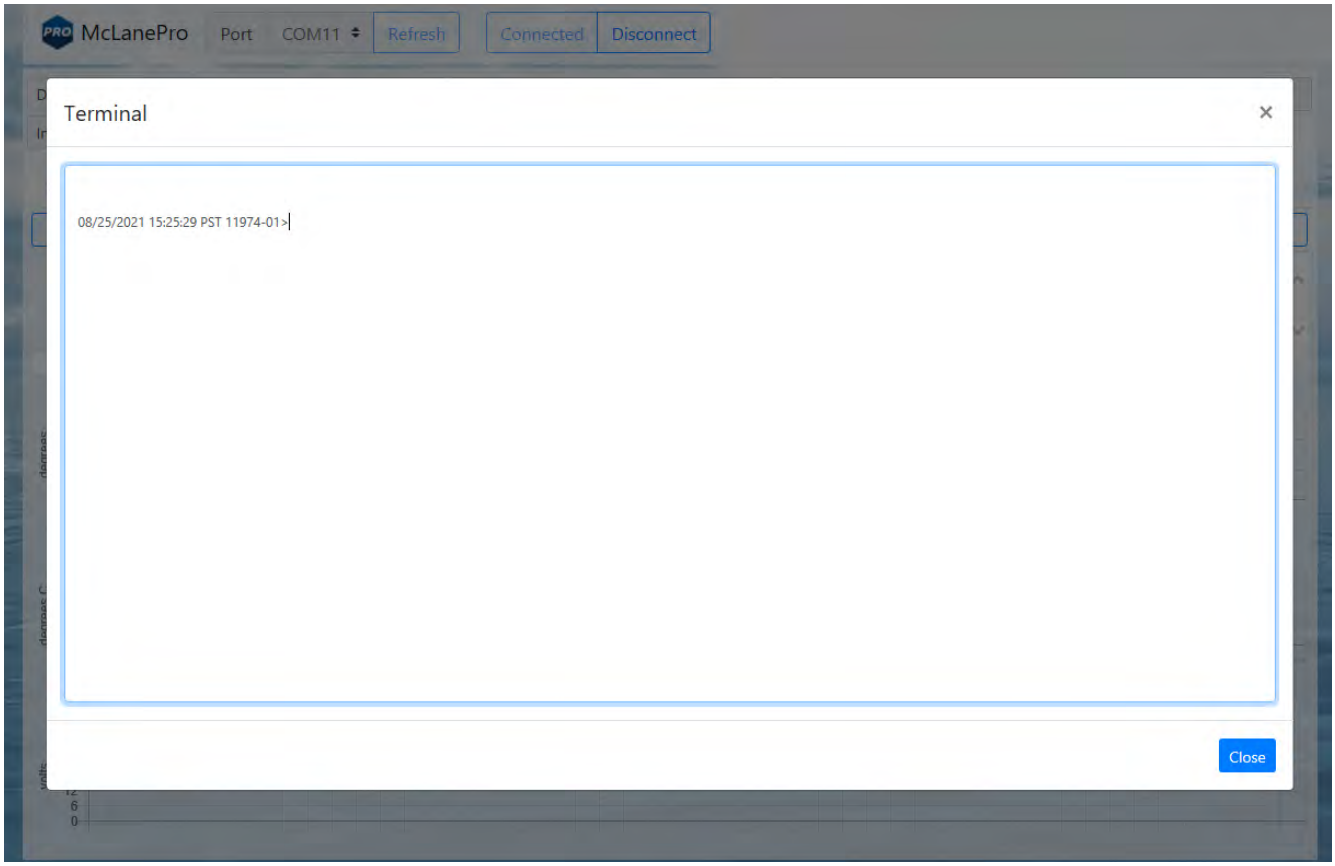
3. Once a **.UPD** file is selected, continue with the update process to update the Sediment Trap.

In some cases, a firmware update may revert the Sediment Trap configuration to default values. McLanePro detects when this happens, and loads the Configuration tab in order to reconfigure the instrument after the firmware update is complete.

The Terminal

A command-line interface provides an option for command-driven control over the Sediment Trap.

Access the terminal interface through the Admin tab, or by typing **ALT+T**.



Whenever the terminal is closed, a log of that session is automatically downloaded.

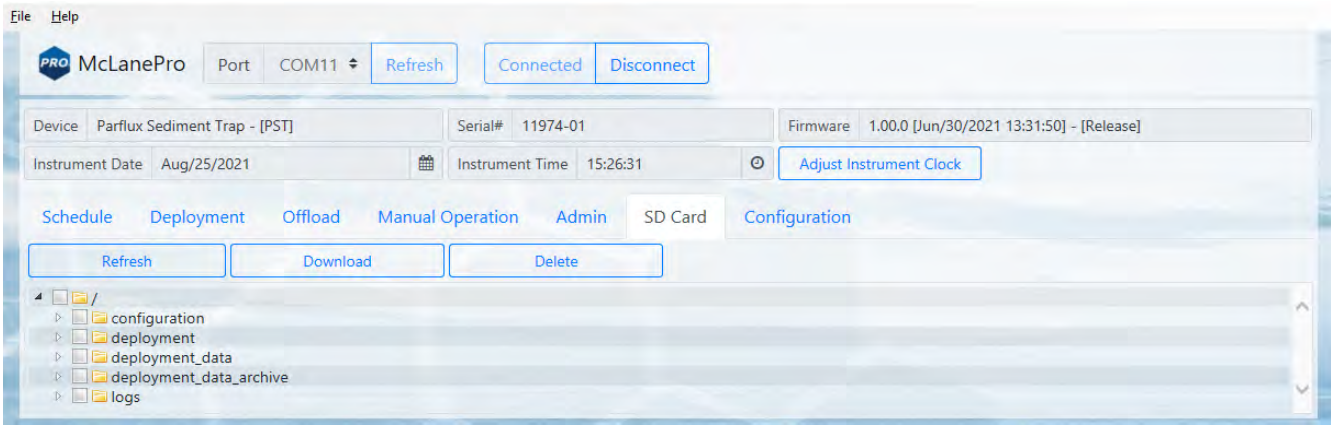
Contact mclane@mclanelabs.com for a list of available terminal commands.

The SD Card Tab

The **SD Card tab** allows for file operations on the Sediment Trap MicroSD Card.

The entire card can be downloaded or deleted.

Contact mclane@mclanelabs.com before deleting any files.

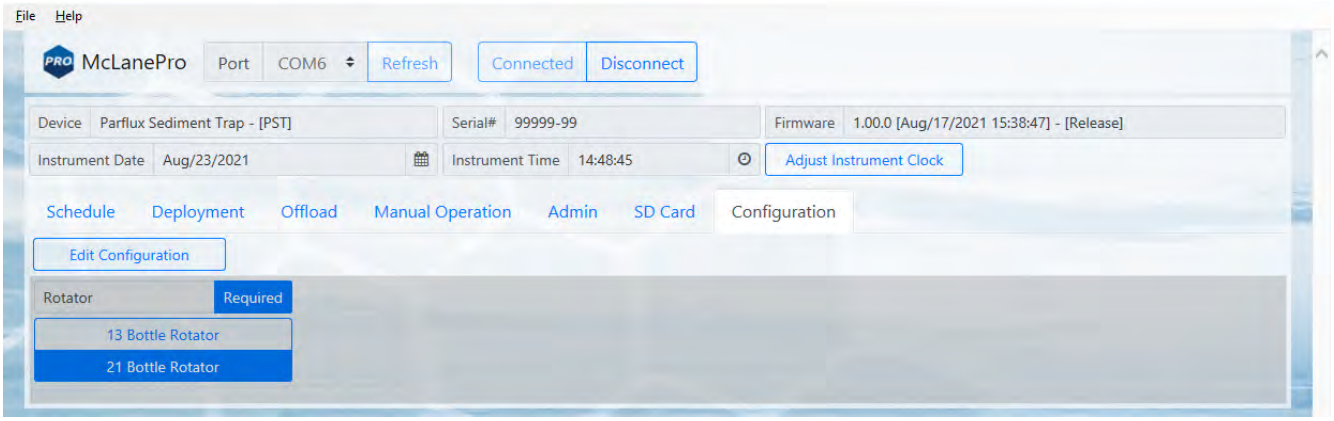


The Configuration Tab

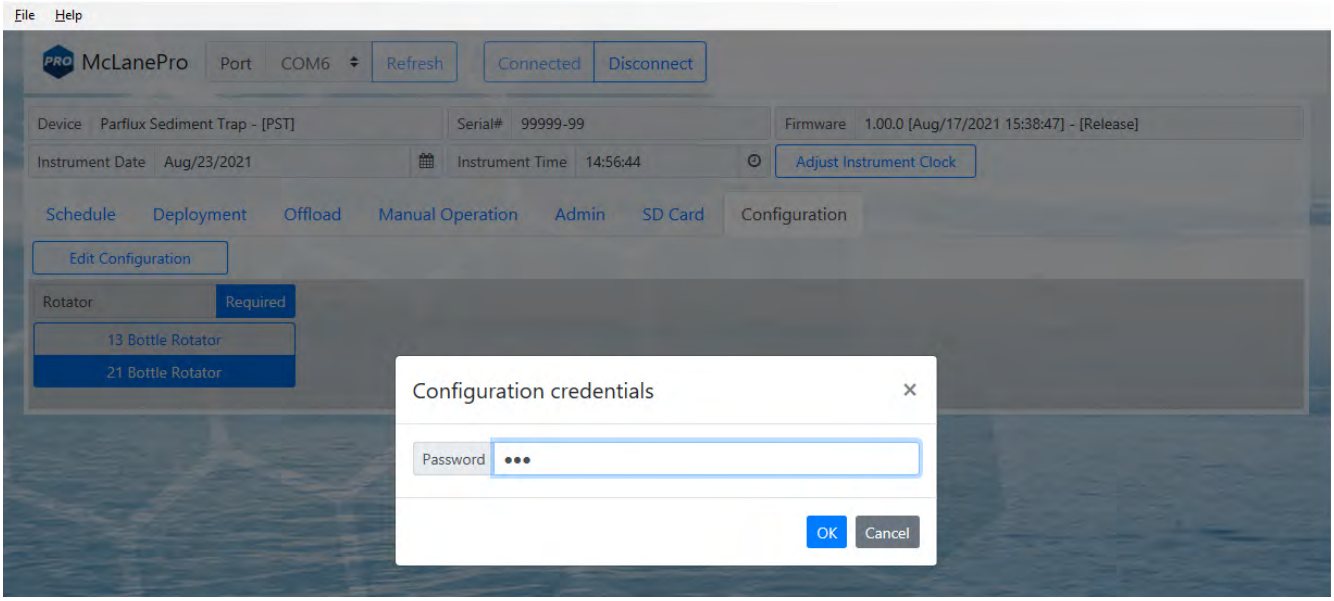
Sediment Traps are offered with a 13 bottle rotator, or a 21 bottle rotator. The firmware is configured to match the Sediment Trap model before shipping.

The **Configuration tab** is not used often. If a firmware update reverts the Sediment Trap to default values, the Configuration tab is used to change the values.

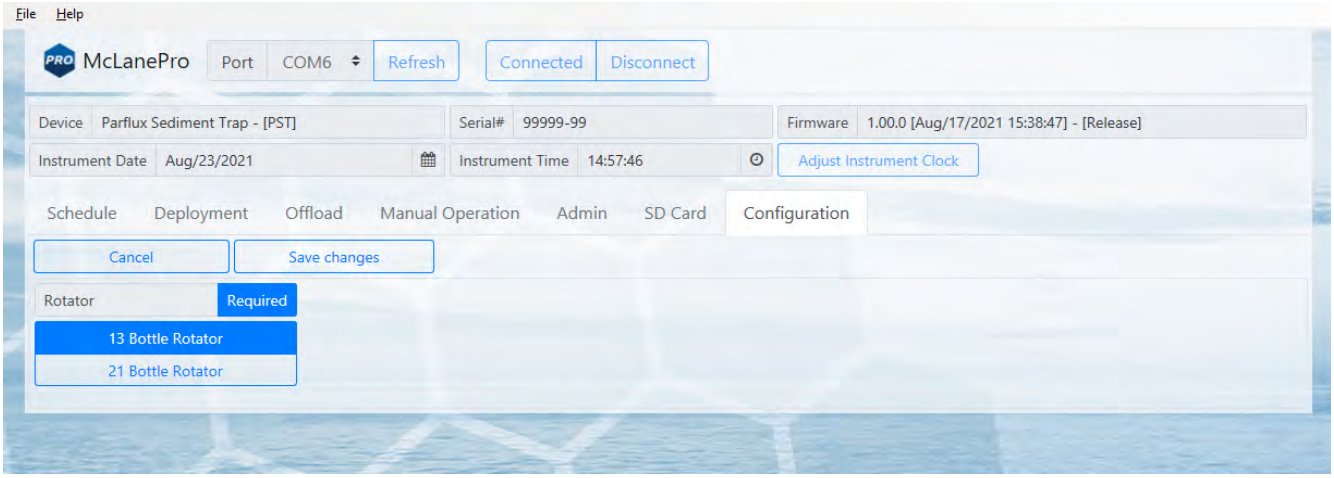
1. To change the Sediment Trap configuration, navigate to the **Configuration** tab and select **Edit Configuration**.



2. When prompted for a password, enter "**con**".

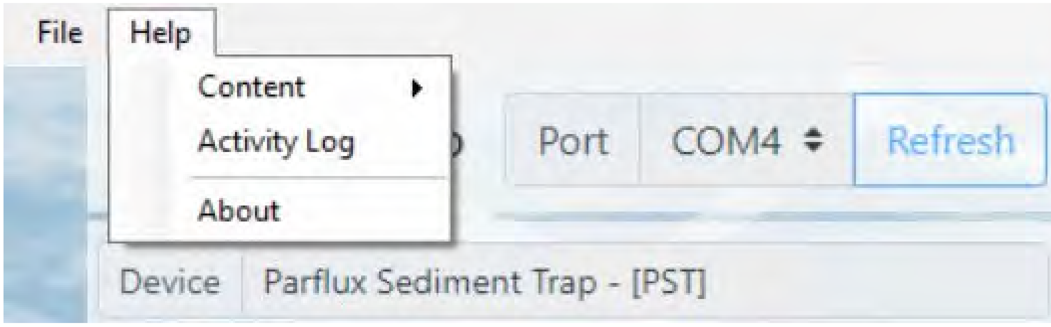


3. Confirm or change the Sediment Trap rotator configuration, and other options (if available) and click **Save changes**.

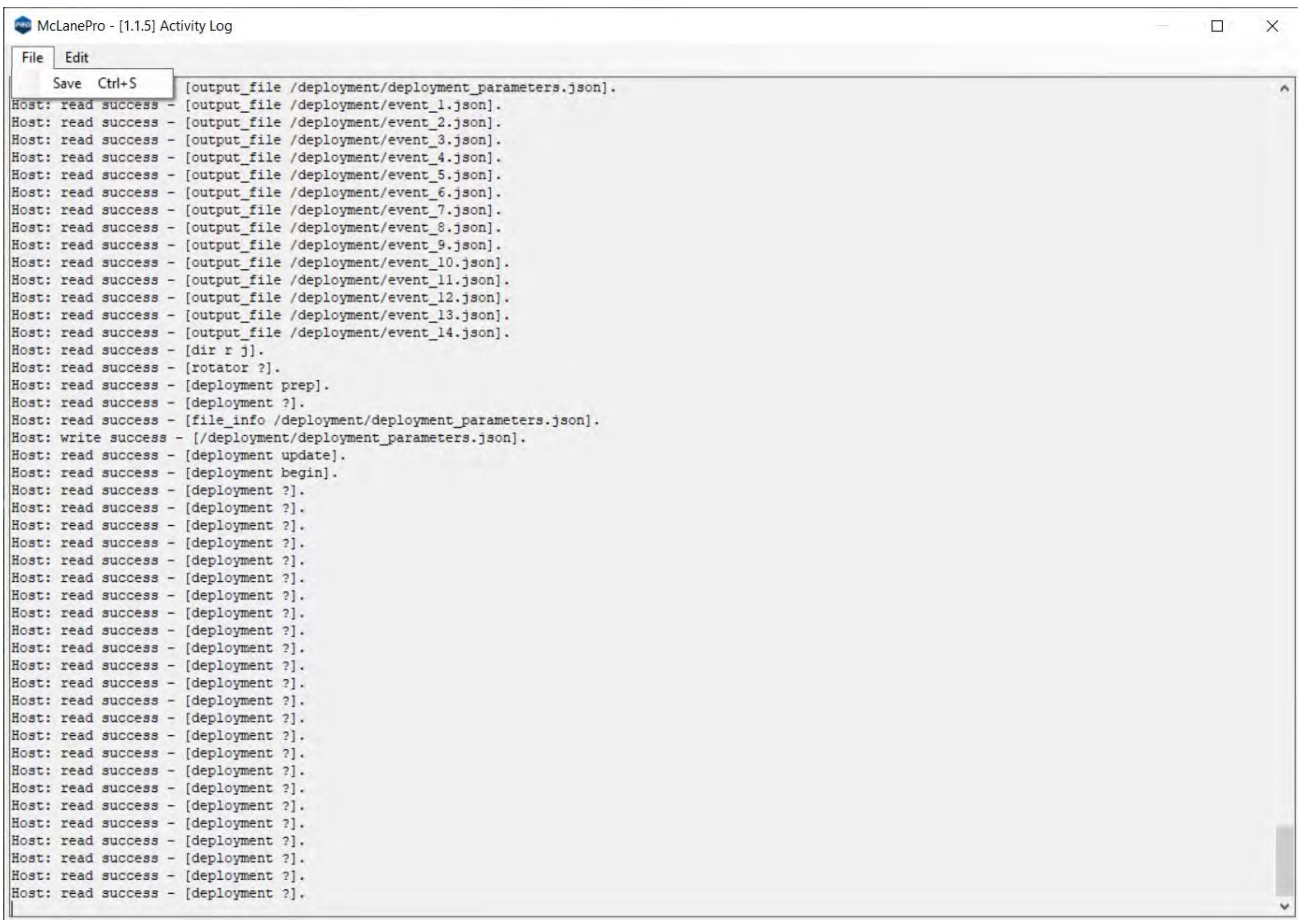

File
Help
McLanePro
Port
COM6
Refresh
Connected
Disconnect
Device
Parflux Sediment Trap - [PST]
Serial#
99999-99
Firmware
1.00.0 [Aug/17/2021 15:38:47] - [Release]
Instrument Date
Aug/23/2021
Instrument Time
14:57:46
Adjust Instrument Clock
Schedule
Deployment
Offload
Manual Operation
Admin
SD Card
Configuration
Cancel
Save changes
Rotator
Required
13 Bottle Rotator
21 Bottle Rotator

The Activity Log

Communications between McLanePro and the Sediment Trap are visible when entering the **Activity Log** from the McLanePro Help menu.

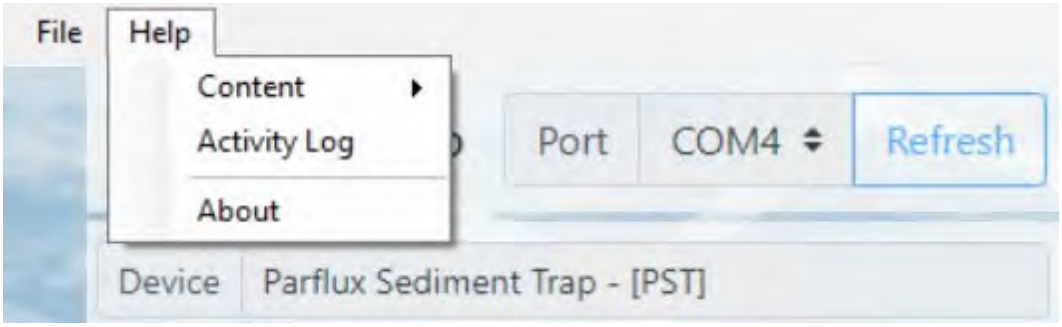


Within the **Activity Log**, there are options to ***Save*** the log to a text file (using the File menu), or to ***Copy*** a selection of the **Activity Log** to the clipboard (using the Edit menu).

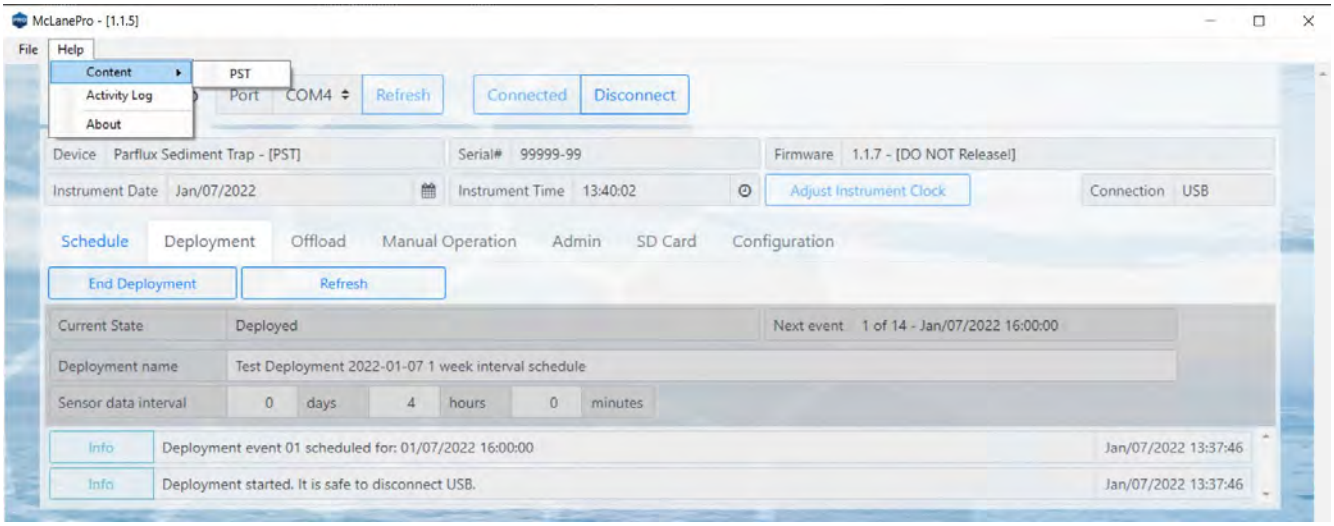


The Help Menu

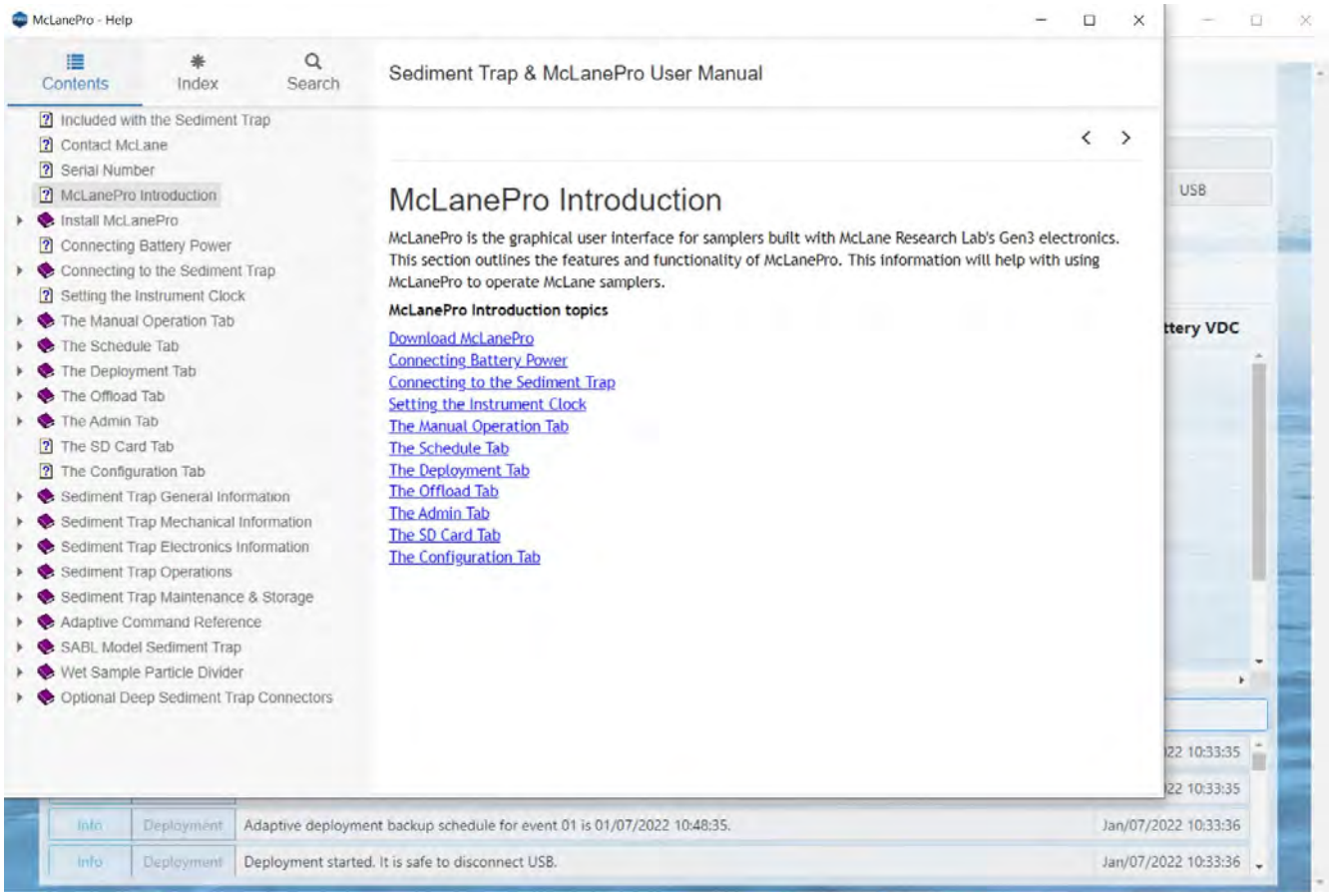
The McLanePro **Help Menu** contains links to device-specific user manuals, as well as McLanePro general information.



Select the appropriate help file for the device connected to McLanePro.



In this example, the device is a Parflux Sediment Trap with device code PST. The help file contains user instruction and information on Parflux Sediment Traps.


McLanePro - Help
Contents
Index
Search
Sediment Trap & McLanePro User Manual
Included with the Sediment Trap
Contact McLane
Serial Number
McLanePro Introduction
Install McLanePro
Connecting Battery Power
Connecting to the Sediment Trap
Setting the Instrument Clock
The Manual Operation Tab
The Schedule Tab
The Deployment Tab
The Offload Tab
The Admin Tab
The SD Card Tab
The Configuration Tab
Sediment Trap General Information
Sediment Trap Mechanical Information
Sediment Trap Electronics Information
Sediment Trap Operations
Sediment Trap Maintenance & Storage
Adaptive Command Reference
SABL Model Sediment Trap
Wet Sample Particle Divider
Optional Deep Sediment Trap Connectors
McLanePro Introduction
McLanePro is the graphical user interface for samplers built with McLane Research Lab's Gen3 electronics. This section outlines the features and functionality of McLanePro. This information will help with using McLanePro to operate McLane samplers.
McLanePro Introduction topics
Download McLanePro
Connecting Battery Power
Connecting to the Sediment Trap
Setting the Instrument Clock
The Manual Operation Tab
The Schedule Tab
The Deployment Tab
The Offload Tab
The Admin Tab
The SD Card Tab
The Configuration Tab
USB
ttery VDC
22 10:33:35
22 10:33:35
Info
Deployment
Adaptive deployment backup schedule for event 01 is 01/07/2022 10:48:35.
Jan/07/2022 10:33:36
Info
Deployment
Deployment started. It is safe to disconnect USB.
Jan/07/2022 10:33:36

Sediment Trap General Information

General information includes short descriptions of Sediment Trap models including available options. More detailed specification sheets are available on the McLane websiteSediment Trap product page.

Sediment Trap General Information topics

Description & Models
Optional Deep Controller Housing

Description & Models

The McLane PARFLUX Sediment Trap is a time-series sampler that uses 21 or 13 individual sample bottles of 250mL or 500mL to collect the flux of settling particles in-situ. Several Sediment Trap models are available to fit different sampling needs.

- Mark 78H-21 - Collects 21 individual samples in 250mL or 500mL bottles (0.5 m^2 collection area).
- Mark 78HW-13 - Collects 13 individual samples in 250mL or 500mL wider bottles (0.5 m^2 collection area).
- Mark 8 - Collects 13 individual samples in 250mL or 500mL bottles. Smaller cone and lighter weight (0.25 m^2 collection area).

Optional Deep Controller Housing

Optional Deep Controller Housing: Sediment Traps deployed at depths from 7,000m to 10,000m require high pressure penetrators on the controller communications port and motor connector. These high pressure penetrators have a locking collar with an inner locking ring.

Related topic

Optional Deep Sediment Trap Controller

Sediment Trap Mechanical Information

Mechanical components of the Sediment Trap include the frame, cone, baffle, controller housing, O-rings, and gear plate assembly.

Sediment Trap Mechanical Information topics

Frame
Cone
Honeycomb Baffle
Controller Housing
Top & Bottom End Caps
O-Rings
End Cap Bulkhead Connectors
Optional High Pressure Penetrators
Gear Plate Assembly
Plastic Ball Bearings
Variseals
Drive Motor

Frame

The Sediment Trap frame is a Grade 2 titanium frame designed to protect the controller electronics and rotator. CTD's, fluorometers or other sensors may also be attached to the frame.

Cone

The cone collects settling particles from the wide opening at the top of the Sediment Trap and deposits them into individual sample bottles on a user-defined schedule.

The collection area is:

- Mark 78H - 0.5m^2
- Mark 8 - 0.25m^2

Honeycomb Baffle

A honeycomb baffle tops a short polyethylene mounting cylinder at the top of the Sediment Trap cone. This baffle prevents large objects and marine life from clogging the sampler because each baffle cell is more narrow than the small aperture at the bottom of the cone.

Controller Housing

The standard titanium controller housing is pressure resistant to 7,000 meters. A deep controller housing option is rated to 10,000 meters. Inside the controller housing is the battery pack for 14 ‘C’ cell alkaline batteries, and the electronics assembly. Two rubber-insulated, 316 stainless steel U-bolts fasten the housing to the frame.

The controller can be opened while attached to the frame.

Top End Cap

A top end cap seals the controller housing from water intrusion with a face o-ring seal and a radial O-ring seal (with a backup ring).

O-Rings

O-ring maintenance and correct placement is critical to prevent water intrusion. Incorrect O-ring placement results in cracks or splits that could affect the O-ring seal and cause water damage to the controller. **Water damage from incorrectly placed or maintained O-rings can void the sampler warranty.**

Each O-ring set includes three O-rings (200-0071, 200-0072, 200-0073).

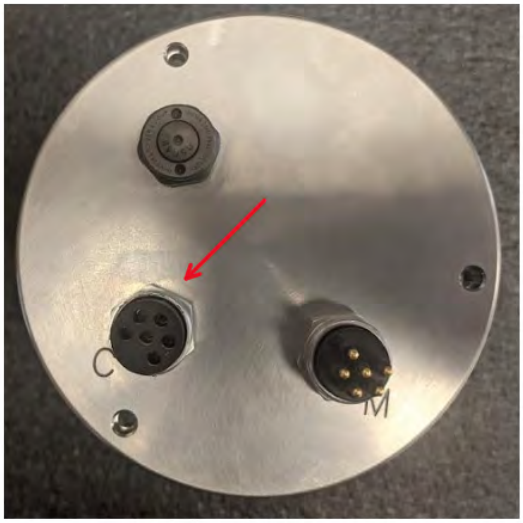
See '[Maintenance and Storage]' for details on cleaning the O-rings and proper O-ring positioning when inserting the end cap into the controller housing.

McLane uses O-rings that meet MIL-G 21569 Class 1 standards. We recommend that replacement O-rings meet this standard. Backup rings are Buna-N, Parker material NO300 or equal.

O-RING	SPECIFICATION
200-0071	3.612 x 0.103 cross section, BUNA-N 70 A Durometer.
200-0072	2-152, BUNA-N, 70 A Durometer
200-0073	8-152, BUNA-N, 90 A Durometer

End Cap Bulkhead Connectors

Do not overtighten the end cap bolts and **do not replace** the stainless steel hardware with any other hardware. The Toolkit includes spare hardware, otherwise contact mclane@mclanelabs.com.

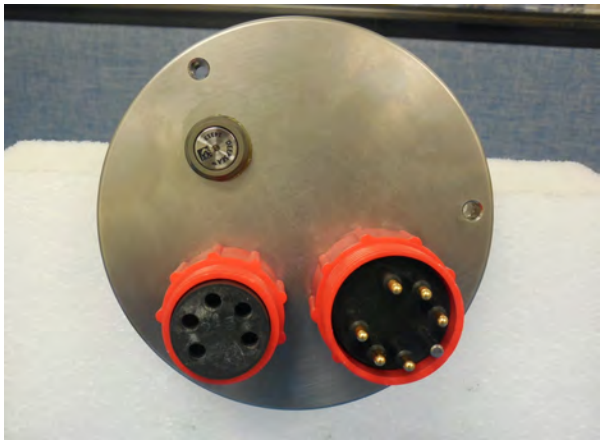


Optional High Pressure Penetrators

Sediment Traps deployed at depths from 7,000 m to 10,000 m, require high pressure penetrators on the controller communications port and motor connector. These penetrators have a locking collar with an inner locking ring.

Related topic

Deep Sediment Trap Connectors



Gear Plate Assembly

The gear plate assembly attaches to the top fixed plate with seven (7) bolts. On the gear plate assembly, four (4) bolts with plastic washers attach the gear ring to the bottom fixed plate.

An unthreaded alignment hole, referred to as Port ‘Zero’ (0) aligns the rotator assembly when the Trap is deployed to protect the integrity of the adjacent sealed bottles and prevent sample contamination. The first sample bottle hole is labeled ‘1’.

Related topics

Move the Rotator

Set the Rotator Position Reference

Plastic Ball Bearings

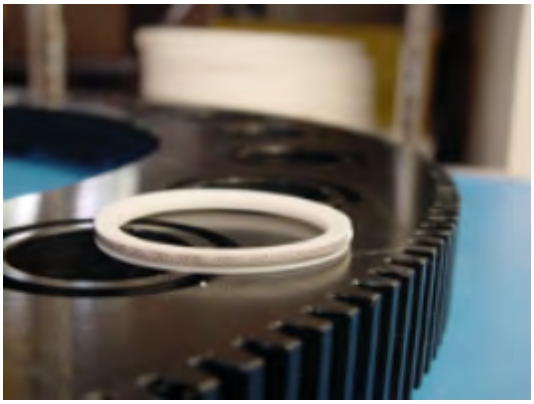
The inside of the Gear Plate Assembly is filled with plastic ball bearings.

Variseals

The upper openings of the sample bottle holes are fitted with Teflon spring-loaded Variseal® gaskets to seal out ambient water and protect the samples from contamination. Do not apply grease or lubricant to the gear ring, bottom fixed plate, or Variseals®.

These gaskets are visible when the gear plate assembly is detached from the top plate. A continuous Hastelloy circular spring inside the gasket expands the upper and lower gasket halves.

The plastic ball bearings and Variseals® in the gear plate assembly are highly durable and withstand multiple years of deployment activity without replacement. **McLane recommends replacing the bearings and seals at the factory**.



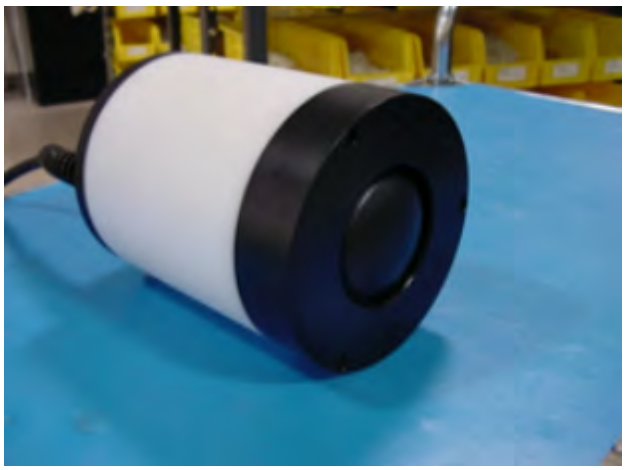
Drive Motor

The drive motor assembly contains a:

- High-torque electronic stepping motor
- Reducing gear train
- Microswitch/cam device
- Titanium main drive shaft

The motor's main drive shaft generates 30 kg/cm torque at the spur gear. A switch and cam assembly in the stepper motor confirms proper alignment of each bottle. The firmware records the time and fill position when each bottle advances.

The motor housing interior is filled with 450 ml of silicone fluid (a quad-ring around the main drive shaft securely separates the silicone fluid from seawater). A bladder of flexible, impermeable Nitrile allows compression of the silicone fluid to compensate for external static pressure. All interior motor housing shafts are supported by high precision ball bearings.



Sediment Trap Electronics Information

The Sediment Trap operates on the McLane Gen3 hardware consisting of a low power microcontroller, motor controller, and connector interface board. Data are stored to a MicroSD© memory card that can be accessed using McLanePro software. Gen3 electronics interface with a McLane-built graphical user interface (GUI), calledMcLanePro.

Related topic
McLanePro Introduction

Sediment Trap Electronics Information topics
Opening the Controller Housing
Main Battery
Tilt Sensor
Instrument Current Consumption

Opening the Controller Housing

Take care in maintaining, operating, and opening the pressure housing. A pressure relief valve (PRV) on the controller housing end cap releases automatically at a pressure differential greater than 10psi. The PRV style may have a center hole and release tool, or the style may have a flat relief valve that must be manually pulled out.

1. Slowly pull on the pressure relief valve to release any vacuum or built up pressure in the housing.
2. Loosen each end cap bolt a few turns at a time in a star pattern.
3. If the end cap separates from the housing as the bolts are loosened, this could indicate a possible pressure buildup inside of the housing. Stop loosening bolts and continue to gently pull on the pressure relief valve.
4. Remove and place the end cap hardware somewhere safe. Typically plastic inserts have a snug fit and will remain in the end cap.
5. Grasp the end cap lip with fingertips and pull the end cap out of the housing. The end cap to housing seal is tight and sometimes difficult to open. Do not use a tool to pull open the

housing. The end cap O-rings can be damaged if objects are used to separate the end cap from the housing.

Main Battery

The Sediment Trap battery holder accepts user replaceable drop-in alkaline ‘C’ cell batteries. The batteries are not installed in a new Sediment Trap. However, new batteries are included either in the toolkit or in the shipping crate.

Install the batteries with the correct orientation in the holder terminals. An instructional video showing drop-in battery replacement is shown on the Sediment Trap video pages at www.mclanelabs.com.

Always take standard electrostatic discharge (ESD) precautions when handling the electronics.

Tilt Sensor

Gen3 electronics include a tilt sensor. Tilt readings are measured at the start and end of an event (a bottle rotation from the current sample to the next bottle). Additional tilt reading are recorded by setting the sensor interval. The default minimum sensor interval is 30 minutes.

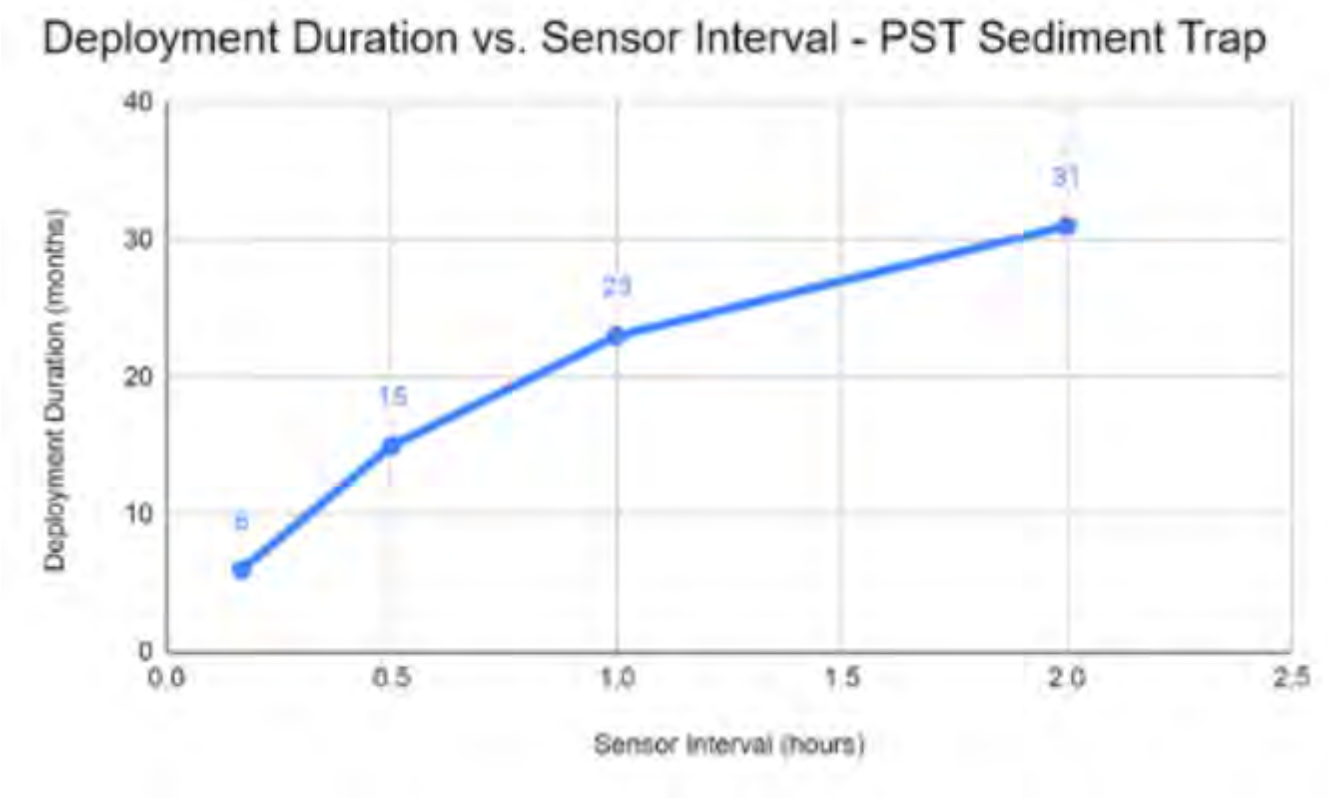
Related topic

Tilt Sensor & End Cap Orientation

Deployment Duration Estimate

This deployment endurance estimate assumes:

- 21 New alkaline C-cell batteries. Do not mix old and new batteries.
- A de-rated battery capacity of 5,000 mAh.
- 6% per year self-discharge rate.
- Sensors include internal temperature and tilt only. For sediment traps with additional sensors please contact McLane.
- Instrument setup, deployment, and recovery with 40% of the battery energy in reserve.



Sediment Trap Operations

Procedures for preparing the Sediment Trap for a deployment include:

- Preparing and attaching the sample bottles.
- Aligning the rotator to the open position.
- Filling the sample bottles.
- Programming deployment parameters.

Sediment Trap Operations topics

Deployment Preparation
Preparing & Attaching Sample Bottles
Aligning the Rotator to the Open Position
Filling the Sample Bottles
Programming the Deployment
Starting the Deployment

Deployment Preparation

1. Install the "C" cell alkaline batteries.
2. Connect battery power.
3. Close the controller housing in the correct orientation.
4. Remove the dummy plug from the communications bulkhead.
5. Connect the communications cable.
6. Confirm the computer and the instrument are communicating.

Related topics

Download McLanePro

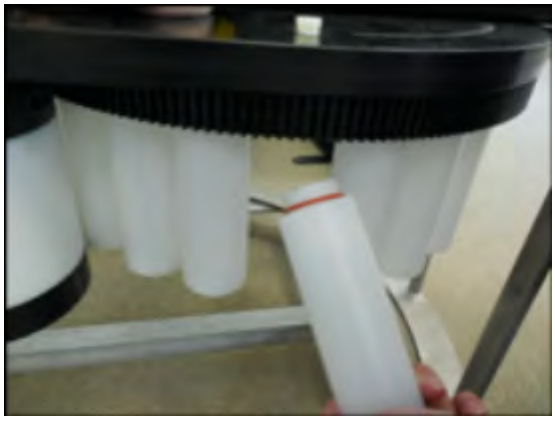
Connecting Battery Power

Connecting to the Sediment Trap

Preparing & Attaching Sample Bottles

Follow these steps to prepare and attach the sample bottles:

1. Follow the steps in Connecting to the Sediment Trap to establish communications with the Sediment Trap.
2. Close and seal the controller housing.
3. Wash and rinse the sample bottles with neutral/distilled water.
4. Dry bottles thoroughly.
5. Slide one silicone O-ring onto each sample bottle.
6. Screw the sample bottles into the holes on the Gear Plate and hand-tighten. It is helpful to number bottles with their port number on the outside with a permanent marker

Aligning the Rotator to the Open Position

Follow the steps in Set the Rotator Position Reference to position the rotator to the starting point.

Filling the Sample Bottles

Follow these steps to fill the sample bottles:

1. Remove the rotator assembly fill plug (a 7/16” wrench is included in the toolkit).
2. Follow steps to Move the Rotator so that the first bottle is positioned beneath the fill port.
3. Fill the first sample bottle with neutral water.
4. Move the rotator forward to the next port. Continue filling the sample bottles with neutral water and moving the rotator forward until the open hole is reached. All sample positions should now be full.
5. Return the plug to the fill hole, using a 7/16” wrench to tighten.
6. Move the rotator to the zero position - the open hole in the rotator should be positioned beneath the cone opening.

Sample collection starts and ends on an open hole in the rotator (the 22nd or 14th sample event, depending on model). If not using all sample bottles, program the schedule to**end the deployment on an open hole** . Ending on a closed hole fills the cone with water and makes the Sediment Trap much heavier to recover.

Programming the Deployment

Follow the steps in the Schedule tab to program the deployment parameters.

Starting the Deployment

Follow these steps to start a deployment after the sample bottles are installed and the rotator is aligned:

1. Connect the battery and close the end cap.
2. Connect the communication cable and confirm firmware deployment settings (see chapter 4 for details about programming the deployment).

3. Use Starting a Deployment to program the deployment parameters.
4. Disconnect the communication cable and attach the dummy plug.
5. Attach the Sediment Trap to the bridle(s), or chain.
6. Deploy the Sediment Trap.

Sediment Trap Maintenance & Storage

Proper maintenance after every deployment is critical for ensuring smooth operation and long instrument life for the Sediment Trap. This section provides guidance on the maintenance recommendations immediately following the recovery, upon returning to a lab setting, and preparing for long-term storage.

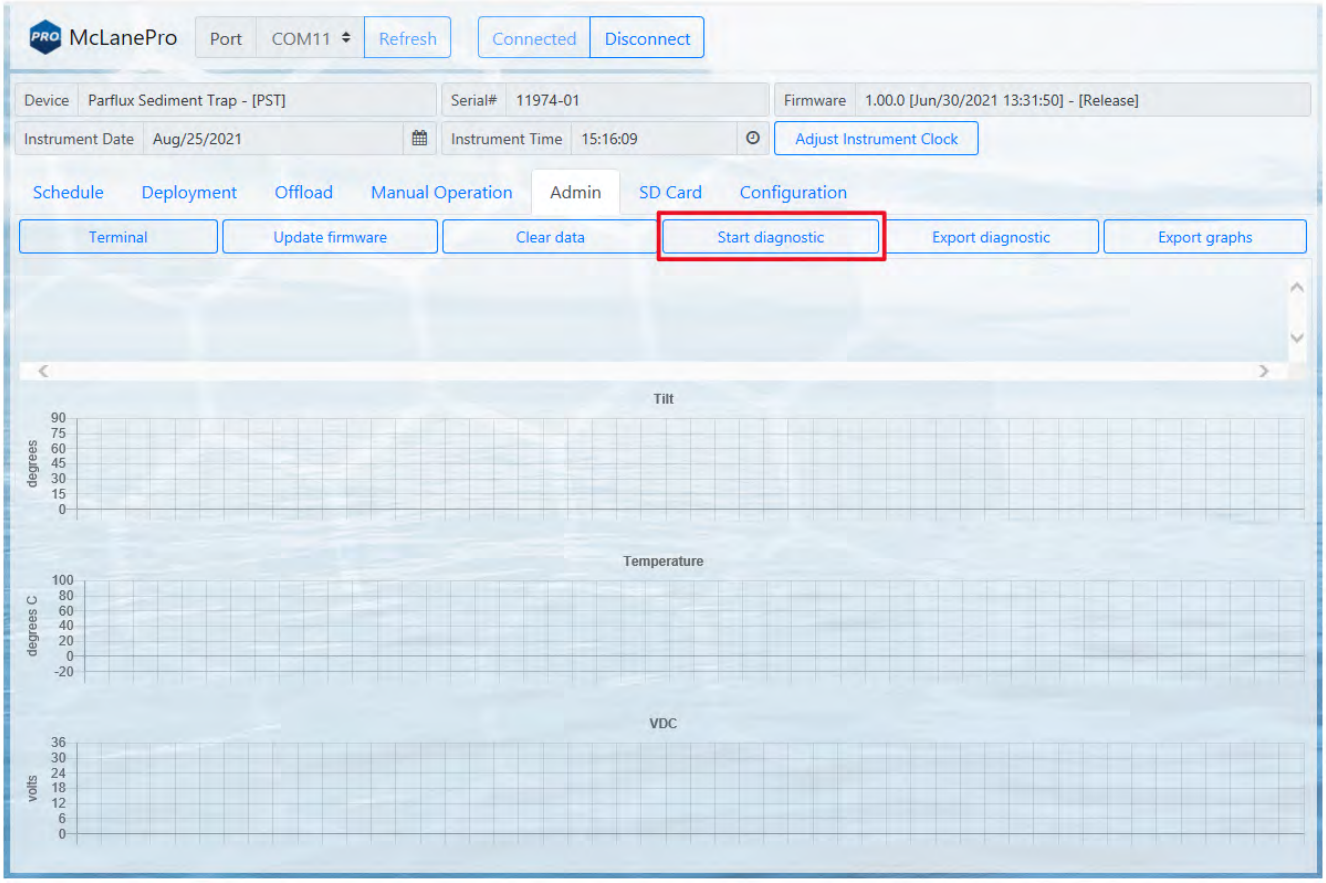
Sediment Trap Maintenance & Storage topics

Tilt Sensor & End Cap Orientation
Immediately Following Recovery
Back from Sea

Tilt Sensor & End Cap Orientation

The Sediment Trap ships with the tilt sensor calibrated. If the controller housing is removed from the Sediment Trap frame, follow these steps to re-orient the end cap for tilt.

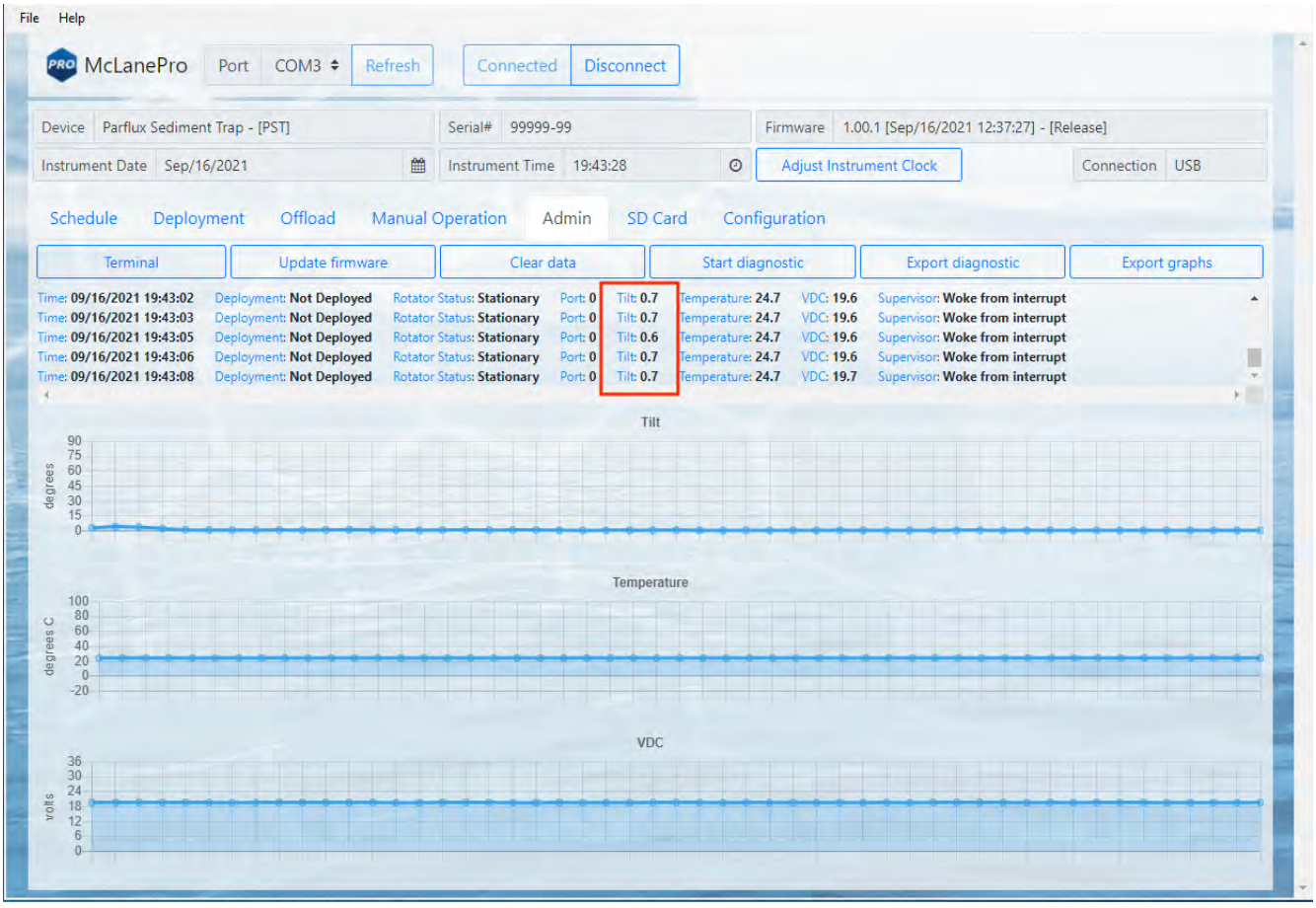
1. Confirm the Sediment Trap is level by placing a small hand level over the Sediment Trap cross channel and on the side of the cross channel (confirm that both axes are level).
2. Loosen the U-bolts that secure the controller housing to the cross channel.
3. From the Admin tab select Start diagnostic.



4. Place the controller housing (with end cap oriented as shown) under the U-bolts but do not

tighten the U-bolts.

5. Watch the tilt reading as the Diagnostics display scrolls and turn the controller housing until the tilt reading is close to zero (exact zero tilt reading is not required).



6. Tighten the U-bolts around the controller housing.

Immediately Following Recovery

STEP	NOTE
1 - Rinse the cone, housing, motor and rotator with fresh water	There are more cleaning steps when the Sediment Trap is returned to the lab
2 - Offload all data from memory	See 'Offloading Data'
3 - Open the controller housing and unplug battery from the electronics	See 'Opening the Controller Housing'
4 - Reseal all components for return shipment	Ensure that alkaline batteries are removed from controller housing

Rinsing the Sediment Trap

Rinsing the cone, controller housing. motor and rotator with fresh water immediately following recovery is extremely important for long-term care of the Sediment Trap. Poor rinsing directly following deployment affects the condition and future performance of the instrument.

Back from Sea

Several maintenance steps should be completed in the lab after a deployment and before longer term storage.

STEP	NOTE
1 - Rinse and scrub the cone, housing, motor and rotator with fresh water	Take extra care around the honeycomb baffle.
2 - Check Oil Bladder in drive motor assembly	Add silicone oil only if the bladder is low (see 'Check the Oil Bladder in the Drive Motor

	Assembly’)
3 - Remove and inspect controller housing O-rings, confirm battery removal	See ‘Remove and Inspect Controller Housing’
4 - Remove rotator and rinse ball bearings with fresh water	See ‘Remove Rotator and Rinse Ball Bearings’
5 - Reinstall the controller housing onto the frame	See ‘Reinstall Components onto the Frame’
6 - Cover top of cone with clean plastic for storage	Do not put weight on the honeycomb baffle during storage

Check the drive motor oil

Visually inspect the drive motor cable and housing assembly before deployment. Confirm that the compensating oil bladder has sufficient silicone oil (the oil can be topped off if necessary). To inspect the drive motor oil bladder, keep the drive motor connected to the rotator assembly and complete the following steps:

1. Place an index finger on the oil bladder located at the bottom of the drive motor housing and press gently.
2. A properly filled bladder indents approximately one inch when slight pressure is applied with the index finger on the center of the bladder.
3. If the bladder indents further than one inch, complete the steps listed next to top off the oil.

When inspecting the compensating oil bladder, keep clear of sharp objects.

Add Oil to the Drive Motor (only if Necessary)

Follow these steps **only if** more oil is needed to top off the oil in the drive motor housing. 20 CST silicone oil is used in the drive motor and may be purchased from McLane.

1. Unplug the drive motor cable from the controller housing.
2. Remove and set aside the three (3) screws that secure the drive motor to the rotator assembly.
3. Place the drive motor housing upright on a dry surface.
4. Hold the drive motor housing firmly at the bottom and side and slowly unscrew the fill plug at the top of the drive motor housing.
5. Insert a funnel or syringe into the fill hole and slowly pour in silicone oil while gently pressing up on the bladder to ‘burp’ out air bubbles. The oil will be drawn into the fill hole as the air bubbles are released.

6. Replace and tighten the fill plug screw.
7. Let the drive motor sit for 24 hours.
8. After 24 hours, release any residual air bubbles by unscrewing the fill plug screw just enough to loosen the O-ring seal.

9. Gently press up on the bladder until oil comes up around the fill hole screw. Tighten the screw.

10. Use an alcohol wipe to thoroughly clean the oil from around the fill plug screw.
11. Follow the steps listed next to align the rotator assembly Fixed Plate and Gear Plate holes and reattach the drive motor.

Remove and Inspect controller housing internal parts

The controller housing should be removed and several maintenance steps can be performed once the Sediment Trap is back in a lab.

Related topics
Inspecting the O-rings
Replacing the batteries
Sealing the controller housing

Align Fixed & Gear Plates, Reattach Drive Motor

The fixed plate and gear plate holes are aligned during assembly at McLane. Realigning these plates should not be required unless the drive motor has been removed from the rotator assembly (for example, if the drive motor is removed so that oil can be added).

Follow these steps to realign the plates and reattach the drive motor:

1. Align the fixed plate hole with the unthreaded gear plate alignment hole.
2. Visually confirm that the drive motor and Gear Plate gears correctly mesh and that the Fixed Plate hole is centered over the gear plate hole.
3. Mount the drive motor back onto the rotator assembly.
4. Secure the drive motor to the rotator assembly by tightening the screws.
5. Clean and lightly lubricate the drive motor bulkhead with Dow-Corning 55.
6. Plug the drive motor connector into the controller housing.

Rotator Assembly Variseals & Bearings

Rinsing before and after each deployment keeps the rotator assembly working for many deployments and/or years.

The plastic ball bearings inside the gear plate assembly and the Variseals® in the gear ring holes are durable and long-lasting.

The steps in this section can be used after speaking with McLane if it is necessary to replace Variseals® or ball bearings.

Spare ball bearings are included in the Sediment Trap toolkit and Variseals® can be obtained from McLane.

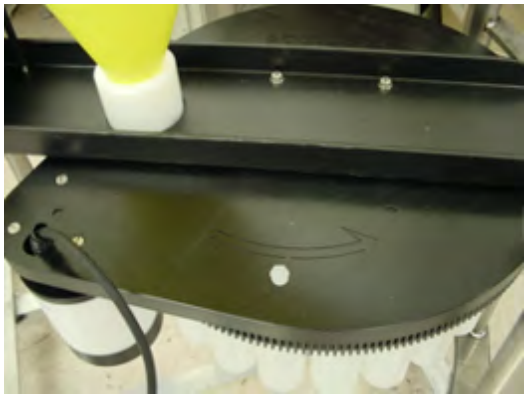
Replacing Varisals® and/or ball bearings is a multi-step process that consists of the following:

Step 1 - Remove Components From the Frame
Step 2 - Clean and/or Replace Variseals®
Step 3 - Clean and/or Replace Ball Bearings
Step 4 - Reassemble Rotator Plates
Step 5 - Perform a Leak Test
Step 6 - Reinstall Components Onto the Frame

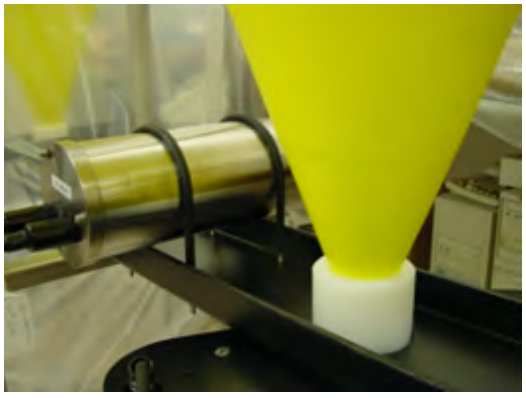
Step 1 - Remove Components from the Frame

Follow these steps to replace Variseals® and/or ball bearings by carefully removing the drive motor, controller housing, cone, and rotator assembly from the Sediment Trap frame.

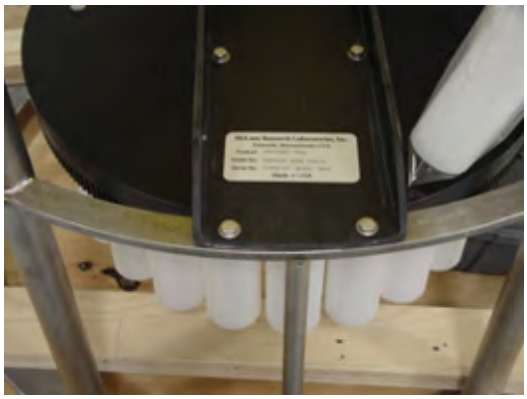
1. Remove the sample bottles from the rotator assembly and disconnect the drive motor cable from the controller housing.
2. Remove the three (3) bolts that hold the drive motor to the top fixed plate and carefully remove the drive motor.



3. Remove the two (2) U-bolts that secure the controller housing to the cross channel and carefully remove the controller housing.



4. Remove the twelve (12) bolts that hold the cone to the frame and the four (4) bolts that hold the cross channel to the frame. Place the plastic inserts that hold the bolts in a safe place so they are not lost



5. While lifting the cone, remove the cross channel and rotator assembly. Keep the cross channel attached to the rotator assembly top fixed plate. Lower the cone back onto the frame and secure in a clean area

6. Remove the seven (7) bolts (without the plastic washers) that secure the gear plate assembly to the top fixed plate and gently remove the gear plate assembly. The gear plate assembly will be visible on the underside of the top fixed plate. The Variseals® will be visible on the underside of the gear plate assembly once it is removed from the top fixed plate.

7. Place the top fixed plate and cross-channel upside down in order to protect the sealing surface.

Step 2 - Clean and replace Variseals (only if needed)

Follow these steps to clean and replace the Variseals® in the gear plate assembly

1. Lay the gear plate assembly with Variseals® facing up on a clean, flat surface
2. Remove Variseals® from the gear ring grooves (using fingers or a plastic tool to avoid scratching the seals).

3. Clean the grooves with alcohol and a lint free wipe.
4. Thoroughly rinse and dry each Variseal®.
5. Inspect Variseals® for signs of wear and the presence of any foreign material (such as hair or grit) that could affect the seal.

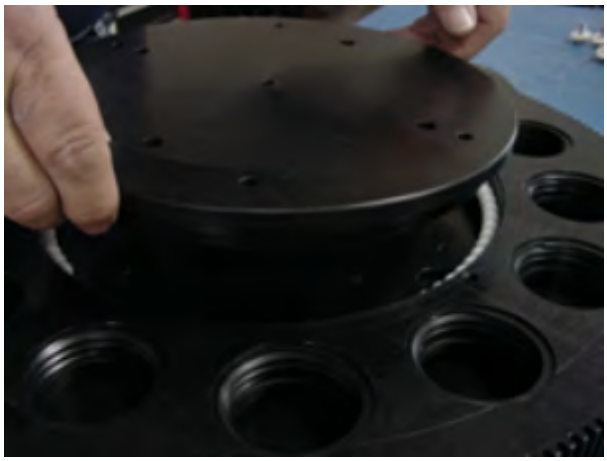
Do not grease or lubricate the gear ring, bottom fixed plate, or seals.

6. Place Variseals® back in the gear ring grooves, replacing with new seals as needed. One Variseal® edge is thinner than the other. To obtain the correct seal, the Variseal® must be placed in the gear ring groove with the thin side down.

7. If also replacing bearings, continue to the next section: Step 3 – Clean and Replace Ball Bearings." Otherwise, continue to Step 4.

Step 3 - Clean and replace ball bearings (only if needed)

1. If not already done, the gear plate assembly should be removed from the top fixed plate.
2. Place the gear plate assembly with Variseals® facing up on a clean, flat surface and remove the bottom fixed plate.
3. Remove the four (4) retaining bolts (with plastic washers) that secure the bottom fixed plate to the gear ring and remove the bottom fixed plate.



4. Rinse the bottom fixed plate with fresh water and carefully clean the bearing groove with alcohol and a lint free wipe.
5. Remove the bearings, rinse and dry thoroughly to remove salt or other foreign matter.
6. Clean the bearing groove in the gear plate with alcohol and a lint free wipe.
7. Inspect bearings and confirm that there are no chips or other damage. Damaged bearings should be replaced with spares from the toolkit.
8. Fill the bearing groove with bearings. The bearing groove for the 21 bottle Sediment Trap holds approximately 99 bearings (approximately 78 bearings for the 13 cup Sediment Trap). A fast method for filling the groove in either size Sediment Trap is to add bearings until no more will fit and then remove four (4) bearings.

Do not lubricate the bearings or grooves.

9. Reinstall the bottom fixed plate and tighten the 4 retaining bolts.
10. Tighten the bolts only until the lock washers become flat. Do not over-tighten!
11. Proceed to Step 4, Reassemble Rotator Assembly

Step 4 - Reassemble Rotator

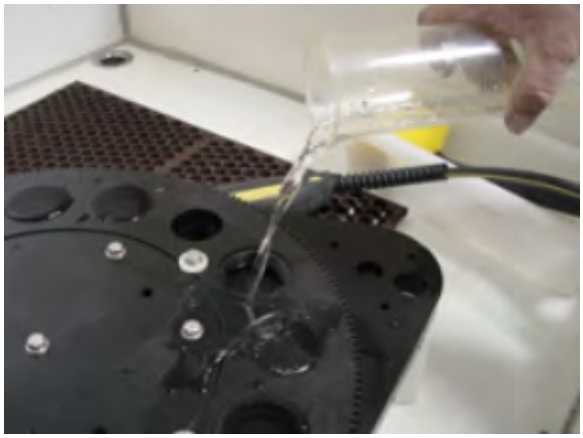
1. Rinse the top fixed plate and gear plate assembly with fresh water. Do not clean the plates with an abrasive cleaner. The surface of the top fixed plate must remain smooth to correctly seal.
2. Reattach the gear plate assembly to the top fixed plate by aligning the center holes and tightening the bolts (position the bolts in the threaded holes and tighten only until the lock washer is flat). Be careful not to lose or pinch any Variseals.
3. Manually rotate the gear plate assembly so that the unthreaded alignment hole matches up with the hole in the top fixed plate.

Step 5 - Perform Leak Test

After parts are replaced and the rotator is reassembled, a leak test should be performed to ensure that the rotator assembly is properly sealed.

Follow these steps to perform a leak test:

1. Confirm that the rotator assembly fill plug is in place before beginning the leak test.
2. Place the rotator assembly in a sink or wet area.
3. Pour clean water into each Gear Plate hole.



4. Let the rotator assembly sit for approximately one hour. A quickly leaking hole can indicate a reassembly problem, for example, a Variseal® that is installed with the thin lip facing incorrectly. If leakage occurs, separate the Top and Bottom Fixed Plates, recheck seals, reassemble the rotator assembly, and repeat the leak test.

Reinstall Components onto Frame

After the leak test confirms that the rotator assembly is sealed, the drive motor, rotator assembly and controller housing must be reattached to the frame.

Follow these steps to reinstall components onto the frame:

1. Lift or remove cone.
2. Place rotator assembly on the frame
3. Reinstall the cone.
4. Reattach the cone to the frame by lifting the cone up about ten (10) inches and placing the rotator assembly onto the resting brackets of the Sediment Trap frame. Lower the cone, making sure the cone is aligned with the cone adapter.
5. Secure the cone to the Sediment Trap frame with the twelve (12) sets of nuts and bolts. When attaching the cone, confirm that the plastic inserts are correctly placed in the holes on the frame (the plastic insert should go in from the bottom of the frame). The mounting holes in the cone are not spaced symmetrically. The cone lip and the frame were marked with black ink prior to shipment to help align the bolt holes during re-assembly.
6. Secure the four (4) sets of nuts and bolts to reattach the cross channel to the frame.
7. Carefully re-install the drive motor by reattaching the three (3) bolts that hold the drive motor to the rotator assembly top fixed plate.
8. Carefully reattach the controller housing to the cross channel by securing the two (2) u-bolts.
9. Plug in the drive motor.
10. See Tilt Sensor & End Cap Orientation.

Storage

Cover the top honeycomb baffle with clean plastic for storage.

The shipping crate is a reusable international freight container that is ISPM-15 compliant for international transport.

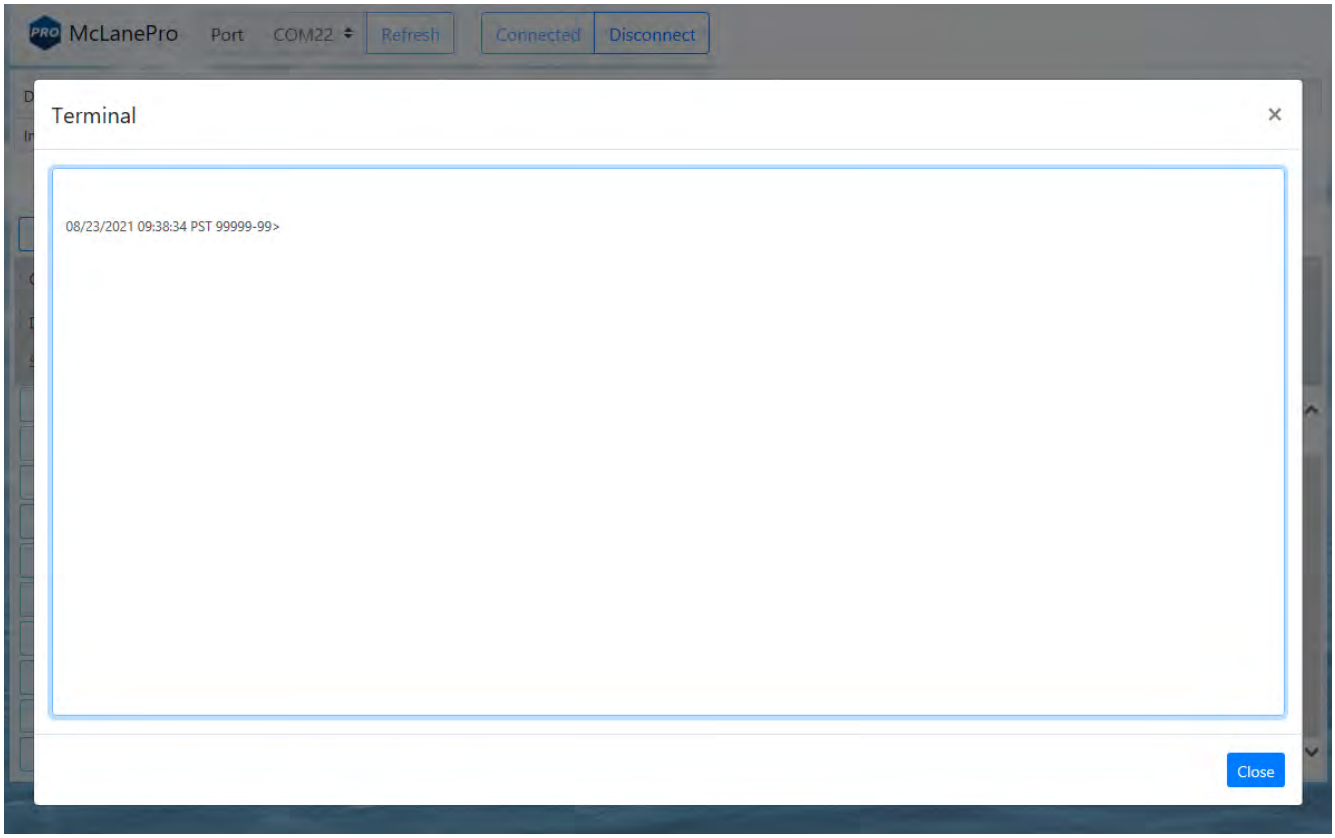
Adaptive Command Reference

For greater control over the Sediment Trap during a deployment, the user may utilize the command-line interface (CLI). The commands in this document will operate the Sediment Trap via a USB, RS-232, or RS-485 serial connection.

- Most users will control the device directly using a terminal emulator. The Sediment Trap may also be connected to other devices capable of communicating over USB, RS-232, or RS-485.
- RS-485 provides communication up to 4000 ft at a baud rate of 19200.
- If communicating over a USB connection, commands may be executed while in low-power sleep mode. USB power is adequate for basic communication and programming of the device, but is not appropriate for moving motors or performing other functions that require more power. To conserve battery power, put the Sediment Trap to sleep if connected via USB and scheduling, doing file operations, or reviewing offload data.
- RS-232 and RS-485 communication are not available while the Sediment Trap is in low-power sleep mode. While sleeping, any character received on these serial connections will wake the Sediment Trap up, and prompt the user with a wake confirmation.
- The Sediment Trap is designed to communicate with the McLanePro interface using JSON files. Streaming data may not contain the complete JSON syntax. They are printed for the user entering commands at a terminal. Using the polling command rotator ? or deployment ? is the suggested method for taking advantage of the JSON formatted output when interfacing with external applications.

Terminal Emulators

McLanePro includes a built-in terminal emulator that is accessed from the Admin tab (or Alt+T).



Also, the latest official version of TeraTerm is used in a few command examples.

Serial Connection Parameters

Serial Connection Details

RS-232

Speed (Baud Rate)	115200
Data	8 bit
Parity	none
Stop Bits	1
Flow Control	none

Suggested RS-232 Adapter:

FTDI US232R-10-BULK:

https://ftdichip.com/products/us232r-10-bulk/

RS-485

Speed (Baud Rate)	19200
Data	8 bit
Parity	none
Stop Bits	1
Flow Control	none

Suggested RS-485 Adapter:

Commfront USB-422-1:

https://www.commfront.com/products/usb-to-4-wire-rs422-rs485-adapter?variant=9208938115

USB

Speed (Baud Rate)	115200
Data	8 bit
Parity	none
Stop Bits	1
Flow Control	none

For USB, if the terminal emulator requires a baud rate, enter 115200. The actual communication speed will depend on the terminal emulator, but will typically be much faster than 115200.

Adaptive Deployments

Overview

An "Adaptive Deployment" is a Command Line Interface (CLI) driven deployment. The Sediment Trap is connected to an external computer or microcontroller (host) via RS-232 or RS-485. The host tells the Sediment Trap when to execute events using commands. This section outlines common commands used in adaptive deployment operations, and provides an example, using the CLI to complete an adaptive deployment.

Adaptive Deployment Backup Schedule

A "backup" deployment event schedule can be programmed using thedeployment_schedule backup_interval command. Deployment events will be executed according to this schedule if something goes wrong with the serial communication during the deployment, and the Sediment Trap cannot be commanded to execute events.

If a backup schedule event interval has been defined, a backup schedule is generated when the deployment begin adaptive command is received. If the backup interval is redefined during a deployment, the backup schedule will be recalculated.

The backup interval can be disable. Deployment events will only be executed when commanded.

Sensor Interval

The Sediment Trap records tilt, temperature, battery voltage, and external sensor data at a defined interval while sleeping between events. This interval is defined using the deployment schedule sensor_interval.

Viewing Adaptive Deployment Parameters

The deployment output parameters command is used to display the adaptive deployment parameters.

Starting and Executing an Adaptive Deployment

Once the backup schedule and sensor interval have been defined, the adaptive deployment can be started using the deployment begin adaptive command.

If a backup interval is defined, a backup schedule will be generated, and the deployment will begin. The Sediment Trap will go to sleep until the backup schedule time for the first event is reached, or until awoken if the backup schedule is disabled. During an adaptive deployment, a deployment event can be executed by waking the Sediment Trap up and sending a deployment next command. At the start of each event, the backup schedule times for subsequent events are rescheduled according to the event interval defined using the deployment schedule backup_interval command. This value may be changed in the middle of a deployment using the deployment_schedule backup_interval command.

Checking Deployment Progress

While the instrument is deployed, the progress may be checked a few different ways.

- McLanePro can be used to view and export deployment data using the Offload tab.
- deployment ? will display a deployment log.
- offload event_summary will output a summary of deployment event data. Sensor data may also be displayed using the data offload commands.

Ending and Resuming Adaptive Deployments

An active deployment may be stopped using the deployment end command. If the deployment contains remaining events, the deployment may be resumed using the deployment resume adaptive command.

Adaptive Deployment Example

Schedule a backup interval using the deployment schedule backup_interval command. Then use the deployment schedule sensor_interval command to define a 6 hour sensor interval.

```
10/06/2021 14:34:40 PST 15246-01>deployment schedule backup_interval 14 0 0 0
{ "Event Interval": { "Days": 14, "Hours": 0, "Minutes": 0, "Seconds": 0 } }
10/06/2021 14:34:42 PST 15246-01>deployment schedule sensor_interval 0 6 0 0
{ "Sensor Interval": { "Days": 0, "Hours": 6, "Minutes": 0, "Seconds": 0 } }
```

Some Sediment Traps have an optional pop-up buoy recovery release. The release can be triggered using the recovery_release_now command. A backup release schedule can also be enabled to ensure that the release will be activated on a programmed date/time if no command is received using the deployment_schedule_recovery_ release command.
Activate the recovery release device.

Syntax

recovery_release now

Note

- This command will align the rotator to the open port before activating the release.

- If the deployment has not yet completed, this command will end the deployment.

Examples

Activate the release while the rotator is aligned to the open port.

```
09/10/2021 16:49:14 PST 99999-99>recovery_release now
{ "MESSAGE": " Recovery release started" }
{ "MESSAGE": " Recovery release completed." }
{ "MESSAGE": "Deployment completed." }
```

Output the adaptive deployment parameters prior to starting the deployment.

```
10/06/2021 14:34:59 PST 15246-01>deployment output parameters
{
"Deployment Parameters":
{
"Event Interval": { "Days": 14, "Hours": 0, "Minutes": 0, "Seconds": 0 },
"Sensor Interval": { "Days": 0, "Hours": 6, "Minutes": 0, "Seconds": 0 },
"Recovery Release Backup Alarm": "10/10/2022 00:00:00",
}
}
```

Begin the adaptive deployment.The Sediment Trap will reply with several deployment-related messages. Immediately after starting the deployment there is a command processing period, during which the user can enter commands before the Sediment Trap goes to sleep. In this example, the deployment status (deployment ?), and the adaptive deployment parameters (deployment output parameters), that contain the backup deployment schedule are output now that the deployment has begun.

```
10/06/2021 14:35:14 PST 15246-01>deployment begin adaptive
{ "MESSAGE": "Please verify that the rotator is aligned to the open port before deploying." }
{ "MESSAGE": "Deployment preparation completed successfully." }
{ "MESSAGE": "Adaptive deployment backup schedule for event 01 is 10/20/2021 14:35:25." }
{ "MESSAGE": "20 second command processing period." }

10/06/2021 14:35:27 PST 15246-01>deployment output parameters

{
"Deployment Parameters":
{
"Event Interval": { "Days": 14, "Hours": 0, "Minutes": 0, "Seconds": 0 },
"Sensor Interval": { "Days": 0, "Hours": 6, "Minutes": 0, "Seconds": 0 },
"Recovery Release Backup Alarm": "10/10/2022 00:00:00",
"Next Event": 1,
"Backup Event Schedule":
[
{ "Event":  1, "Start Time": "10/20/2021 14:35:25" },
{ "Event":  2, "Start Time": "11/03/2021 14:35:25" },
{ "Event":  3, "Start Time": "11/17/2021 14:35:25" },
{ "Event":  4, "Start Time": "12/01/2021 14:35:25" },
{ "Event":  5, "Start Time": "12/15/2021 14:35:25" },
{ "Event":  6, "Start Time": "12/29/2021 14:35:25" },
{ "Event":  7, "Start Time": "01/12/2022 14:35:25" },
{ "Event":  8, "Start Time": "01/26/2022 14:35:25" },
{ "Event":  9, "Start Time": "02/09/2022 14:35:25" },
{ "Event": 10, "Start Time": "02/23/2022 14:35:25" },
{ "Event": 11, "Start Time": "03/09/2022 14:35:25" },
{ "Event": 12, "Start Time": "03/23/2022 14:35:25" },
```

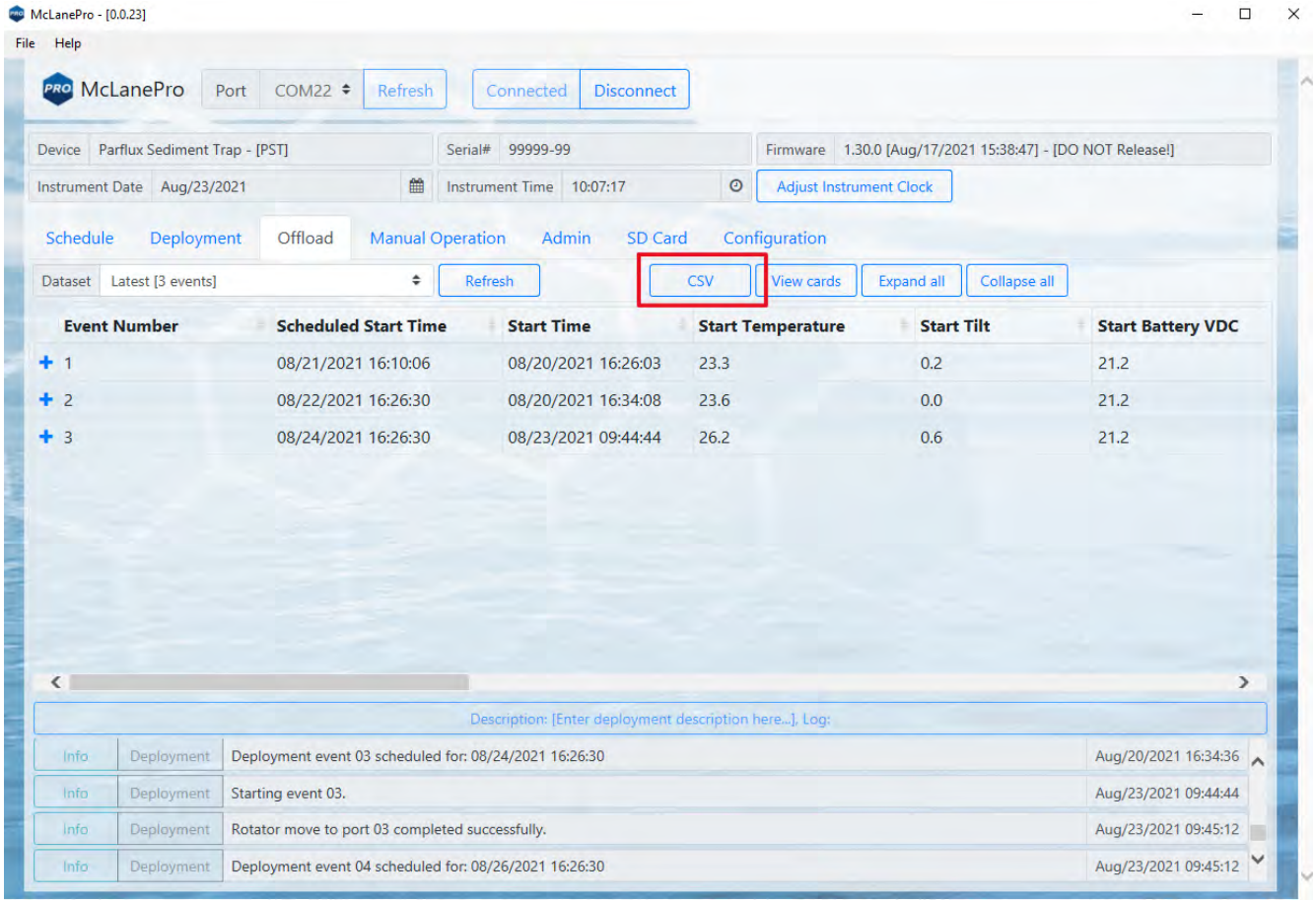
```
{ "Event": 13, "Start Time": "04/06/2022 14:35:25" },
{ "Event": 14, "Start Time": "04/20/2022 14:35:25" },
{ "Event": 15, "Start Time": "05/04/2022 14:35:25" },
{ "Event": 16, "Start Time": "05/18/2022 14:35:25" },
{ "Event": 17, "Start Time": "06/01/2022 14:35:25" },
{ "Event": 18, "Start Time": "06/15/2022 14:35:25" },
{ "Event": 19, "Start Time": "06/29/2022 14:35:25" },
{ "Event": 20, "Start Time": "07/13/2022 14:35:25" },
{ "Event": 21, "Start Time": "07/27/2022 14:35:25" },
{ "Event": 22, "Start Time": "08/10/2022 14:35:25" }
]
}
}

10/06/2021 14:35:34 PST 15246-01>deployment ?
{
"Deployment":
{
"Deployment Status": "Deployed",
"Number of events": 22,
"Event": 1,
"Start": "10/20/2021 14:35:25",
"Adaptive Deployment": "true",
"Deployment Log":
[
{ "Deployment Prep Message": "Please verify that the rotator is aligned to the open port
before deploying.", "Time": "10/06/2021 14:35:26" },
{ "Deployment Prep Message": "Deployment preparation completed successfully.", "Time":
"10/06/2021 14:35:26" },
{ "Deployment Message": "Adaptive deployment backup schedule for event 01 is 10/20/2021
14:35:25.", "Time": "10/06/2021 14:35:27" }
]
}
}

10/06/2021 14:35:36 PST 15246-01>
{ "MESSAGE": "Entering low-power sleep mode. Sleeping until deployment event 1 backup schedule
time 10/20/2021 14:35:25", "Time": "10/06/2021 14:35:47" }
```


Wake the Sediment Trap and execute the first event. After the event there is a command processing period. In this example, deployment status and the deployment parameters are requested during that period. Notice that the backup schedule was adjusted while executing the event, and that event 1 is no longer listed in the backup schedule, because it has already been executed.


```
10/06/2021 16:46:14 PST 15246-01>deployment next
{ "MESSAGE": "Starting event 01." }

10/06/2021 16:46:36 PST 15246-01>
{ "MESSAGE": "Rotator move to port 01 completed successfully." }
{ "MESSAGE": "Adaptive deployment backup schedule for event 02 is 10/20/2021 16:46:36." }
{ "MESSAGE": "10 second command processing period." }

10/06/2021 16:47:21 PST 15246-01>deployment ?
{
"Deployment":
{
```

```
"Deployment Status": "Deployed",
"Number of events": 22,
"Event": 2,
"Start": "10/20/2021 16:46:36",
"Adaptive Deployment": "true",
"Deployment Log":
[
{ "Deployment Prep Message": "Please verify that the rotator is aligned to the open port
before deploying.", "Time": "10/06/2021 16:45:36" },
{ "Deployment Prep Message": "Deployment preparation completed successfully.", "Time":
"10/06/2021 16:45:37" },
{ "Deployment Message": "Adaptive deployment backup schedule for event 01 is 10/20/2021
16:45:36.", "Time": "10/06/2021 16:45:37" },
{ "Deployment Message": "Starting event 01.", "Time": "10/06/2021 16:46:36" },
{ "Deployment Message": "Rotator move to port 01 completed successfully.", "Time": "10/06/2021
16:47:04" },
{ "Deployment Message": "Adaptive deployment backup schedule for event 02 is 10/20/2021
16:46:36.", "Time": "10/06/2021 16:47:04" }
]
}
}

10/06/2021 16:47:24 PST 15246-01>deployment output parameters

{
"Deployment Parameters":
{
"Event Interval": { "Days": 14, "Hours": 0, "Minutes": 0, "Seconds": 0 },
"Sensor Interval": { "Days": 0, "Hours": 6, "Minutes": 0, "Seconds": 0 },
"Recovery Release Backup Alarm": "10/10/2022 00:00:00",
"Next Event": 2,
"Backup Event Schedule":
[
{ "Event":  2, "Start Time": "10/20/2021 16:46:36" },
{ "Event":  3, "Start Time": "11/03/2021 16:46:36" },
{ "Event":  4, "Start Time": "11/17/2021 16:46:36" },
{ "Event":  5, "Start Time": "12/01/2021 16:46:36" },
{ "Event":  6, "Start Time": "12/15/2021 16:46:36" },
{ "Event":  7, "Start Time": "12/29/2021 16:46:36" },
{ "Event":  8, "Start Time": "01/12/2022 16:46:36" },
{ "Event":  9, "Start Time": "01/26/2022 16:46:36" },
{ "Event": 10, "Start Time": "02/09/2022 16:46:36" },
{ "Event": 11, "Start Time": "02/23/2022 16:46:36" },
{ "Event": 12, "Start Time": "03/09/2022 16:46:36" },
{ "Event": 13, "Start Time": "03/23/2022 16:46:36" },
{ "Event": 14, "Start Time": "04/06/2022 16:46:36" },
{ "Event": 15, "Start Time": "04/20/2022 16:46:36" },
{ "Event": 16, "Start Time": "05/04/2022 16:46:36" },
{ "Event": 17, "Start Time": "05/18/2022 16:46:36" },
{ "Event": 18, "Start Time": "06/01/2022 16:46:36" },
{ "Event": 19, "Start Time": "06/15/2022 16:46:36" },
{ "Event": 20, "Start Time": "06/29/2022 16:46:36" },
{ "Event": 21, "Start Time": "07/13/2022 16:46:36" },
{ "Event": 22, "Start Time": "07/27/2022 16:46:36" }
]
}
}

10/06/2021 16:47:29 PST 15246-01>
```

Deployment data may be checked during deployment by using the offload event_summary command, or by connecting to McLanePro and navigating to the Offload tab.



Data are exported from McLanePro by clicking the CSV button. A compressed folder of CSV files is downloaded that may be easily imported into other programs.

Commands

- System Commands - Commands that control low-power sleep mode and system peripherals like the SD card, onboard sensors, and real time clocks.
- Rotator Commands - Commands that control the trap bottle rotator.
- Deployment Commands - Commands used to program, schedule, and execute deployment functionality.
- Recovery Release Commands - If a Sediment Trap is configured with a recovery release device, users can control and configure it with these commands.
- Data Offload Commands - Commands used to view data collected during a deployment.
- SD Card and File Commands - Commands used to view data collected during a deployment.

System Commands

BATTERY
SLEEP
WAKE

TILT
VERSION
TEMPERATURE

BATTERY

Description

Displays the battery voltage.

Examples

```
08/19/2021 12:53:44 PST 99999-99>battery
{ "Battery Voltage": 21.2 }
```

SLEEP

Description

The Sediment Trap will enter low-power sleep mode to conserve battery power between events, or if commanded. Battery power is removed from the Sediment Trap while in low-power sleep mode. If USB is plugged in, USB power will supply the main processor. Commands that don't require significant power can be executed while sleeping and powered via USB. If a command that requires battery power is called, the Sediment Trap will wake from low-power sleep before it executes.

Notes

- If USB is connected when a Sediment Trap goes to sleep, the Sediment Trap removes the battery power from any circuitry that consumes a significant amount of power. While in this state, if the user is communicating over USB, the user can continue to interact with the Sediment Trap without using battery power.
- If the user is connected to the USB port a sleeping Sediment Trap can be woke using the wake command.
- If the user is connected to the RS-232 or RS-485 port, any character will wake the Sediment Trap, but must be followed by a CTRL-Z command to confirm the wake. If CTRL-Z is not received the Sediment Trap will return to sleep.

Syntax

sleep
Sleeps until woken up by the user.

sleep forever
Sleeps until woke up by the user.

sleep until [month] [day] [year] [hour] [minute] [second]
Sleeps until the specified time.

sleep for [day] [hour] [minute]
Sleeps for the specified length of time.

Examples

Sleep until woken up by user.

```
10/06/2021 12:40:32 PST 15246-01>sleep
{ "MESSAGE": "Entering low-power sleep mode. Sleeping until user interrupt.", "Time":
"10/06/2021 12:40:43" }


10/06/2021 12:40:57 PST 15246-01>sleep forever
{ "MESSAGE": "Entering low-power sleep mode. Sleeping until user interrupt.", "Time":
"10/06/2021 12:41:39" }
```

Sleep until a specified time.

```
10/06/2021 12:56:42 PST 15246-01>sleep until 10 7 2021 1 2 3
{ "MESSAGE": "Entering low-power sleep mode. Sleeping until 10/07/2021 01:02:03", "Time":
"10/06/2021 12:56:53" }
```

Sleep for a specified duration.

```
10/06/2021 13:01:39 PST 15246-01>sleep for 1 0 0 0
{ "MESSAGE": "Entering low-power sleep mode. Sleeping until 10/07/2021 13:01:47", "Time":
"10/06/2021 13:01:48" }
```

If connected and powered via USB during sleep.

```
10/06/2021 12:57:58 PST 15246-01>sleep
{ "MESSAGE": "Entering low-power sleep mode. Sleeping until user interrupt.", "Time":
"10/06/2021 12:58:00" }


10/06/2021 12:58:08 PST 15246-01 USB POWER MODE>wake

10/06/2021 12:58:12 PST 15246-01>
```

WAKE

Description

Wakes the Sediment Trap up from low power sleep mode.

Notes

- If the Sediment Trap is sleeping to conserve power and is connected via USB, the Sediment Trap remains responsive.
- If connected to a sleeping Sediment Trap via USB, use the wake command and wait **two seconds** for the Sediment Trap to be powered.
- If connected via RS-232, any incoming characters will wake the Sediment Trap up and prompt the user for a wake confirmation.

Example

Connected via USB.

```
10/06/2021 13:04:18 PST 15246-01 USB POWER MODE>sleep
{ "MESSAGE": "Entering low-power sleep mode. Sleeping until user interrupt.", "Time":
"10/06/2021 13:04:21" }

10/06/2021 13:04:28 PST 15246-01 USB POWER MODE>wake
```

```
10/06/2021 13:04:31 PST 15246-01>
```

Connected via RS-232 or RS-485.

```
10/06/2021 13:03:19 PST 15246-01>sleep
{ "MESSAGE": "Entering low-power sleep mode. Sleeping until user interupt.", "Time":
"10/06/2021 13:03:21" }

10/06/2021 13:03:28 PST 15246-01 USB POWER MODE>
{ "MESSAGE": "To wake up press Ctrl-Z." }

10/06/2021 13:03:31 PST 15246-01>
```

TILT

Description

For interacting with the tilt sensor.

Syntax

tilt

Outputs tilt data to serial port.

tilt zero

Define the current tilt value as zero.

tilt reset

Resets the zero tilt reference value.

tilt ?

Outputs tilt details.

Notes

To set the zero-point of the tilt sensor, insert the electronics into the housing. Get the chassis parallel with the floor or another position to be registered as 0 degrees of tilt, enter the the "tilt zero" command.

Examples

Read tilt.

```
08/19/2021 13:24:59 PST 99999-99>tilt

{ "Tilt":   0.0 }

08/19/2021 13:25:01 PST 99999-99>
```

Set the tilt zero reference, and read the tilt to verify it worked.

```
08/18/2021 15:41:36 PST 99999-99>tilt zero

08/18/2021 15:41:40 PST 99999-99>tilt
{ "Tilt":   0.1 }
```

Clear the zero reference and verify it worked.

```
08/18/2021 15:41:42 PST 99999-99>tilt reset

08/18/2021 15:41:51 PST 99999-99>tilt
{ "Tilt":   4.3 }

08/18/2021 15:41:54 PST 99999-99>
```

Tilt details

```
08/19/2021 13:36:04 PST 99999-99>tilt reset

08/19/2021 13:36:15 PST 99999-99>tilt ?
{ "Raw Tilt": 0.782, "Tilt Offset": 0.000, "Tilt": 0.8 }

08/19/2021 13:36:18 PST 99999-99>tilt zero

08/19/2021 13:36:33 PST 99999-99>tilt ?

{ "Raw Tilt": 0.941, "Tilt Offset": 0.842, "Tilt": 0.1 }

08/19/2021 13:36:37 PST 99999-99>tilt

{ "Tilt":   0.1 }

08/19/2021 13:36:41 PST 99999-99>
```

VERSION

Description

Outputs the current Supervisor and T36 firmware versions.

Examples

```
08/18/2021 12:16:56 PST 99999-99>version
{ "T36 Version": "1.01.00", "Supervisor Version": "1.0.4" }
```

TEMPERATURE

Description

Outputs the onboard temperature sensor value.

Notes

The onboard temperature sensor is located on the electronics inside the pressure housing and will be impacted by using peripherals like motor controllers, or solenoid valve circuitry. The reading is used as a system diagnostic data point, but if a Sediment Trap hasn't recently executed operations that might heat up the sensor, it may be used to measure ambient temperature inside of the electronics housing.

Examples

```
08/19/2021 13:39:52 PST 99999-99>temperature

{ "Temperature":  26.8 }
```

```
08/19/2021 13:39:57 PST 99999-99>
```

Time Commands

SET_TIME
GET_TIME

SET_TIME

Description

Sets the T36 and external RTC time

Syntax

set_time [month] [day] [year] [hour] [minute] [second]

Examples

```
11/17/2020 14:52:15 MCLANE>set_time 11 18 2020 14 55 55

{
  "Time": {
    "System": "11/18/2020 14:55:55",
    "External RTC": "11/18/2020 14:55:55"
  }
}
```

GET_TIME

Description

Command for querying the various system real time clock (RTC) times

Notes

- The Sediment Trap has two RTCs
- Internal - The main processor RTC
- External - A more accurate external RTC shared by the main processor and the supervisor processor

Syntax

Arguments are optional and may be provided in any order.

get_time
Prints the internal RTC time to the serial port.

get_time x
Prints the internal and external RTC time to the serial port.

get_time s
Prints the internal RTC and supervisor time to the serial port.

get_time x s
Prints the internal RTC, external RTC, and the supervisor time.

Examples

```
11/17/2020 14:45:57 MCLANE>get_time
{
  "Time": {
    "System": "11/17/2020 14:46:48"
  }
}

11/17/2020 14:46:48 MCLANE>get_time x

{
  "Time": {
    "System": "11/17/2020 14:46:55",
    "External RTC": "11/17/2020 14:46:55"
  }
}

11/17/2020 14:46:55 MCLANE>get_time x s

{
  "Time": {
    "System": "11/17/2020 14:47:03",
    "Supervisor": "11/17/2020 14:47:04",
    "External RTC": "11/17/2020 14:47:04"
  }
}

11/17/2020 14:47:04 MCLANE>
```

Rotator Commands

ROTATOR ?
ROTATOR NEXT / PREVIOUS
ROTATOR PORT

ROTATOR ?

Description

Returns the last state of the rotator feedback while moving, or while stationary.

Notes

This returns a lot of data, most of which will mean nothing to most users, but are very helpful while troubleshooting sediment traps.

Syntax

rotator ?

Example

```
08/18/2021 10:52:59 PST 99999-99>rotator ?

{"Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 33, "Port": 1.203812 , "Last
Known Port": 1, "Total Steps":    203812, "Direction": 1, "Window": 29397, "Wall": 174046,
"Switch": 0, "Abs Position": 174046, "VDC":  20.8, "Motor mA": 111.7, "Time": "08/18/2021
10:53:24"}
```

Response

Status

A description of the state of the current rotator operation.

Progress

The progress (%) of the current rotator operation. If moving multiple ports this will reset to zero each time the rotator reaches a new port location.

Port

This displays the currently aligned rotator port if the rotator is stationary. If the rotator is in the middle of a move, it will display the last known port position, a decimal point, and then the number of steps that it has moved from the last known location.

Last Known Port

The last port the rotator was aligned to.

Total Steps

The total amount of steps taken between ports

Direction

The direction the motor is moving.

Window

Steps measured while the rotator cam switch indicates the rotator is aligned to a port.

Wall

Steps measured while the rotator cam switch indicates the rotator is not aligned to a port.

Switch

Rotator cam switch signal. Used for troubleshooting.

VDC

Battery voltage.

Motor mA

Rotator motor current.

Time

Time the data were collected.

ROTATOR NEXT / PREVIOUS

Description

Moves the rotator forward or backward one position, even without a set zero position.

Notes

In both polled and streaming modes, rotator diagnostic data are written to "/logs/rotator_log.json". While a Sediment Trap is deployed, rotator data are logged to "/deployment_data/event_[event number].json", not the rotator log.

Polled Mode

The "p" argument sets the silent "polled" mode. While in polled mode there is no streaming output. The user can check the status of the move using the rotator ? command.

Syntax

rotator next
Moves the rotator counter-clockwise to the next port.

rotator next p
Moves the rotator counter-clockwise to the next port in "polled mode"

rotator previous
Moves the rotator clockwise to the previous port.

rotator previous p
Moves the rotator clockwise to the previous port in polled mode.

Examples:

Move to the next port and stream diagnostic data.


```
08/12/2021 09:53:14 PST 99999-99>rotator next
  {
  "Rotator Operation":
  {
  "Diagnostic Data":
  [
  { "Status": ["Moving", "Finding end of current port"], "Progress": 0, "Port": 0.0      ,
"VDC":  21.2},
  { "Status": ["Moving", "Finding end of current port", "Not-aligned"], "Progress": 3, "Port":
0.18829  , "VDC":  21.4},
  { "Status": ["Moving", "Not-aligned"], "Progress": 4, "Port": 0.29032  , "VDC":  21.2},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 4, "Port": 0.29032  ,
"VDC":  21.2},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 7, "Port": 0.47899  ,
"VDC":  21.0},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 11, "Port": 0.66985  ,
"VDC":  20.9},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 14, "Port": 0.86074  ,
"VDC":  20.9},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 17, "Port": 0.105166 ,
"VDC":  21.1},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 20, "Port": 0.124257 ,
"VDC":  21.2},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 23, "Port": 0.143344 ,
"VDC":  21.2},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 26, "Port": 0.162432 ,
"VDC":  21.4},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 30, "Port": 0.181520 ,
"VDC":  21.2},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 33, "Port": 0.200605 ,
"VDC":  21.2},
```

```
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 36, "Port": 0.219693 ,
"VDC":  20.7},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 39, "Port": 0.238774 ,
"VDC":  20.7},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 42, "Port": 0.257853 ,
"VDC":  20.9},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 45, "Port": 0.276938 ,
"VDC":  21.0},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 49, "Port": 0.296021 ,
"VDC":  21.2},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 52, "Port": 0.315104 ,
"VDC":  21.2},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 55, "Port": 0.334180 ,
"VDC":  21.2},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 58, "Port": 0.353261 ,
"VDC":  21.2},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 61, "Port": 0.372339 ,
"VDC":  21.1},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 64, "Port": 0.391421 ,
"VDC":  21.3},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 67, "Port": 0.410508 ,
"VDC":  21.4},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 71, "Port": 0.429593 ,
"VDC":  21.0},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 74, "Port": 0.448678 ,
"VDC":  21.0},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 77, "Port": 0.467763 ,
"VDC":  20.8},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 80, "Port": 0.486847 ,
"VDC":  20.8},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 83, "Port": 0.505929 ,
"VDC":  21.1},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 86, "Port": 0.525011 ,
"VDC":  21.2},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 90, "Port": 0.544096 ,
"VDC":  21.2},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 93, "Port": 0.563181 ,
"VDC":  21.2},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 96, "Port": 0.582266 ,
"VDC":  21.3},
  { "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 99, "Port": 0.601353 ,
"VDC":  21.3},
  { "Status": ["Moving", "Not-aligned"], "Progress": 100, "Port": 0.616051 , "VDC":  21.2},
  { "Status": ["Stationary", "Aligned"], "Progress": 100, "Port": 1, "VDC":  21.2},
  ],
  "Rotator Operation Summary":
  {
  "Starting VDC": 21.2,
  "Lowest VDC": 20.7,
  "End Time": "08/12/2021 09:53:42",
  "Status Flags": ["Stationary", "Aligned"]
  }
  }
  }
  08/12/2021 09:53:42 PST 99999-99>
```


Move to the next port in the silent "polled" mode. Check on the progress using the [rotator ?](#) command.

```
08/20/2021 14:20:52 PST 99999-99>rotator next p

08/20/2021 14:20:58 PST 99999-99>rotator ?
{"Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 13, "Port": 3.81950  , "Last
Known Port": 3, "Total Steps":     81950, "Direction": 1, "Window": 27828, "Wall": 53624,
"Switch": 0, "Abs Position": 53624, "VDC":  20.9, "Motor mA": 116.5, "Time": "08/20/2021
14:21:02"}

08/20/2021 14:21:02 PST 99999-99>rotator ?
{"Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 23, "Port": 3.141656 , "Last
Known Port": 3, "Total Steps":    141656, "Direction": 1, "Window": 27828, "Wall": 113330,
"Switch": 0, "Abs Position": 113330, "VDC":  21.2, "Motor mA": 119.7, "Time": "08/20/2021
14:21:04"}

08/20/2021 14:21:04 PST 99999-99>rotator ?
{"Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 33, "Port": 3.199919 , "Last
Known Port": 3, "Total Steps":    199919, "Direction": 1, "Window": 27828, "Wall": 171593,
"Switch": 0, "Abs Position": 171593, "VDC":  21.2, "Motor mA": 125.5, "Time": "08/20/2021
14:21:07"}

08/20/2021 14:21:07 PST 99999-99>rotator ?
{"Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 64, "Port": 3.388341 , "Last
Known Port": 3, "Total Steps":    388341, "Direction": 1, "Window": 27828, "Wall": 360015,
"Switch": 0, "Abs Position": 360015, "VDC":  21.2, "Motor mA": 128.1, "Time": "08/20/2021
14:21:14"}

08/20/2021 14:21:14 PST 99999-99>rotator ?
{"Status": ["Stationary", "Aligned"], "Progress": 100, "Port": 4, "Last Known Port": 4, "Total
Steps":    616419, "Direction": 1, "Window": 27828, "Wall": 588093, "Switch": 0, "Abs
Position": 588093, "VDC":  21.2, "Motor mA": 104.9, "Time": "08/20/2021 14:23:27"}

08/20/2021 14:23:27 PST 99999-99>
```

ROTATOR PORT

Description

Move to, or assign the specified rotator port position.

Syntax

rotator port [port number]
Move to a specified port position on the rotator.

rotator port [port number] p
Move to a specified port position on the rotator in the silent "polled" mode.

rotator port = [port number]
If a rotator position has been lost, the position may be reassigned using the " = " argument.

Examples

Assign a rotator position if the Sediment Trap has lost track of its port alignment.

```
08/18/2021 10:46:59 PST 99999-99>rotator port = 3

{"Status": ["Stationary", "Aligned"], "Progress": 100, "Port": 3, "Last Known Port": 3, "Total
Steps":         0, "Direction": 0, "Window": -99, "Wall": -99, "Switch": 0, "Abs Position": 0,
"VDC":  21.4, "Motor mA": 124.4, "Time": "08/18/2021 10:49:23"}
```

Move from port 3 to the open port of the rotator (port 0).

```
08/18/2021 10:49:23 PST 99999-99>rotator port 0
{
"Rotator Operation":
{
"Diagnostic Data":
[
{ "Status": ["Moving", "Finding end of current port"], "Progress": 0, "Port": 3.0      ,
"VDC":  21.3},
{ "Status": ["Moving", "Finding end of current port", "Not-aligned"], "Progress": 3, "Port":
3.18816  , "VDC":  21.4},
{ "Status": ["Moving", "Not-aligned"], "Progress": 4, "Port": 3.28096  , "VDC":  20.9},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 4, "Port": 3.28096  ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 7, "Port": 3.46957  ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 10, "Port": 3.66028  ,
"VDC":  21.1},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 14, "Port": 3.85101  ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 17, "Port": 3.104184 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 20, "Port": 3.123264 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 23, "Port": 3.142349 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 26, "Port": 3.161428 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 29, "Port": 3.180513 ,
"VDC":  21.1},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 33, "Port": 3.199598 ,
"VDC":  20.7},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 36, "Port": 3.218686 ,
"VDC":  20.8},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 39, "Port": 3.237773 ,
"VDC":  21.1},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 42, "Port": 3.256853 ,
"VDC":  21.1},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 45, "Port": 3.277534 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 49, "Port": 3.296617 ,
"VDC":  20.7},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 52, "Port": 3.315696 ,
"VDC":  20.7},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 55, "Port": 3.334775 ,
"VDC":  20.8},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 58, "Port": 3.353836 ,
"VDC":  20.8},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 61, "Port": 3.372919 ,
"VDC":  20.8},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 64, "Port": 3.391999 ,
"VDC":  20.8},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 68, "Port": 3.411082 ,
"VDC":  21.1},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 71, "Port": 3.430161 ,
```

```
"VDC":  21.1},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 74, "Port": 3.449247 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 77, "Port": 3.468330 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 80, "Port": 3.487410 ,
"VDC":  21.1},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 83, "Port": 3.506483 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 86, "Port": 3.525555 ,
"VDC":  21.1},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 90, "Port": 3.544633 ,
"VDC":  21.3},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 93, "Port": 3.563713 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 96, "Port": 3.582797 ,
"VDC":  21.3},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 99, "Port": 3.601878 ,
"VDC":  21.3},
{ "Status": ["Moving", "Not-aligned"], "Progress": 101, "Port": 3.613631 , "VDC":  21.2},
{ "Status": ["Stationary", "Aligned"], "Progress": 100, "Port": 2, "VDC":  21.2},
],
"Rotator Operation Summary":
{
"Starting VDC": 21.2,
"Lowest VDC": 20.7,
"End Time": "08/18/2021 10:50:15",
"Status Flags": ["Stationary", "Aligned"]
}
}
}
{
"Rotator Operation":
{
"Diagnostic Data":
[
{ "Status": ["Moving", "Finding end of current port"], "Progress": 0, "Port": 2.0      ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding end of current port", "Not-aligned"], "Progress": 3, "Port":
2.18836  , "VDC":  21.2},
{ "Status": ["Moving", "Not-aligned"], "Progress": 4, "Port": 2.25905  , "VDC":  20.9},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 4, "Port": 2.25905  ,
"VDC":  21.3},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 7, "Port": 2.44764  ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 10, "Port": 2.63846  ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 13, "Port": 2.82929  ,
"VDC":  21.1},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 16, "Port": 2.102007 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 20, "Port": 2.121080 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 23, "Port": 2.140151 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 26, "Port": 2.159226 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 29, "Port": 2.178308 ,
"VDC":  21.4},
```

```
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 32, "Port": 2.197387 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 35, "Port": 2.216465 ,
"VDC":  21.3},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 38, "Port": 2.235538 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 42, "Port": 2.254615 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 45, "Port": 2.273691 ,
"VDC":  21.3},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 48, "Port": 2.292766 ,
"VDC":  20.9},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 51, "Port": 2.311839 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 54, "Port": 2.330918 ,
"VDC":  20.7},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 57, "Port": 2.349994 ,
"VDC":  20.9},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 61, "Port": 2.369073 ,
"VDC":  20.7},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 64, "Port": 2.388152 ,
"VDC":  20.7},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 67, "Port": 2.407228 ,
"VDC":  20.9},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 70, "Port": 2.426307 ,
"VDC":  20.9},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 73, "Port": 2.445383 ,
"VDC":  21.1},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 76, "Port": 2.464461 ,
"VDC":  21.0},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 80, "Port": 2.483541 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 83, "Port": 2.502615 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 86, "Port": 2.521689 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 89, "Port": 2.540761 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 92, "Port": 2.559838 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 95, "Port": 2.578916 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 98, "Port": 2.597985 ,
"VDC":  21.2},
{ "Status": ["Moving", "Not-aligned"], "Progress": 101, "Port": 2.613218 , "VDC":  21.2},
{ "Status": ["Stationary", "Aligned"], "Progress": 100, "Port": 1, "VDC":  21.2},
],
"Rotator Operation Summary":
{
"Starting VDC": 21.2,
"Lowest VDC": 20.7,
"End Time": "08/18/2021 10:50:40",
"Status Flags": ["Stationary", "Aligned"]
}
}
}
{
"Rotator Operation":
{
```

```
"Diagnostic Data":
[
{ "Status": ["Moving", "Finding end of current port"], "Progress": 0, "Port": 1.0      ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding end of current port", "Not-aligned"], "Progress": 3, "Port":
1.18835  , "VDC":  21.2},
{ "Status": ["Moving", "Not-aligned"], "Progress": 5, "Port": 1.30241  , "VDC":  21.3},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 5, "Port": 1.30241  ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 8, "Port": 1.49088  ,
"VDC":  20.9},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 11, "Port": 1.68164  ,
"VDC":  20.9},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 14, "Port": 1.87239  ,
"VDC":  21.1},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 17, "Port": 1.106315 ,
"VDC":  21.0},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 20, "Port": 1.125396 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 23, "Port": 1.144479 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 27, "Port": 1.163562 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 30, "Port": 1.182648 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 33, "Port": 1.201729 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 36, "Port": 1.220817 ,
"VDC":  21.3},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 39, "Port": 1.239899 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 42, "Port": 1.258980 ,
"VDC":  20.8},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 46, "Port": 1.278064 ,
"VDC":  20.8},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 49, "Port": 1.297150 ,
"VDC":  20.9},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 52, "Port": 1.316234 ,
"VDC":  21.0},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 55, "Port": 1.335318 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 58, "Port": 1.354401 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 61, "Port": 1.373485 ,
"VDC":  21.2},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 64, "Port": 1.392570 ,
"VDC":  21.3},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 68, "Port": 1.411647 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 71, "Port": 1.430724 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 74, "Port": 1.449797 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 77, "Port": 1.468873 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 80, "Port": 1.487949 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 83, "Port": 1.507028 ,
"VDC":  21.2},
```

```
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 87, "Port": 1.526097 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 90, "Port": 1.545166 ,
"VDC":  21.3},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 93, "Port": 1.564233 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 96, "Port": 1.583297 ,
"VDC":  21.4},
{ "Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 99, "Port": 1.602370 ,
"VDC":  21.4},
{ "Status": ["Moving", "Not-aligned"], "Progress": 102, "Port": 1.616999 , "VDC":  21.2},
{ "Status": ["Stationary", "Aligned"], "Progress": 100, "Port": 0, "VDC":  21.2},
],
"Rotator Operation Summary":
{
"Starting VDC": 21.2,
"Lowest VDC": 20.7,
"End Time": "08/18/2021 10:51:06",
"Status Flags": ["Stationary", "Aligned"]
}
}
}
```


Move to port 2 from port 0 using the silent "polled mode," and query the rotator status using the rotator ? command until the operation is completed.

```
08/18/2021 10:51:06 PST 99999-99>rotator port 2 p

08/18/2021 10:52:51 PST 99999-99>rotator ?
{"Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 13, "Port": 0.82141  , "Last
Known Port": 0, "Total Steps":     82141, "Direction": 1, "Window": 4691, "Wall": 77413,
"Switch": 0, "Abs Position": 77413, "VDC":  21.2, "Motor mA": 118.1, "Time": "08/18/2021
10:52:55"}

08/18/2021 10:52:55 PST 99999-99>rotator ?
{"Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 27, "Port": 0.166570 , "Last
Known Port": 0, "Total Steps":    166570, "Direction": 1, "Window": 4691, "Wall": 161842,
"Switch": 0, "Abs Position": 161842, "VDC":  20.9, "Motor mA": 118.1, "Time": "08/18/2021
10:52:59"}

08/18/2021 10:52:59 PST 99999-99>rotator ?
{"Status": ["Moving", "Finding port", "Not-aligned"], "Progress": 33, "Port": 1.203812 , "Last
Known Port": 1, "Total Steps":    203812, "Direction": 1, "Window": 29397, "Wall": 174046,
"Switch": 0, "Abs Position": 174046, "VDC":  20.8, "Motor mA": 111.7, "Time": "08/18/2021
10:53:24"}

08/18/2021 10:53:24 PST 99999-99>rotator ?
{"Status": ["Stationary", "Aligned"], "Progress": 100, "Port": 2, "Last Known Port": 2, "Total
Steps":    616821, "Direction": 1, "Window": 29397, "Wall": 587055, "Switch": 0, "Abs
Position": 587055, "VDC":  21.2, "Motor mA": 133.4, "Time": "08/18/2021 10:53:53"}

08/18/2021 10:53:53 PST 99999-99>
```

Deployment Commands

DEPLOYMENT SCHEDULE SENSOR_INTERVAL
DEPLOYMENT SCHEDULE BACKUP_INTERVAL
DEPLOYMENT SCHEDULE EVENT
DEPLOYMENT SCHEDULE RECOVERY RELEASE

DEPLOYMENT OUTPUT PARAMETERS
DEPLOYMENT BEGIN ADAPTIVE
DEPLOYMENT NEXT
DEPLOYMENT ?
DEPLOYMENT END
DEPLOYMENT RESUME ADAPTIVE
DEPLOYMENT LOG_SENSORS

DEPLOYMENT SCHEDULE SENSOR_INTERVAL

Description

Define a new sensor interval for a deployment.

Notes

While deployed, a Sediment Trap will wake up at the programmed sensor data interval in order to record temperature, battery voltage, internal temperature, and any external sensor data (if equipped). This command allows programming of this interval. Recording these data interrupts low-power sleep mode and will consume power. For battery-powered deployments, a sensor interval greater than 30 minutes is recommended. Less frequent sensor logging will result in longer battery life while deployed.

Syntax

deployment schedule sensor_interval [interval day] [interval hour] [interval minute] [interval second]

Examples

```
08/16/2021 13:41:38 PST 99999-99>deployment schedule sensor_interval 1 0 0 0

{ "Sensor Interval": { "Days": 1, "Hours": 0, "Minutes": 0, "Seconds": 0 } }

08/16/2021 13:42:08 PST 99999-99>
```

DEPLOYMENT SCHEDULE BACKUP_INTERVAL

Description

Define a backup event interval for an adaptive deployment.

Notes

- In adaptive deployments the user executes events with the deployment next command. The backup interval value is used as a safeguard against losing serial communication during the deployment.
- If a backup interval is defined and an adaptive deployment is started, a backup schedule is generated using the backup interval between each event.
- Every time an event is executed, the backup schedule is recalculated for all subsequent events.
- If the backup interval is redefined during a deployment, the backup schedule is recalculated.

- The backup event interval can be disabled using the disable argument. No backup schedule will be generated. If disabled during a deployment, the backup schedule for all subsequent events will be disabled.

Syntax

deployment schedule backup_interval [interval day] [interval hour] [interval minute] [interval second]

deployment schedule backup_interval disable

Examples

```
08/16/2021 13:42:08 PST 99999-99>deployment schedule backup_interval 14 0 0 0

{ "Event Interval": { "Days": 14, "Hours": 0, "Minutes": 0, "Seconds": 0 } }

08/16/2021 13:43:40 PST 99999-99>
```

DEPLOYMENT SCHEDULE EVENT

Description

Manually schedule an event start time from the command-line interface.

Syntax

deployment schedule event [event number] [month] [day] [year] [hour] [minute] [second]

Note

This can be done in the middle of a deployment.

Examples

```
08/16/2021 13:54:07 PST 99999-99>deployment schedule event 3 8 16 2021 13 58 0
{
"Event Parameters": {
"Event Number": {
"Data Type": "RO_SHORT",
"Value": 3
},
"Start Time": {
"Month": 8,
"Day": 16,
"Year": 2021,
"Hour": 13,
"Minute": 58,
"Second": 0
}
}
}
```

DEPLOYMENT SCHEDULE RECOVERY_RELEASE

Description

Define a date and time for the recovery release to be activated.

Syntax

deployment schedule recovery_release [month] [day] [year] [hour] [minute] [second]
deployment schedule recovery_release disable

Notes

In an adaptive deployment the recovery release mechanism will typically be activated using the recovery release now command. The deployment schedule recovery_release command is used as a safeguard if serial communication is lost during the deployment, prohibiting interactive activation of the recovery release. If the specified time is reached, the deployment will be ended, and the recovery release will be activated.

Examples

Schedule a time for the recovery release to be activated.

```
09/10/2021 17:45:51 PST 99999-99>deployment schedule recovery_release 10 10 2022 0 0 0

{"Recovery Release Backup Alarm": "10/10/2022 00:00:00"}
```

Disable the backup schedule for the recovery release. The release will only be activated when commanded.

```
09/10/2021 17:40:50 PST 99999-99>deployment schedule recovery_release disable

{"Recovery Release Backup Alarm": "Disabled"}
```

DEPLOYMENT OUTPUT PARAMETERS

Description

Outputs deployment parameters to the serial port.

Syntax

deployment output parameters

Examples

Schedule a deployment then output the parameters to the serial port.

```
09/16/2021 09:23:01 PST 99999-99>deployment output parameters

{
"Deployment Parameters":
{
"Event Interval": { "Days": 0, "Hours": 1, "Minutes": 0, "Seconds": 0 },
"Sensor Interval": { "Days": 0, "Hours": 0, "Minutes": 30, "Seconds": 0 },
"Recovery Release Backup Alarm": "10/10/2022 00:00:00",
"Next Event": 6,
"Backup Event Schedule":
[
{ "Event":  6, "Start Time": "09/16/2021 10:23:00" },
{ "Event":  7, "Start Time": "09/16/2021 11:23:00" },
{ "Event":  8, "Start Time": "09/16/2021 12:23:00" },
{ "Event":  9, "Start Time": "09/16/2021 13:23:00" },
{ "Event": 10, "Start Time": "09/16/2021 14:23:00" },
```

```
{ "Event": 11, "Start Time": "09/16/2021 15:23:00" },
{ "Event": 12, "Start Time": "09/16/2021 16:23:00" },
{ "Event": 13, "Start Time": "09/16/2021 17:23:00" },
{ "Event": 14, "Start Time": "09/16/2021 18:23:00" },
{ "Event": 15, "Start Time": "09/16/2021 19:23:00" },
{ "Event": 16, "Start Time": "09/16/2021 20:23:00" },
{ "Event": 17, "Start Time": "09/16/2021 21:23:00" },
{ "Event": 18, "Start Time": "09/16/2021 22:23:00" },
{ "Event": 19, "Start Time": "09/16/2021 23:23:00" },
{ "Event": 20, "Start Time": "09/17/2021 00:23:00" },
{ "Event": 21, "Start Time": "09/17/2021 01:23:00" },
{ "Event": 22, "Start Time": "09/17/2021 02:23:00" }
]
}
}
```


DEPLOYMENT BEGIN ADAPTIVE

Description

The "deployment begin adaptive" command will make sure a Sediment Trap is ready for a deployment, check for scheduling conflicts, and begin an adaptive command-line driven deployment.

Notes

There is a brief command processing period after a deployment is started that allows users to get a few last commands entered before the Sediment Trap goes to sleep.

Syntax

deployment begin adaptive

Examples

In the following example:

1. A deployment event backup interval is defined.
2. A sensor interval is defined.
3. A recovery release alarm is defined.
4. Deployment parameters are checked.
5. A deployment is started.
6. Deployment parameters and the backup schedule are checked during the command processing period after the deployment has started.

```
10/06/2021 14:34:40 PST 15246-01>deployment schedule backup_interval 14 0 0 0

{ "Event Interval": { "Days": 14, "Hours": 0, "Minutes": 0, "Seconds": 0 } }

10/06/2021 14:34:42 PST 15246-01>deployment schedule sensor_interval 0 6 0 0

{ "Sensor Interval": { "Days": 0, "Hours": 6, "Minutes": 0, "Seconds": 0 } }

10/06/2021 14:34:50 PST 15246-01>deployment schedule recovery_release 10 10 2022 0 0 0

{"Recovery Release Backup Alarm": "10/10/2022 00:00:00"}
```

```
10/06/2021 14:34:59 PST 15246-01>deployment output parameters

{
"Deployment Parameters":
{
"Event Interval": { "Days": 14, "Hours": 0, "Minutes": 0, "Seconds": 0 },
"Sensor Interval": { "Days": 0, "Hours": 6, "Minutes": 0, "Seconds": 0 },
"Recovery Release Backup Alarm": "10/10/2022 00:00:00",
}
}

10/06/2021 14:35:14 PST 15246-01>deployment begin adaptive
{ "MESSAGE": "Please verify that the rotator is aligned to the open port before deploying." }
{ "MESSAGE": "Deployment preparation completed successfully." }
{ "MESSAGE": "Adaptive deployment backup schedule for event 01 is 10/20/2021 14:35:25." }
{ "MESSAGE": "20 second command processing period." }

10/06/2021 14:35:27 PST 15246-01>deployment output parameters

{
"Deployment Parameters":
{
"Event Interval": { "Days": 14, "Hours": 0, "Minutes": 0, "Seconds": 0 },
"Sensor Interval": { "Days": 0, "Hours": 6, "Minutes": 0, "Seconds": 0 },
"Recovery Release Backup Alarm": "10/10/2022 00:00:00",
"Next Event": 1,
"Backup Event Schedule":
[
{ "Event":  1, "Start Time": "10/20/2021 14:35:25" },
{ "Event":  2, "Start Time": "11/03/2021 14:35:25" },
{ "Event":  3, "Start Time": "11/17/2021 14:35:25" },
{ "Event":  4, "Start Time": "12/01/2021 14:35:25" },
{ "Event":  5, "Start Time": "12/15/2021 14:35:25" },
{ "Event":  6, "Start Time": "12/29/2021 14:35:25" },
{ "Event":  7, "Start Time": "01/12/2022 14:35:25" },
{ "Event":  8, "Start Time": "01/26/2022 14:35:25" },
{ "Event":  9, "Start Time": "02/09/2022 14:35:25" },
{ "Event": 10, "Start Time": "02/23/2022 14:35:25" },
{ "Event": 11, "Start Time": "03/09/2022 14:35:25" },
{ "Event": 12, "Start Time": "03/23/2022 14:35:25" },
{ "Event": 13, "Start Time": "04/06/2022 14:35:25" },
{ "Event": 14, "Start Time": "04/20/2022 14:35:25" },
{ "Event": 15, "Start Time": "05/04/2022 14:35:25" },
{ "Event": 16, "Start Time": "05/18/2022 14:35:25" },
{ "Event": 17, "Start Time": "06/01/2022 14:35:25" },
{ "Event": 18, "Start Time": "06/15/2022 14:35:25" },
{ "Event": 19, "Start Time": "06/29/2022 14:35:25" },
{ "Event": 20, "Start Time": "07/13/2022 14:35:25" },
{ "Event": 21, "Start Time": "07/27/2022 14:35:25" },
{ "Event": 22, "Start Time": "08/10/2022 14:35:25" }
]
}
}

10/06/2021 14:35:34 PST 15246-01>deployment ?
{
"Deployment":
{
"Deployment Status": "Deployed",
```

```
"Number of events": 22,
"Event": 1,
"Start": "10/20/2021 14:35:25",
"Adaptive Deployment": "true",
"Deployment Log":
[
{ "Deployment Prep Message": "Please verify that the rotator is aligned to the open port
before deploying.", "Time": "10/06/2021 14:35:26" },
{ "Deployment Prep Message": "Deployment preparation completed successfully.", "Time":
"10/06/2021 14:35:26" },
{ "Deployment Message": "Adaptive deployment backup schedule for event 01 is 10/20/2021
14:35:25.", "Time": "10/06/2021 14:35:27" }
]
}
}

10/06/2021 14:35:36 PST 15246-01>
{ "MESSAGE": "Entering low-power sleep mode. Sleeping until deployment event 1 backup schedule
time 10/20/2021 14:35:25", "Time": "10/06/2021 14:35:47" }
```


DEPLOYMENT NEXT

Description

Executes the next event in an adaptive deployment.

Syntax

deployment next

Notes

When a deployment event is started, if the backup event interval is enabled, the backup deployment schedule for all subsequent events is adjusted.

Examples


```
10/06/2021 14:36:07 PST 15246-01>deployment next
{ "MESSAGE": "Starting event 01." }

10/06/2021 14:36:16 PST 15246-01>
{ "MESSAGE": "Rotator move to port 01 completed successfully." }
{ "MESSAGE": "Adaptive deployment backup schedule for event 02 is 10/20/2021 14:36:16." }
{ "MESSAGE": "10 second command processing period." }

10/06/2021 14:36:44 PST 15246-01>deployment ?
{
"Deployment":
{
"Deployment Status": "Deployed",
"Number of events": 22,
"Event": 2,
"Start": "10/20/2021 14:36:16",
"Adaptive Deployment": "true",
"Deployment Log":
[
{ "Deployment Prep Message": "Please verify that the rotator is aligned to the open port
before deploying.", "Time": "10/06/2021 14:35:26" },
{ "Deployment Prep Message": "Deployment preparation completed successfully.", "Time":
```

```
"10/06/2021 14:35:26" },
{ "Deployment Message": "Adaptive deployment backup schedule for event 01 is 10/20/2021
14:35:25.", "Time": "10/06/2021 14:35:27" },
{ "Deployment Message": "Starting event 01.", "Time": "10/06/2021 14:36:15" },
{ "Deployment Message": "Rotator move to port 01 completed successfully.", "Time": "10/06/2021
14:36:43" },
{ "Deployment Message": "Adaptive deployment backup schedule for event 02 is 10/20/2021
14:36:16.", "Time": "10/06/2021 14:36:44" }
]
}
}

10/06/2021 14:36:50 PST 15246-01>
{ "MESSAGE": "Entering low-power sleep mode. Sleeping until sensor logging event at 10/06/2021
20:36:43", "Time": "10/06/2021 14:36:54" }
```


DEPLOYMENT ?

Description

Retrieves the deployment status. May be run at any time to find the state and history of the current or most recent deployment.

Examples


```
08/17/2021 14:04:45 PST 99999-99>deployment ?
{
"Deployment":
{
"Deployment Status": "Deployed",
"Number of events": 5,
"Event": 2,
"Start": "08/18/2021 14:04:25",
"Adaptive Deployment": "true",
"Deployment Log":
[
{ "Deployment Prep Message": "Please verify that the rotator is aligned to the open port
before deploying.", "Time": "08/17/2021 14:03:39" },
{ "Deployment Prep Message": "Deployment preparation completed successfully.", "Time":
"08/17/2021 14:03:40" },
{ "Deployment Message": "Deployment event 01 scheduled for: 08/18/2021 13:46:44", "Time":
"08/17/2021 14:03:40" },
{ "Deployment Message": "Deployment started. It is safe to disconnect USB.", "Time":
"08/17/2021 14:03:40" },
{ "Deployment Message": "Starting event 01.", "Time": "08/17/2021 14:03:56" },
{ "Deployment Message": "Rotator move to port 01 completed successfully.", "Time": "08/17/2021
14:04:25" },
{ "Deployment Message": "Deployment event 02 scheduled for: 08/18/2021 14:04:25", "Time":
"08/17/2021 14:04:25" }
]
}
}

08/17/2021 14:04:48 PST 99999-99>
```


If deployment status is queried while executing an event, a different response indicates the progress of the event.

```
08/17/2021 14:04:48 PST 99999-99>deployment next
{ "MESSAGE": " Starting event 02." }

08/17/2021 14:06:20 PST 99999-99>deployment ?
{
"Deployment":
{
"Deployment Status": "Executing event",
"Number of events": 5,
"Event": 2,
"Event Progress":
[
{"Label": "Rotator Move", "Data": { "Progress": 33 } }
]
}
}

08/17/2021 14:06:23 PST 99999-99>
```

DEPLOYMENT END

Description

Ends the current deployment.

Note

Adaptive deployments may be ended using the deployment end command.

Examples

08/16/2021 13:51:12 PST 99999-99>deployment end

```
{ "MESSAGE": "Deployment canceled by user." }
```

DEPLOYMENT RESUME ADAPTIVE

Description

Resume an adaptive deployment that was ended before all deployment events were completed.

Note

When an adaptive deployment is resumed, the backup schedule is adjusted using the defined backup event interval.

Examples

In this example an adaptive deployment is resumed and the deployment parameters and deployment status are queried during the command processing period before the Sediment Trap enters low-power sleep mode.

```
10/06/2021 15:45:22 PST 15246-01>deployment resume adaptive
{ "MESSAGE": "Deployment event 02 scheduled for: 10/20/2021 15:45:27" }
{ "MESSAGE": "Deployment resumed." }
{ "MESSAGE": "20 second command processing period." }

10/06/2021 15:45:28 PST 15246-01>deployment output parameters

{
"Deployment Parameters":
```

```
{
"Event Interval": { "Days": 14, "Hours": 0, "Minutes": 0, "Seconds": 0 },
"Sensor Interval": { "Days": 0, "Hours": 6, "Minutes": 0, "Seconds": 0 },
"Recovery Release Backup Alarm": "Disabled",
"Next Event": 2,
"Backup Event Schedule":
[
{ "Event":  2, "Start Time": "10/20/2021 15:45:27" },
{ "Event":  3, "Start Time": "11/03/2021 15:45:27" },
{ "Event":  4, "Start Time": "11/17/2021 15:45:27" },
{ "Event":  5, "Start Time": "12/01/2021 15:45:27" },
{ "Event":  6, "Start Time": "12/15/2021 15:45:27" },
{ "Event":  7, "Start Time": "12/29/2021 15:45:27" },
{ "Event":  8, "Start Time": "01/12/2022 15:45:27" },
{ "Event":  9, "Start Time": "01/26/2022 15:45:27" },
{ "Event": 10, "Start Time": "02/09/2022 15:45:27" },
{ "Event": 11, "Start Time": "02/23/2022 15:45:27" },
{ "Event": 12, "Start Time": "03/09/2022 15:45:27" },
{ "Event": 13, "Start Time": "03/23/2022 15:45:27" },
{ "Event": 14, "Start Time": "04/06/2022 15:45:27" },
{ "Event": 15, "Start Time": "04/20/2022 15:45:27" },
{ "Event": 16, "Start Time": "05/04/2022 15:45:27" },
{ "Event": 17, "Start Time": "05/18/2022 15:45:27" },
{ "Event": 18, "Start Time": "06/01/2022 15:45:27" },
{ "Event": 19, "Start Time": "06/15/2022 15:45:27" },
{ "Event": 20, "Start Time": "06/29/2022 15:45:27" },
{ "Event": 21, "Start Time": "07/13/2022 15:45:27" },
{ "Event": 22, "Start Time": "07/27/2022 15:45:27" }
]
}
}

10/06/2021 15:45:34 PST 15246-01>deployment ?
{
"Deployment":
{
"Deployment Status": "Deployed",
"Number of events": 22,
"Event": 2,
"Start": "10/20/2021 15:45:27",
"Adaptive Deployment": "true",
"Deployment Log":
[
{ "Deployment Prep Message": "Please verify that the rotator is aligned to the open port
before deploying.", "Time": "10/06/2021 15:36:07" },
{ "Deployment Prep Message": "Deployment preparation completed successfully.", "Time":
"10/06/2021 15:36:08" },
{ "Deployment Message": "Adaptive deployment backup schedule for event 01 is 10/20/2021
15:36:07.", "Time": "10/06/2021 15:36:08" },
{ "Deployment Message": "Starting event 01.", "Time": "10/06/2021 15:36:47" },
{ "Deployment Message": "Rotator move to port 01 completed successfully.", "Time": "10/06/2021
15:37:15" },
{ "Deployment Message": "Adaptive deployment backup schedule for event 02 is 10/20/2021
15:36:47.", "Time": "10/06/2021 15:37:15" },
{ "Deployment Message": "Deployment canceled by user.", "Time": "10/06/2021 15:37:54" },
{ "Deployment Message": "Deployment event 02 scheduled for: 10/20/2021 15:45:27", "Time":
"10/06/2021 15:45:28" },
{ "Deployment Message": "Deployment resumed.", "Time": "10/06/2021 15:45:28" }
]
```

```
}
}

10/06/2021 15:45:36 PST 15246-01>
{ "MESSAGE": "Entering low-power sleep mode. Sleeping until sensor logging event at 10/06/2021
21:45:28", "Time": "10/06/2021 15:45:48" }
```

DEPLOYMENT LOG_SENSORS

Description

Logs sensor data to the deployment data files.

Syntax

deployment log_sensors

Examples

```
10/06/2021 15:37:33 PST 15246-01>deployment log_sensors
{ "MESSAGE": "Logging sensor data." }
{ "MESSAGE": "Entering low-power sleep mode. Sleeping until sensor logging event at 10/06/2021
21:37:41", "Time": "10/06/2021 15:37:42" }
```

Recovery Release Commands

If a Sediment Trap has a recovery release installed, it can be configured and controlled using these commands.

RECOVERY_RELEASE TIME_ON
RECOVERY_RELEASE NOW
RECOVERY_RELEASE ?

RECOVERY_RELEASE TIME_ON

Description

Display or define the duration during which the recovery release device will remain activated.

Syntax

recovery_release time_on
recovery_release time_on = [milliseconds]

Examples

Display the recovery release period value.

```
10/06/2021 15:41:06 PST 15246-01>recovery_release time_on

{ "Activation Period (mS)": 15000 }

10/06/2021 15:41:33 PST 15246-01>
```

Define the recovery release period value.

```
10/06/2021 15:41:33 PST 15246-01>recovery_release time_on = 16000
```

```
{ "Activation Period (mS)": 16000 }

10/06/2021 15:41:42 PST 15246-01>
```

RECOVERY_RELEASE NOW

Description

Activate the recovery release device.

Syntax

recovery_release now

Note

- This command will align the rotator to the open port before activating the release.
- If the deployment has not yet completed, this command will end the deployment.

Examples

Activate the release while the rotator is aligned to the open port.

```
09/10/2021 16:49:14 PST 99999-99>recovery_release now
{ "MESSAGE": " Recovery release started" }
{ "MESSAGE": " Recovery release completed." }
{ "MESSAGE": "Deployment completed." }

09/10/2021 16:49:25 PST 99999-99>
```

Activate the recovery release device while not aligned to the open port.

```
09/10/2021 16:50:08 PST 99999-99>recovery_release now
{ "MESSAGE": " Locating open rotator port before activating recovery release..." }
{ "MESSAGE": " Locating open rotator port before activating recovery release..." }
{ "MESSAGE": " Locating open rotator port before activating recovery release..." }
{ "MESSAGE": " Recovery release started" }
{ "MESSAGE": " Recovery release completed." }


09/10/2021 16:51:39 PST 99999-99>
```

RECOVERY_RELEASE ?

Description

Displays the recovery release status and configuration data.

Syntax

recovery_release ?

Examples

```
10/06/2021 15:40:01 PST 15246-01>recovery_release ?
{"Recovery Release":{ "Type": "EdgeTech PORT", "Activation Period (mS)": 15000, "Recovery
Release Backup Alarm": "Disabled", "Status": "Release pending"} }
```

Data Offload Commands

There are several options for offloading data from a device:

- Connect to the McLanePro interface and use the Offload tab.
- Output individual files from the command line.
- Transfer individual files from the SD card using the XMODEM protocol.
- Use the offload command to output deployment data in JSON or CSV format.

This section covers the final option.

OFFLOAD TILT
OFFLOAD TEMPERATURE
OFFLOAD POWER
OFFLOAD_EVENT_SUMMARY

OFFLOAD TILT

Description

Offload tilt data in either JSON or CSV format.

Syntax

```
offload tilt [ json ]
offload tilt [ csv ]
```

Examples

```
09/15/2021 17:22:13 PST 99999-99>offload tilt csv

Event, Timestamp, Tilt
1, 09/15/2021 17:15:16, 1.5
2, 09/15/2021 17:16:17, 1.6
3, 09/15/2021 17:17:59, 1.5
3, 09/15/2021 17:18:22, 1.4
3, 09/15/2021 17:18:47, 1.5
3, 09/15/2021 17:19:03, 1.6
4, 09/15/2021 17:19:55, 1.3
4, 09/15/2021 17:20:08, 1.6
4, 09/15/2021 17:20:22, 1.2
4, 09/15/2021 17:20:35, 1.3
5, 09/15/2021 17:21:27, 1.5

09/15/2021 17:23:20 PST 99999-99>offload tilt json

{
"Tilt Data":
[
{"Event": 1, "Timestamp": "09/15/2021 17:15:16", "Tilt": 1.5},
{"Event": 2, "Timestamp": "09/15/2021 17:16:17", "Tilt": 1.6},
{"Event": 3, "Timestamp": "09/15/2021 17:17:59", "Tilt": 1.5},
{"Event": 3, "Timestamp": "09/15/2021 17:18:22", "Tilt": 1.4},
{"Event": 3, "Timestamp": "09/15/2021 17:18:47", "Tilt": 1.5},
{"Event": 3, "Timestamp": "09/15/2021 17:19:03", "Tilt": 1.6},
{"Event": 4, "Timestamp": "09/15/2021 17:19:55", "Tilt": 1.3},
```

```
{"Event": 4, "Timestamp": "09/15/2021 17:20:08", "Tilt": 1.6},
{"Event": 4, "Timestamp": "09/15/2021 17:20:22", "Tilt": 1.2},
{"Event": 4, "Timestamp": "09/15/2021 17:20:35", "Tilt": 1.3},
{"Event": 5, "Timestamp": "09/15/2021 17:21:27", "Tilt": 1.5}
]
}
```


OFFLOAD TEMPERATURE

Description

Offload onboard temperature sensor data in either JSON or CSV format.

Syntax

offload temperature [json]
offload temperature [csv]

Examples

```
09/15/2021 17:22:21 PST 99999-99>offload temperature csv

Event, Timestamp, Temperature
1, 09/15/2021 17:15:17, 28.9
2, 09/15/2021 17:16:17, 28.9
3, 09/15/2021 17:18:00, 28.8
3, 09/15/2021 17:18:22, 28.8
3, 09/15/2021 17:18:48, 28.8
3, 09/15/2021 17:19:04, 28.8
4, 09/15/2021 17:19:56, 28.8
4, 09/15/2021 17:20:09, 28.8
4, 09/15/2021 17:20:22, 28.8
4, 09/15/2021 17:20:36, 28.8
5, 09/15/2021 17:21:28, 28.8


09/15/2021 17:23:34 PST 99999-99>offload temperature json

{
"Temperature Data":
[
{"Event": 1, "Timestamp": "09/15/2021 17:15:17", "Temperature": 28.9},
{"Event": 2, "Timestamp": "09/15/2021 17:16:17", "Temperature": 28.9},
{"Event": 3, "Timestamp": "09/15/2021 17:18:00", "Temperature": 28.8},
{"Event": 3, "Timestamp": "09/15/2021 17:18:22", "Temperature": 28.8},
{"Event": 3, "Timestamp": "09/15/2021 17:18:48", "Temperature": 28.8},
{"Event": 3, "Timestamp": "09/15/2021 17:19:04", "Temperature": 28.8},
{"Event": 4, "Timestamp": "09/15/2021 17:19:56", "Temperature": 28.8},
{"Event": 4, "Timestamp": "09/15/2021 17:20:09", "Temperature": 28.8},
{"Event": 4, "Timestamp": "09/15/2021 17:20:22", "Temperature": 28.8},
{"Event": 4, "Timestamp": "09/15/2021 17:20:36", "Temperature": 28.8},
{"Event": 5, "Timestamp": "09/15/2021 17:21:28", "Temperature": 28.8}
]
}
```

OFFLOAD POWER

Description

Offload power data in either JSON or CSV format.

Syntax

offload power [json]
offload power [csv]

Examples

```
09/15/2021 17:22:32 PST 99999-99>offload power csv

Event, Timestamp, Battery VDC
1, 09/15/2021 17:15:16, 19.9
2, 09/15/2021 17:16:17, 19.9
3, 09/15/2021 17:18:00, 19.9
3, 09/15/2021 17:18:23, 19.9
3, 09/15/2021 17:18:48, 19.9
3, 09/15/2021 17:19:03, 19.9
4, 09/15/2021 17:19:56, 19.9
4, 09/15/2021 17:20:09, 19.9
4, 09/15/2021 17:20:22, 19.9
4, 09/15/2021 17:20:35, 19.9
5, 09/15/2021 17:21:27, 19.9


09/15/2021 17:23:06 PST 99999-99>offload power json

{
"System Power Data":
[
{"Event": 1, "Timestamp": "09/15/2021 17:15:16", "Battery VDC": 19.9},
{"Event": 2, "Timestamp": "09/15/2021 17:16:17", "Battery VDC": 19.9},
{"Event": 3, "Timestamp": "09/15/2021 17:18:00", "Battery VDC": 19.9},
{"Event": 3, "Timestamp": "09/15/2021 17:18:23", "Battery VDC": 19.9},
{"Event": 3, "Timestamp": "09/15/2021 17:18:48", "Battery VDC": 19.9},
{"Event": 3, "Timestamp": "09/15/2021 17:19:03", "Battery VDC": 19.9},
{"Event": 4, "Timestamp": "09/15/2021 17:19:56", "Battery VDC": 19.9},
{"Event": 4, "Timestamp": "09/15/2021 17:20:09", "Battery VDC": 19.9},
{"Event": 4, "Timestamp": "09/15/2021 17:20:22", "Battery VDC": 19.9},
{"Event": 4, "Timestamp": "09/15/2021 17:20:35", "Battery VDC": 19.9},
{"Event": 5, "Timestamp": "09/15/2021 17:21:27", "Battery VDC": 19.9}
]
}
```

OFFLOAD EVENT_SUMMARY

Description

Offload deployment event summary data in either JSON or CSV format.

Syntax

offload event_summary [json]
offload event_summary [csv]

Examples

```
09/15/2021 17:22:39 PST 99999-99>offload event_summary csv

Event, Start Time, Start Temperature, Start Tilt, Start VDC, Lowest VDC, End Temperature, End
Tilt, End VDC, End Time, Event Result
1, 09/15/2021 17:15:15, 28.8, 1.4, 19.9, 19.8, 28.8, 1.5, 19.9, 09/15/2021 17:15:42,
Stationary; Aligned
2, 09/15/2021 17:16:16, 28.8, 1.4, 19.9, 19.8, 28.9, 1.3, 19.9, 09/15/2021 17:16:42,
Stationary; Aligned
3, 09/15/2021 17:19:02, 28.8, 1.4, 19.9, 19.8, 28.8, 1.4, 19.9, 09/15/2021 17:19:29,
Stationary; Aligned
4, 09/15/2021 17:20:34, 28.8, 1.4, 19.9, 19.8, 28.8, 1.5, 19.9, 09/15/2021 17:21:01,
Stationary; Aligned
5, 09/15/2021 17:21:26, 28.8, 1.4, 19.9, 19.8, 28.8, 1.5, 19.9, 09/15/2021 17:21:53,
Stationary; Aligned


09/15/2021 17:22:48 PST 99999-99>offload event_summary json


{
"Deployment Event Summary":
[
{
"Event": 1,
"Start Time": "09/15/2021 17:15:15",
"Start Temperature": 28.8,
"Start Tilt": 1.4,
"Start VDC": 19.9,
"Event Result": "Stationary; Aligned",
"Lowest VDC": 19.8,
"End Temperature": 28.8,
"End Tilt": 1.5,
"End VDC": 19.9,
"End Time": "09/15/2021 17:15:42"
},
{
"Event": 2,
"Start Time": "09/15/2021 17:16:16",
"Start Temperature": 28.8,
"Start Tilt": 1.4,
"Start VDC": 19.9,
"Event Result": "Stationary; Aligned",
"Lowest VDC": 19.8,
"End Temperature": 28.9,
"End Tilt": 1.3,
"End VDC": 19.9,
"End Time": "09/15/2021 17:16:42"
},
{
"Event": 3,
"Start Time": "09/15/2021 17:19:02",
"Start Temperature": 28.8,
"Start Tilt": 1.4,
"Start VDC": 19.9,
"Event Result": "Stationary; Aligned",
"Lowest VDC": 19.8,
"End Temperature": 28.8,
"End Tilt": 1.4,
"End VDC": 19.9,
```

```
"End Time": "09/15/2021 17:19:29"
},
{
"Event": 4,
"Start Time": "09/15/2021 17:20:34",
"Start Temperature": 28.8,
"Start Tilt": 1.4,
"Start VDC": 19.9,
"Event Result": "Stationary; Aligned",
"Lowest VDC": 19.8,
"End Temperature": 28.8,
"End Tilt": 1.5,
"End VDC": 19.9,
"End Time": "09/15/2021 17:21:01"
},
{
"Event": 5,
"Start Time": "09/15/2021 17:21:26",
"Start Temperature": 28.8,
"Start Tilt": 1.4,
"Start VDC": 19.9,
"Event Result": "Stationary; Aligned",
"Lowest VDC": 19.8,
"End Temperature": 28.8,
"End Tilt": 1.5,
"End VDC": 19.9,
"End Time": "09/15/2021 17:21:53"
}
]
}
```


SD Card and File Commands

SD card and file commands are available to the user in order to manipulate files on the SD card. These advanced functions are not required for a typical adaptive deployment.

COPY
DEL
DIR
INPUT_FILE
OUTPUT_FILE
MKDIR
XMODEM
FILE_INFO

COPY

Description

Copies the specified file or directory to the specified location.

Syntax

copy [source file] [destination file]
copy [source directory] [destination directory]

Note

Use absolute paths. Files that are not in the root directory require the entire path to the file.

Examples

Copy a file.

```
08/13/2021 09:19:33 PST 99999-99 USB POWER MODE>copy /logs/adc_debug_log.json copied_file.json

08/13/2021 09:37:14 PST 99999-99 USB POWER MODE>dir
  /configuration
  /supervisor
  /deployment_data
  /deployment
  /system_test
  /logs
  copied_file.json 472 08/13/2021 09:37:14
  /deployment_data_archive
```

Example of an error copying files.

```
08/13/2021 09:42:09 PST 99999-99 USB POWER MODE>copy file_doesnt_exist.huh
not_going_to_work.sad
{ "ERROR": "Could not open file_doesnt_exist.huh" }
{ "ERROR": "Command Failed" }

08/13/2021 09:42:17 PST 99999-99 USB POWER MODE>
```

Copy a directory, print the contents of the directory using the dir command.

```
08/17/2021 14:27:51 PST 99999-99>copy /configuration /config_copy

08/17/2021 14:28:15 PST 99999-99>dir
  /configuration
  /supervisor
  /deployment_data
  /deployment
  /system_test
  /logs
  copied_file.json 472 08/13/2021 09:37:14
  deployment_data_renamed 0 08/16/2021 11:11:34
  /deployment_data_archive
  /config_copy

08/17/2021 14:30:14 PST 99999-99>dir /config_copy
  power.json 1906 08/17/2021 14:28:14
  trap_rotator.json 840 08/17/2021 14:28:14
  device_definition.json 1038 08/17/2021 14:28:14


08/17/2021 14:30:21 PST 99999-99>
```

DEL

Description

Deletes the specified file or directory.

Syntax

del [file or directory to delete]

Notes

- Use absolute paths.
- Only responds if something went wrong.

Examples

Copy a directory, then delete it. Verify both operations worked by using the dir command.

```
08/17/2021 14:27:51 PST 99999-99>copy /configuration /config_copy
08/17/2021 14:28:15 PST 99999-99>dir
  /configuration
  /supervisor
  /deployment_data
  /deployment
  /system_test
  /logs
  copied_file.json 472 08/13/2021 09:37:14
  deployment_data_renamed 0 08/16/2021 11:11:34
  /deployment_data_archive
  /config_copy

08/17/2021 14:30:14 PST 99999-99>dir /config_copy
  power.json 1906 08/17/2021 14:28:14
  trap_rotator.json 840 08/17/2021 14:28:14
  device_definition.json 1038 08/17/2021 14:28:14

08/17/2021 14:41:13 PST 99999-99>del /config_copy

08/17/2021 14:41:20 PST 99999-99>dir
  /configuration
  /supervisor
  /deployment_data
  /deployment
  /system_test
  /logs
  copied_file.json 472 08/13/2021 09:37:14
  /deployment_data_archive
```

Delete a file in the root directory.

```
08/17/2021 14:48:56 PST 99999-99>dir
  /configuration
  /supervisor
  /deployment_data
  /deployment
  /system_test
  /logs
  copied_file.json 472 08/13/2021 09:37:14
  /deployment_data_archive


08/17/2021 14:50:24 PST 99999-99>del copied_file.json
```

```
08/17/2021 14:50:32 PST 99999-99>dir
  /configuration
  /supervisor
  /deployment_data
  /deployment
  /system_test
  /logs
  /deployment_data_archive
```

Delete a file in a sub-directory.

```
08/17/2021 14:50:34 PST 99999-99>dir /supervisor
  upload_log.json 5567 06/30/2021 12:02:26

08/17/2021 14:52:32 PST 99999-99>del /supervisor/upload_log.json

08/17/2021 14:52:43 PST 99999-99>dir /supervisor

08/17/2021 14:52:48 PST 99999-99>
```

DIR

Description

Prints the SD card contents to the screen.

Arguments

Arguments can be provided in any order.

- r : Recursively outputs all sub-directory contents.
- j : Writes and outputs JSON directory listing.

Examples

Perform a directory listing of the root directory.

```
08/17/2021 14:52:48 PST 99999-99>dir
  /configuration
  /supervisor
  /deployment_data
  /deployment
  /system_test
  /logs
  /deployment_data_archive
```

Directory listing of the "/logs" directory.

```
08/17/2021 15:18:37 PST 99999-99>dir /logs
  adc_debug_log.json 472 08/13/2021 09:13:20
  /adc_logs
  system_log.json 226758 08/17/2021 15:14:28
  rotator_log.json 11820 08/16/2021 17:51:22
```

Recursive directory listing of root directory.

```
08/17/2021 14:53:43 PST 99999-99>dir r
  /configuration
    power.json 1906 08/17/2021 14:26:12
    trap_rotator.json 840 08/17/2021 14:26:12
    device_definition.json 1038 08/17/2021 14:26:12
  /supervisor
  /deployment_data
    /archived_deployment_parameters
      deployment_parameters.json 1790 08/17/2021 14:03:38
      event_1.json 261 08/17/2021 14:03:38
      event_2.json 261 08/17/2021 14:03:38
      event_3.json 261 08/17/2021 14:03:38
      event_4.json 261 08/17/2021 14:03:38
      event_5.json 261 08/17/2021 14:03:38
    deployment_log.json 1207 08/17/2021 14:17:02
    event_1.json 11340 08/17/2021 14:04:24
    event_1_summary.json 691 08/17/2021 14:04:24
    event_1_tilt.json 75 08/17/2021 14:03:56
    event_1_power.json 92 08/17/2021 14:03:56
    event_1_temperature.json 92 08/17/2021 14:03:58
    event_2.json 11050 08/17/2021 14:06:40
    event_2_summary.json 691 08/17/2021 14:06:40
    event_2_tilt.json 75 08/17/2021 14:06:14
    event_2_power.json 92 08/17/2021 14:06:14
    event_2_temperature.json 92 08/17/2021 14:06:14
  /deployment
    deployment_parameters.json 1793 08/17/2021 14:17:02
    event_1.json 261 08/17/2021 14:03:38
    event_2.json 261 08/17/2021 14:03:38
    event_3.json 261 08/17/2021 14:03:40
    event_4.json 261 08/17/2021 14:03:40
    event_5.json 261 08/17/2021 14:03:40
  /system_test
  /logs
    system_log.json 209326 08/17/2021 14:50:24
    rotator_log.json 11820 08/16/2021 17:51:22
  /deployment_data_archive
    /archived_8-17-2021_13-32-48
      /archived_deployment_parameters
        deployment_parameters.json 1791 08/17/2021 13:32:48
        event_1.json 261 08/17/2021 13:32:48
        event_2.json 261 08/17/2021 13:32:48
        event_3.json 261 08/17/2021 13:32:48
        event_4.json 258 08/17/2021 13:32:48
        event_5.json 258 08/17/2021 13:32:48
      deployment_log.json 280 08/17/2021 13:32:48
```

JSON formatted listing of the "/logs" directory


```
{
"Contents":
[
{ "Type": "File", "Name": "adc_debug_log.json", "File Size": 472, "Date": "08/13/2021
09:13:20" },
{
 "Type": "Sub-Directory",
 "Name": "adc_logs"
},
{ "Type": "File", "Name": "system_log.json", "File Size": 226758, "Date": "08/17/2021
```

```
15:14:28" },
{ "Type": "File", "Name": "rotator_log.json", "File Size": 11820, "Date": "08/16/2021
17:51:22" }
]
}
```

INPUT_FILE

Description

Reads bytes from a serial stream to a file. There are no CRC or checksums included in the file transfer. To perform a CRC check afterwards, use the file_info command.

It is recommended that McLanePro be used for any file operations whenever possible. If help is needed with this command, please contact McLane.

Syntax

input_file [file name] [file size] [inactivity timeout (milliseconds)]

Notes

- This command will stop reading bytes from the serial port after the specified number of bytes are read, or the inactivity timeout is reached.
- Make sure to use the ACTUAL file size of the file, not the "size on disk" value.
- This command was developed and tested using the TeraTerm "Send file..." feature.

Examples

Start the transfer

```
08/17/2021 16:23:56 PST 99999-99>input_file file_i_sent_from_teraterm.txt 11 30000
{ "MESSAGE": " Waiting to receive file_i_sent_from_teraterm.txt" }
```

Use a terminal emulator or other application to send a file byte per byte to the Sediment Trap

This example uses the TeraTerm File Menu ->Send File.

In this case the transfer finished without errors. Check the card for the file that was sent.

```
08/17/2021 16:39:25 PST 99999-99>dir
  /configuration
  /supervisor
  /deployment_data
  /deployment
  /system_test
  /logs
  file_i_sent_from_teraterm.txt 11 08/17/2021 16:39:24
  /deployment_data_archive
```

Use file_info to check the CRC.

```
08/17/2021 16:39:27 PST 99999-99>file_info file_i_sent_from_teraterm.txt
{
  "File": {
```

```
    "Name": "file_i_sent_from_teraterm.txt",
    "Size": 11,
    "CRC": "0x68ce"
  }
}

08/17/2021 16:39:45 PST 99999-99>
```

OUTPUT_FILE

Description

Prints file contents to the serial port.

Syntax

output_file [file name]

Examples

```
08/17/2021 16:17:56 PST 99999-99>output_file /deployment/event_1.json
{
  "Event Parameters": {
    "Event Number": {
      "Data Type": "RO_SHORT",
      "Value": 1
    },
    "Start Time": {
      "Month": 8,
      "Day": 18,
      "Year": 2021,
      "Hour": 15,
      "Minute": 47,
      "Second": 3
    }
  }
}

08/17/2021 16:18:10 PST 99999-99>
```

MKDIR

Description

Creates the specified directory.

Syntax

mkdir [directory to create]

Notes

Use absolute paths.

Examples

Create a new directory in the parent directory.

```
05/13/2020 08:27:11 mclane>mkdir dir_i_made
05/13/2020 08:29:18 mclane>dir
        messages.dat    83576   04/30/2020 09:52:20
```

```
        /configuration
        supervisor.dat  46920   01/01/2000 01:00:00
        /deployment
        alarm.dat       4       01/01/2000 01:00:00
        system_log.json 17540   01/01/2000 01:00:00
        supervisor_log.json     205     01/01/2000 01:00:00
        dir_file.json   3583    01/01/2000 01:00:00
        /dir_i_made
```

Create a new directory in a sub-directory.

```
05/13/2020 08:31:02 mclane>mkdir /deployment/dir_i_made_in_sub_directory
05/13/2020 08:31:26 mclane>dir /deployment
        deployment_parameters.json      1828    01/01/2000 01:00:00
        event_1.json    203     01/01/2000 01:00:00
        event_2.json    203     01/01/2000 01:00:00
        event_3.json    203     01/01/2000 01:00:00
        event_4.json    203     01/01/2000 01:00:00
        event_5.json    203     01/01/2000 01:00:00
        event_6.json    203     01/01/2000 01:00:00
        event_7.json    203     01/01/2000 01:00:00
        event_8.json    203     01/01/2000 01:00:00
        event_9.json    203     01/01/2000 01:00:00
        event_10.json   204     01/01/2000 01:00:00
        event_11.json   204     01/01/2000 01:00:00
        event_12.json   204     01/01/2000 01:00:00
        event_13.json   204     01/01/2000 01:00:00
        event_14.json   204     01/01/2000 01:00:00
        event_15.json   204     01/01/2000 01:00:00
        event_16.json   204     01/01/2000 01:00:00
        event_17.json   204     01/01/2000 01:00:00
        event_18.json   204     01/01/2000 01:00:00
        event_19.json   204     01/01/2000 01:00:00
        event_20.json   204     01/01/2000 01:00:00
        event_21.json   204     01/01/2000 01:00:00
        event_22.json   204     01/01/2000 01:00:00
        /dir_i_made_in_sub_directory
```

XMODEM

Description

Transfer files using the XMODEM protocol.

Syntax

xmodem_transmit [file path]
xmodem_receive [file path]

Notes

- This command works well with TeraTerm XMODEM file transfer.
- Use absolute paths.
- Enter CTRL-X to cancel an XMODEM transfer.
- *The preferred method to transfer files is by using operations provided within the McLanePro SD Card tab.*

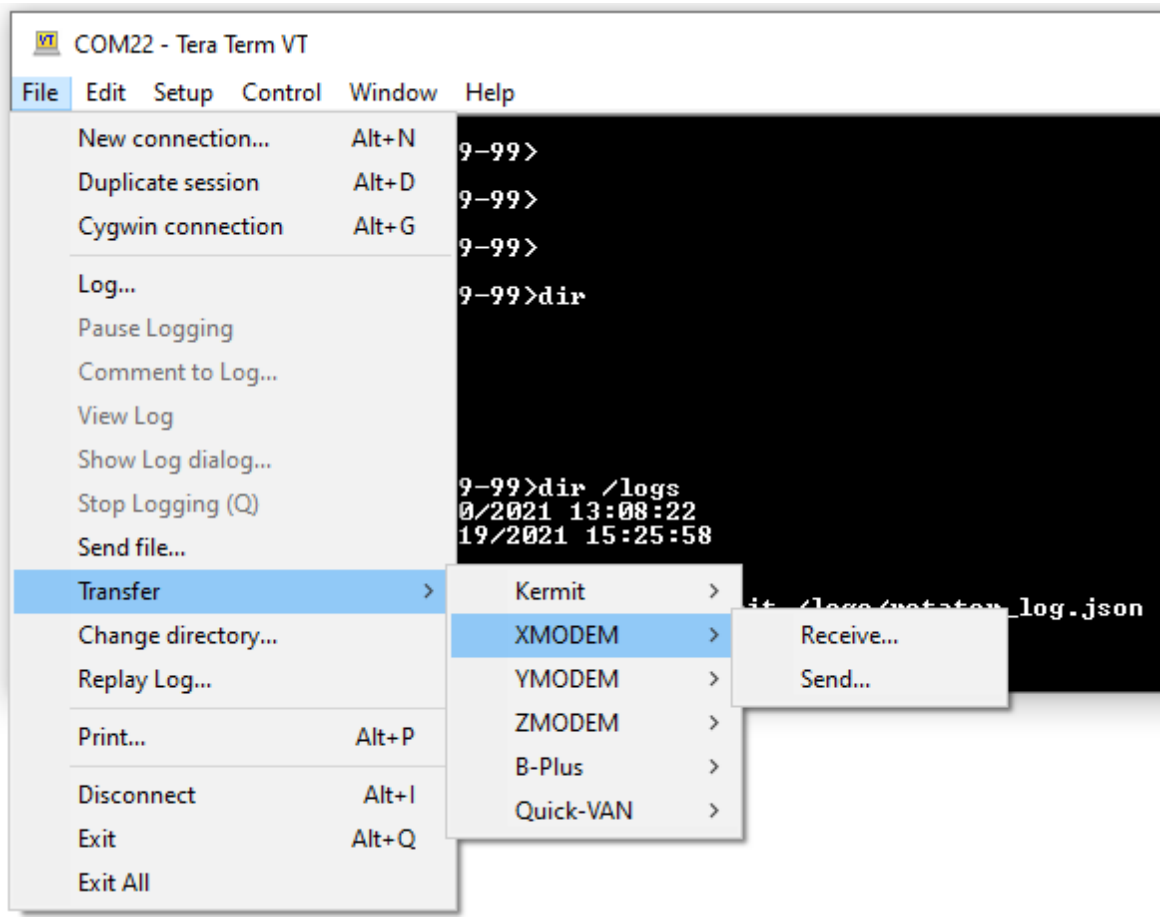
Examples

Send a file to the host

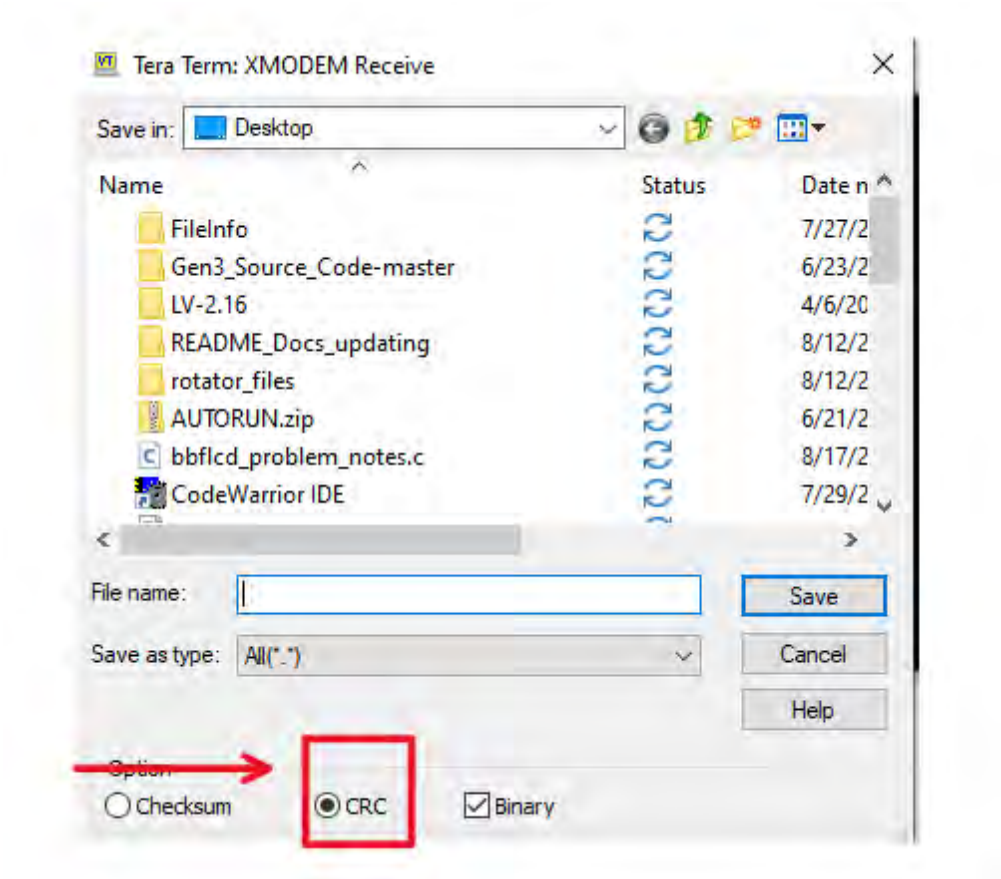
Start the transfer process with the **xmodem_transmit** command.

```
08/20/2021 13:08:39 PST 99999-99>xmodem_transmit /logs/rotator_log.json
Sending /logs/rotator_log.json

08/20/2021 13:09:23 PST 99999-99>
```

Use a terminal program to receive the file using XMODEM.



Ensure that "CRC" is selected before receiving the file.

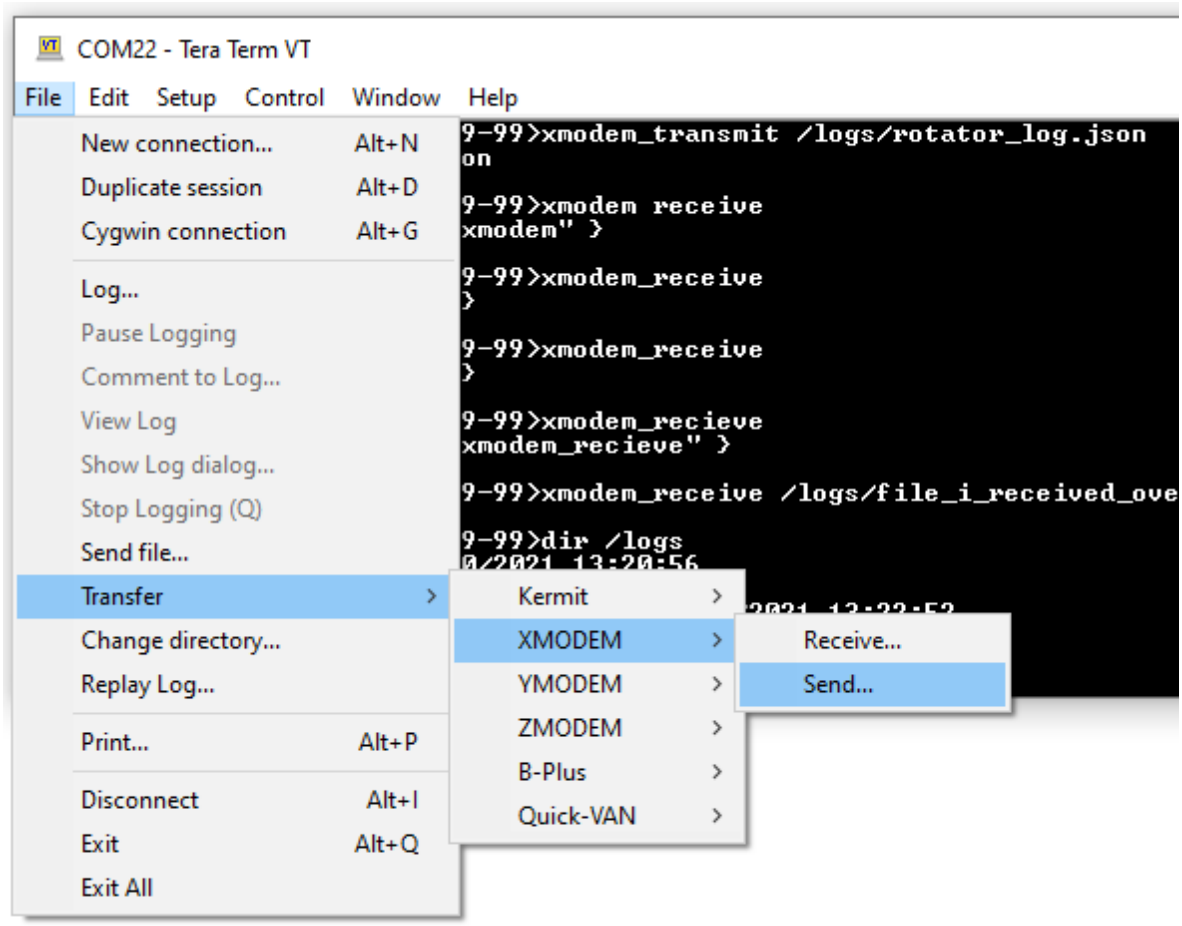


Receive a file from the host

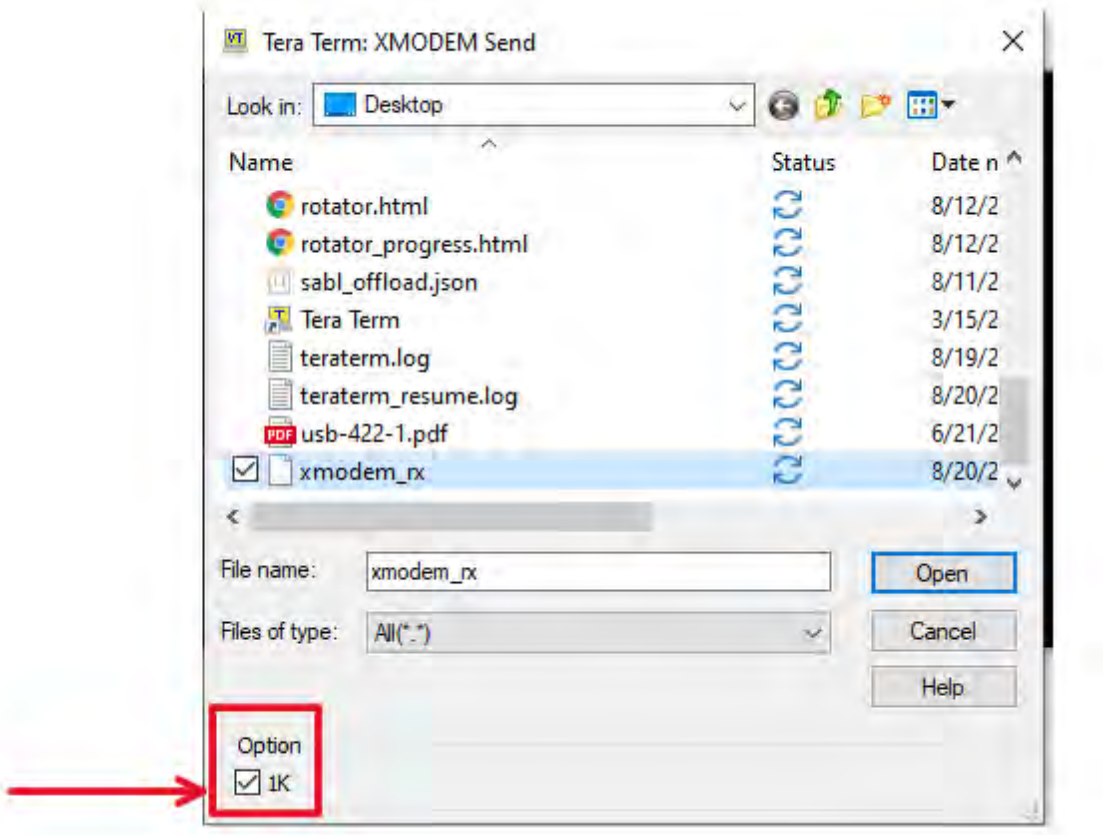
Start the transfer process with the **xmodem_receive** command. Notice the "C"s printing after the command. That indicates the transfer has started.

```
08/20/2021 13:20:56 PST 99999-99>xmodem_receive /logs/file_i_received_over_xmodem.txtCCC

08/20/2021 13:22:53 PST 99999-99>dir /logs
  system_log.json 25176 08/20/2021 13:20:56
  rotator_log.json 11038 08/19/2021 15:25:58
  file_i_received_over_xmodem.txt 11038 08/20/2021 13:22:52


08/20/2021 13:22:58 PST 99999-99>
```

Use the terminal program to send a file over XMODEM.



Select the "1K" transfer option.



FILE_INFO

Description

Output file information for the specified file.

Syntax

file_info [file path]

Notes

- The CRC is **CRC-16-CCITT - XMODEM.**
- Use absolute paths.

Examples

```
08/17/
{
  "File": {
    "Name": "file_i_sent_from_teraterm.txt",
    "Size": 11,
    "CRC": "0x68ce"
  }
}

08/17/2021 16:39:45 PST 99999-99>
```

SABL Model Sediment Trap

The Signal Activated Bottom Lander (SABL) Sediment Trap model is designed to target specific discharge or re-suspension events (for example, stormwater discharge, dredging events, sediment disturbance).

Introduction

The Signal Activated Bottom Lander (SABL) Sediment Trap works with the same Sediment Trap firmware as the other Sediment Trap models. This section provides steps for procedures specific

to the SABL.

SABL Sediment Trap topics

Removing and Installing the Rotator
Removing the cone & baffle for cleaning
Mounting the Rotator to the Frame
Setting up the Pop-up Buoy

Removing & Installing the Rotator Assembly

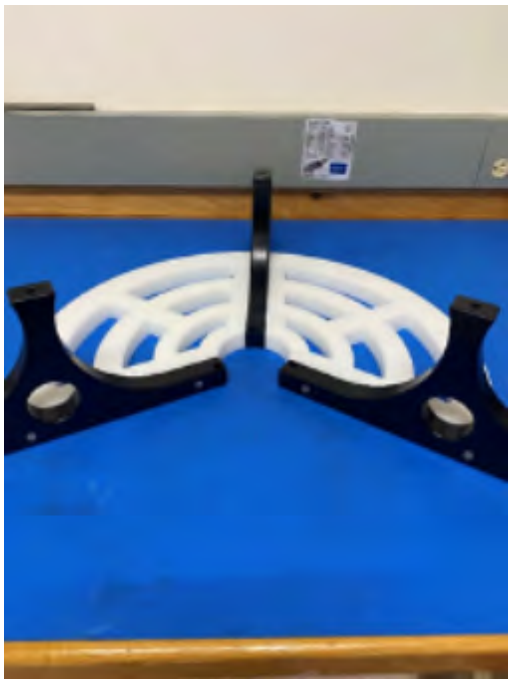
Tools required:

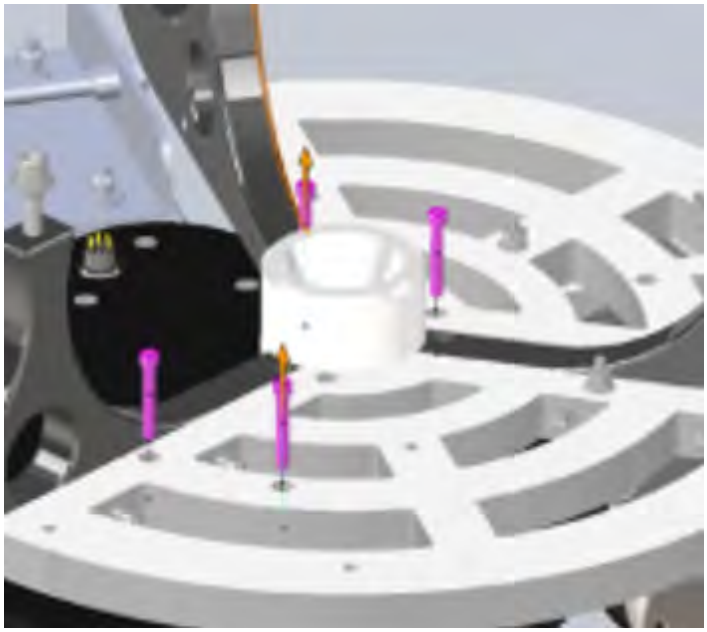
- 3/16” hex ball driver
- Flat head screwdriver

Hardware (if needed):

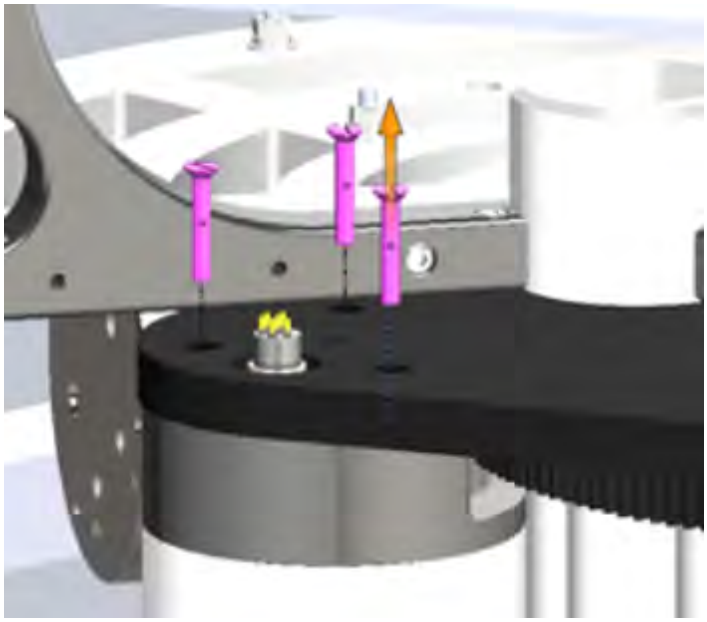
- ¼-20 1 ¼ “L soc cap screw 316SS
- ¼-20 1 ¼ “L flathead 316SS screws

1. Attach rotator to hanger ring using (4x) ¼-20 1 ¼ “L soc cap screw 316SS.





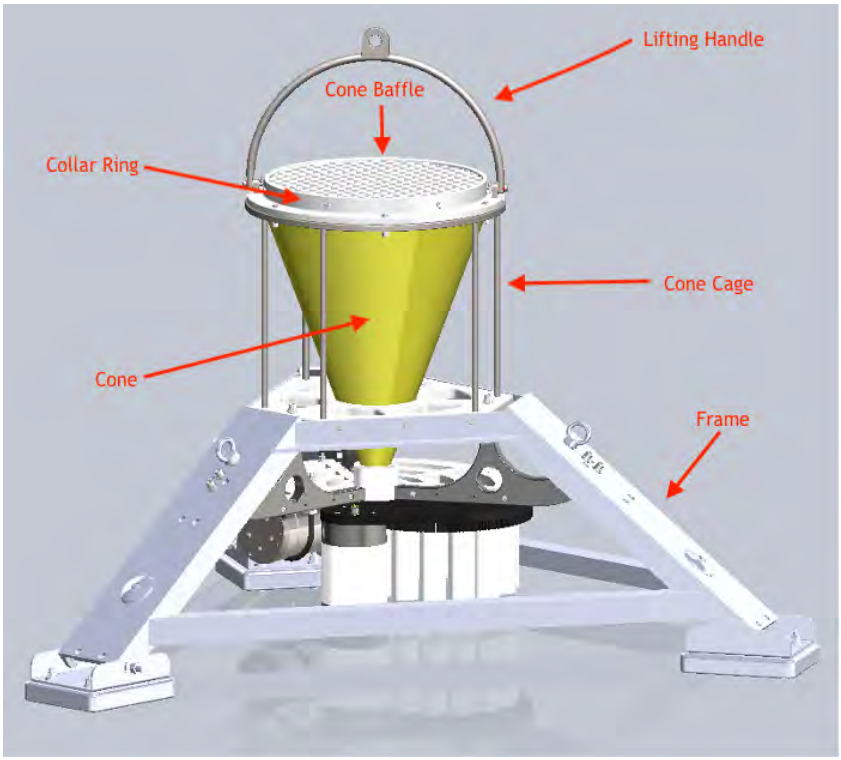
2. Orient the rotator so motor holes are free.
3. Attach motor to rotator using (3x) ¼-20 1 ¼ “L flathead 316SS screws.



Removing the cone & baffle for cleaning

Tools required:

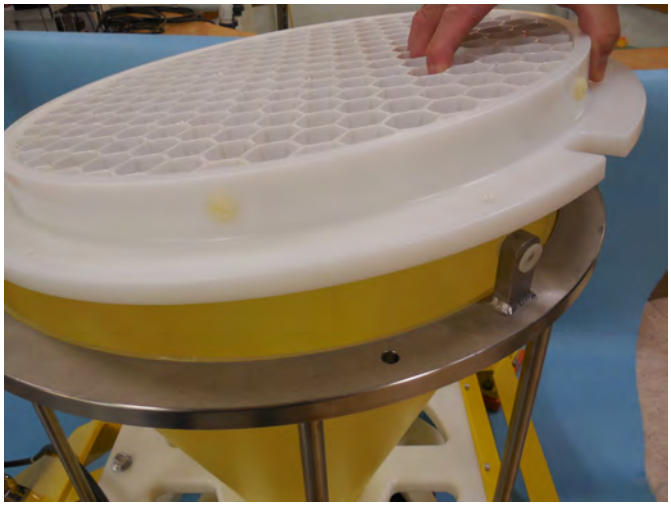
- 7/16” combo wrench
- Hardware: 2” L titanium wire



1. Remove the titanium wire cotter pin.

2. Remove hinge pins from both sides.

3. Remove lifting handle.
4. Remove 6 hex bolts holding the collar ring to titanium cage.
5. The baffle and cone are now free to be removed.



Mounting the Rotator to the Frame

Tools required:

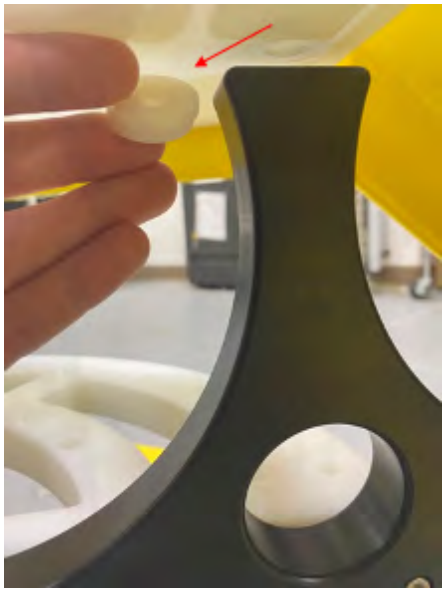
- 3/8 Hex Driver

Hardware (if needed):

- (9) SS 3/8-16 1 ¾ “ Bolt
- (9) SS 3/8 Lock Washer
- (9) SS 3/8 Flat Washer
- (6) 3/8 Nylon insulating Bushing
- (6) 3/8 Nylon Flat Washer

1. Use the (3) 3/8-16 1 ¾ “ length bolts along with 3/8 split, and flat washers to secure the hangers to the base plate.

2. Place (2) of the nylon flat washers in between the hanger and the baseplate. This will allow for a proper hole alignment on the frame legs.



3. Use the Remaining (6) bolts and allocated hardware to attach the hanger to the legs of the frame.
4. Be sure to place the 3/8 nylon insulating bushings in the leg holes.

Setting up the Pop-up Buoy

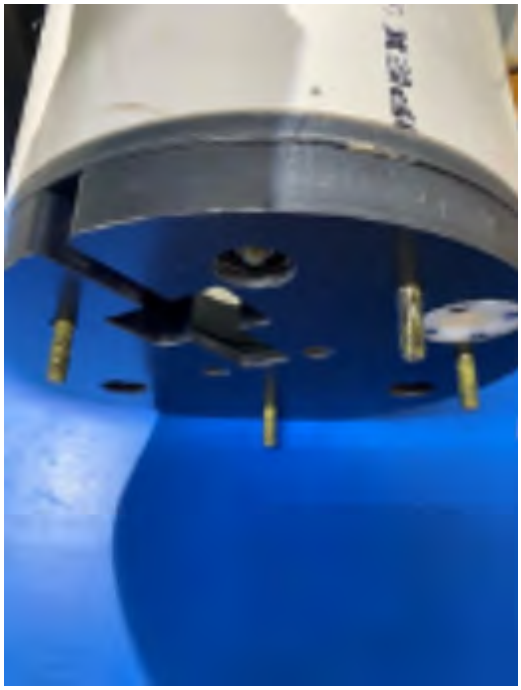
The SABL trap is shipped with the pop-up canister unattached to the frame. Follow these steps to attach the canister to the frame.

Tools required:

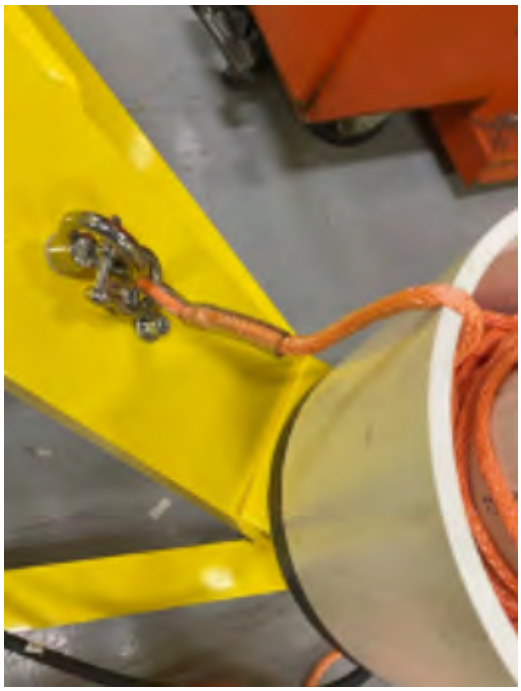
- 7/16 combo wrench
- 2x 9/16 combo wrench
- Philips head screwdriver
- 5/32 hex ball driver

1. Using the (4) bolts, place the canister onto the frame leg with the pop-up bracket. There will be only one configuration where this is possible.

2. Using two 9/16 combo wrenches, secure the bolts by threading on the hex nuts.

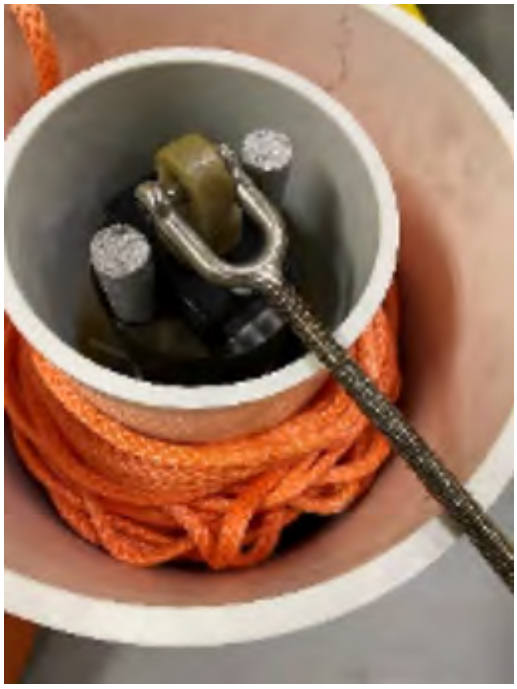



3. Ensure the release cable has not come loose during this process, then connect the cable to the controller housing.
4. Attach one shackle to the eye bolt on the leg of frame.



5. Refer to the EdgeTech Manual, included on the Sediment Trap USB drive, for instructions on arming the pop-up buoy.

6. Neatly coil the spectra line inside the canister. Attach the other shackle end to the pop-up buoy. Attach the threaded rod to the release link using the 5/32 hex ball driver as shown below.



7. Place the pop-up buoy on top of the canister so the threaded rod comes out of the through hole. Using a 9/16 combo wrench secure the flat washer, lock washer and hex nuts.

8. Inspect the integrity of spectra line and ensure that both shackled ends are connected to the frame, and pop-up buoy prior to deployment.

Wet Sample Particle Divider

The Wet Sample Particle Divider (WSD-10) divides wet particulate samples for bio-geochemical analysis into five or ten equal parts. Dividing wet particulate samples provides more pure samples than drying samples to obtain the particulate.

A video that explains use of the WSD-10 can be downloaded from the Sediment Trap Videos page on McLane's website, mclanelabs.com/sediment-trap-videos/.

The WSD-10 includes a rotary sample splitter head, tower, and sample tray with a 500 ml capacity. Dials set the movement speed for the rotary splitter and tower. A quantity of 100 glass vials and 5 plastic sample cups are provided with a new WSD-10.

Setting up the WSD-10

To prevent damage, the Wet Sample Divider is shipped with the sample tray uninstalled.

Follow these steps to install the tray:

1. Wash the sample tray and rotary head with neutral water.
2. Plug the Wet Sample Divider into an AC power outlet.
3. Turn the Tower switch ‘On’ and Press the ‘Up’ button (the Tower must be all the way up before the sample tray can be installed).
4. Slide the sample tray into the grooved notch at the top of the Tower.

Using the Wet Sample Divider

Follow these steps to use the Wet Sample Divider:

1. Set the rotary head speed dial to 10 (1 revolution per second).
2. Set the tower speed dial to 4 (5 cm per second).
3. Place sample cups under the rotary head.
4. Confirm that tower is completely in the ‘Down’ position.
5. Turn the rotary head switch ‘On’.
6. Slowly pour the wet sample into the tray.
7. Press the tower switch ‘On’.
8. When the sample begins to drain from the tray, use a squirt bottle to pour a constant stream of neutral water into the tray and move the sample down into the sample bottles.
9. After the tower stops in the upward position, rinse the sides of the tray with water from the squirt bottle.
10. Press the rotary head switch ‘Off’ and Remove the sample tray.
11. Rinse the side walls of the rotary head.

Optional Deep Sediment Trap Connectors

Sediment Traps deployed at depths from 7,000m to 10,000m, require high pressure penetrators on the controller communications port and motor connector. These high pressure penetrators have a locking collar with an inner locking ring.

Removing Deep Motor Connector

Removing Deep Motor Connector

To remove the motor from the Sediment Trap, the motor connector must fit through a hole in the rotator. First, the red locking collar and inner locking ring must be removed.

Remove the locking collar and locking ring only if the user is removing the motor from the Sediment Trap.

1. Unscrew the locking collar from the Sediment Trap controller housing and unplug the motor bulkhead and slide the red locking collar onto the motor cable.
2. Using a screwdriver or other flat tool such as pliers, lift the silver locking ring by the groove and pull up onto top of locking collar. Continue pulling locking ring until the ring releases from groove inside the locking collar.
3. Remove the red locking collar from the motor cable.
4. Twist the locking ring off of the motor cable.
5. Remove the motor cable by fitting the motor cable through the hole in the rotator.

Re-attaching Penetrator Locking Collar & Ring

Follow these steps to re-attach the locking collar, locking ring and reconnect the motor cable.

1. Slide the motor cable up through the rotator plate.
2. Twist the locking ring sideways onto the motor cable and slide the locking collar back onto motor cable. Face the grooves in the locking collar towards the bulkhead connector.
3. Turn the locking ring to the side to fit into the groove inside the locking collar.
4. With a thumb secured on bottom of red collar, push forward towards the bulkhead.
5. This motion should push the locking ring inside the groove. The locking ring is secure when it snaps into place with a ‘click’

Optional Temperature and Pressure Sensor

Sediment Traps may be optionally equipped with the Sea-Bird model 39plus Temperature (Depth) Recorder. Information on the SBE 39plus can be found at:

https://www.seabird.com/moored/sbe-39plus-temperature-depth-recorder/family?productCategoryId=54627473774

When integrated with the Sediment Trap, power is provided by the Sediment Trap controller. Lithium batteries are removed from the SBE 39plus. Data are stored on the Sediment Trap controller and are available upon recovery from the deployment.

If operating with the batteries installed and connected to external power, be advised that the battery pack is diode-OR'd with the external source, so power is drawn from whichever voltage source is higher.

Sensor Mounting

The SBE 39plus is mounted to the Sediment Trap cross-channel next to the controller housing.

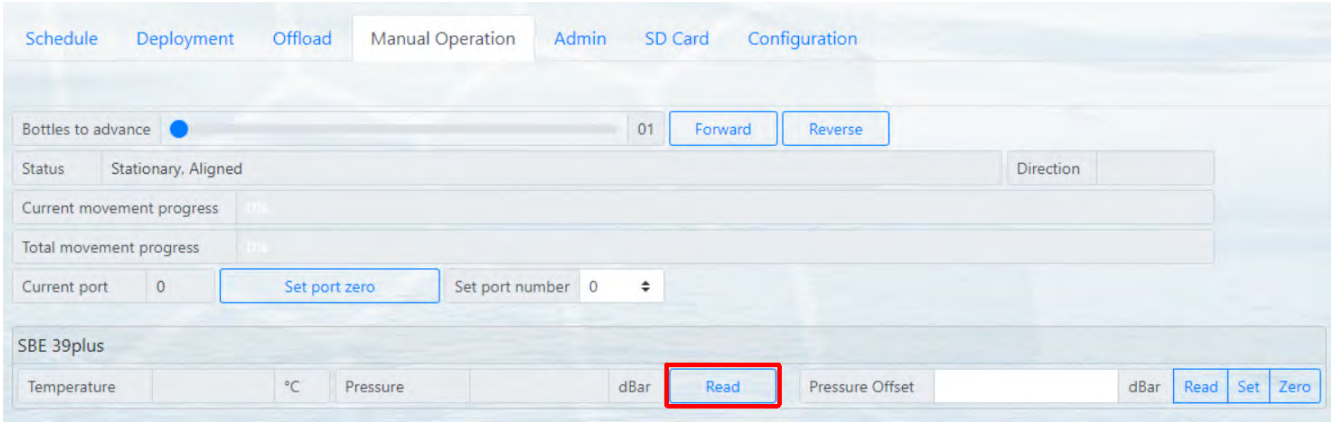
To remove the sensor from the mounting clamps, loosen the bracket screws using a 3/16" Hex

Driver.

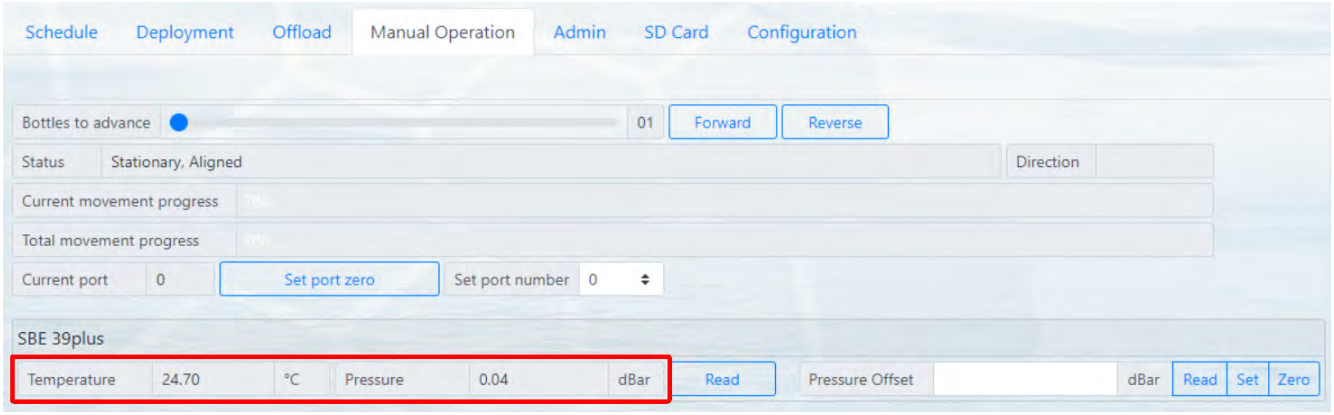
The power and communication cable, M3558, is plugged into the sensor and the controller housing as shown. Screw the connector locking sleeve on finger-tight.

Manual Operation

Control for the SBE 39plus is provided on the **Manual Operation** tab. Click the **Read** button to query the sensor for a measurement.

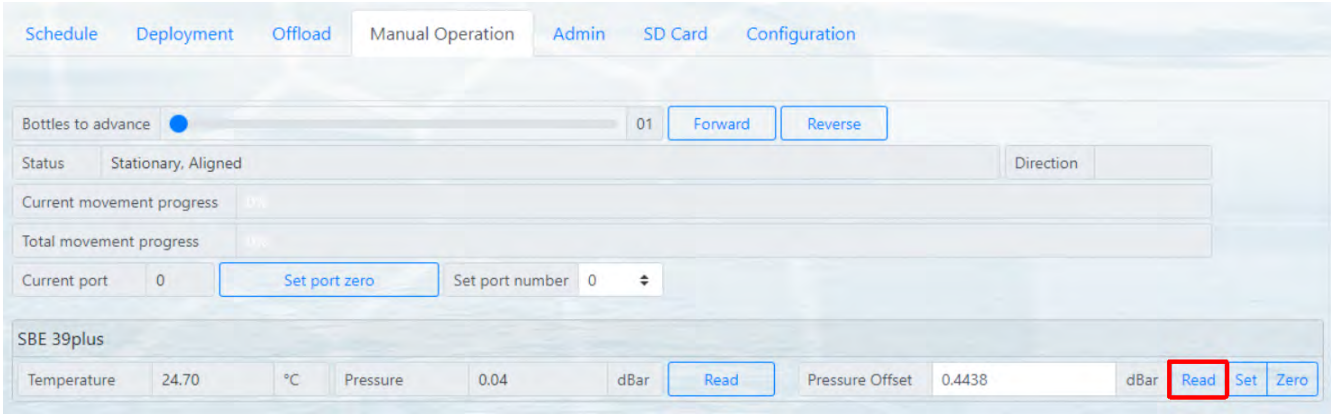


The Sediment Trap will communicate with the SBE 39plus to obtain a temperature and pressure reading.

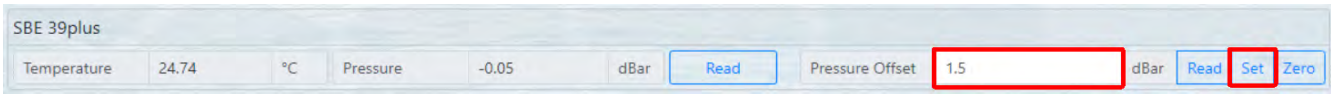


Setting the Pressure Offset

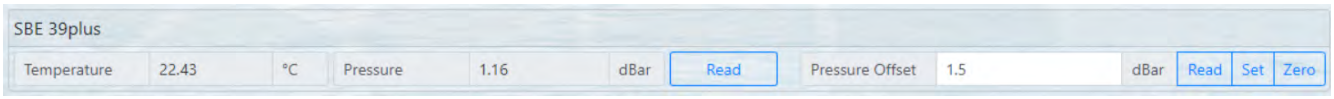
Controls are provided on the **Manual Operation tab** to read and set the pressure offset value. Click **Read** to display the current value for the pressure offset.



A new value may be set by using the **Set** button. Enter a value in the **Pressure Offset** window and click **Set**.

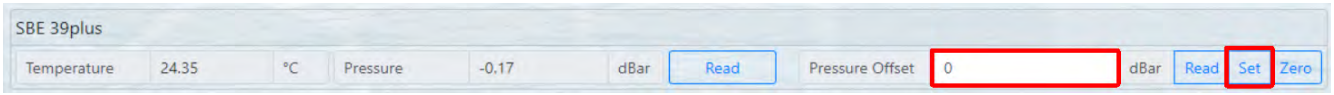


The new adjusted pressure reading will now be displayed.

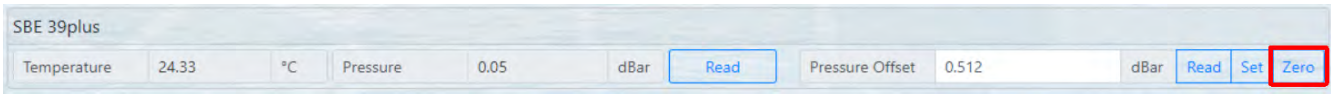


Clicking the **Zero** button will command the sensor to take an average of 5 readings and applies the corresponding pressure offset. Please note that the pressure offset should first be set to '0' before running this routine.

First set the pressure offset to zero.



Next, click **Zero** to take the average of 10 readings and apply the corresponding pressure offset.

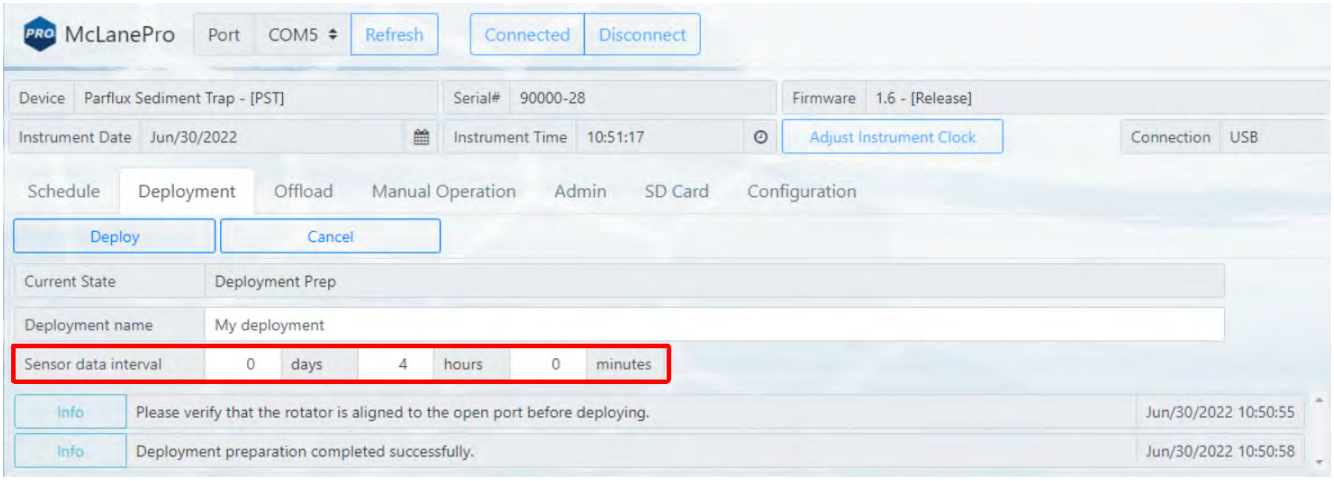


Deployment Settings

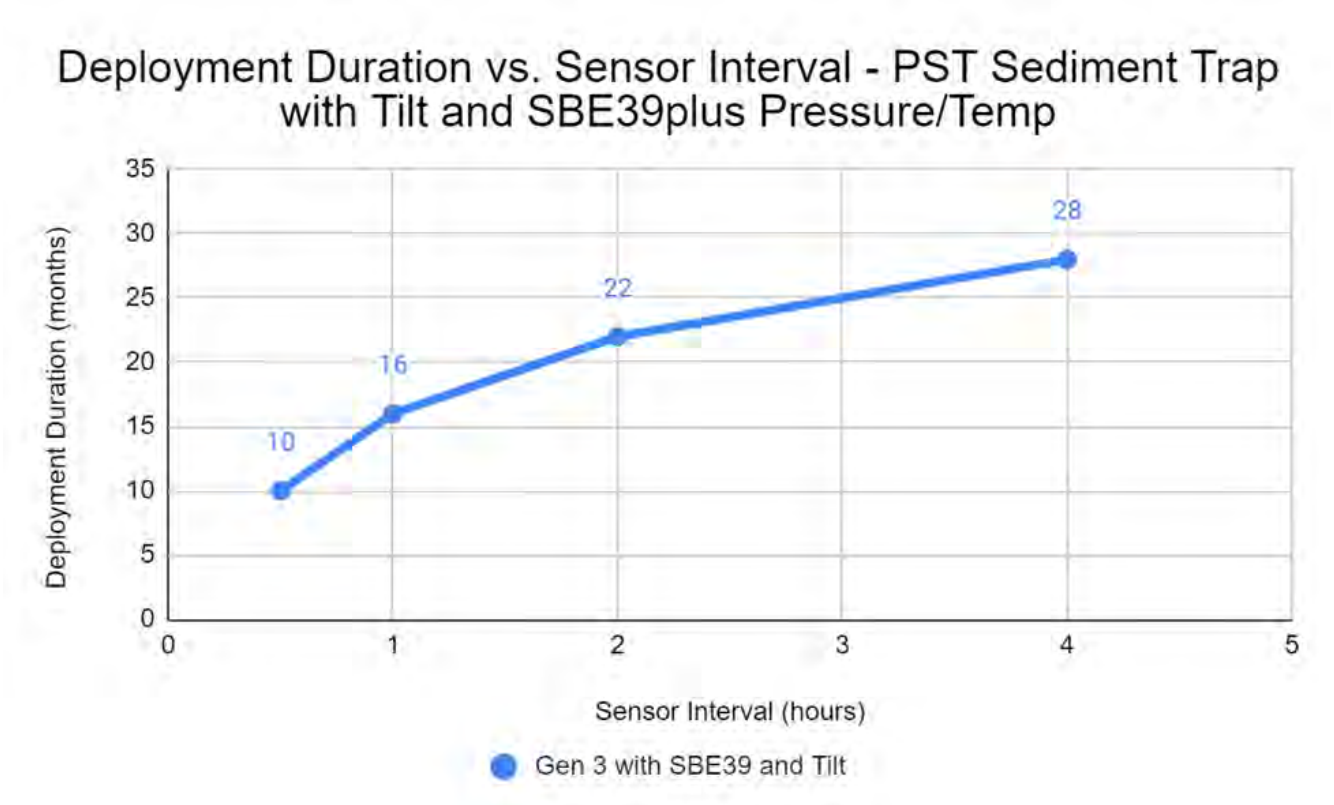
Temperature and pressure measurements are made when an event is started or finished, and also according to the preset sensor interval. Measurements are made interactively while in an adaptive deployment.

Select an appropriate sensor data interval during deployment preparation. The default value is 4

hours.



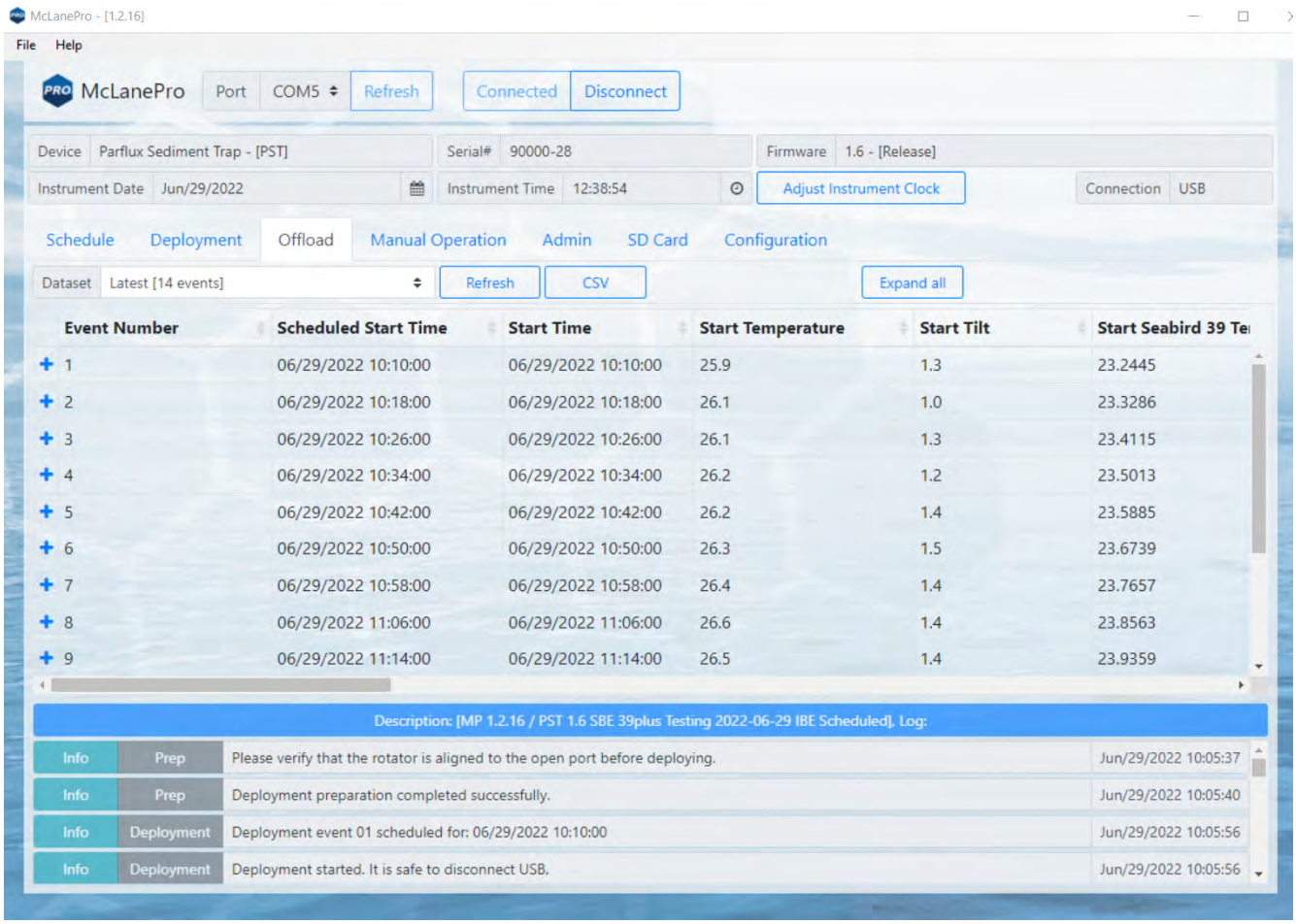
Deployment duration may be limited when using a sensor data interval below the default. See the chart below to estimate the deployment duration.



Offload Tab

The **Offload tab** is used to view and export data collected during deployments.

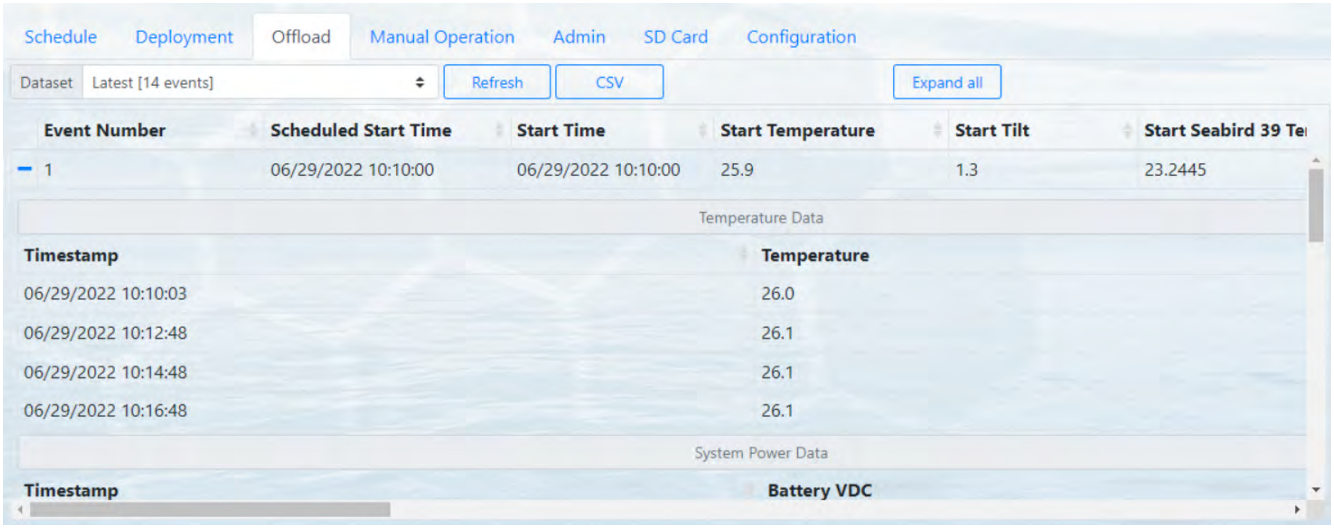
When connecting to a Sediment Trap that has recently completed a deployment, McLanePro loads the **Offload tab** in order to review collected data.



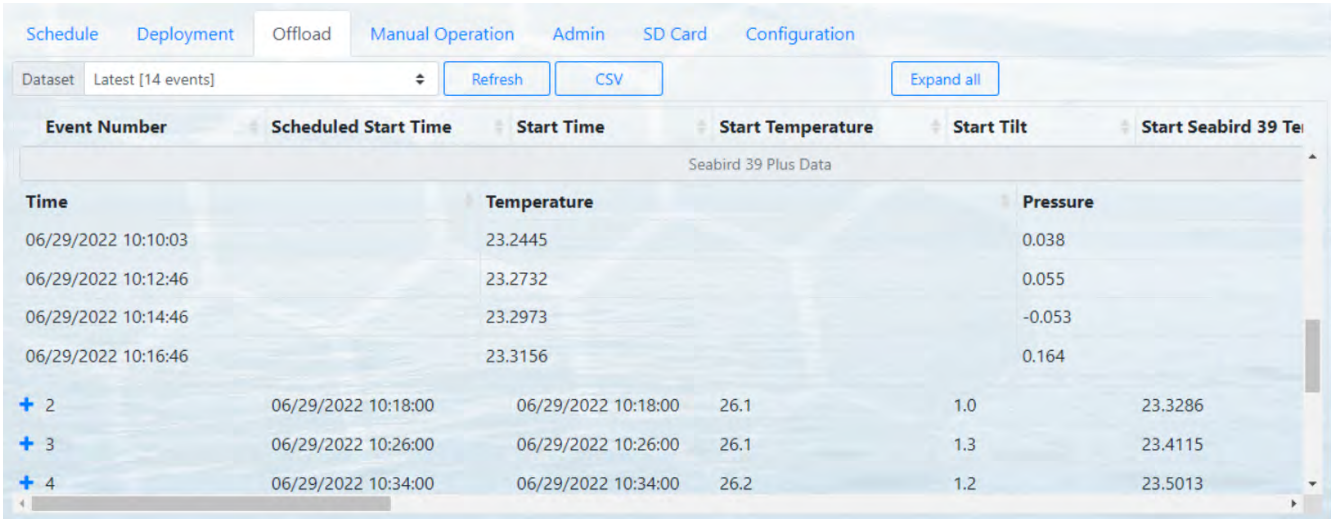
Click the "+" of an event summary row to expand the event data and display the sensor data collected during the event.

Sensor data collected for Event 1 are data collected at the defined sensor data interval while sleeping between event one and event two.

Sensor data readings are always measured at the start and end of an event (a bottle rotation from the current sample to the next bottle), except that no sensor data are collected before the first event, or after the last event.

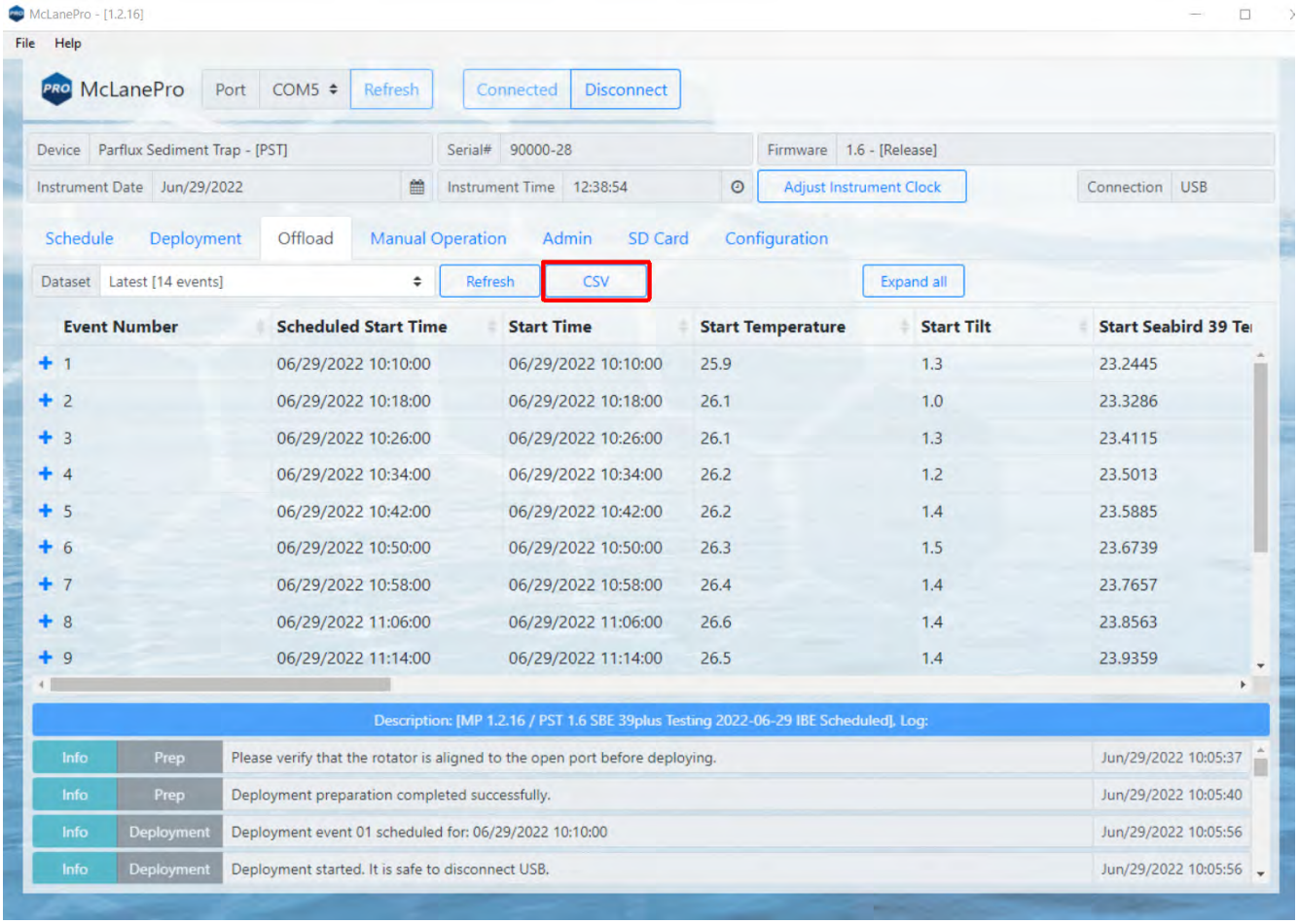


Scroll down to find the additional SBE 39plus data.

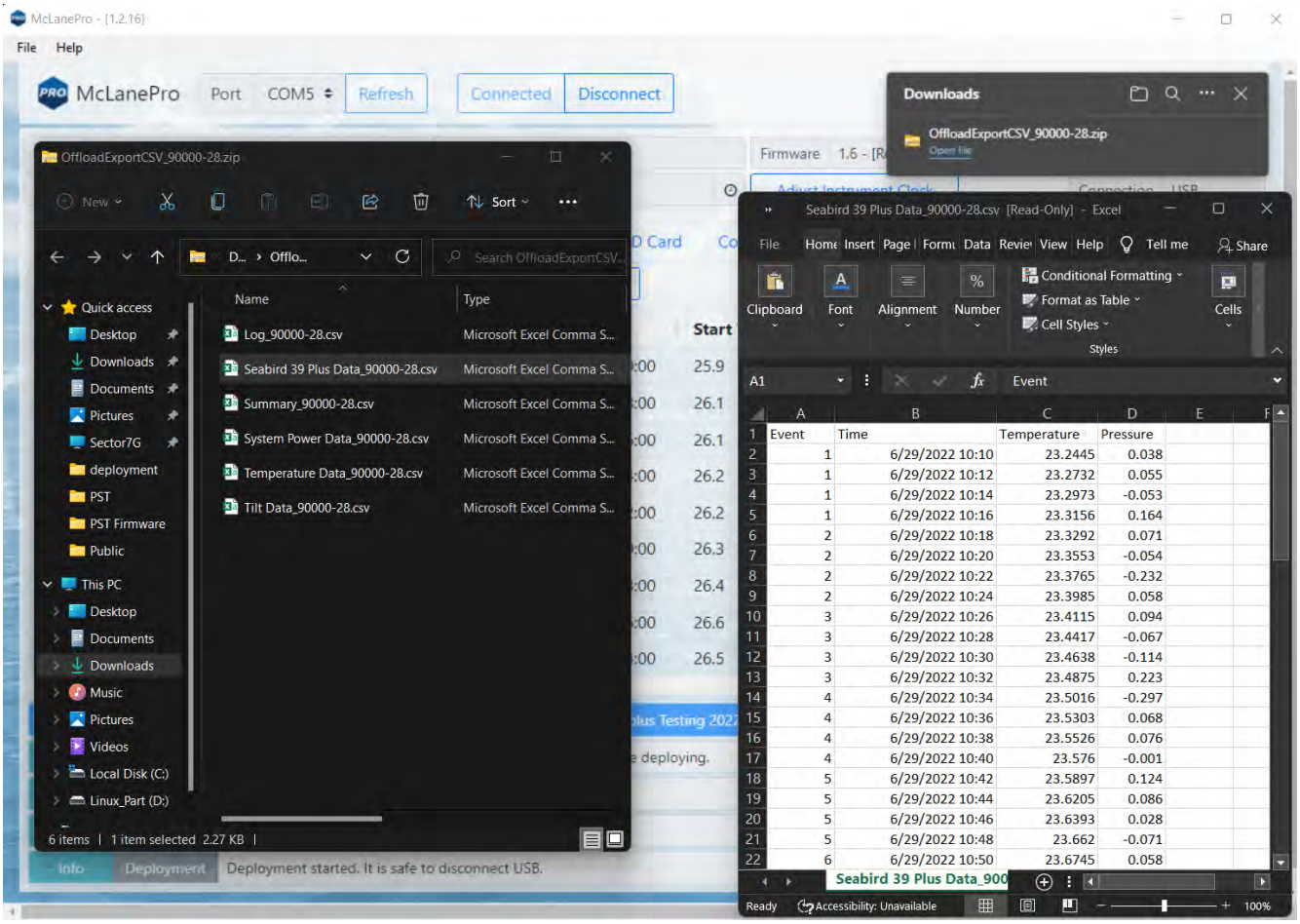


Offload Files

SBE 39plus data are recorded to file and available as part of the data offload. Click **CSV** to offload the compressed data.

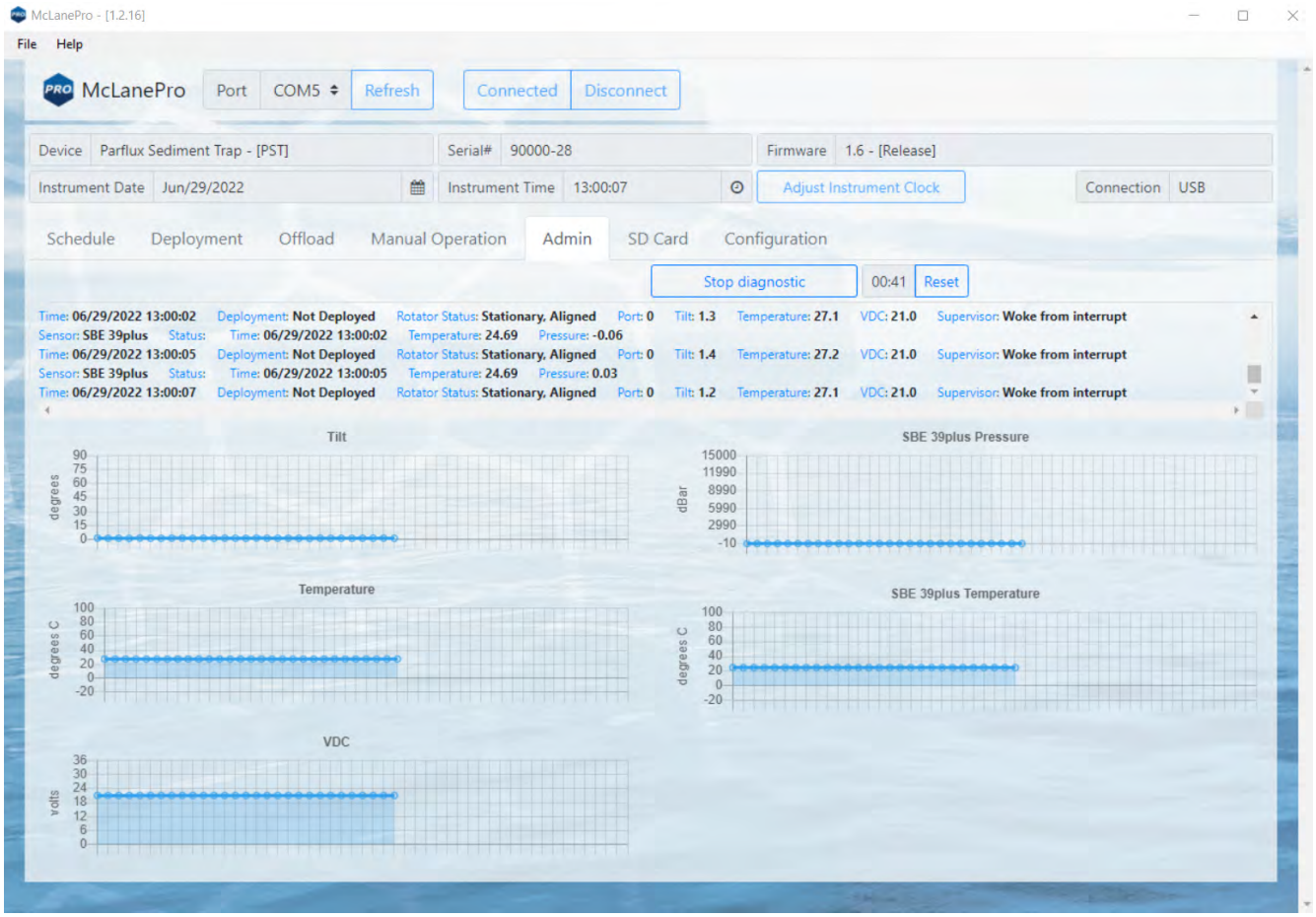


Once extracted, these data are viewable by opening the *Seabird 39 Plus Data_(serial number).csv* file.



Admin Tab

SBE 39plus measurements are also made when using the diagnostic tool on the **Admin tab**. SBE 39plus data are plotted along with the Sediment Trap's internal sensor data.


McLanePro - [1.2.16]
File Help
McLanePro Port COM5 Refresh Connected Disconnect
Device Parflux Sediment Trap - [PST] Serial# 90000-28 Firmware 1.6 - [Release]
Instrument Date Jun/29/2022 Instrument Time 13:00:07 Adjust Instrument Clock Connection USB
Schedule Deployment Offload Manual Operation Admin SD Card Configuration
Stop diagnostic 00:41 Reset
Time: 06/29/2022 13:00:02 Deployment: Not Deployed Rotator Status: Stationary, Aligned Port: 0 Tilt: 1.3 Temperature: 27.1 VDC: 21.0 Supervisor: Woke from interrupt
Sensor: SBE 39plus Status: Time: 06/29/2022 13:00:02 Temperature: 24.69 Pressure: -0.06
Time: 06/29/2022 13:00:05 Deployment: Not Deployed Rotator Status: Stationary, Aligned Port: 0 Tilt: 1.4 Temperature: 27.2 VDC: 21.0 Supervisor: Woke from interrupt
Sensor: SBE 39plus Status: Time: 06/29/2022 13:00:05 Temperature: 24.69 Pressure: 0.03
Time: 06/29/2022 13:00:07 Deployment: Not Deployed Rotator Status: Stationary, Aligned Port: 0 Tilt: 1.2 Temperature: 27.1 VDC: 21.0 Supervisor: Woke from interrupt
Tilt
degrees
90 75 60 45 30 15 0
SBE 39plus Pressure
dBar
15000 11990 8990 5990 2990 -10
Temperature
degrees C
100 80 60 40 20 0 -20
SBE 39plus Temperature
degrees C
100 80 60 40 20 0 -20
VDC
volts
36 30 24 18 12 6 0