TSI® FMS 5 SOFTWARE
HOW TO INTEGRATE
AEROTRAK®+ Remote ACTIVE AIR SAMPLER

TECHNICAL BULLETIN TCC-187
(11/6/2020) Rev B

Contents

Description

This technical note explains, using a procedural example, how to configure the AeroTrak®+ Remote Active Air Sampler (AAS) in FMS 5 Software. It outlines how to create AAS programs that can be assigned to one or more AeroTrak+ Remote AAS sample points.

The instructions and example explained herein are using the FMS Software pharmaceutical screen layout.

Prerequisites

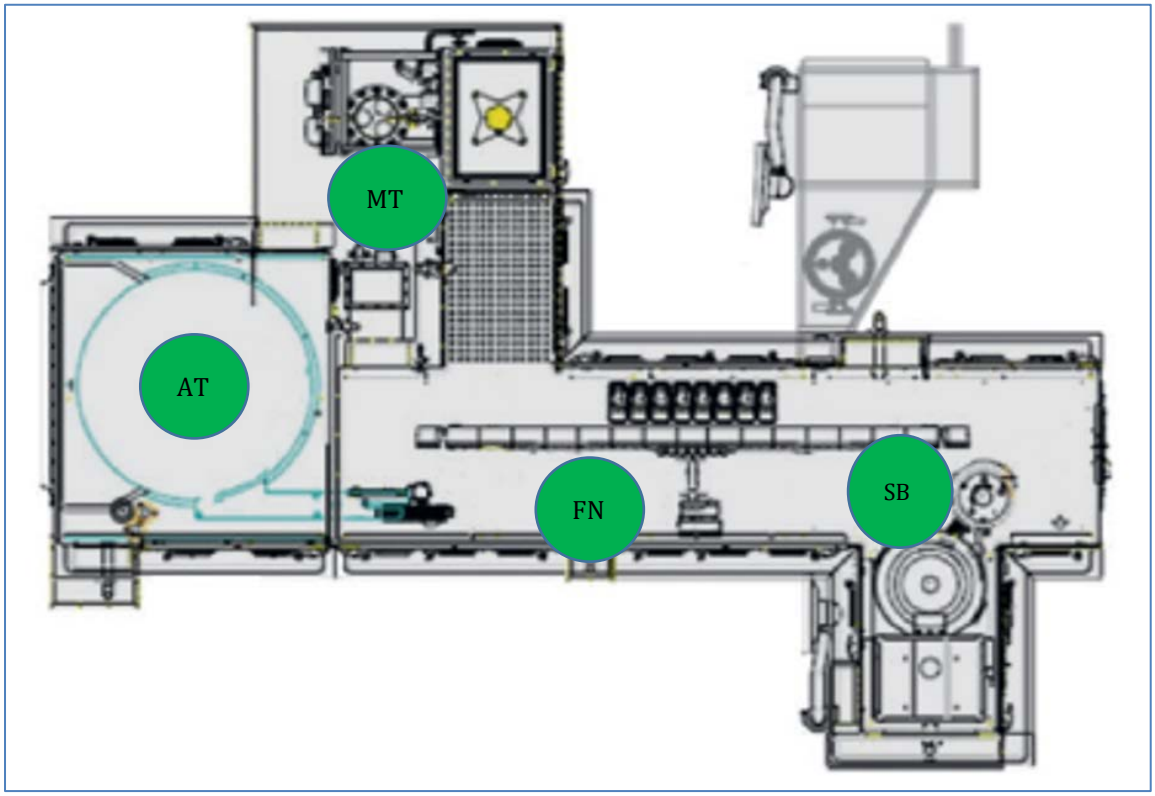
- This procedure is only valid for FMS Software 5.6 or above with use of AeroTrak+ Remote AAS.
- AeroTrak+ Remote AAS is installed following process as outlined in the *Installation Instruction* and *Operation Manual,* and centralized facility vacuum system is turned ON.
- Windows® Firewall Inbound Rule is set to allow multicast on UDP port 5000 or any other port that has been assigned by network administrator.
- Windows® Firewall Inbound Rule is set to allow State Change Notifications on TCP port 3603.

Assumptions

- All AeroTrak+ Remote AAS that will be configured in FMS Software have the following network setup when delivered:
  - ✓ **TCP/IP Address** 192.168.200.90
  - ✓ **Gateway Address** 192.168.200.1
  - ✓ **Subnet Mask** 255.255.255.0
  - ✓ **Multicast Address** 239.100.100.1
  - ✓ **Multicast Port** 5000
- Prior to configuring instruments in FMS Software, the instrument must first be setup with the following network settings with application software:
  - ✓ **TCP/IP Address** 192.168.1.93
  - ✓ **Gateway Address** 192.168.1.1
  - ✓ **Subnet Mask** 255.255.255.0
  - ✓ **Multicast Address** 239.100.100.1
  - ✓ **Multicast Port** 5000

AeroTrak+ Remote AAS Procedural Example

This technical note explains how to configure and setup one AeroTrak+ Remote AAS in FMS Software that is installed near the filling needles and the associated sampling Programs. It will be run following the example below.



AeroTrak+ Remote AAS Locations

Unit Name	AAS Sample Point Name	Locations	
U_AAS_MATERIAL	AAS_MATERIAL	MT	Material Transfer Isolator
U_AAS_ACCUMULATION	AAS_ACCUMULATION	AT	Accumulation Table
U_AAS_FILLING_1	**AAS_FILLING_1**	**FN**	**Fill Needles**
U_AAS_STOPPER	AAS_STOPPER	SB	Stopper Bowl

Note—In the context of this example, we will only configure the **AAS_FILLING_1** Sample Point in FMS Software.

AeroTrak+ Remote AAS Sampling Programs

Sampling Programs that will be configured in FMS Software.

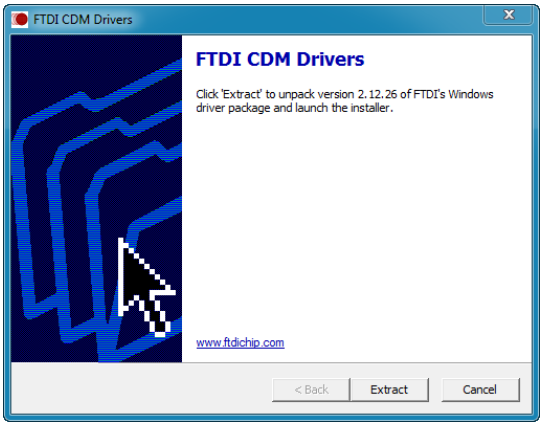
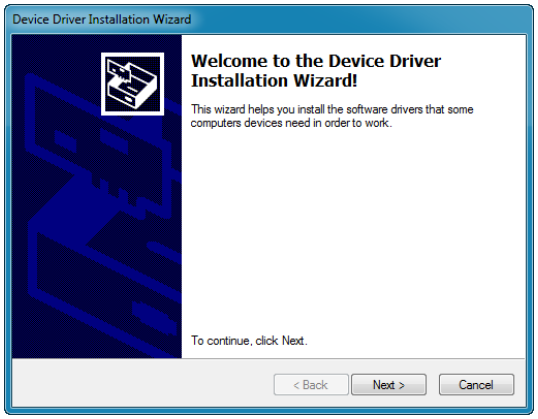
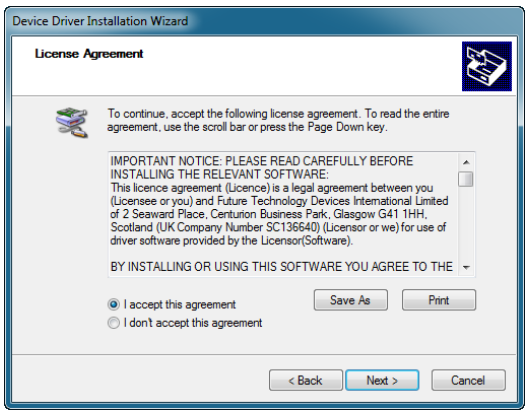
Program Name	AAS Locations	Continuous/ Intermittent	Total Sample Volume	Total Time of Sampling	Delay Time	Total Sample Time	Number of Sample Fractions	Fraction Time	Hold Time
Pre-Fill	MT, AT, **FN**, SB	Continuous	1 m³	Calculated from volume	00:00:00	00:35:21	1	00:35:21	00:00:00
2 hr Fill	AT, **FN**, SB	Intermittent (4 fractions)	1 m³	2 hrs	00:00:00	00:35:21	4	00:08:51	00:28:12
Post-Fill	AT, **FN**, SB	Continuous	1 m³	Calculated from volume	00:00:00	00:35:21	1	00:35:21	00:00:00

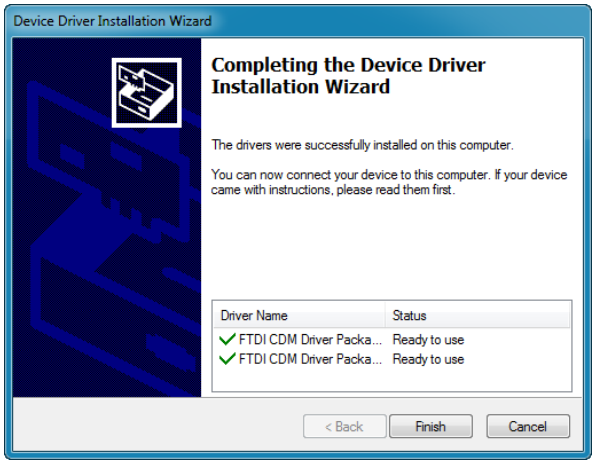
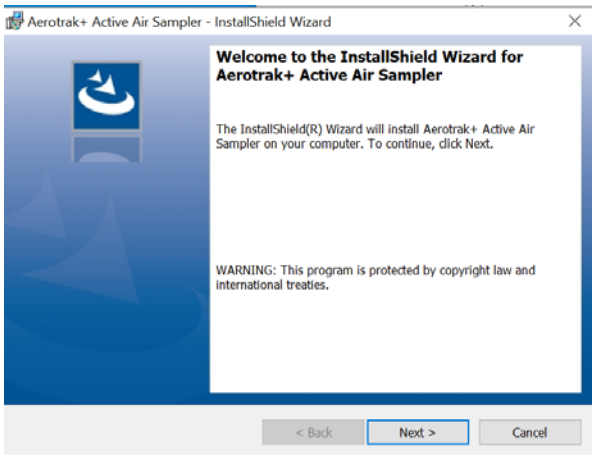
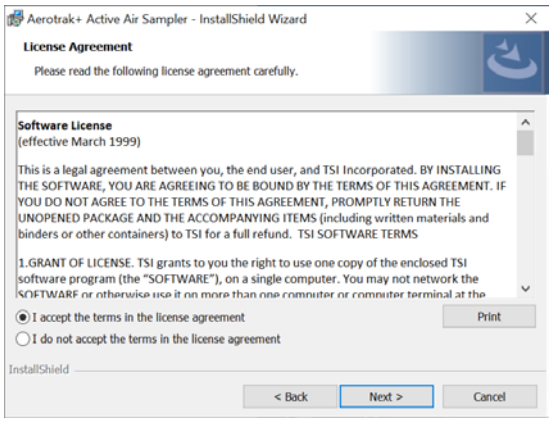
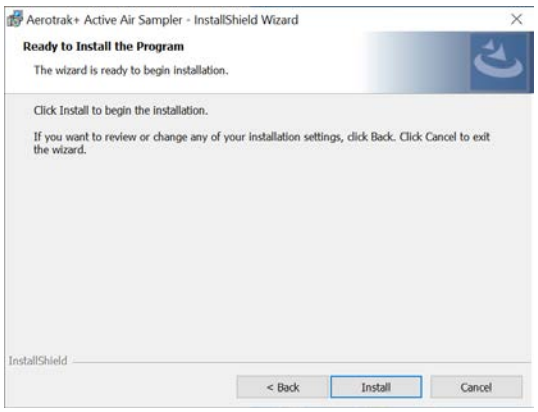
AeroTrak+ Remote AAS Setup

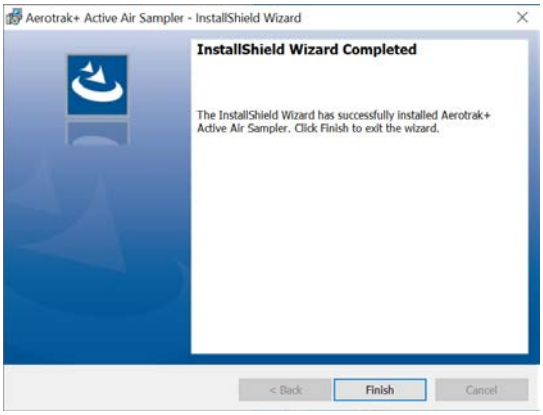
Before starting to setup the AeroTrak+ Remote AAS, install the TSI AeroTrak+ Remote AAS Application and the FTDI driver which can be found on the USB thumb drive delivered with the instrument. Install Adobe® Reader® Software if wanting to use Adobe Reader Software to read report PDF files generated by the app.

To setup the AeroTrak+ Remote AAS, a USB-A to USB-C cable is required.

TSI AeroTrak+ Remote AAS Application Installation

1. Install the FTDI driver by running **CDM21226_Setup.exe.** Follow the on-screen instructions. 2. Click **Extract**.	
3. Click **Next**.	
4. Accept the License terms. 5. Click **Next**.	

6. When installation is finished, click **Finish**.	
7. To install TSI AeroTrak+ Remote AAS Setup Application, run the installer ***ActiveAirSamplerSetup.exe***	
8. Click **Next**. 9. Accept the License terms. 10. Click **Next.**	
11. Click **Install** to start installation.	

12. Click **Finish**.	

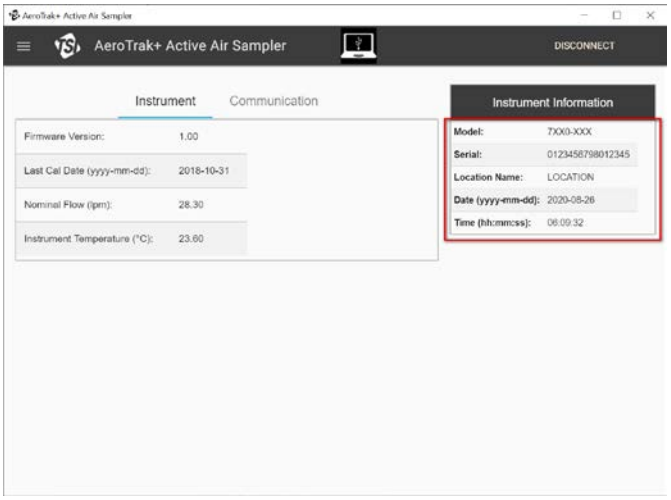
AeroTrak+ Remote AAS Configuration Settings

1. Connect AeroTrak+ Remote AAS to a computer with a USB-A to USB-C cable, the device will initialize.
2. Start the TSI Remote Application by double-clicking the **AeroTrak+ AAS** shortcut on the desktop.

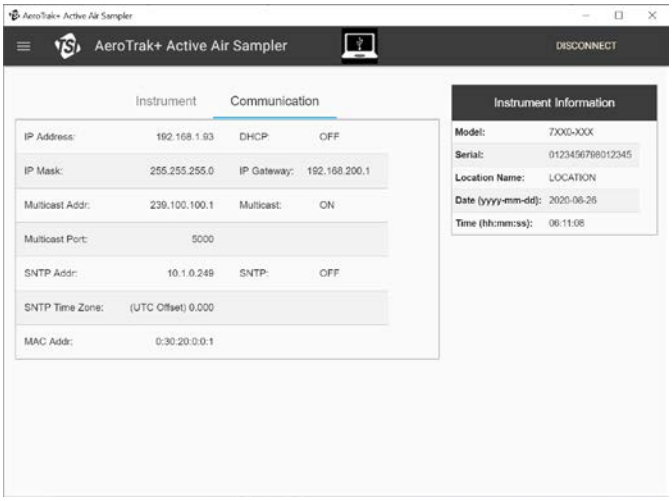
Icon	Description
	TSI Setup Application connected to the AeroTrak+ Device.
	Export AeroTrak+ Active Air Sampler configuration to an XML file for further use.
	Import an XML Template file with configuration settings.

3. When the AeroTrak+ Remote AAS Application starts, it will download the settings saved in the instrument as shown.

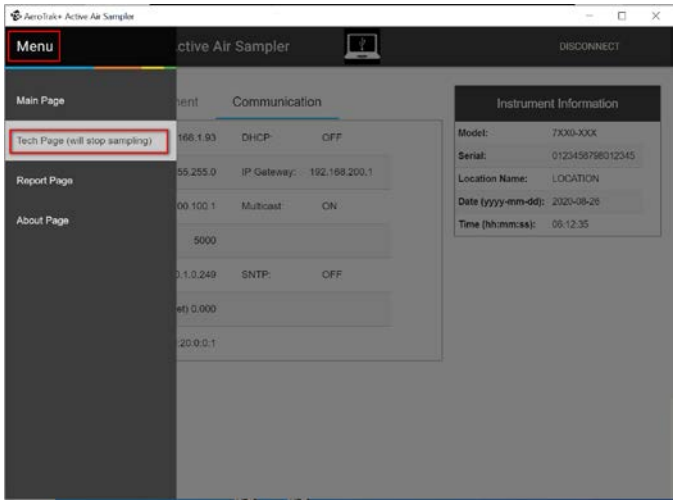
Note—Date and Time will be synchronized with FMS Software after FMS Software configuration is saved except if SNTP is turned ON.



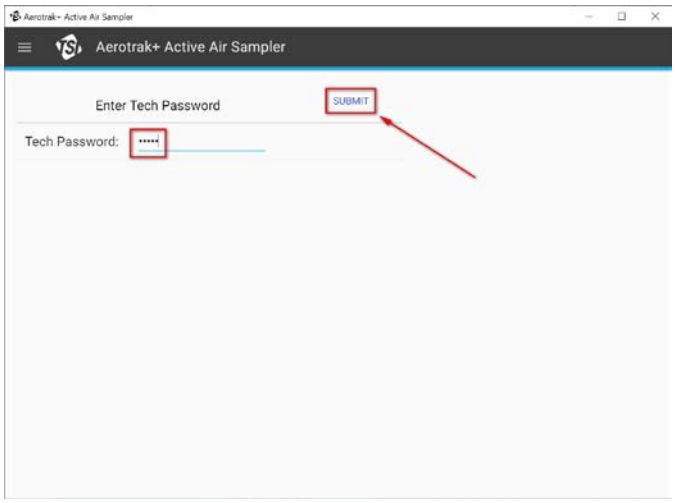
4. Go to the **Communication** tab to check the previously set Instrument Communication Settings.



5. To make any changes to the instrument settings, go to **Menu** and select **Tech Page**.



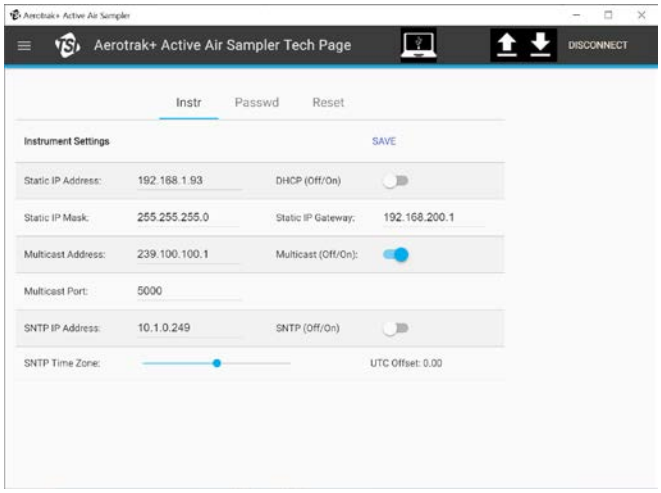
6. When requested, enter **Tech Password** (**admin** by default, must be all lower-case).
7. Click **Submit**.



8. **Instr** screen where the communication settings can be set to display.

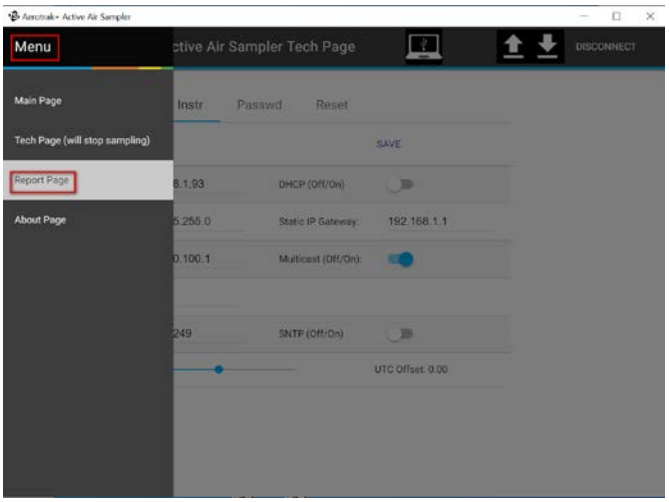
   NOTE—If a template file has been previously saved to quickly configure an instrument, it can be loaded from this point by clicking  icon.

9. Make any changes as required.
10. To save Instrument settings, click **SAVE**
11. After **Instr Settings** are saved, click **OK.**

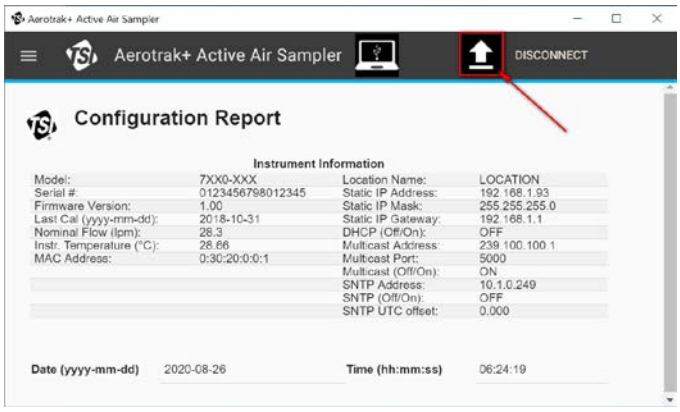


INSTRUMENT SETTINGS	
DHCP (Off/On)	When DHCP (Dynamic Host Configuration Protocol) is turned ON, AeroTrak+ Remote AAS will receive network configuration from a DHCP Server. In such case, Static IP fields will be grayed out.
Static IP Address	Device TCP/IP address.
Static IP Mask	Subnet mask.
Static IP Gateway	Default gateway for the subnet mask.
Multicast Address	IP address used by FMS Software to search for AeroTrak+ Remote AAS. **Default**: 239.100.100.1
Multicast Port	TCP port used by the multicast address. **Default**: 5000
Multicast (Off/On)	Enabled/disabled use of multicast address on the network.
SNTP (Off/On)	Turned ON, SNTP (Simple Network Time Protocol) will allow AeroTrak+ Remote AAS to automatically synchronize internal date and time against a domain NTP server.
SNTP IP Address	IP address of SNTP server. **Example**: time.windows.com at 52.168.138.145
SNTP Time Zone	SNTP protocol is using UTC time. When SNTP is turned ON, an offset against GMT time has to be set related to the time zone where the device is installed.

12. If required you can generate a PDF file report with **ALL** the AeroTrak+ Remote AAS settings.
    a. Go to **Menu**.
    b. Click **Report**.



13. A complete **Configuration Report** will be shown. To save as a PDF file, click  icon.



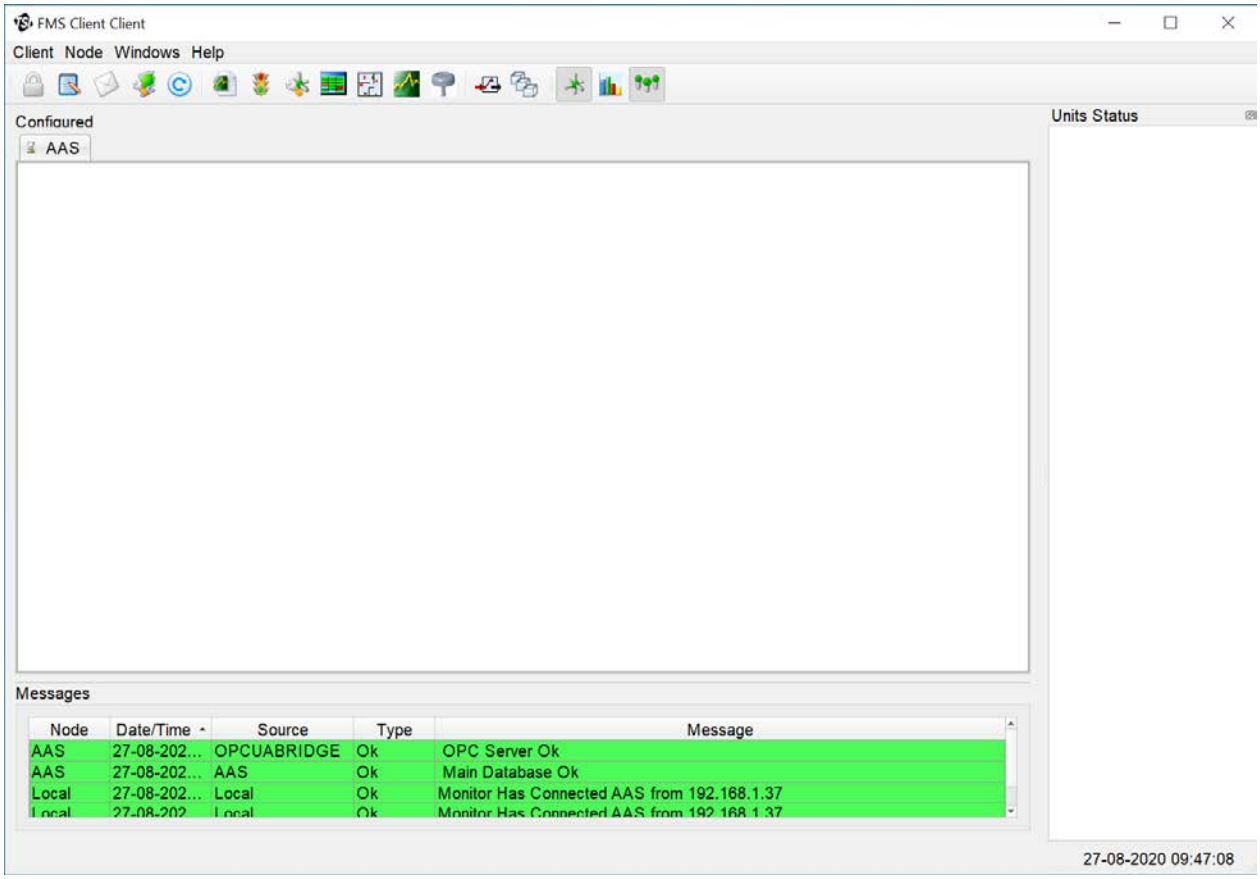
Configuration of AeroTrak+ Remote AAS in FMS Software

Adding Instrument

For this example, the following settings for Example 1 are assumed for the instrument:

	Example 1
TCP/IP Address.....	192.168.1.93
Gateway Address.....	192.168.1.1
Subnet Mask.....	255.255.255.0
Location.....	Filling_1
FMS Unit Name	U_AAS_FILLING_1
FMS Sample Point Name.....	AAS_Filling_1

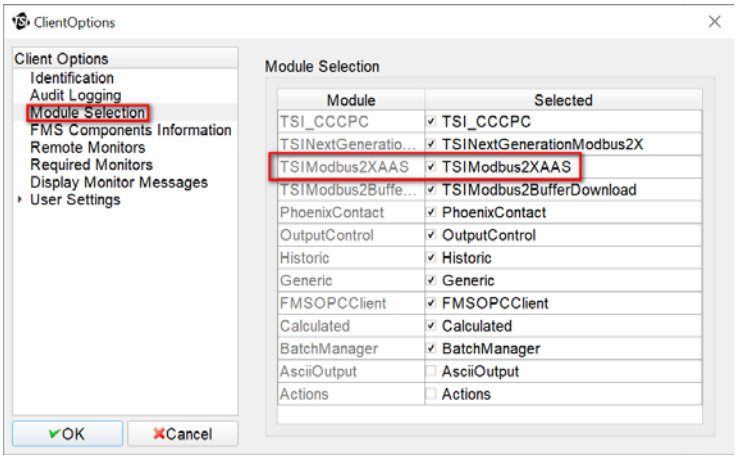
1. Start **Guard Service**.
2. Start FMS Client.



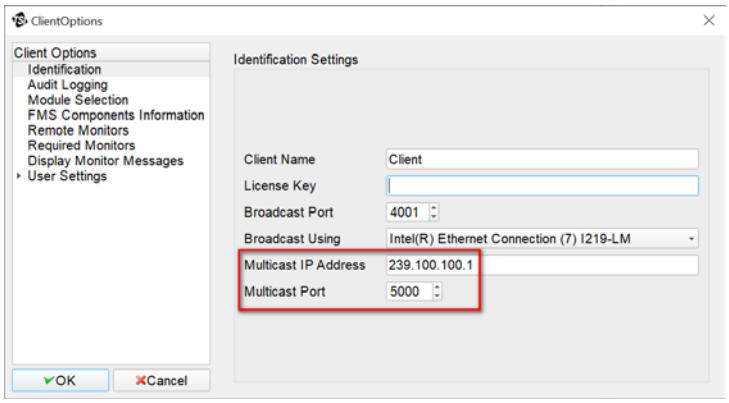
3. Go to **Client** menu. Select **Client Options.**
4. Verify that the following settings are set according to the instrument setup.

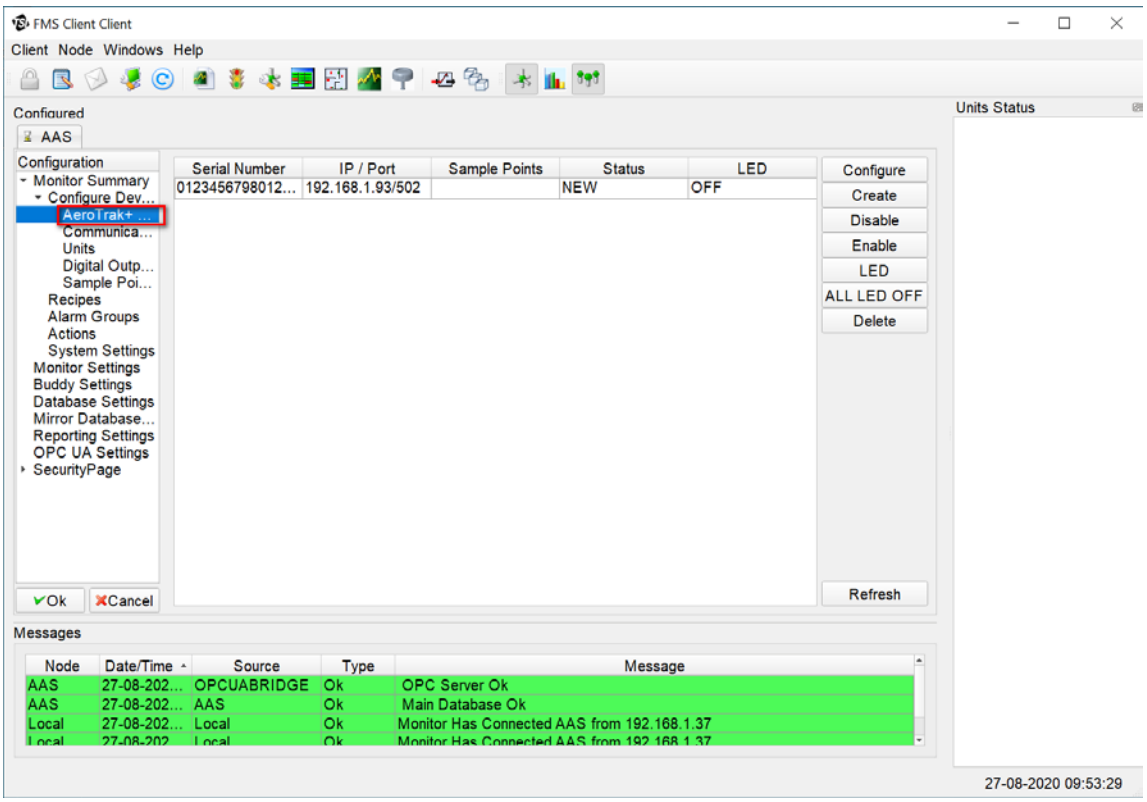
Multicast IP Address	Default Address is 239.100.100.1
Multicast Port	Default Value is 5000

5. Go to **Module Selection** to confirm **TSIModbus2XAAS** is selected.



6. If one of the multicast settings is changed, the corresponding settings will need to be changed on the instrument.
7. If one of the above settings is changed, click **OK** and restart **FMS Client**.
8. Go to **Configure Node**.
9. Expand **Monitor Summary**.
10. Expand **Configure Devices**.
11. Click **AeroTrak+ Devices**.



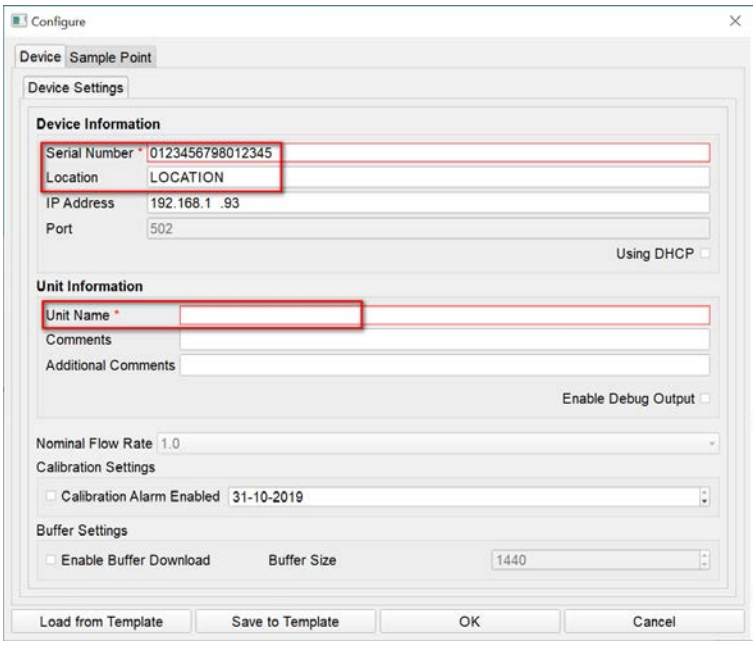


12. When **Multicast Address** is enabled on the instrument, the instrument will automatically be listed in FMS Software to configure and **NEW** will display in the **Status** column.
13. The different **Status** levels of the instrument include:

NEW	New instrument needs to be configured.
PENDING	Instrument configured but waiting for FMS Software configuration to be saved. *or* Instrument modified but waiting for FMS Software configuration to be saved.
CONNECTED	Instrument and FMS have established a connection.
DISCONNECTED	Instrument is disconnected from the network.
SAMPLING	Instrument is configured, enabled, and sampling.
DISABLED	Instrument is set to disabled.

14. Select the instrument by clicking on the **Serial Number**.
15. Click **Configure**.
16. **Device Settings** tab will display.

    At this time, FMS Software is loading the settings set in the instrument during setup.



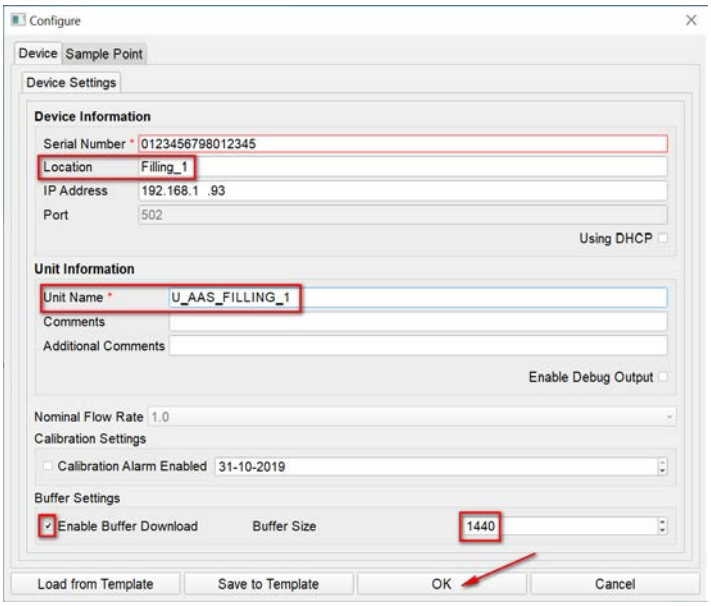
DEVICE INFORMATION	
Serial Number	When instrument is listed from the multicast network, the serial number is automatically read from the instrument.
Location	Location name. This has to be programmed with TSI APP
IP Address	The IP address of the instrument. This is used by FMS Software to configure the instrument and collect data from it.
Port	Modbus port number to communicate with instrument. Default value is 502.
Using DHCP	Enabling DHCP mode will automatically disable **IP address** selection. **NOTE:** When using DHCP mode, be sure the DHCP server will always assign the same IP address when lease time expires.

UNIT INFORMATION	
Unit Name	Enter the name for the instrument.
Comments	Enter comments about the instrument.
Additional Comments	Enter additional comments about the instrument.
Nominal Flow Rate	Nominal flow rate of the instrument.
CALIBRATION SETTINGS	
Calibration Alarm Enabled	According to the date entered, FMS 5 Software will start generating warnings that the calibration date for the instrument is approaching.
BUFFER SETTINGS	
Enable Buffer Download	FMS Software will download, from the device buffer, up to the number of samples entered in **Buffer Size** after recovering from a communication issue. Buffer download option is always enabled.
Buffer Size	Number of samples to be downloaded when **Enable Buffer Download** is enabled. **Default Value** 1440 (1 day) **Max Value** 256000

17. Enter the following settings to configure the instrument.

Serial Number	**DO NOT** change as it is read direct from the instrument.
Location	Enter the location where instrument is installed. **Filling_1**
IP Address	**DO NOT** change as it is read direct from the instrument.
Using DHCP	Ensure **Using DHCP** is unchecked.
Unit Name	**U_AAS_FILLING_1**
Comments	Enter comments about the instrument.
Additional Comments	Enter additional comments about the instrument.
Enable Buffer Download	Checked.
Buffer Size	For purposes of this document, either disable buffer download or select a buffer size >1.

18. Click **Device Recipe** tab.

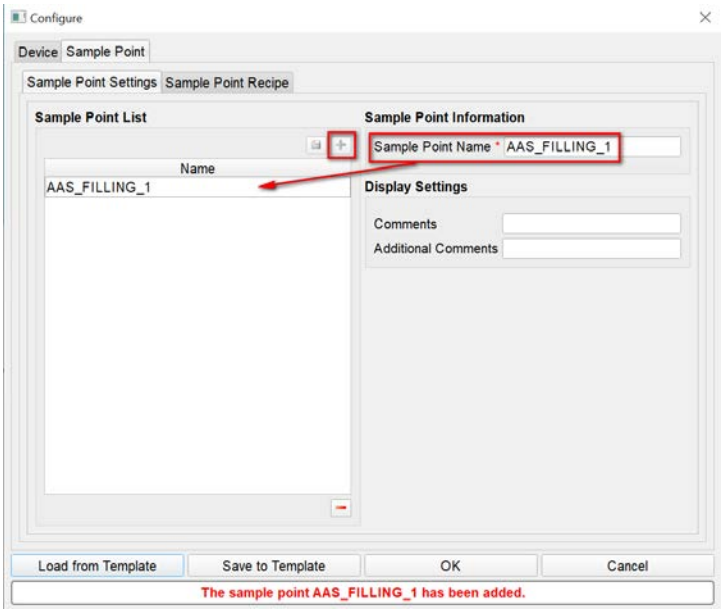


19. Click **Sample point** tab.

20. Enter the following information to configure the instrument.

    Sample Point Name:
    AAS_FILLING_1

21. Click + icon to add sample point.



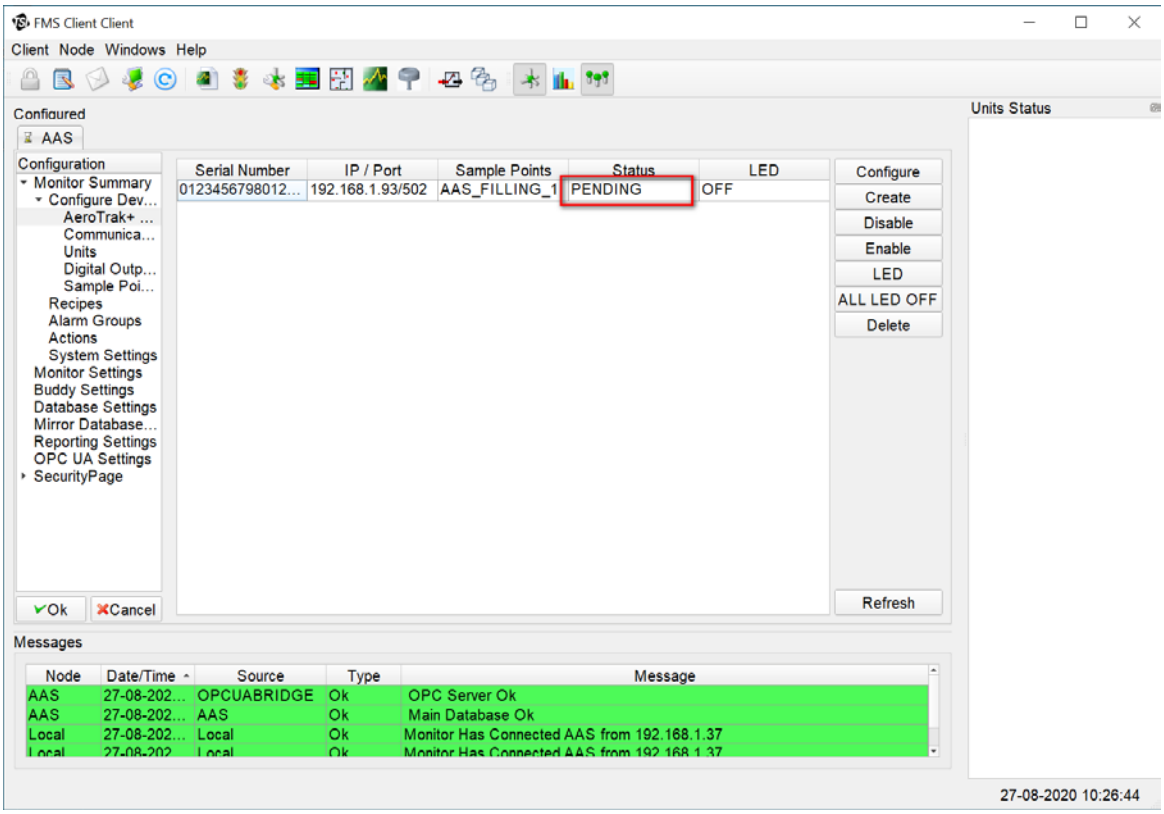
22. Click **OK** to exit **AeroTrak+ Devices** configuration screen.

SAMPLE POINT INFORMATION	
Sample Point Name	Name must start with letter A to Z and may not contain spaces. Name must be alpha-numeric. Underscore character is allowed. **NOTE:** Maximum of 32 characters allowed. Only one sample point Name can be added to the list of **Name**
	Click to add a new recipe.
	Click to save recipe settings.
	Click to delete a selected recipe.

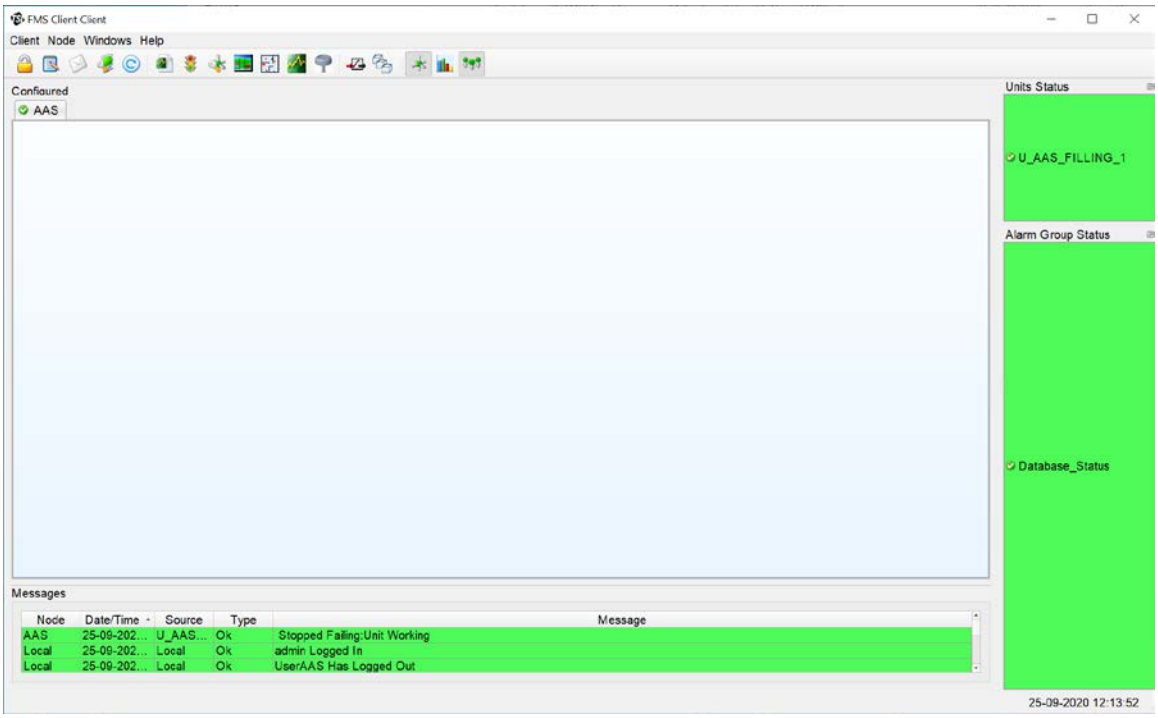
23. Click **OK.**

24. Click **Save** to save FMS Software configuration.

25. Click **Yes** to reboot the monitor.



26. After monitoring node is restarted, your FMS Software screen will look like below.



Create AeroTrak+ Remote AAS Programs

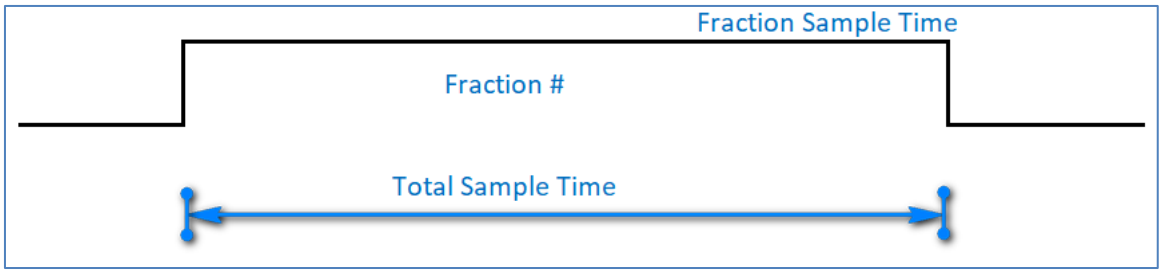
An AeroTrak+ Remote AAS Program is a sampling program that can be assigned to one or more AeroTrak+ Remote AASs. When started, an AeroTrak+ Remote AAS program will automatically sample a user-defined volume of air during a predefined time, with or without a user-defined delay time prior to starting. The sample volume can be sampled in a user-defined number of fractions over the course of the user-defined time.

AeroTrak+ Remote AAS Programs are accessible by clicking  icon **. AeroTrak+ Remote AAS Programs** window allows new AeroTrak+ Remote AAS Program to be added. They can also be edited or deleted, but always remain available for recall during Reports.

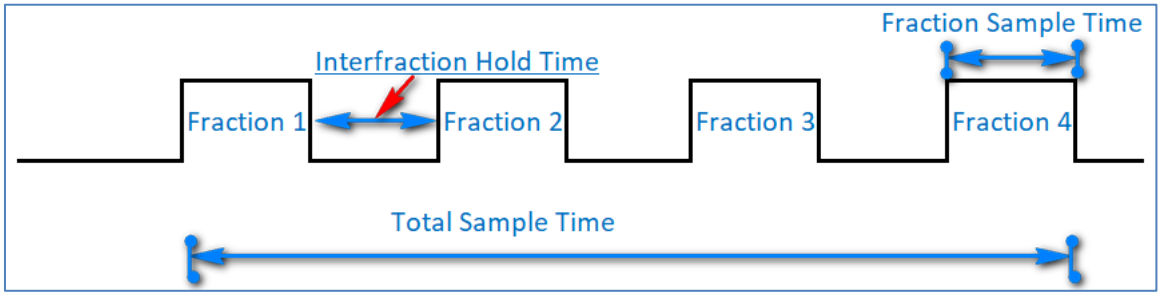
FMS Software can store up to 100 different AeroTrak+ Remote AAS Programs. If a User does not have AeroTrak+ Remote AAS **Edit** Program permissions assigned, FMS Software will hide the **AAS Programs** icon.

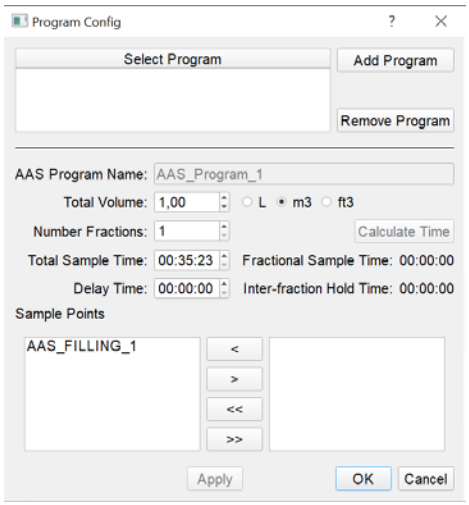
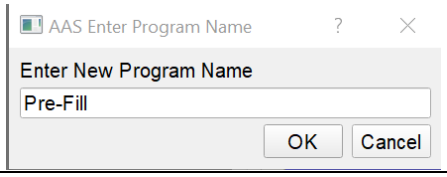
Field Label	Description
Total Volume	Desired volume to be sampled by the AeroTrak+ Remote AAS Program.
Number Fractions	Desired Number of fractions to be sampled by the AeroTrak+ Remote AAS Program.
Total Sample Time	Desired Sample Time of the AeroTrak+ Remote AAS Program. The sample Time is the total amount of time to complete the Program. The Total Time can be split into fractions.
Fractional Sample Time	Amount of sampling time per fraction of the AeroTrak+ Remote AAS Program.
Delay Time	The desired delay time used by the AeroTrak+ Remote AAS Program. The Delay Time is the amount of time the Program will wait after starting before beginning its sampling.
Inter-fraction Hold Time	Amount of hold time per fraction of the AeroTrak+ Remote AAS Program.
Calculate Time	The Calculate Time button is used to calculate the sampling times and hold times based on the total volume and number of fractions of the AeroTrak+ Remote AAS Program.

Program Example 1: A single fraction where the total volume is sampled continuously.



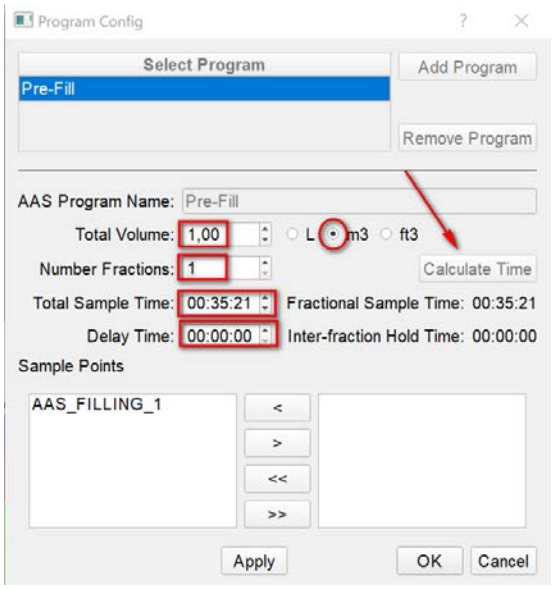
Program Example 2: Four sample fractions where the total volume is sampled in four equal fractions with an interfraction Hold Time that is dependent upon the Total Sample Time defined by the User.



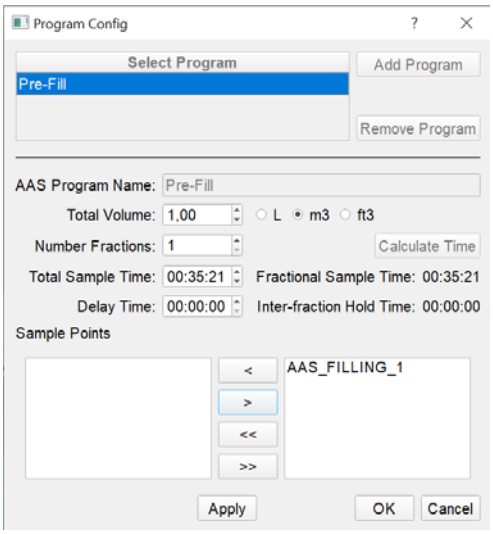
1. Click  icon on the Main screen. This screen allows Users to configure AAS Program. An AAS Program may be a simple combination of multiple AAS Sample Points and a set of AAS timing settings. 2. **Active AAS Programs** window will come up.	
3. Click **Edit Programs** 4. **Program Config** will popup	
5. Click **Add Program**. 6. Enter **Program Name** as mentioned in Program Pre-Fill Example **7.** Click **OK**	

8. Enter settings for **Pre-Fill** program as mentioned in Program Pre-Fill Example :
   - Total Volume: **1m³**
   - Number Fractions: **1**
   - Total Sample Time: **00:35:21**
   - Delay Time**:** **00:00:00**
9. Click **Calculate Time** button to calculate.

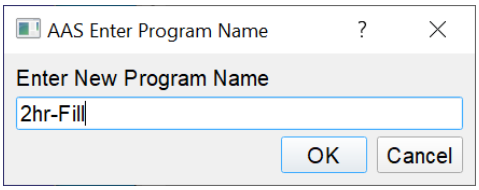
Note—Calculate Time button will calculate Sampling Time and Hold Time based on the Total Volume and Number of Fractions



10. In **Sample Points** list, select the Sample Point(s) to which this program is assigned.
11. Click **>** button to move the selected Sample Point(s) to the right frame.
12. Click **Apply.**
13. Click **OK.**

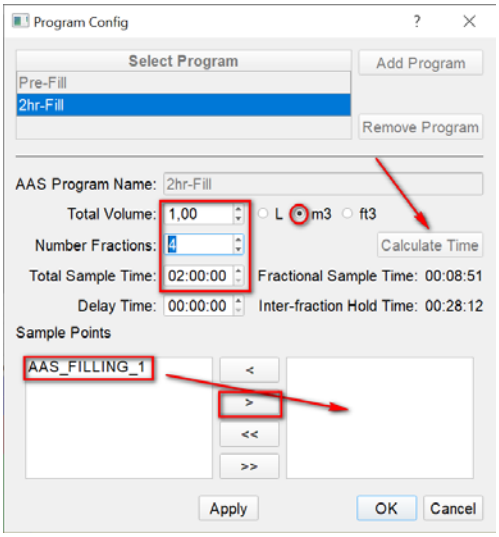


14. Click **Edit Programs.**
15. Click **Add Program**.
16. Add **2 hr-Fill** program.
17. Enter **Program Name** as mentioned in Program 2 hr-Fill Example.
18. Click **OK.**



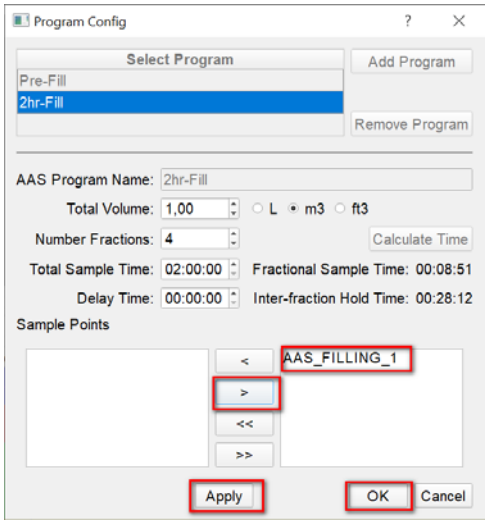
19. Enter settings for **2 hr-Fill** program as mentioned in Program 2 hr-Fill Example:
   - Total Volume: **1m³**
   - Number Fractions: **4**
   - Total Sample Time: **02:00:00**
   - Delay Time**:** **00:00:00**
20. Click **Calculate Time** button to calculate.

Note—Calculate Time button will calculate Sampling Time and Hold Time based on the total Volume and Number of Fractions.

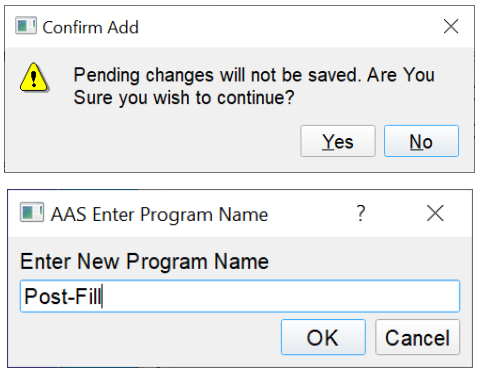


21. In **Sample Points** list, select the Sample Point(s) to which this program is assigned.
22. Click **>** button to move the selected Sample Point(s) to the right frame.
23. Click **Apply.**

    Note—Sample points moved to the right frame are included in the program.

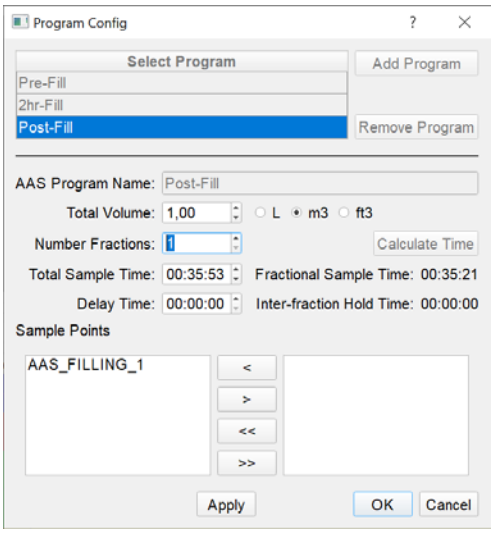


24. Click **Add Program**.
25. Click **Yes** to confirm you wish to continue.
26. Add **Post-Fill** program.
27. Enter **Program Name** as mentioned in [Program Post-Fill Example.]
28. Click **OK.**



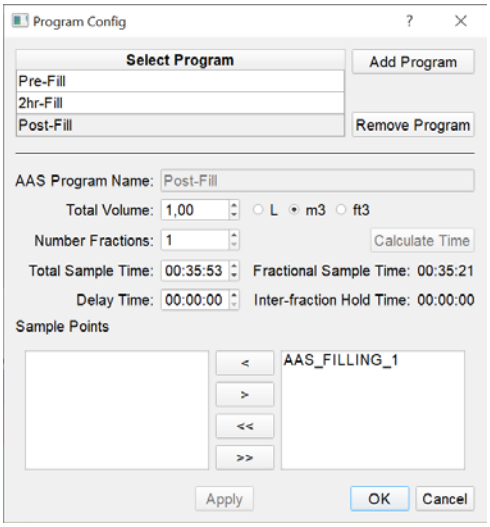
29. Enter settings for **Post-Fill** program as mentioned in [Program Post-Fill Example] :
    - Total Volume: **1m³**
    - Number Fractions: **1**
    - Total Sample Time: **00:35:21**
    - Delay Time**:** **00:00:00**
30. Click **Calculate Time** button to calculate.

Note—Calculate Time button will calculate Sampling Time and Hold Time based on the total Volume and Number of Fractions.



31. In **Sample Points** list, select the Sample Point(s) to which this program is assigned.
32. Click **>** button to move the selected Sample Point(s) to the right frame.
33. Click **Apply**

    Note—Sample points moved to the right frame are included in the program.



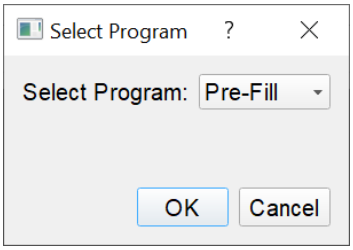
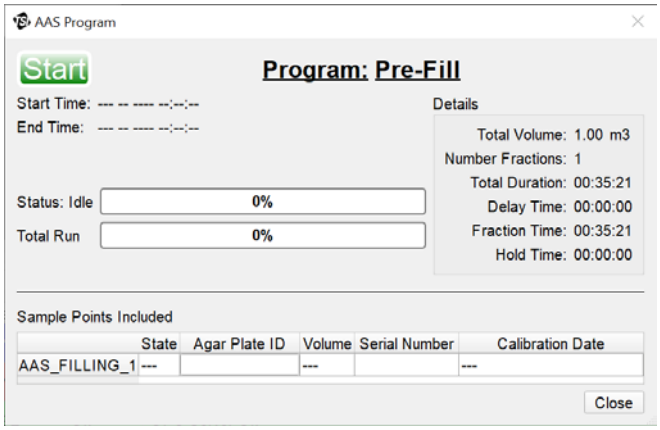
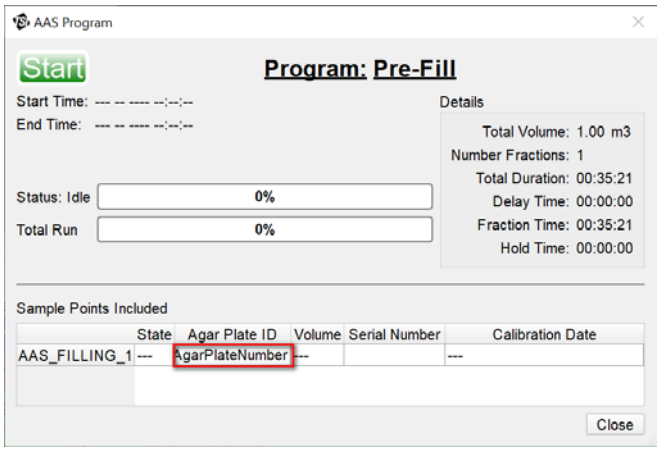
34. Click **OK** to return to Main Screen.

Running AeroTrak+ Remote AAS Programs

Once AeroTrak+ Remote AAS Sample Points are configured and one or more Programs are defined, the user can run a sampling Program by following these steps.

IMPORTANT NOTE
Changing the Location Name in FMS configuration while a program is running is "**Not Supported**". Trying to do so will stop the program in-progress.

Starting an AeroTrak+ Remote AAS Program

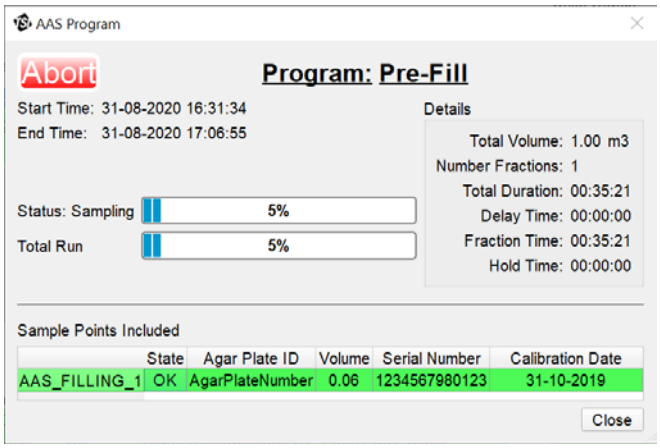
1. Click  icon on the Main screen to access **Active AAS Programs.** 2. Click **Select Program** button. 3. From the **Select Program** drop down list, select **Pre-Fill.** 4. Click **OK.**	
5. **Pre-Fill** Program appears on the **Active AAS Programs** window.	
6. Click once on the **Pre-Fill** Program so that the **AAS Program** window shows up.	
7. Click on the **Agar Plate ID** for the **AAS_FILLING_1** Sample Point. 8. Enter the **Agar Plate ID**. Only Alphanumeric characters are accepted.	

9. Click **Start** button. When **Start** button is clicked, **Abort** button will display to allow the AAS Program to be stopped.

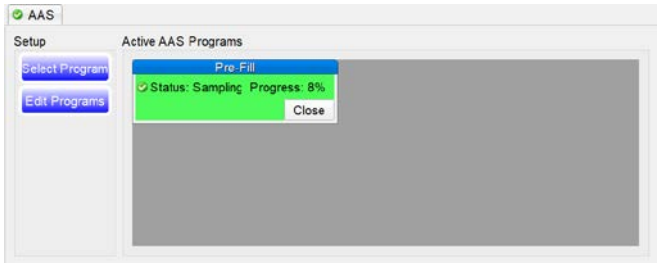
Note—Starting an AAS Program is not allowed until all Agar Plate IDs are entered.

If FMS Software Security is turned ON, the operator will have to give their credentials before starting an AAS Program.

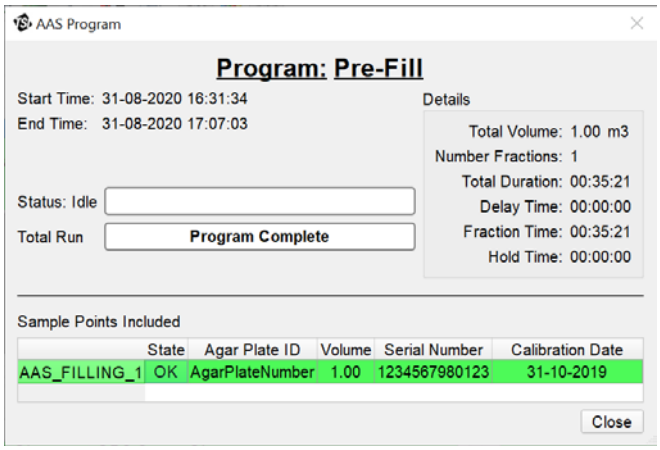
Clicking Start button will be reflected in the Audit Log.



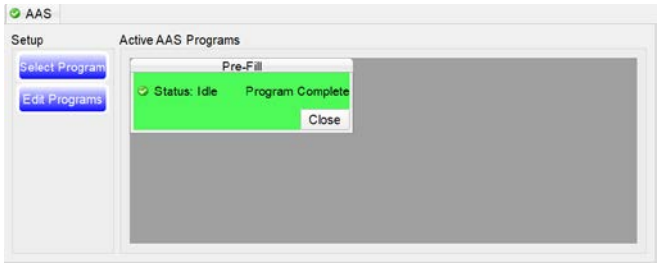
10. If the **AAS Program** window is closed during sampling, a minimized view will be shown on the Active AAS Programs window showing the progress.



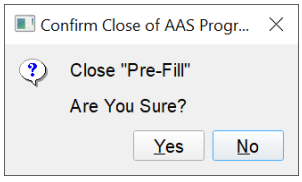
11. When AAS Program is finished, **Abort** button will be hidden.
12. Click **Close** button.



13. On the **Active AAS Programs** window, the **Pre-Fill** Program shows complete.



14. It can remain viewable on the screen or click **Close** to remove the Program from the running list. Confirm to remove it.

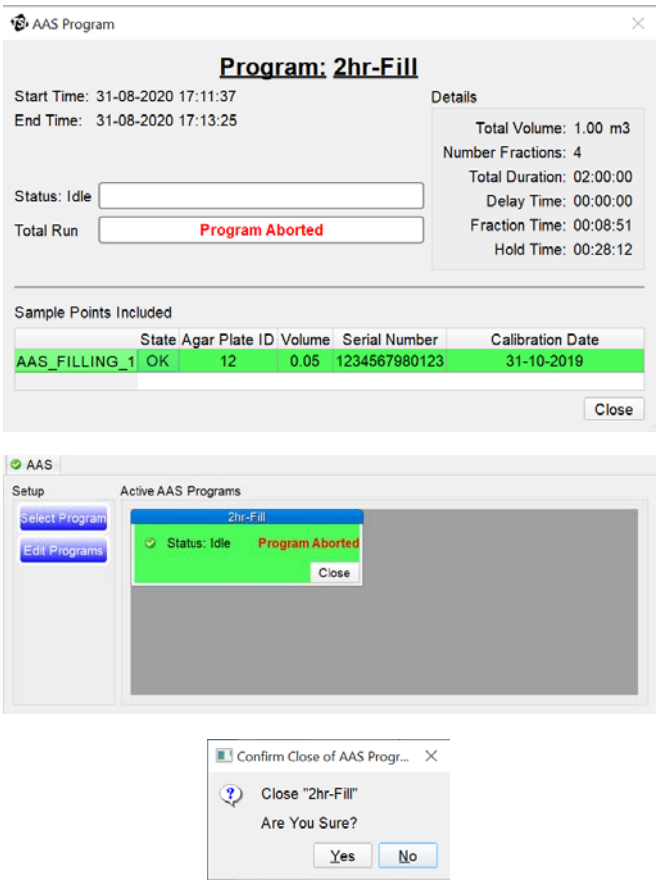


Aborting AeroTrak+ Remote AAS Programs

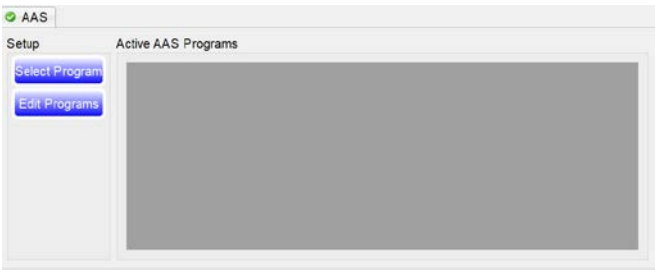
To abort the sampling program prior to its completion according to the program parameters, follow these steps.

1. If an AAS Program is aborted, the AAS Program can be deleted from the **Active AAS Programs** minimized view.
2. Click **Close** button.
3. Respond to the "Are you sure" message. If the AAS Program is still running, an error message will appear.
   There will be an "Are you sure" message after the Abort button is clicked.

   User credentials will be requested before Aborting if FMS Software security is turned ON.



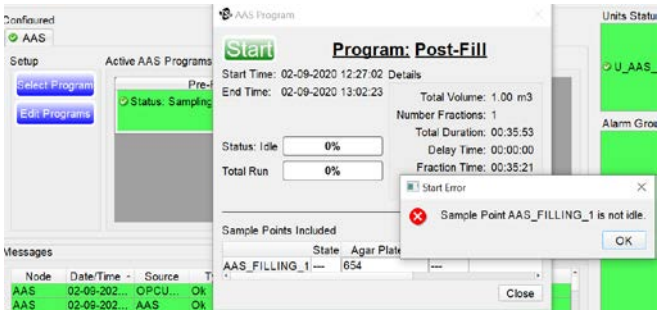
4. Minimized AAS Program is removed from **Active AAS Program**.



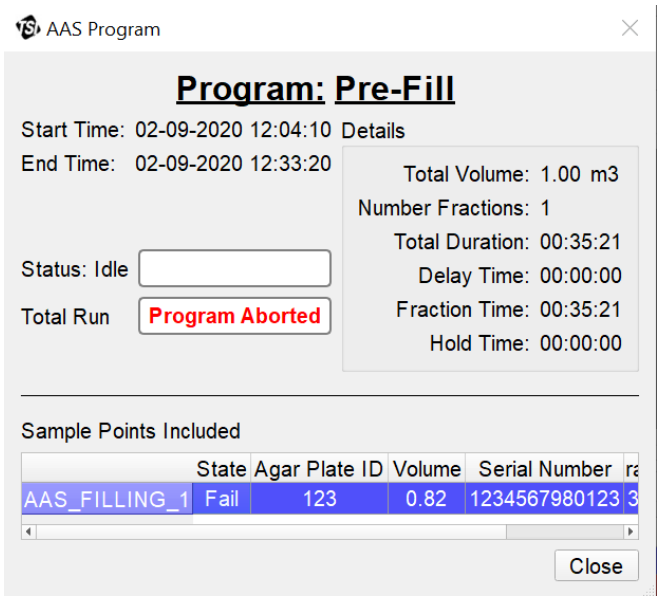
AeroTrak+ Remote AAS Error Cases

If a Flow Error occurs (i.e. flow drop from 28.3 LPM to 20.0 LPM) during sampling, a **Volume Error** will be generated when Program is finished. This means that the desired Volume has not been sampled during the requested sampling Time.

If the Sampling Point is already in Sampling Mode for a specific AAS Program, a message will warn the User who wants to Start another AAS Program that the AAS Sampling Point is not in Idle Mode.



If an **AAS Program** is Aborted, a Volume Error will be generated to mention that the desired Volume to be sampled has not been met.



An **AAS Program** which includes a Sample Point in Communication Error can be started for the remaining active Sample points.

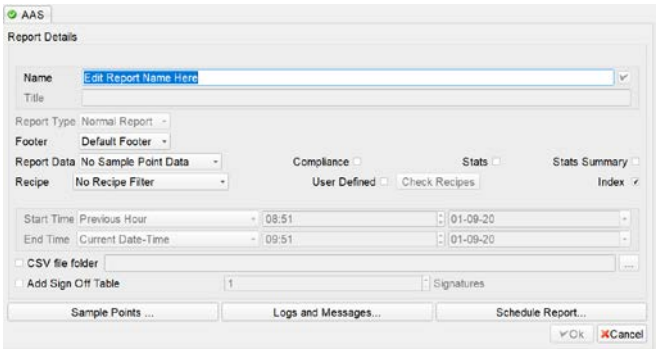
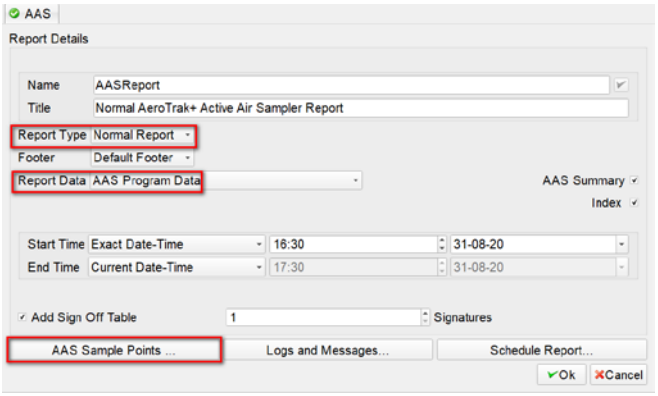
Running AeroTrak+ Remote AAS Programs with Batch Report

AeroTrak+ Remote AAS Sample Points can also be used with Batch Manager. To setup **Batch Manager,** please refer to *TCC-127—How to Setup Batch Manager*.

Running AeroTrak+ Remote AAS Reports

AeroTrak+ Remote AAS Reports can be used for both Normal or Batch report selection.

Generate Normal Report

<table>
<tr>
<td>1. Click  icon to access Reports.
2. Click New Report.</td>
<td> 
</td>
</tr>
<tr>
<td>3. Enter a name and Title for this report.
4. Select Normal Report from the Report Type drop down list.
5. Select AAS Program Data from the Report Data drop down list.
6. Select the desired time duration.</td>
<td> 
</td>
</tr>
</table>

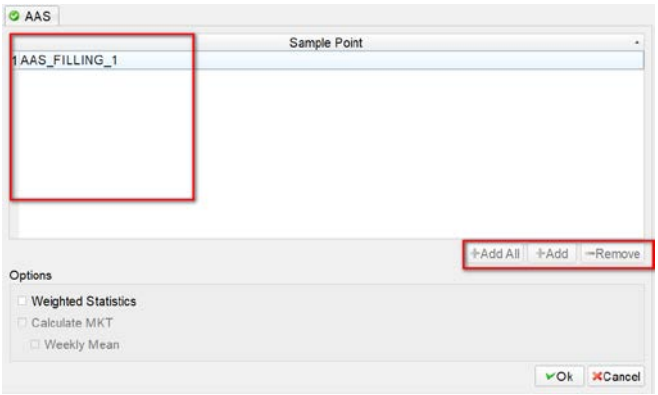
7. Click **AAS Sample Points** to add AAS Sample Points used during this time frame.

   By default, AAS Sample Points available to be selected are all the AAS Sample Points used during the time period specified.

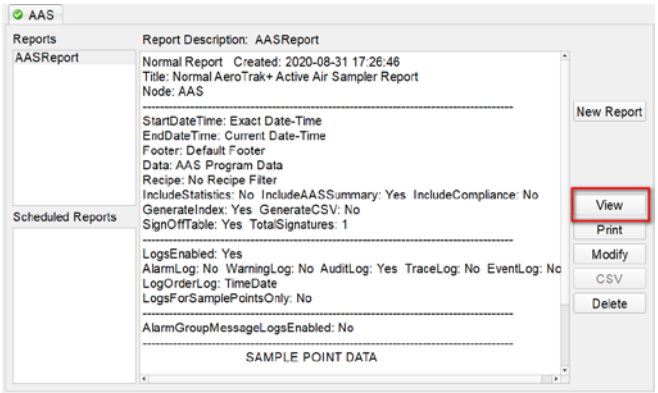
8. To include another AAS Sample Point in the report, do as follow:
   - Click **+ Add** button for a new row.
   - Double click on the new row.
   - Open the dropdown.
   - From the dropdown select a new AAS Sample Point.

Note—If an AAS Sample Point has to be removed from the Report, select it and click **Remove** button.

9. Click **OK** to close the **Sample Point** Selection window.
10. Click **OK** to close the **report details** window.



11. Click **View** button to preview the Report.



Example 1: Normal FMS Software Report Format.

Normal AeroTrak+ Active Air Sampler Report AASREPORT From: 25-09-2020 10:40:29 To: 25-09-2020 12:18:56

Results Table For: Audit Log

Results Table For: Audit Log		
Date Time	Source	Comment
25-09-2020 10:52:25	FMS_Client	Client Has Started
25-09-2020 10:53:55	FMS_Client	Client Has Started
25-09-2020 10:54:24	FMS_Client	UserAAS Has Logged In As User To AAS
25-09-2020 10:54:53	FMS_Client	Adding Batch Event Start_Batch_1 for Batch ProductName by AAS USER
25-09-2020 10:55:44	FMS_Client	Started Pre-Fill (TotalDuration 00:35:21, TotalVolume 1.00m3, NumberOfFractions 1, delay 00:00:00) on AAS_FILLING_1 using plateid Plate_1 by UserAAS
25-09-2020 11:32:37	FMS_Client	Started Post-Fill (TotalDuration 00:35:53, TotalVolume 1.00m3, NumberOfFractions 1, delay 00:00:00) on AAS_FILLING_1 using plateid Plate_test by UserAAS
25-09-2020 11:33:30	FMS_Client	Aborted Post-Fill on AAS_FILLING_1 by UserAAS Comment: Aborting Program for testing
25-09-2020 11:34:22	FMS_Client	Started Post-Fill (TotalDuration 00:35:53, TotalVolume 1.00m3, NumberOfFractions 1, delay 00:00:00) on AAS_FILLING_1 using plateid Plate_2 by UserAAS
25-09-2020 12:11:00	FMS_Client	Started 2hr-Fill (TotalDuration 02:00:00, TotalVolume 1.00m3, NumberOfFractions 4, delay 00:00:00) on AAS_FILLING_1 using plateid 456 by UserAAS
25-09-2020 12:11:32	FMS_Client	Aborted 2hr-Fill on AAS_FILLING_1 by UserAAS Comment: No Comment
25-09-2020 12:12:08	FMS_Client	Adding Batch Event Stop_Batch_1 for Batch ProductName by AAS USER
25-09-2020 12:12:14	FMS_Client	UserAAS Has Logged Out
25-09-2020 12:12:21	FMS_Client	admin Has Logged In As User To AAS
25-09-2020 12:13:14	FMS_Client	Started Pre-Fill (TotalDuration 00:35:21, TotalVolume 1.00m3, NumberOfFractions 1, delay 00:00:00) on AAS_FILLING_1 using plateid 789 by UserAAS
25-09-2020 12:18:48	FMS_Client	Making Report AASREPORT For AAS As Administrator

Example 2: New AAS-specific FMS Software Report Format.

Normal AeroTrak+ Active Air Sampler Report AASREPORT From: 25-09-2020 10:40:29 To: 25-09-2020 12:18:56

Results Table For: PlateID: Plate_1 Location: AAS_FILLING_1

PlateID: Plate_1, Location: AAS_FILLING_1, SerialNumber: 123456				
Date Time	Event	Fraction	Cum. Volume (m3)	Event Details
25-09-2020 10:55:46	Start Sampling	1	0	Started by UserAAS
25-09-2020 11:31:07	Stop Sampling	1	1	Completed

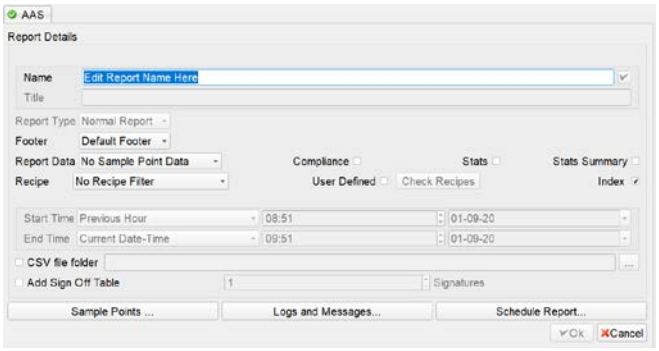
Normal AeroTrak+ Active Air Sampler Report AASREPORT From: 25-09-2020 10:40:29 To: 25-09-2020 12:18:56

Results Table For: PlateID: Plate_test Location: AAS_FILLING_1

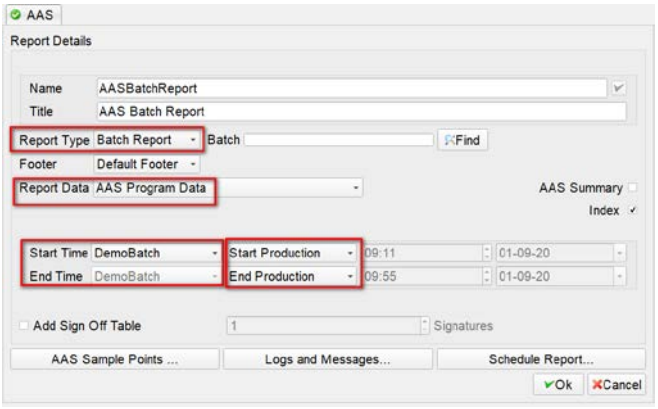
PlateID: Plate_test, Location: AAS_FILLING_1, SerialNumber: 123456				
Date Time	Event	Fraction	Cum. Volume (m3)	Event Details
25-09-2020 11:32:39	Start Sampling	1	0	Started by UserAAS
25-09-2020 11:33:30	Stop Sampling	1	0.02	Flow Error Aborted by UserAAS, Comment: Aborting Program for testing

Generate Batch Report

1. Click  icon to access Reports.
2. Click **New Report**.



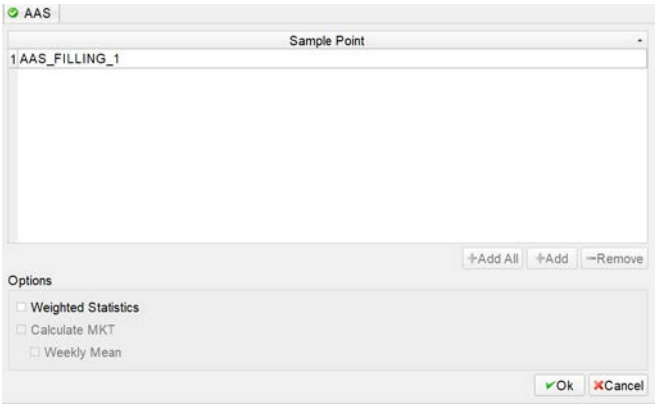
3. Enter a **name** and **Title** for this report.
4. Select **Normal Report** from the **Report Type** drop down list.
5. Select **Batch Report** from the **Report Type** drop down list.
6. Select **AAS Program Data** from the **Report Data** drop down list.
7. Select for Start and **End Time** desired, **Batch Name** followed by selecting **Event Name**.



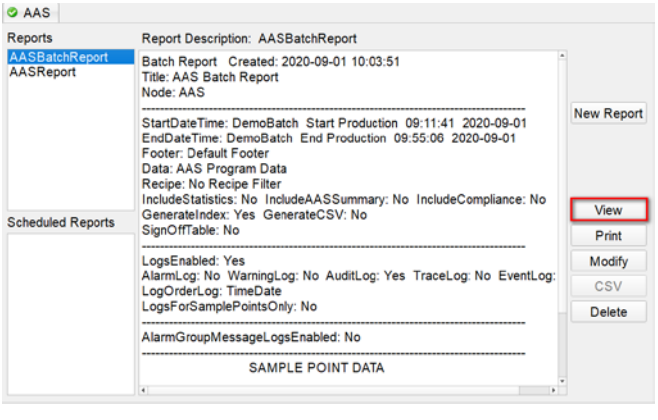
8. Click **AAS Sample Points** to add the AAS Sample Points used during this time frame.
9. To include another AAS Sample Point in the report, do as follows:
   - Click **+ Add** button for a new row.
   - Double click on the new row.
   - Open the dropdown.
   - From the dropdown, select a new AAS Sample Point.

Note—If an AAS Sample Point has to be removed from the Report, select it and click on **Remove** button.

10. Click **OK** to save the Report Configuration



11. Click **View** button to preview the Report.



Example 1: Normal FMS Software Report Format.

Batch Report AeroTrak+ Active Air Sampler Report AASREPORT ProductName
From: Start_Batch_1 25-09-2020 10:54:31 To: Stop_Batch_1 25-09-2020 12:11:47

Results Table For: Audit Log

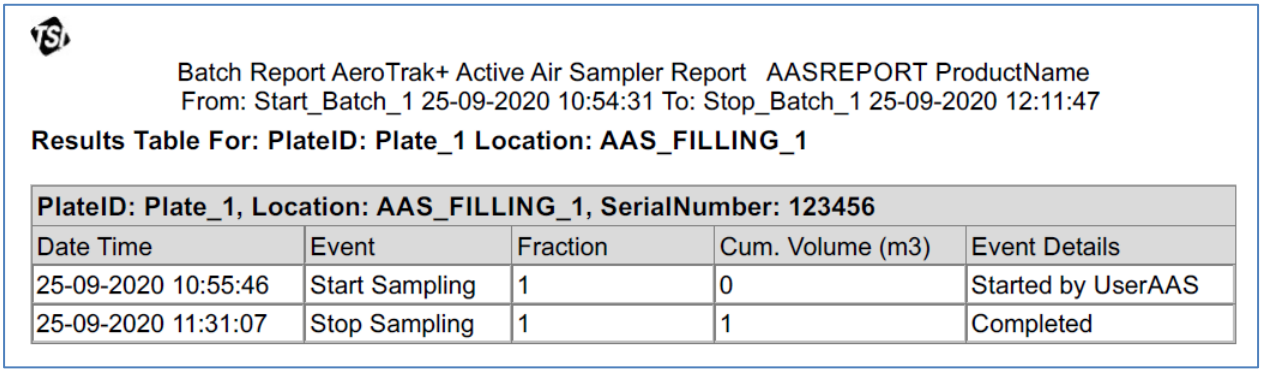
Results Table For: Audit Log		
Date Time	Source	Comment
25-09-2020 10:54:53	FMS_Client	Adding Batch Event Start_Batch_1 for Batch ProductName by AAS USER
25-09-2020 10:55:44	FMS_Client	Started Pre-Fill (TotalDuration 00:35:21, TotalVolume 1.00m3, NumberOfFractions 1, delay 00:00:00) on AAS_FILLING_1 using plateid Plate_1 by UserAAS
25-09-2020 11:32:37	FMS_Client	Started Post-Fill (TotalDuration 00:35:53, TotalVolume 1.00m3, NumberOfFractions 1, delay 00:00:00) on AAS_FILLING_1 using plateid Plate_test by UserAAS
25-09-2020 11:33:30	FMS_Client	Aborted Post-Fill on AAS_FILLING_1 by UserAAS Comment: Aborting Program for testing
25-09-2020 11:34:22	FMS_Client	Started Post-Fill (TotalDuration 00:35:53, TotalVolume 1.00m3, NumberOfFractions 1, delay 00:00:00) on AAS_FILLING_1 using plateid Plate_2 by UserAAS
25-09-2020 12:11:00	FMS_Client	Started 2hr-Fill (TotalDuration 02:00:00, TotalVolume 1.00m3, NumberOfFractions 4, delay 00:00:00) on AAS_FILLING_1 using plateid 456 by UserAAS
25-09-2020 12:11:32	FMS_Client	Aborted 2hr-Fill on AAS_FILLING_1 by UserAAS Comment: No Comment

Batch Report AeroTrak+ Active Air Sampler Report AASREPORT ProductName
From: Start_Batch_1 25-09-2020 10:54:31 To: Stop_Batch_1 25-09-2020 12:11:47

AAS Table Summary

AAS Table Summary		
Batch	Start	Stop
ProductName	Start_Batch_1 25-09-2020 10:54:31	Stop_Batch_1 25-09-2020 12:11:47

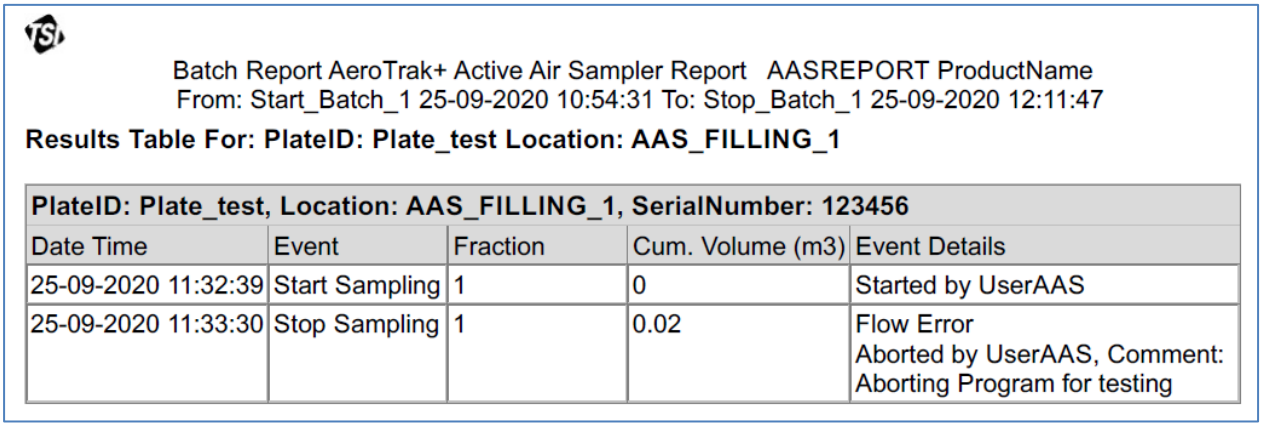
Example 2: New AAS-specific FMS Software Report Format.



Batch Report AeroTrak+ Active Air Sampler Report AASREPORT ProductName
From: Start_Batch_1 25-09-2020 10:54:31 To: Stop_Batch_1 25-09-2020 12:11:47

Results Table For: PlateID: Plate_1 Location: AAS_FILLING_1

PlateID: Plate_1, Location: AAS_FILLING_1, SerialNumber: 123456				
Date Time	Event	Fraction	Cum. Volume (m3)	Event Details
25-09-2020 10:55:46	Start Sampling	1	0	Started by UserAAS
25-09-2020 11:31:07	Stop Sampling	1	1	Completed



Batch Report AeroTrak+ Active Air Sampler Report AASREPORT ProductName
From: Start_Batch_1 25-09-2020 10:54:31 To: Stop_Batch_1 25-09-2020 12:11:47

Results Table For: PlateID: Plate_test Location: AAS_FILLING_1

PlateID: Plate_test, Location: AAS_FILLING_1, SerialNumber: 123456				
Date Time	Event	Fraction	Cum. Volume (m3)	Event Details
25-09-2020 11:32:39	Start Sampling	1	0	Started by UserAAS
25-09-2020 11:33:30	Stop Sampling	1	0.02	Flow Error Aborted by UserAAS, Comment: Aborting Program for testing

AeroTrak+ Remote AAS Buffer Download

AeroTrak+ Remote AAS Buffer Data, when Enabled in FMS, may occur during several cases which are described below.

Buffer Download Cases:

1. User installs a new Instrument with buffer download enabled:

    - User enables buffer download in Sample Point setup through Configure and saves.
    - After buffer is cleared, FMS Software will go into real time monitoring state without buffer download.
    - FMS Software will perform buffer download afterwards triggered by Monitor restart or communication error recovery.

2. User installs a backup Instrument using existing setup with buffer download enabled:

    Backup instrument is configured with the same TCP/IP address as the replaced but has a different Serial Number.

    - Buffer download is enabled in existing setup.
    - After driver reinitiated, FMS Software will clear Instrument's buffer to prevent unwanted buffer download process triggered by Monitor restart or communication error recovery.
    - After buffer is cleared, FMS Software will go into real time monitoring state without buffer download.
    - FMS Software will perform buffer download afterwards triggered by Monitor restart or communication error recovery.

3. Buffer Download enabled:

    - User saves the configuration and restart monitor.
    - FMS Software will clear Instrument's buffer.
    - FMS Software will go into real time monitoring state.
    - No buffer is downloaded (buffer download is still enabled and will happen if needed).

4. Power lost to the Instrument with buffer download enabled:

    - System is already running with buffer download enabled.
    - Power lost to the Instrument.
    - FMS Software loses communication to the Instrument.
    - FMS Software will try to recover communication.
    - Power is back online to the Instrument.
    - Communication recovered.
    - Buffer download will occur.

5. Power lost to building with buffer download enabled:

    - System is already running with buffer download enabled.
    - Power lost to the whole building.
    - FMS Software is down.
    - Power is back online to the whole building.
    - FMS Software is back online.
    - Buffer download will occur.

6. Power lost to monitoring computer with buddy process and buffer download enabled:

    - System is already running with buffer download enabled.
    - Power lost to the monitoring computer.
    - Instrument is collecting data.
    - Buddy starts.
    - Buffer download will occur.
    - Data is recovered.
    - Power is back online and the main Monitor starts up.
    - Buffer download will occur.

7. Communication lost or monitor restart during buffer download process:

    - FMS Software is performing buffer download.
    - Communication is lost or a monitor restart occurs.
    - FMS Software re-establishes communication or monitor is running again.
    - Buffer download will attempt to start over again.

8. An alarm condition within buffered data:

    - Alarm condition data has been logged in Instrument buffer.
    - FMS Software starts performing a buffer download.
    - When FMS Software encounters alarm condition, it will not post alarm acknowledge message the same way as real time data process (will not trigger digital output).
    - No disruption will occur in buffer download due to alarm condition.
    - User can not acknowledge the buffered data.
    - User can acknowledge alarm condition data buffered after transfer to the database.

9. An alarm condition during buffer download process:

    - FMS Software starts performing a buffer download
    - Instrument detects an alarm condition.
    - FMS PROCESS Alarm condition as real time.
    - FMS Software will NOT process the failure until after the Buffer Download is complete.

10. All Database is down during buffer download:

    - FMS Software is performing a buffer download process.
    - Database is down.
    - FMS Software posts processed buffer data to database.
    - Posted data is being spooled.
    - FMS Software continues buffer download until complete.
    - Database comes back on-line, and spooled data is posted to the database. Spooled data in the queue after duplicated key will skipped to prevent garbage data in database.

11. Mirrored DB exists and either / both main / mirrored DB is down during buffer download:

    - FMS Software is performing a buffer download process.
    - Database (either main or mirrored) database(s) go down.
    - FMS Software posts processed buffer data to database.
    - For any database that is down, posted data is being spooled.
    - FMS Software continues buffer download until complete.
    - Database(s) comes back on-line, and spooled data is posted to the database(s). Spooled data in the queue after duplicated key will skipped to prevent garbage data in database.

Alarm Group Messages

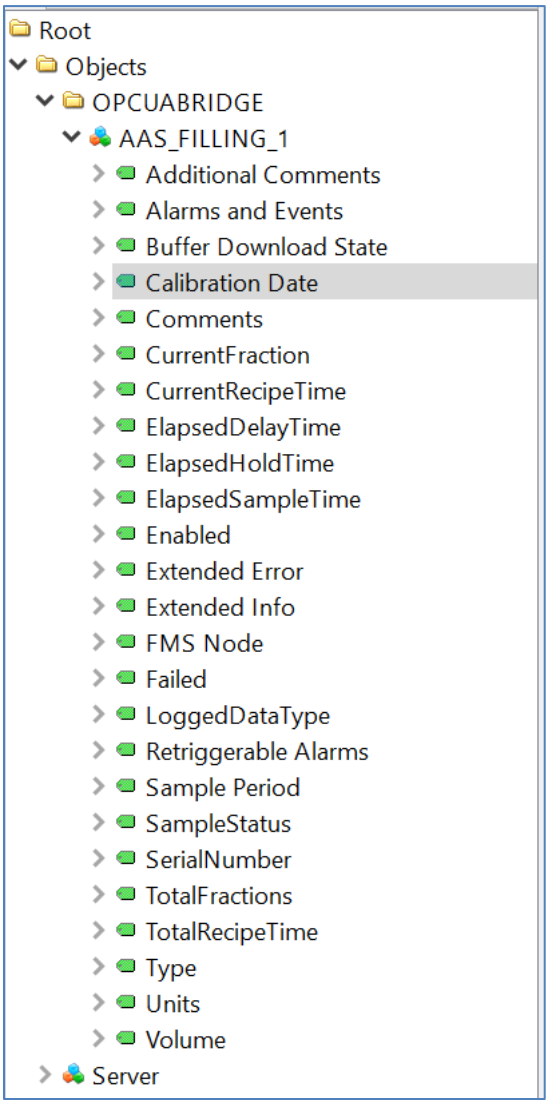
Technical bulletin **TCC-137: FMS 530 Alarm Group with Messages Setup Configuration** explains how to setup alarm group messaging to be able to alarm on specific messages generated by FMS Software.

By introducing AeroTrak+ Remote AAS driver **TSIModbus2XAAS**, the following messages can be selected in alarm group.

- Communication problem: timeout getting sample record
- Instrument alert was triggered externally
- Communication problem: invalid sample record data from buffer
- Ambient condition alert
- Cal. corrupt alert
- Stale data: reinitializing counter
- Communication problem: timeout during initializing
- Volume Alert
- Communication problem: timeout getting sample index
- Flow alert
- Index sequence error: record(s) possibility lost
- Instrument error
- Instrument not ready alert
- Resetting com channel
- Service alert
- Unit working
- Wrong driver selected for this device. This driver for TSI map revision 2.xx only

AeroTrak+ Remote AAS Node Tags Available in OPC UA Server

The following screen shot from UA Expert shows all tags made available per AeroTrak+ Remote AAS Sample Point.



Note—All time values below are reported in seconds.

NODE TAG	DATA TYPE	DESCRIPTION
Additional Comments	String	Additional comments about the instrument.
Alarms and Events	String	Sample Point Alarms and Events generated by FMS Software
Buffer Download State	Boolean	This is not implemented for AAS (Status code is BadAttributeIdInvalid).
Calibration Date	DateTime	Last Calibration Date from device.
Comments	String	Comments about the instrument.
CurrentFraction	Double	Current fraction of the program.
CurrentRecipeTime	Double	Current elapsed time in the program (seconds).
ElapsedDelayTime	Double	The accumulated delay time.
ElapsedHoldTime	Double	The accumulated hold time in the current fraction.
ElapsedSampleTime		The accumulated sample time in the current fraction.
Enabled	Boolean	If Unit or Sample Point is disabled this turn false.
Extended Error	Boolean	Not defined for AAS (will be always false).

NODE TAG	DATA TYPE	DESCRIPTION
Extended Info	String	Will report current AeroTrak+ Remote AAS Program Status in a XML formatted string: • <ExtendedInfo NumberOfFractions="1" Delay="00:00:00" TotalVolume="5.00" Action="Started" Time="2020-09-02T11:48:28" TotalDuration="00:10:00" Program="FlowTest" VolumeUnit="ft3" PlateId="FlowTest1"/> • <ExtendedInfo Action="Completed" Program="FlowTest"/>
FMS Node	String	FMS Node name in which the Sample Point is part of.
Failed	Boolean	If the Unit is failed this will turn into false.
LoggedDataType	double	Determine what the logged data is: 0 = DONE bit 0 = 1-minute data bit 1 = state change data
Retriggerable Alarms	Boolean	
Sample Period	Double	Sampling time.
SampleStatus	Double	Accumulated Status (calculated by FMS Software). State of the sample: 0 = Idle 1 = Start Delay 2 = Holding 3 = Sampling 4 = RTC_Sync 5 = Stopping 6 = Zeroing 7 = RTC Error 8 = Aborting
SerialNumber	Double	AeroTrak+ Remote AAS Serial Number.
TotalFractions	Double	Total Number of fractions to be run in a program
TotalRecipeTime	Double	Total program time includes sample time, hold time, delay time and number of fractions (seconds).
Type	String	By default set to Counts. (Not used for AeroTrak+ Remote AAS)
Units	String	By default set to L.
Volume		Sample Volume in program (Liters).

Security

With introduction of the AeroTrak+ Remote AAS driver, the following security rights can be assigned.

User Groups Level

AAS Program Node:

- Create/Edit
- Start/Abort

Files to Backup

With the introduction of the AeroTrak+ Remote Airborne Particle Counters, new files are required to be added to the configuration backup.

Listed below are **ALL** the folders and files required to be included in the FMS 5 Software configuration backup.

- C:\FMS5\Config\Actions*.*
- C:\FMS5\Bin\Guard.ini
- C:\FMS5\Config\AASAllPrograms.xml
- C:\FMS5\Config\NodeLocal.xml
- C:\FMS5\Config\NodePassword.xml
- C:\FMS5\Config\ServerOptions.xml (Only if FMS OPC UA SVR option is installed)
- C:\FMS\Maps*NodeName*.jpg
- C:\FMS\Maps*NodeName*.xml
- C:\FMS5\Node*NodeName*.xml
- C:\FMS5\Node\AlarmGroups*.* (And Sub folders)
- C:\FMS5\Template*.* (AeroTrak+ instrument Template files)
- C:\FMS5\PKI*.* (And Sub folders, only if FMS OPC UA SVR option is installed)
- C:\FMS5\Translations*.* (And Sub folders, only for Non English FMS5 Interface)

IMPORTANT NOTE
The file **AASActivePrograms.xml** located in C:\FMS5\Config\ do not need to be backup as this file will be updated from a table located in the database and this each time the Main Monitor is restarted or when the Buddy takes over.

Troubleshooting

SNTP Issue

When SNTP is Enabled through the TSI Remote Application, an issue may show up if the IP Address of the SNTP Server is incorrect or the SNTP Time Zone is not correctly set:

- AeroTrak+ Remote AAS Maxi screen will not update the progress of the Program and will not show complete until 6-8 minutes after the instrument is done sampling. When the Maxi screen finally shows complete, the database and Report are as expected.
- If AeroTrak+ Remote AAS is synced against an SNTP Server where, for example, the time is off by one hour, it's expected that the data being collected are one hour old and FMS Software does not distribute old data well. If the Program ends and the Report is complete, that is as good as it gets.

In such cases, please verify with TSI Remote Application that the SNTP IP Address and SNTP Offset Time Zone (UTC Offset against GMT) are correctly set to not have time difference between the AeroTrak+ Remote AAS and FMS Software.

Multicast Address Issues

1. Some Windows® 7 or Windows® 10 Operating Systems will mysteriously refuse sending multicast messages. Adding the **Reliable Multicast Protocol** in the protocol list used by the network card may be needed.

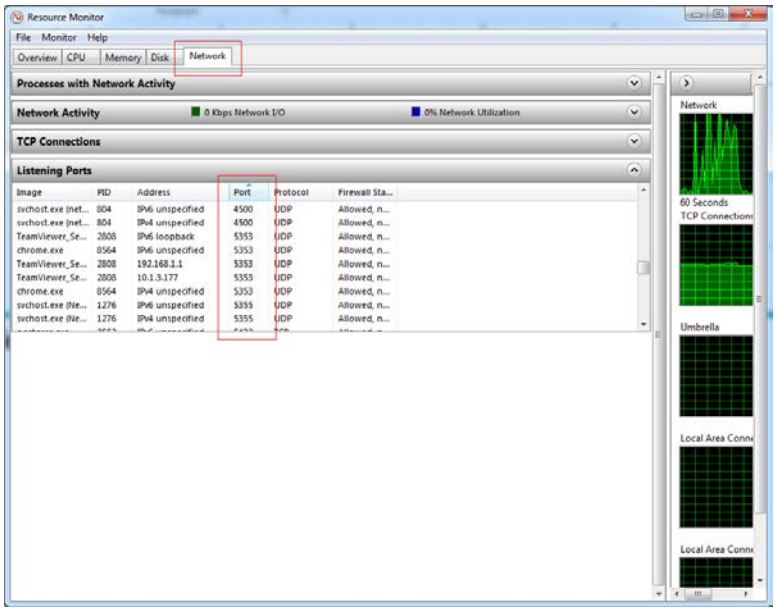
2. Multicasting **DOES NOT** work on an Ethernet network where multicast addresses are blocked.

   The Windows registry may have to be edited to add the IGMP protocol values as outlined below.

   - Open the Registry Editor, and navigate to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters\
   - In the right pane, right-click and select New – DWORD (32-bit value), set name as **IGMPVersion**, and set value to 4. A value of 4 means support IGMP version 3.
   - In the right pane, right-click and select New – DWORD (32-bit value), set name as **IGMPLevel,** and set value to 2. IGMP level 2 means it supports sending and receiving multicast packets.
   - Restart computer to activate the settings.

IMPORTANT NOTE
To edit the Windows registry, you must be logged in with an account having local administrative rights.

3. Verify the availability of the default port 5000. Follow the process below to do so.
   - Open **Resource Monitor.**
   - Select **Network** tab.
4. If port 5000 is used by other programs, re-assign a new multicast port for both instrument and FMS Software.



References—Technical Bulletins

- TCC-127—How to Setup Batch Manager
- TCC-137—FMS 530 FMS Alarm Group with Messages Setup Configuration

Revision History

Revision	Released	Description
A	10 October 2020	Initial Release
B	6 November 2020	• Added Important Note on page 20. • Change Unit description to **L** in OPC UA Section.

UNDERSTANDING, ACCELERATED

TSI Incorporated – Visit our website www.tsi.com for more information.

USA	**Tel:** +1 800 680 1220	**India**	**Tel:** +91 80 67877200
UK	**Tel:** +44 149 4 459200	**China**	**Tel:** +86 10 8219 7688
France	**Tel:** +33 1 41 19 21 99	**Singapore**	**Tel:** +65 6595 6388
Germany	**Tel:** +49 241 523030		

