BIOPROFILE® FLEX2

OPC Server Instruction for Use Manual

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BioProfile® FLEX2 OPC Server Instructions for Use Manual

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1 INTRODUCTION

The Open Platform Communication (OPC) Server for the Nova Biomedical BioProfile FLEX2 is designed to accommodate both OPC Data Access (DA) and OPC Unified Architecture (UA) standards. The FLEX2 analyzer is equipped with a dedicated OPC Server pre-installed on the Bridge Computer. Following the licensing of the OPC Server, the Server facilitates a continuous real-time flow of sample data and pertinent analyzer information, ensuring seamless integration into automation environments that are compatible with OPC. Each FLEX2 analyzer requires a permanent OPC Server license that may be purchased through your local Nova Sales Representative or an authorized Nova distributor.

This Instructions for Use Manual is for the Nova Biomedical BioProfile FLEX2 OPC Server.

Throughout this manual:

NOTE indicates specific information that may or may not align with your instrument requirements.

IMPORTANT indicates information that is critical to avoid incorrect results.

DISCLAIMER indicates information for clarification of the scope or purpose of something.

1.1 DA SERVER-SPECIFIC CONFIGURATIONS

1.1.1 OPC VERSION 1.2.19066 DA SERVER SPECIFICATIONS

- *Supports:* OPC DA 2.0 and OPC DA 3.0
- *Server Description:* OPC FlexII Automation Server (on host LOCALHOST)
- *ProgID:* Nova.Biomedical.Server
- *GUID (AppID):* {aaaaaaaa-bbbb-cccc-dddd-170330111111}
- *Source Item Name:* Example.Item.Name
- *Source Item Location:* localhost → OPCSystemObjects → Example.Item.Name
- *Source Item ID:* ns = 2; s = OPCSystemObjects → Example.Item.Name
- *NameSpaceIndex:* NS = 2
- *Identifier Type:* S = or (String) for all tags
- *Identifier:* s = OPCSystemObjects → Example.Item.Name

1.1.2 OPC VERSION ≥ 3.0 DA SERVER SPECIFICATIONS

- *Supports:* OPC DA 2.0 and OPC DA 3.0
- *Server Description:* Nova Biomedical OPC DA Server
- *ProgID:* Nova.Biomedical.OPC.DA.Server
- *GUID (AppID):* {aaaaaaaa-bbbb-cccc-dddd-170330111111}

- *Source Item Name:* Example.Item.Name
- *Source Item Location:* FlexII Bridge → OPCSystemObjects → Example.Item.Name
- *Source Item ID:* ns = 3; s = OPCSystemObjects → Example.Item.Name
- *NameSpaceIndex:* NS = 3 for tags and NS = 2 for tag folders
- *Identifier Type:* S = or (String) for all tags
- *Identifier:* s = OPCSystemObjects → Example.Item.Name

1.2 UA Server-Specific Configurations

1.2.1 OPC Version 1.2.19066 UA Server Specifications

- *Server Description:* OPC Expert UA Server
- *ProgID:* opc.tcp:///*(IP Address)*:59888/OpcExpert
- *GUID (AppID):* {af9bec88-0179-4d0e-83ad- f3e265e3cf3b}
- *Source Item Name:* Example.Item.Name
- *Source Item Location:* localhost → OPCSystemObjects → Example.Item.Name
- *Source Item ID:* ns = 2; s = OPCSystemObjects → Example.Item.Name
- *NameSpaceIndex:* NS = 2
- *Identifier Type:* S = or (String) for all tags
- *Identifier:* s = OPCSystemObjects → Example.Item.Name

1.2.2 OPC Version ≥ 3.0 UA Server Specifications

- *Server Description:* Nova Biomedical OPC UA Server
- *ProgID:* opc.tcp:///(*IP Address*):59888/NovaBiomedical
- *GUID (AppID):* {d4a1fae2-95ec-45dc-8541-a68f90f472ab}
- *Source Item Name:* Example.Item.Name
- *Source Item Location:* FlexII Bridge → OPCSystemObjects → Example.Item.Name
- *Source Item ID:* ns = 3; s = OPCSystemObjects → Example.Item.Name
- *NameSpaceIndex:* NS = 3 for tags and NS = 2 for tag folders
- *Identifier Type:* S = or (String) for all tags
- *Identifier:* s = OPCSystemObjects → Example.Item.Name

1.3 BioProfile FLEX2 Computer Configuration

The FLEX2 Analyzer is comprised of two single-board computers (SBCs) commonly referred to as the "Host" and the "Bridge." The Host SBC controls the FLEX2 analyzer, and the Bridge SBC acts as a bridge between the analyzer and the outside world. The communication between the Host and Bridge computers is restricted to create a secure system and reduce cyber security concerns.

Host Computer / Analytical Unit (AU)

The Host is responsible for the analyzer's primary functions, including sample analysis, mechanical control, data storage, and operation of the User Interface (UI). The Host is restricted and must not be reconfigured in any way. Changes to the Host configuration may compromise the system's functionality and void the warranty. For protection against cyber threats, there is no direct external access to the Host besides the wireless keyboard and touchscreen display. The data from the Host computer may be exported to a shareable folder on the Bridge computer or to a USB drive. More importantly, the FLEX2 Open Platform Communication (OPC) Unified Architecture (UA) or Data Access (DA) Server may also be utilized to export data to a compatible OPC Client of your choice.

Bridge Computer

The Bridge computer provides external access to data generated by the FLEX2 system, functioning as an intermediary between the external environment and the Analytical Unit. Unrestricted access to the Bridge desktop facilitates seamless integration with corporate networks and domains without jeopardizing the functionality or security of the Host computer. The OPC Server is both installed and operated on the Bridge computer.

Specifications:

- 512GB Solid-State Drive (SSD) (Software Version 4.2 Or Newer)
- 16GB Memory*
- 4GB Memory**
- Microsoft® Windows 10 Enterprise 2021 LTSC 64-Bit OS*
- Microsoft® Windows 10 Enterprise 2016 LTSB 64-Bit OS**

* Software Version 4.0 or Newer and FLEX2 Instruments Manufactured on or After June 29th, 2023.

** Software Version 3.3 or Newer and FLEX2 Instruments Manufactured Prior to June 29th, 2023.

1.4 Server Policy Management

This section outlines the security policy options configured for the installed server version on your instrument that can be enabled, specifying the supported encryption algorithms and security modes for the installed server version. The security policy defines the hash algorithms and key lengths that the client employs to establish a secure connection with the server.

1.4.1 Security Policy Encryption Types Explained

Basic256Sha256: 256-Bit Encryption

- This security policy encryption type will support Sha256 or stronger hash algorithms for server certificates.

Basic256: 256-Bit Encryption

- This security policy encryption type will support Sha1 and Sha256 hash algorithms for server certificates.

Basic128Rsa15: 128-Bit Encryption

- This security policy encryption type utilizes Rsa15 as a Key-Wrap and will support Sha1 or stronger hash algorithms for server certificates.

None

- No security is applied.

1.4.2 Message Security Modes Explained

The *Message Security Modes* dictate the overall level of security implemented for messages exchanged between the server and the client.

Sign & Encrypt: Every message is both signed and undergoes an encryption process.

- Signing utilizes the message signature to verify the legitimacy of requests.
- Additionally, encryption ensures that only authorized entities can decipher the message, thereby preserving confidentiality.

Sign: Every message is signed but not encrypted.

- Signing utilizes the message signature to verify the legitimacy of requests.

None

- No security is applied.

1.4.3 Supported Security Polices by OPC Server Version

1.4.3.1 OPC Server Version 1.2.19066 Security Policies

- Basic256 – Sign
- Basic128Rsa15 – Sign & Encrypt
- None – None

1.4.3.2 OPC Server Version ≥ 3.0 Security Policies

- Basic256Sha256 – Sign & Encrypt
- Basic256Sha256 – Sign
- Basic256 – Sign
- Basic128Rsa15 – Sign
- None – None

2 Customize and Access the Bridge Computer

When implementing the FLEX2 analyzer into your automation system, it will likely become necessary to access the Bridge computer to adjust network settings and load OPC client or Tunneller software.

2.1 Customization of the Bridge Computer

Almost all aspects of the Bridge can be configured to meet domain policy and company asset requirements. This includes changing the computer name, adding user accounts, configuring a static IP, installing anti-virus software, installing printer drivers, and altering shared properties. However, the following must not be disabled in any way:

Service Account

A local administrator account must remain accessible on the Bridge computer to allow Nova Field Service personnel access to perform software updates and instrument repairs. The default local admin account is **FlexII**. If end users choose to alter or create their own service account, please inform your local Field Service Representative(s) accordingly.

Services

The following services must remain configured for automatic startup:

- *"FlexII AutomationService"* – Required for customers interfacing with Nova-approved devices.
- Allows access to OPC tags via OPC UA communication:
  - *OPC V3.0 and Newer:*
    "Nova Biomedical OPC UA Server"
  - *OPC V1.2.19066 and Older:*
    "OPC Expert UA Server"
- Allows access to OPC tags via OPC DA communication:
  - *OPC V3.0 and Newer:*
    "Nova Biomedical OPC DA Server"
  - *OPC V1.2.19066 and Older:*
    "OPC FlexII Automation Server (on host LOCALHOST)"

TCP/IP Ports

The following ports must remain open to **incoming** connections:

- *59888* – FLEX2 OPC – required for OPC functionality.

The following ports must remain open to **outgoing** connections:

- *59888* – FLEX2 OPC – required for OPC functionality.
- *9040* – FLEX2 Automation Gateway Port – required for communication between the Automation Service and the Analytical Unit.

NOTE: ***The preconfigured Ethernet adapter with static IP (FLEX2 with Software Version 3.6 and Older: 10.1.1.102 and subnet mask 255.255.255.0; FLEX2 with Software Version 4.0 and Newer: 223.255.255.2 and subnet mask 255.255.255.252) must not be altered. This address is embedded into the system software for security reasons and changing it will result in loss of Bridge/Host communication. If your company network utilizes the same IP subnet, you will need to utilize routing tables to resolve IP conflicts.***

DISCLAIMER: ***Nova cannot test all possibilities of domain restrictions or anti-virus providers to guarantee uninhibited Bridge computer functionality once changed or installed respectively.***

2.2 Access the Bridge Computer

To modify network settings, load OPC clients, or manage other software, accessing the Bridge computer is necessary.

Two methods are available for accessing the Bridge.

2.2.1 Remote Connection Via the FLEX2 User Interface (Requires FLEX2 Software Version ≥ 3.3)

To access the Bridge computer from the UI, only users logged into an Administrator account will have access to the "Remote Desktop" button. To access this remote connection, follow the steps below:

1. Select the *"Printer"* icon from the top of the analyzer's Status screen.
2. Select the *"Remote Desktop"* button.
3. If required, login to the default Bridge Administrator account using the details provided below and accept any security certificate changes.

   Username: FlexII
   Password: FlexII

NOTE: ***Often you will not be required to input these credentials and you will log in automatically after establishing a remote connection to the Bridge computer.***

4. The remote connection window will appear over the FLEX2 UI and can be controlled using the supplied keyboard or touch controls. To return to the UI, you may minimize or close the remote connection using the "**–**" or "**X**." This can be found on the blue taskbar located at the top of the screen.

2.2.2 Remote Connection Via an External Monitor

If the Bridge computer cannot be accessed through the UI, an external monitor can be connected to the FLEX2 via the external HDMI port.

To access the BioProfile FLEX2 Bridge computer, the following equipment will be required:

- HDMI Monitor
- USB Mouse
- USB Keyboard

If all necessary equipment is available, follow the steps below:

1. Connect the external monitor, mouse, and keyboard to the rear right corner of the analyzer.
2. Power cycle the analyzer:
   a. Select the *"Shutdown"* button located on the second Home screen of the UI and follow the prompts to confirm the power down of the analyzer.
   b. Once the analyzer's display goes dark, toggle the switch located in the rear right corner of the analyzer to the OFF position. Wait one minute, then toggle the switch to the ON position. The HDMI monitor should then display the Bridge computer.

NOTE: ***If the Remote Desktop does not display the Bridge computer, repeat the above steps. The steps may need to be repeated three or more times for the Bridge computer to display on the external monitor. If the Bridge computer does not display on the external monitor after three consecutive power cycles, contact Nova Biomedical Technical Support at 1-800-545-6682.***

3. If necessary, log in to the default local administrator account:

   Username: FlexII
   Password: FlexII

3 Licensing Your OPC Server

If you are interested in incorporating the BioProfile FLEX2 into your OPC automation system, please contact your local sales representative or authorized Nova distributor for information on purchasing a permanent server license.

3.1 Determining if an OPC License is Installed

To gain access to the Nova OPC Plugin (Localhost or FlexII Bridge) when browsing the Nova OPC UA/DA Server, it is important to determine if an OPC License is installed.

To confirm if an OPC server license is installed, follow the steps below:

1. If prompted, log in to the analyzer to gain access to the User Interface (UI).
2. Navigate to the second home screen by swiping left on the UI.
3. On the right-hand side of the second home screen of the analyzer, select *"Settings."*

NOTE: ***For instruments operating on software versions preceding Version 4.3, simply choose the OPC button within the Settings drop-down menu in Step 3. No further action is required for Steps 4 and 5; you can seamlessly move on to Step 6.***

4. Select *"Licensing"* from the settings drop-down menu.

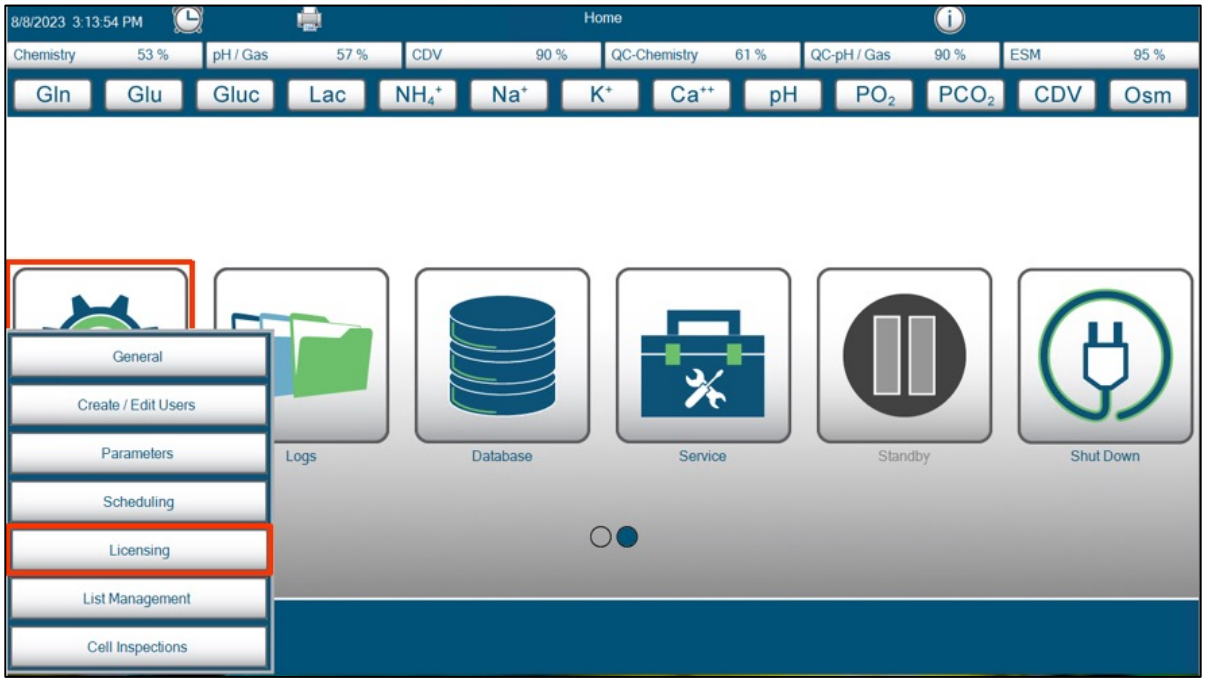

Figure 3.1 Settings → Licensing

5. On the Licensing screen, select *"OPC."*

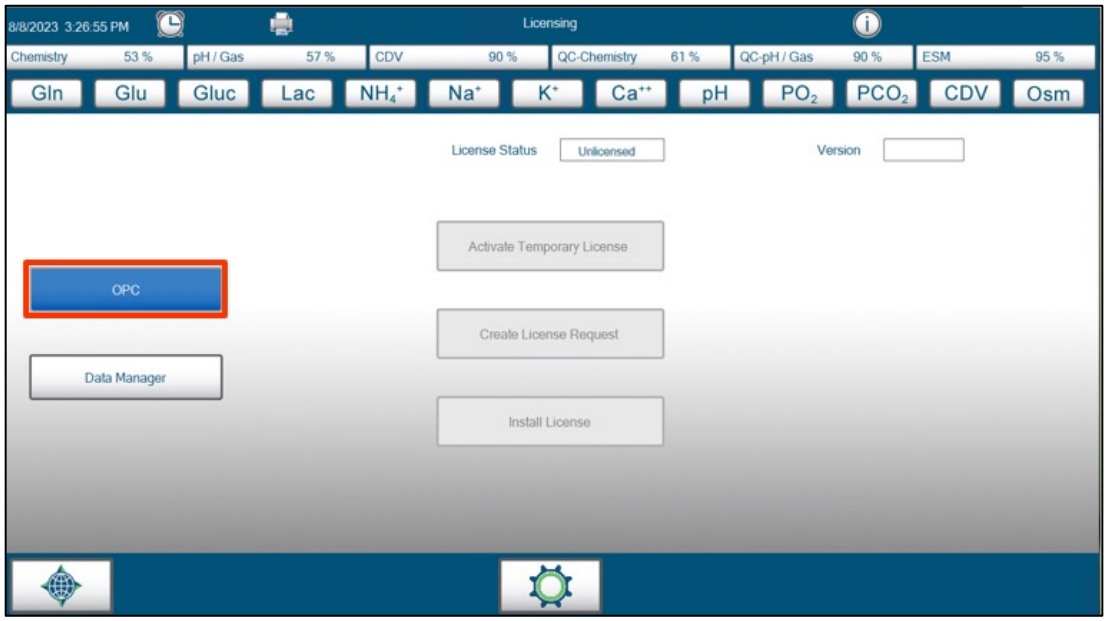

Figure 3.2 Licensing → OPC

6. In the OPC License Status field, if no OPC license has been installed, it will display "Unlicensed." Conversely, if an OPC license has been successfully installed, the field will indicate "Licensed," as seen in Figure 3.3.

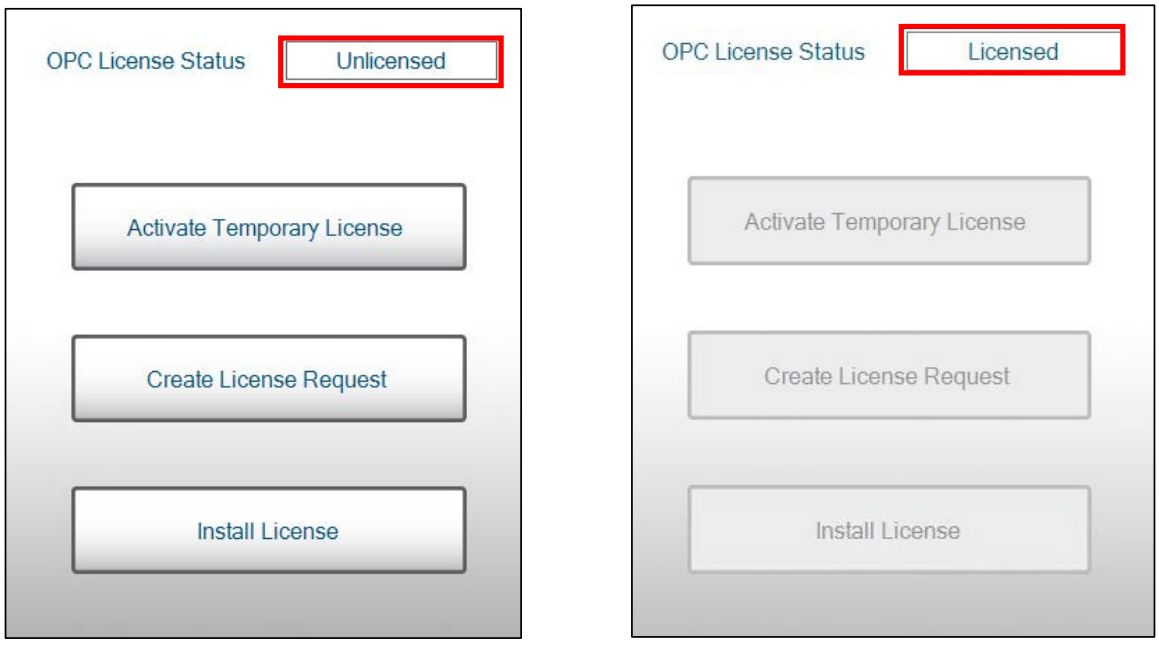

Figure 3.3 OPC License Uninstalled (left), OPC License Installed (right)

3.2 Activating a Temporary OPC Server License

The BioProfile FLEX2 analyzer comes with a temporary server license for one-time use. The temporary server license provides comprehensive access to the full functionality of both the OPC Unified Architecture (UA) and OPC Data Access (DA) server's tags, enabling thorough testing for your automation environment needs. Upon activation, the temporary license remains valid for a duration of 30 days. Following this period, the server will be deactivated until a permanent license is purchased and installed.

To activate the temporary OPC server license, follow the steps below:

1. If prompted, log in to the analyzer to gain access to the User Interface (UI).
2. Navigate to the second home screen by swiping left on the UI.
3. On the right-hand side of the second home screen of the analyzer, select *"Settings."*

NOTE: ***For instruments operating on software versions preceding Version 4.3, simply choose the OPC button within the Settings drop-down menu in Step 3. No further action is required for Steps 4 and 5; you can seamlessly move on to Step 6.***

4. Select *"Licensing"* from the Settings drop-down menu.

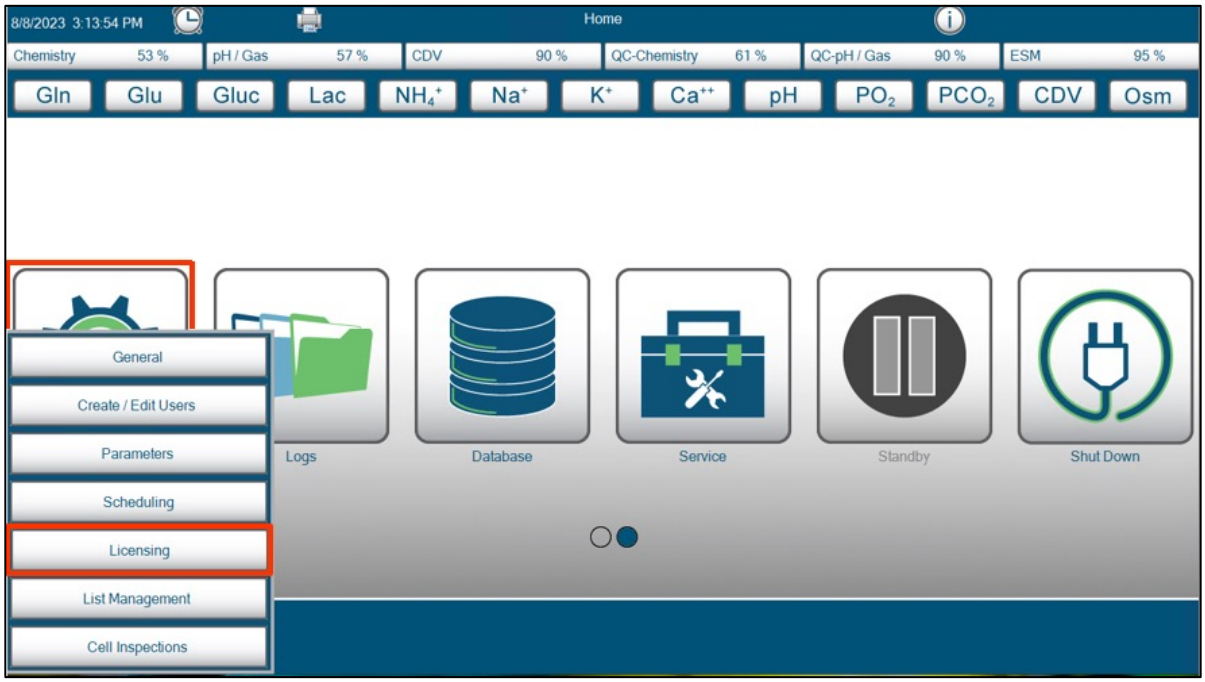

Figure 3.4 Settings → Licensing

5. On the Licensing screen, select *"OPC."*

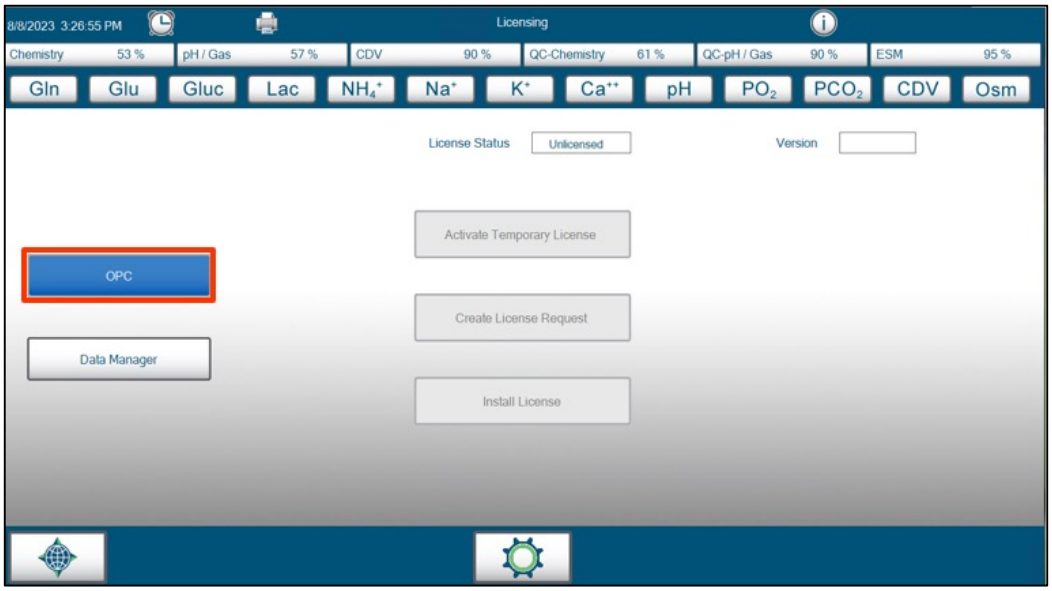

Figure 3.5 Licensing → OPC

6. Select *"Activate Temporary License."* Once the temporary license is activated, the *OPC License Status* field will change from "Unlicensed" to "Temporary" with an expiration date of 30 days from the activation date, as shown in Figure 3.6.

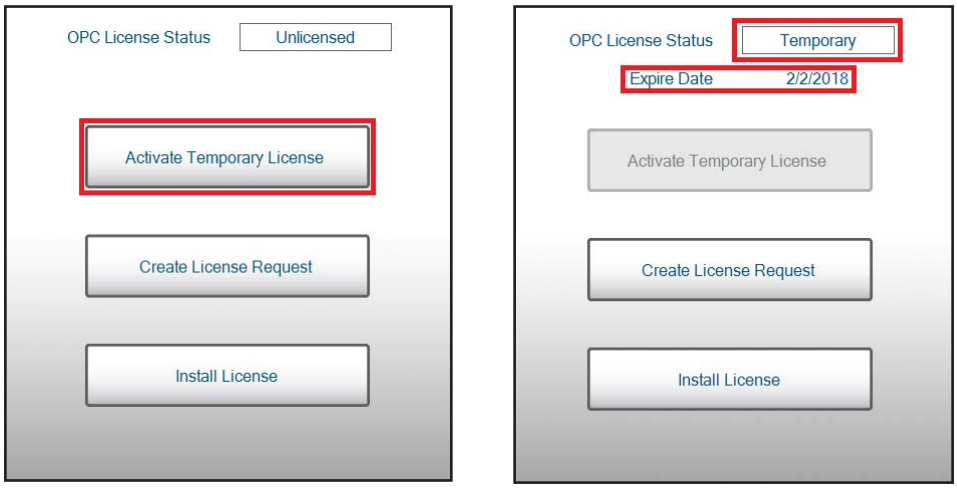

Figure 3.6 Activate Temporary License

7. The OPC License will take effect after a power cycle of the analyzer. To perform a power cycle of the unit:
   a. Select the navigation button in the bottom left-hand corner, then select the top image to return to the main home screen.
   b. Navigate to the second home screen and select the *"Shut Down"* button to power down the analyzer.
   c. Once the analyzer display powers down, wait one minute, then turn off the instrument by toggling the power switch (located on the rear, right-hand side of the analyzer) to the OFF position. Wait an additional minute, then toggle the

switch to the ON position. Allow the FLEX2 to complete the initialization and calibration phase before checking the OPC Server functionality.

Upon the successful activation of the temporary OPC server license, comprehensive access to all read and write tags published through the Nova Biomedical UA and DA OPC Server is granted for a period of 30 days. For detailed guidance on implementing the FLEX2 analyzer with your OPC-compliant devices, please refer to *Section 4 Recommended Client Configuration Options* and *Section 9 BioProfile FLEX2 OPC Tag List*.

3.3 Requesting a Permanent OPC Server License

To ensure prompt licensing of the BioProfile FLEX2 OPC Server, please make sure you have already purchased a full license (PN 59637) through your local sales representative.

Upon the acquisition of the permanent OPC license through your local sales representative or an authorized Nova distributor, the next step involves extracting the unique identifying file with the extension ".ID" from the FLEX2. This file is essential for redeeming your permanent OPC server license.

Exporting to an External Device on the Bridge Computer

To export data to an external device on the Bridge computer, insert your device into an available USB port located on the lower rear, right-hand corner of the analyzer. When prompted with the option to *"Export"* on the User Interface, highlight and select your external device from the list of export destinations. Confirm your selection by choosing the green checkmark icon.

IMPORTANT: The exportable file with the .ID extension will be sent to the root directory file path "E:\", where the external device is assumed to have been assigned the letter "E."

Exporting to the Pre-Defined Shared Folder on the Bridge Computer

The FLEX2 Shared Folder, "Export," is located on the Bridge computer at a fixed file path location: "*C:\Export*." This file destination is hardcoded into the Analytical Unit software and is not customizable. When prompted with the option to *"Export"* on the User Interface, highlight and select *"Shared Folder"* from the list of export destinations. Confirm your selection by selecting the green checkmark icon.

IMPORTANT: The exportable file with the .ID extension will be sent to the file path C:\Export.

Once you have purchased the permanent OPC license via your local sales representative or an authorized Nova distributor, you can request your unique permanent server license be processed by following the steps below:

1. If prompted, log in to the analyzer to gain access to the User Interface (UI).
2. Navigate to the second home screen by swiping to the left on the UI.

3. On the right-hand side of the home screen, select *"Settings."*

NOTE: ***For instruments operating on software versions preceding Version 4.3, simply choose the OPC button within the Settings drop-down menu in Step 3. No further action is required for Steps 4 and 5; you can seamlessly move on to Step 6.***

4. Select *"Licensing"* from the Settings drop-down menu.

Figure 3.7 Settings → Licensing

5. On the *"Licensing screen,"* select *OPC*.

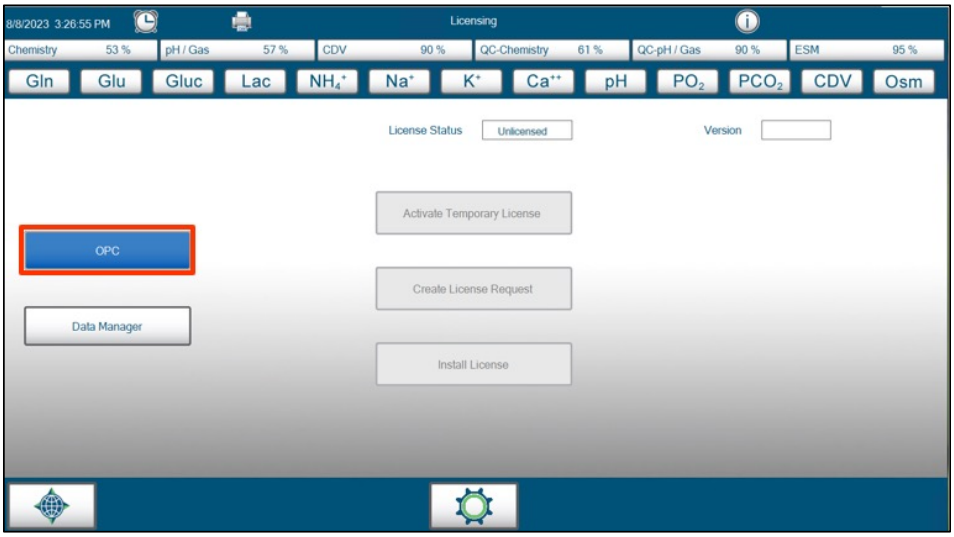

Figure 3.8 Licensing → OPC

6. Insert an external drive into one of the external USB ports located on the rear, right-hand side of the FLEX2.

NOTE: ***If external drive usage is not feasible, utilize the Shared Folder "Export" located on the Bridge computer to access the exported file with the .ID extension through your network or domain.***

7. Select *"Create License Request"* (Figure 3.9).

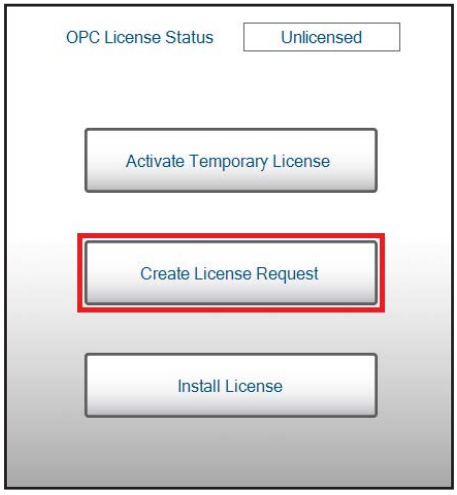

Figure 3.9 Create License Request

8. A pop-up with 2 blank fields will be displayed, as shown on the left in Figure 3.10. In the *Licensee* field, input the company name that purchased the OPC server license. In the *Serial Number* field, input the serial number corresponding to the FLEX2 analyzer you are licensing. Select the green checkmark icon to save these entries and generate the unique .ID file.

NOTE: The serial number is typically situated on a label positioned on the inside left side of the analyzer.

9. Export the license .ID file to an external USB drive by highlighting the destination and selecting the green checkmark icon to confirm.

NOTE: If your facility does not allow the use of USB drives, you can export the license .ID file to the Shared Folder "Export" to be accessed through your network.

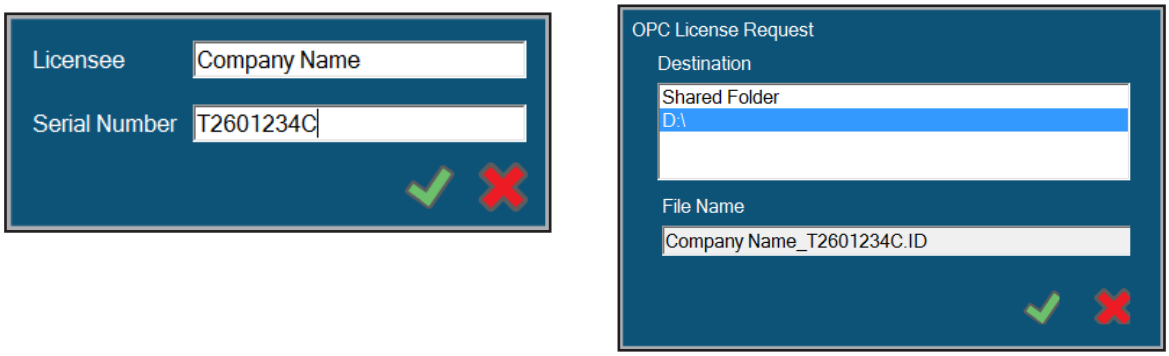

Figure 3.10 Enter Company and Serial Number

10. Email the file with the .ID extension to OPCSupport@novabio.com to receive the uniquely generated OPC license file with the .LIC extension for the analyzer (Figure 3.11).

IMPORTANT: ***When composing the email, ensure the subject line incorporates your company name and the FLEX2 Serial Number. In the email body, provide the original Purchase Order number generated for the OPC license order, along with the company name and the FLEX2 Serial Number. Include the name, email address, and phone number of the primary contact for any potential license-related issues, and remember to attach the file with the .ID extension extracted from the analyzer.***

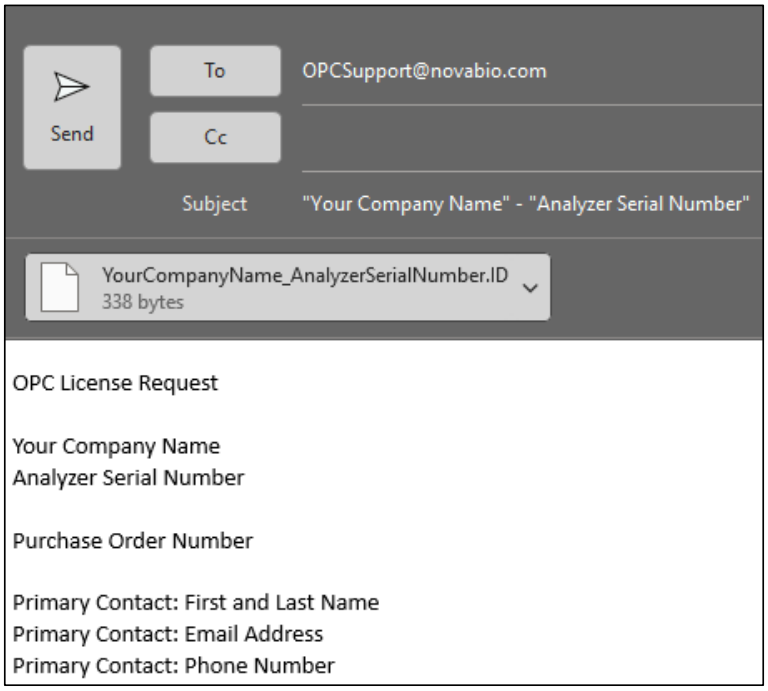

Figure 3.11 Email Format for Permanent License Request

3.4 Installing a Permanent OPC Server License

Once Nova's OPC Automation Support Team has generated the OPC Server permanent license against the PO number supplied in the license request email, the registered unique permanent license key file with the .LIC extension will be emailed to the contact specified in the request. The file will contain the same format as the received .ID extension file with the addition of the suffix "_OPC," i.e., "CompanyName_AnalyzerSerialNumber_OPC.LIC."

To install the permanent OPC Server License:

1. Copy the .LIC file to an external drive and insert the external drive into one of the available USB ports located on the rear right-hand corner of the FLEX2 analyzer.

NOTE: ***If external drive usage is not feasible, copy the .LIC file to the Shared Folder "Export" located on the Bridge Computer of the FLEX2 analyzer from your network or domain.***

2. If prompted, log in to the analyzer to gain access to the UI.
3. Navigate to the second home screen by swiping left on the UI.
4. On the right-hand side of the home screen, select *"Settings."*

NOTE: ***For instruments operating on software versions preceding Version 4.3, simply choose the OPC button within the Settings drop-down menu in Step 4. No further action is required for Steps 5 and 6; you can seamlessly move on to Step 7.***

5. Select "*Licensing"* from the Settings drop-down menu.

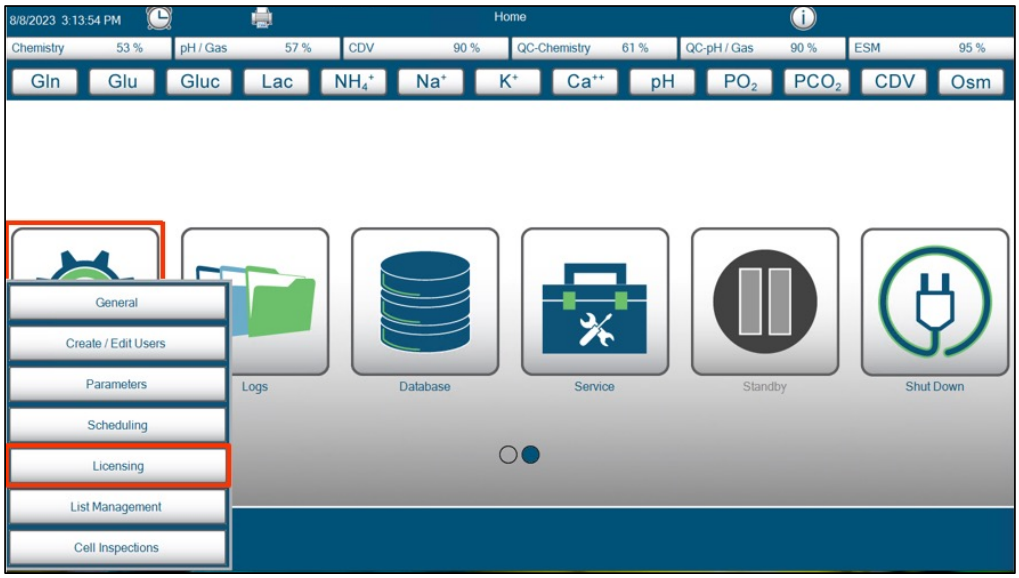

Figure 3.12 Settings → Licensing

6. On the *"Licensing"* screen, select *"OPC."*

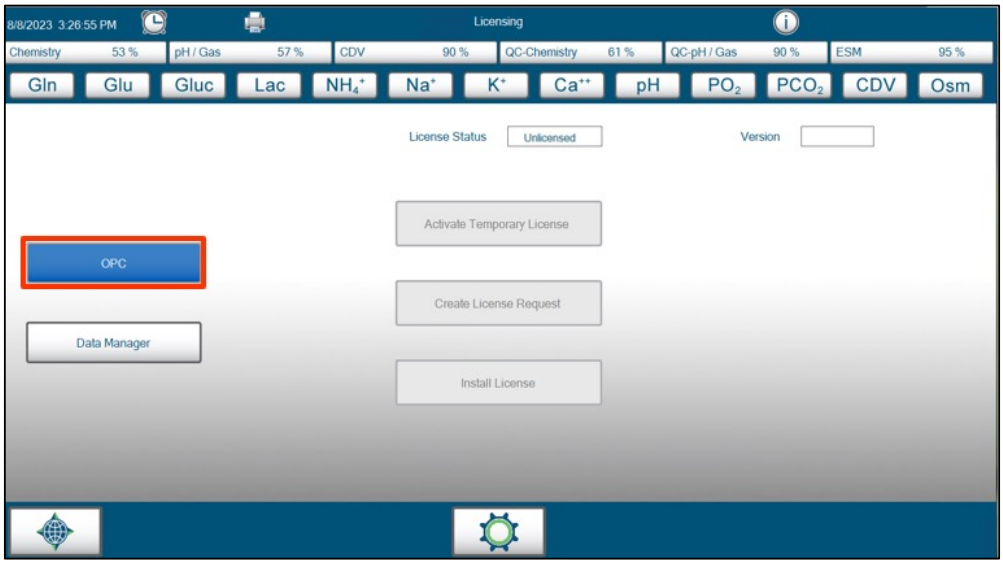

Figure 3.13 Licensing → OPC

7. Select *"Install License."*

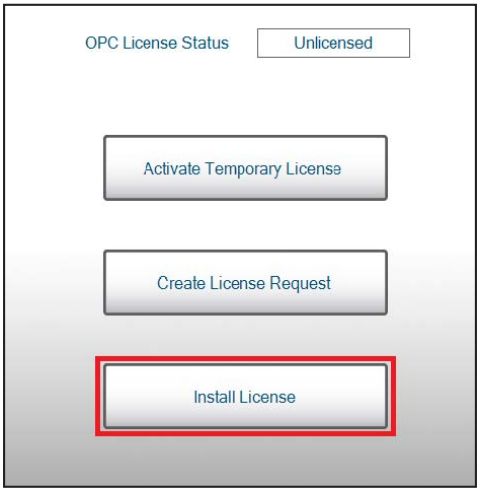

Figure 3.14 Install License

8. Highlight the destination containing the .LIC file, whether it is an external drive or the Shared Folder. Confirm your selection by selecting the green check mark.

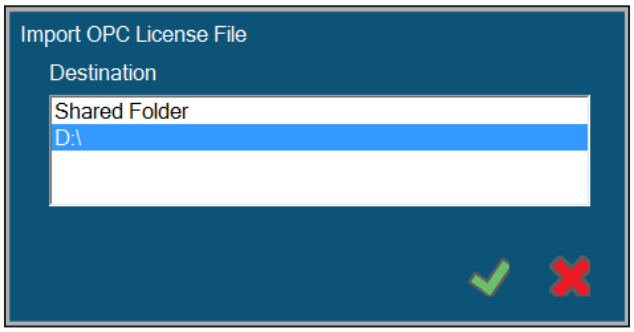

Figure 3.15 Shared Folder Screen

9. Highlight the identifed OPC licensed key file that you intend to upload and confirm your selection by selecting the green check mark.

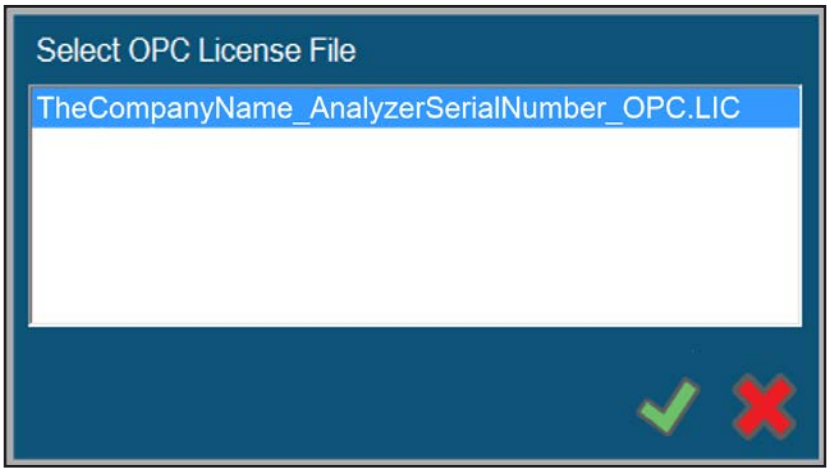

Figure 3.16 Select the OPC License File

10. Once the permanent license key file is successfully activated, the OPC License Status field will update from "Unlicensed" to "Licensed" as illustrated in Figure 3.17.

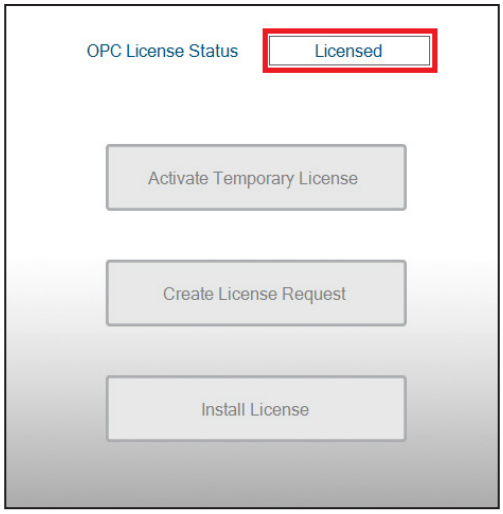

Figure 3.17 OPC License Status Box

11. The OPC license will take effect after a power cycle of the analyzer. To perform a power cycle of the unit:
    a. Select the *"Navigation"* button in the bottom left-hand corner and select the top image to return to the home screen.
    b. Navigate to the second home screen and select *"Shut Down"* to power down the analyzer.
    c. Once the analyzer display goes dark, wait one minute, then turn off the instrument by toggling the power switch located on the rear right-hand side of the analyzer to the OFF position. Wait an additional minute, then toggle the switch to the ON position. Allow the FLEX2 to complete the initialization and calibration phase before checking the OPC server functionality.

Upon the successful activation of the permanent OPC server license, comprehensive access to all read and write tags published through the Nova Biomedical UA and DA OPC Server is granted for the lifetime of the analyzer. For detailed guidance on implementing the FLEX2 analyzer with your OPC-compliant devices, please refer to *Section 4 Recommended Client Configuration Options* and *Section 9 BioProfile FLEX2 OPC Tag List*.

4 IDENTIFY THE INSTALLED OPC VERSION

1. Navigate to the **Bridge Computer** using one of the methods detailed in Section 2.2.
2. Open the **Windows File Explorer** and navigate to the **Local (C:) Drive**.
3. On the Bridge Computer, follow the path below:
   a. Version 1.2.19066: "*C:\FlexII_OPC\FlexII_OPC_0000\OPC Service"*
   b. Version 3.0 and Higher: "*C:\FlexII_OPC\FlexII_OPC_XXXX*," where "*XXXX*" is greater than "0000" and the largest number present.

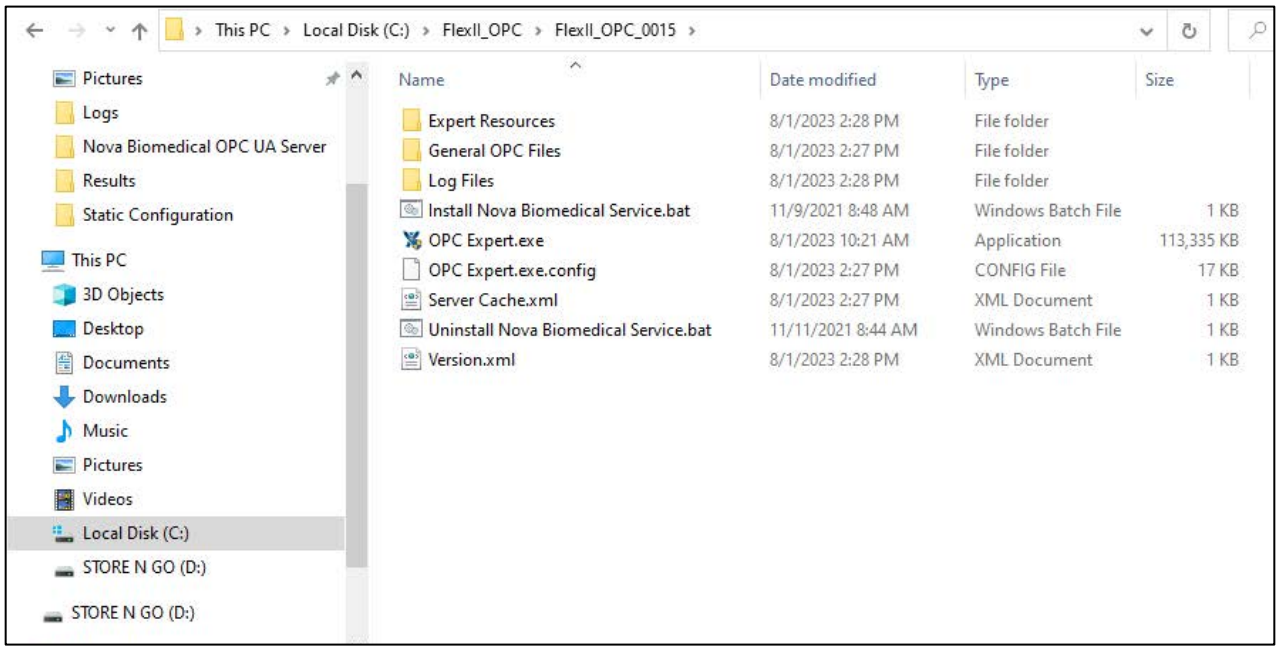

Figure 4.1 OPC Version File Location

4. Right-click on the file "Version.xml" and select "*Edit"* to view the OPC Software Version.
5. The OPC Version will be listed in this file as shown below.

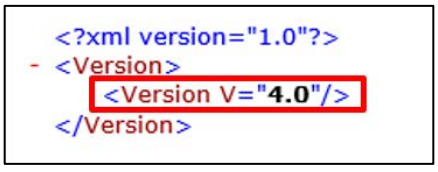

Figure 4.2 OPC Version Display

5 Recommended Client Configuration Options

The OPC client software seamlessly establishes connections with the FLEX2 OPC server through a variety of validated methods. The following represent some commonly employed approaches that have undergone validation with the FLEX2 OPC server.

5.1 Connecting the OPC UA Server with a Remote Client

When establishing a connection to the FLEX2 OPC UA server from a remote network location, it is imperative that the following requirements are met:

- The third-party OPC client being utilized is compatible with UA server connections.
- The FLEX2 Bridge Computer is accessible through your corporate network/domain.
- The Nova Biomedical OPC server is licensed.

If these requirements are met, you can instruct your remote client to connect to the FLEX2 Bridge Computer using the IP Address provided by your IT department.

a. Version 1.2.19066 UA Server Source ProgID or URL:
opc.tcp:///(IP Address):59888/OpcExpert

b. Version ≥ 3.0 UA Server Source ProgID or URL:
opc.tcp:///(IP Address):59888/NovaBiomedical

For additional details on configuration, refer to *Section 1.2 UA Server-Specific Configurations.*

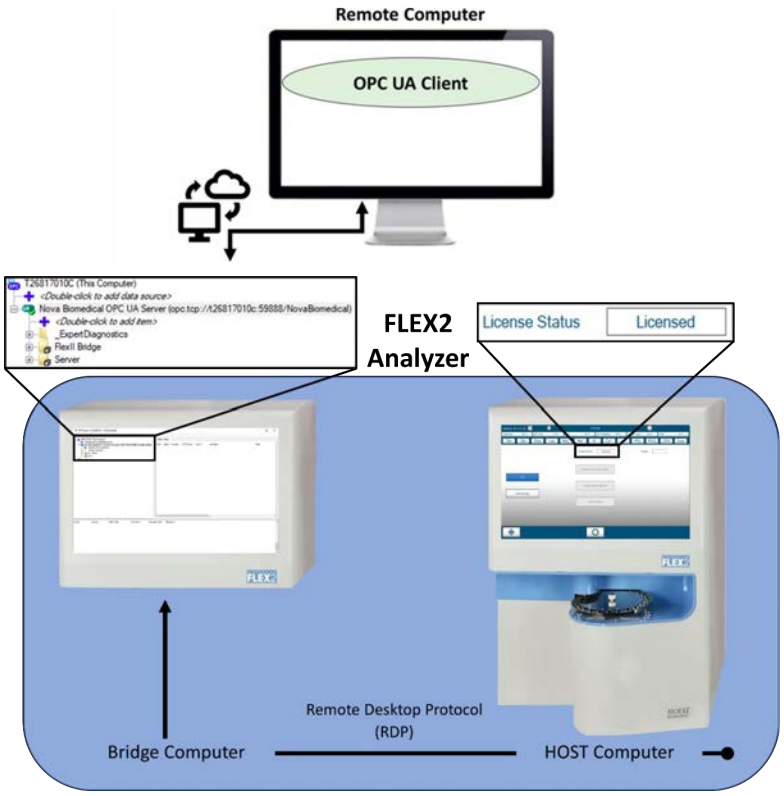

Figure 5.1 Connection Diagram: OPC UA Server Remote Client

5.2 Connecting the OPC DA Server with a Remote Client

When establishing a connection to the BioProfile FLEX2 OPC DA Server from a remote network location, it is imperative to ensure the following requirements are met:

- The third-party OPC client being utilized is compatible with DA server connections.
- The FLEX2 Bridge Computer is accessible through your corporate network/domain.
- The Nova Biomedical OPC server is licensed.
- DCOM is properly configured on the FLEX2 Bridge Computer.
- DCOM is properly configured on your third-party computer.

NOTE: The standard configuration for utilizing Tunneling is pre-configured on the FLEX2 Bridge Computer. Reference Section 4.3 for detailed instructions on connecting to the Nova Biomedical OPC DA server by utilizing the "Mimic" configuration.

If these requirements are met, you can instruct your remote client to connect to the FLEX2 Bridge Computer using the IP Address provided by your IT department.

a. Version 1.2.19066 UA Server Source ProgID or URL:
opc.tcp:///(IP Address):59888/OpcExpert

b. Version ≥ 3.0 UA Server Source ProgID or URL:
opc.tcp:///(IP Address):59888/NovaBiomedical

For additional details on configuration, refer to *Section 1.1 DA Server-Specific Configurations.*

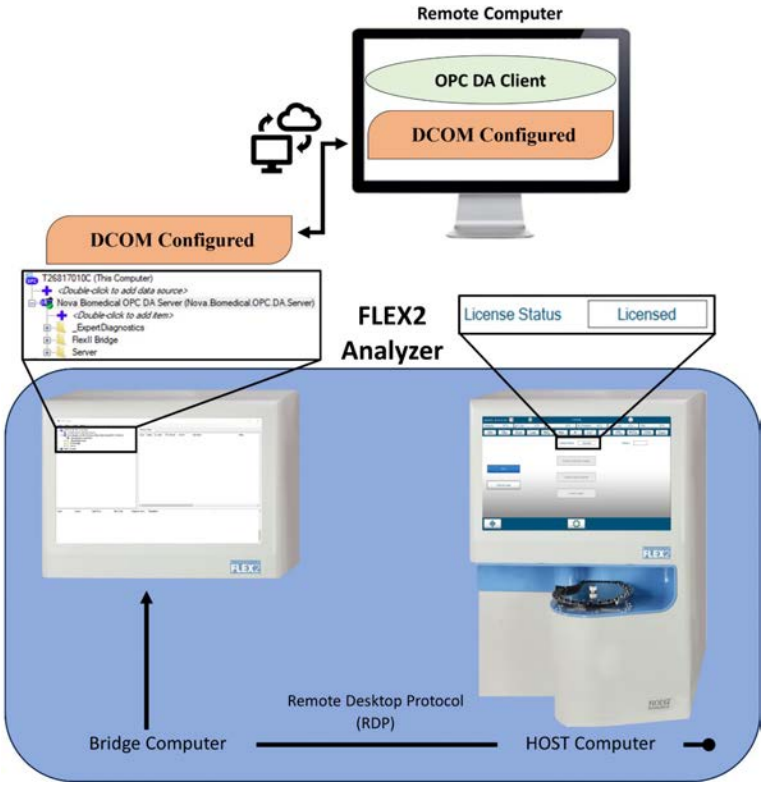

Figure 5.2 Connection Diagram: The OPC DA Server DCOM Remote Client

5.3 Connecting the OPC DA Server using a Mimic of the UA on a Remote Client

When establishing a connection to the FLEX2 OPC DA Server from a remote network location utilizing a mimic configuration, it is imperative to ensure that the following requirements are met:

- The third-party OPC client being utilized is compatible with DA server connections.
- The third-party OPC client being utilized is equipped with the capability to apply a mimic from the Nova OPC UA Server for the establishment of an OPC DA Server.
- The FLEX2 Bridge Computer is accessible through the network to the Remote PC.
- The Nova Biomedical OPC server is licensed.

If these requirements are met:

1. Instruct your third-party client to establish a connection with the FLEX2 Bridge Computer using the provided IP Address assigned by your IT department.
2. Leverage the mimic capability of the third-party client to convert the FLEX2 UA Server into a DA server.
   a. Version 1.2.19066 UA Server Source ProgID or URL:
   opc.tcp:///(IP Address):59888/OpcExpert
   b. Version ≥ 3.0 UA Server Source ProgID or URL:
   opc.tcp:///(IP Address):59888/NovaBiomedical
3. Conclude the process by directing the remote client to connect to the locally hosted DA Mimic server.

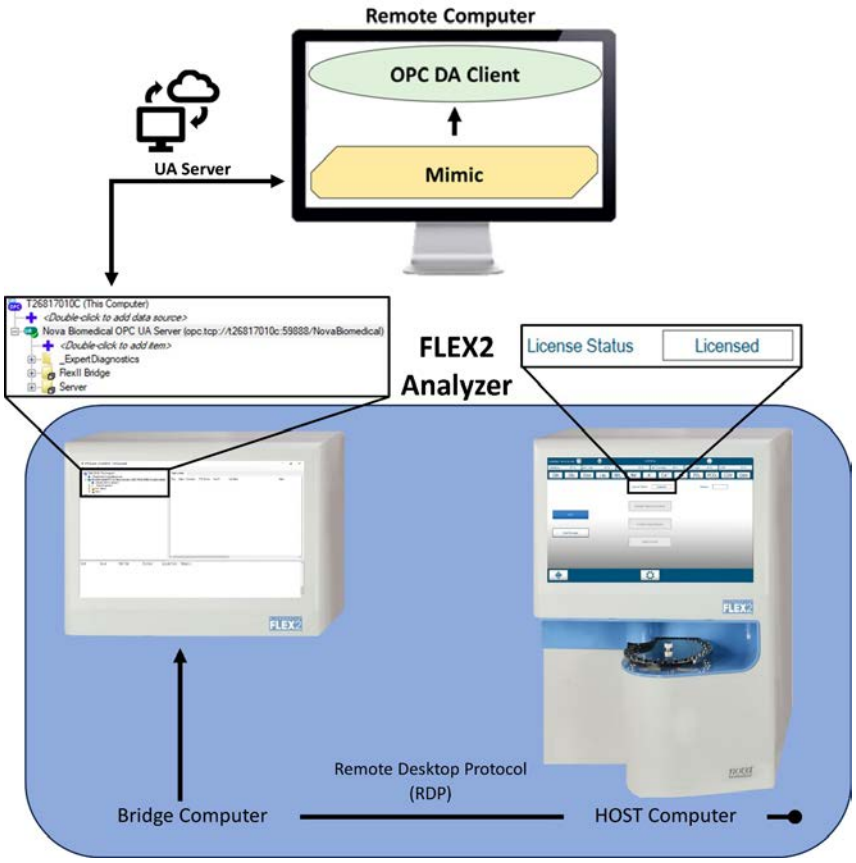

Figure 5.3 Connection Diagram: The OPC DA Server with a Mimic from the UA Server

6 CONFIRMING THE FLEX2 OPC UA/DA SERVER IS UPDATING

If you encounter difficulties browsing the OPC UA and DA Servers as per the configuration options detailed in this manual, employ the following procedures to determine if the OPC Server is functioning properly.

NOTE: To identify the software version of the OPC Server, refer to Section 4.

6.1 CONFIRM OPC DA SERVER FUNCTIONALITY

6.1.1 OPC SERVER VERSION 1.2.19066

1. Access the **Bridge Computer** by following the steps in Section 2.2.
2. Locate the third-party licensed client application, "OPC Expert," on the Bridge Computer by navigating to the following path:
   a. *C:\FlexII_OPC\FlexII_OPC_0000\OPC Expert*

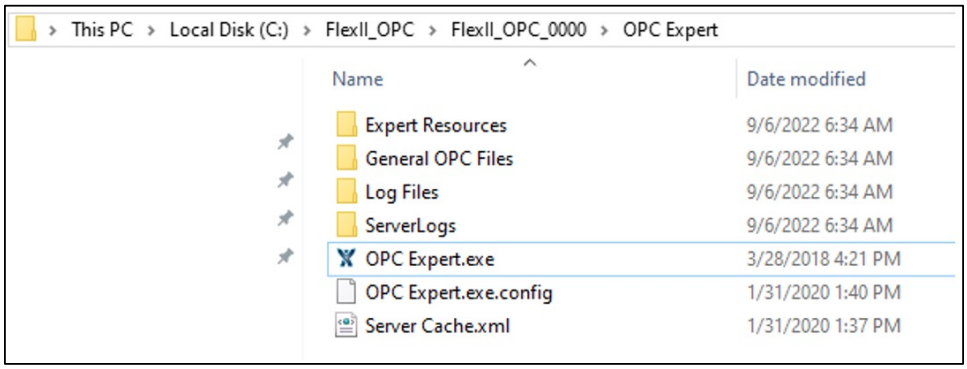

Figure 6.1 OPC Expert Application Location

3. Right-click on **OPC Expert.exe** and select **Run as Administrator**.
4. Within the application, browse for the OPC DA Server by double-clicking **This Computer** in the browse tree.

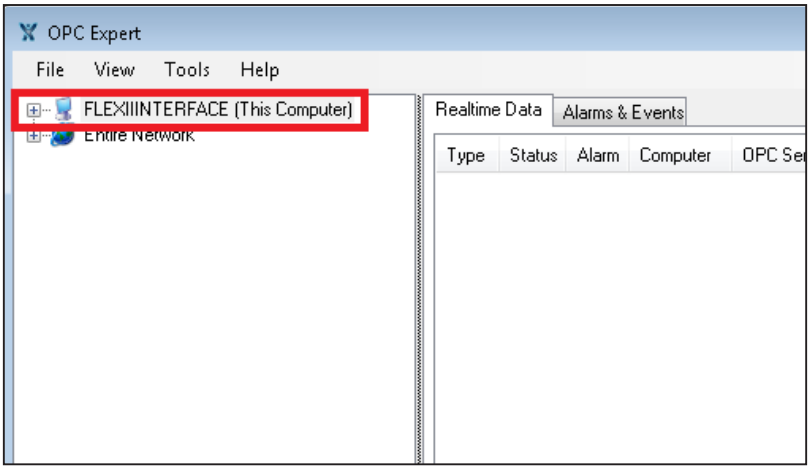

Figure 6.2 Expanding This Computer for DA Server in Browse Tree

5. Expand the OPC DA Server with "FlexII Automation Server (Nova.Biomedical. Server)" by double-clicking the server name.

Figure 6.3 OPC DA Server in V1.2.19066 Expansion

6. Browse the folder "Localhost" and subscribe to the tags located under:
   a. OPCSystemObjects → CoreHeartbeat → UpTime

      Receives constant updates and indicates how long the analyzer has been up and running since the last shutdown.

   b. OPCSystemObjects → DateTime → DateTime

      Provides the current Date and Time from the Bridge Computer.

7. Verify that the two tags listed above are operating correctly, with values that are regularly updated.

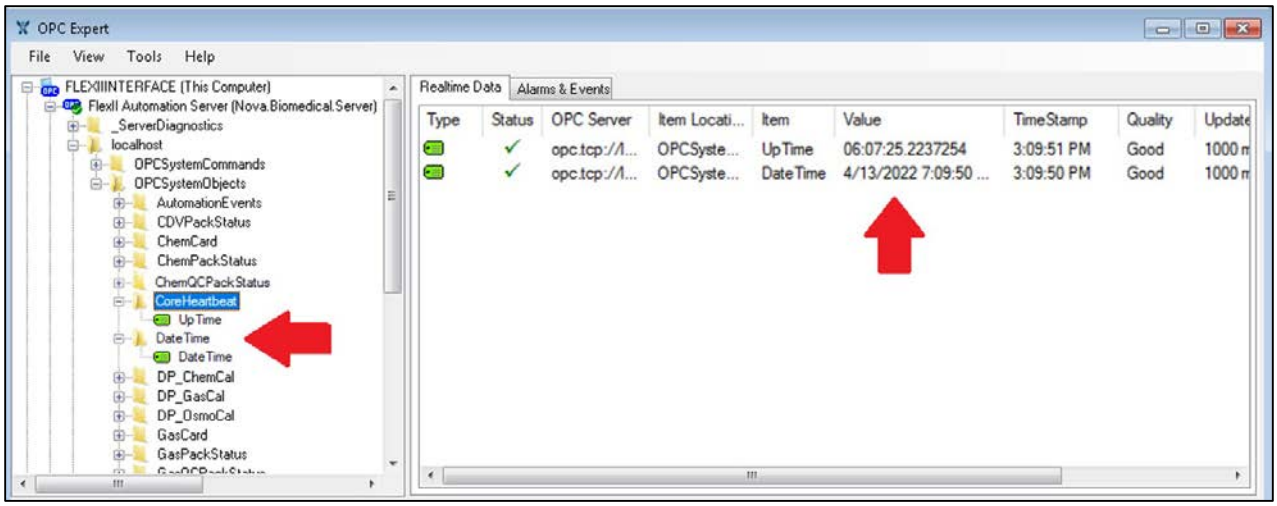

Figure 6.4 Browse the Localhost Folder and Subscribe to Tags

A green checkmark ✓ in OPC Expert indicates proper communication functionality. If a yellow exclamation mark ! or red cross ✘ is displayed, it signifies an issue with your communication setup. Detailed descriptions and troubleshooting recommendations can be found by double-clicking a specific error message ⚠ found at the bottom of the application. If still unable to subscribe to tags, refer to *Section 8: Troubleshooting OPC Connectivity.*

6.1.2 OPC SERVER VERSION ≥ 3.0

1. Access the **Bridge Computer** by following the steps in Section 2.2.
2. Locate the third-party licensed client application, "OPC Expert," on the Bridge Computer by navigating to the following path:
   a. *C:\Program Files\OPC Expert*

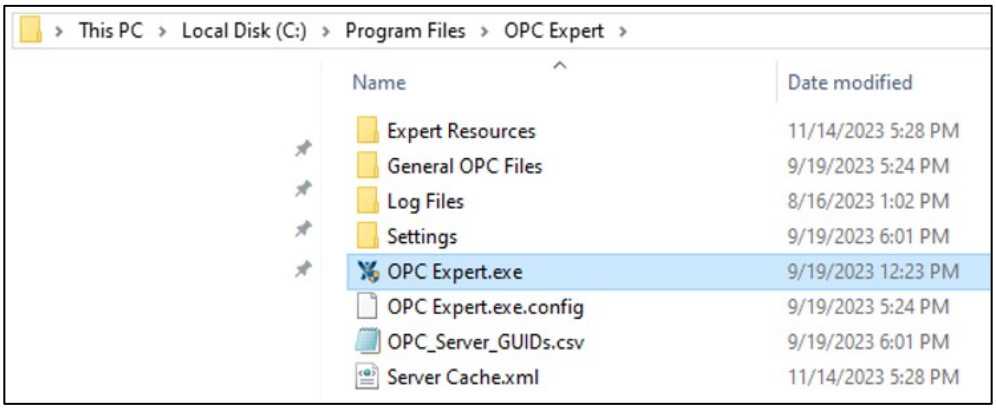

Figure 6.5 OPC Expert Application Location

3. Right-click on **OPC Expert.exe** and select **Run as Administrator**.
4. Within the application, browse for the OPC DA Server by double-clicking **This Computer** in the browse tree.

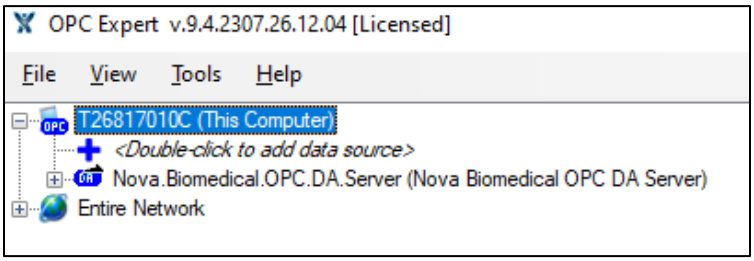

Figure 6.6 Expanding This Computer for DA Server V1.2.19066 in Browse Tree

5. Expand the OPC DA Server with "Nova.Biomedical.OPC.DA.Server" by double-clicking the server's name.

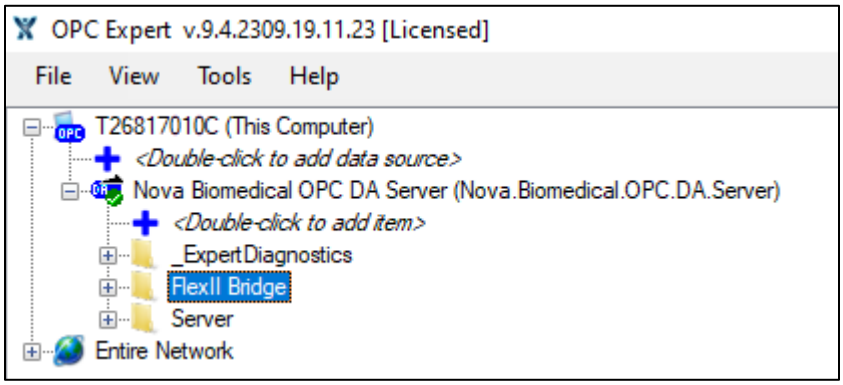

Figure 6.7 OPC DA Server in V1.2.19066 Expansion

6. Browse the folder "FlexII Bridge" and subscribe to the tags located under:
   a. OPCSystemObjects → CoreHeartbeat → UpTime

      Receives constant updates and indicates how long the analyzer has been up and running since the last shutdown.

   b. OPCSystemObjects → DateTime → DateTime

      Provides the current Date and Time from the Bridge Computer.
7. Verify that the two tags listed above are operating correctly, with values that are regularly updated.

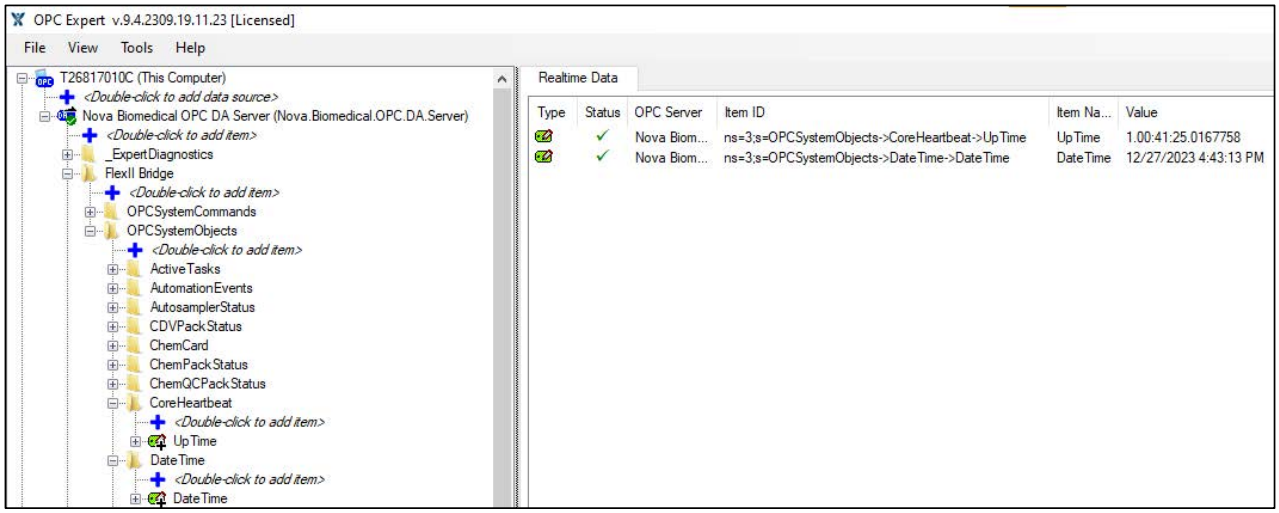

Figure 6.8 Browse the FlexII Bridge Folder and Subscribe to Tags

A green checkmark ✓ in OPC Expert indicates proper communication functionality. If a yellow exclamation mark ! or red cross ✘ is displayed, it signifies an issue with your communication setup. Detailed descriptions and troubleshooting recommendations can be found by double-clicking a specific error message ⚠ found at the bottom of the application. If still unable to subscribe to tags, refer to *Section 8: Troubleshooting OPC Connectivity.*

6.2 Confirm OPC UA Server Functionality

6.2.1 OPC Server Version 1.2.19066

1. Access the **Bridge Computer** by following the steps in Section 2.2.
2. Locate the third-party licensed client application, "OPC Expert," on the Bridge Computer by navigating to the following path:
   a. *C:\FlexII_OPC\FlexII_OPC_0000\OPC Expert*

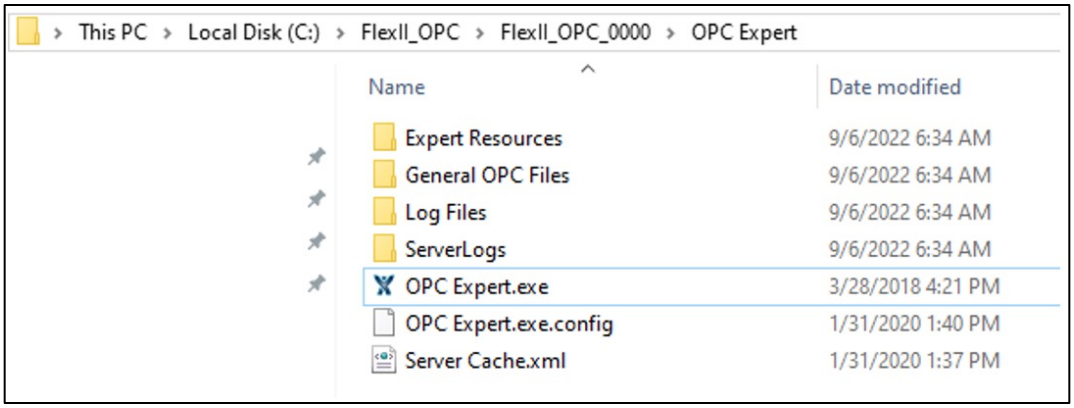

Figure 6.9 OPC Expert Application Location

3. Right-click on **OPC Expert.exe** and select **Run as Administrator**.
4. Within the application, right-click **This Computer** in the browse tree and select **Add OPC Server**.

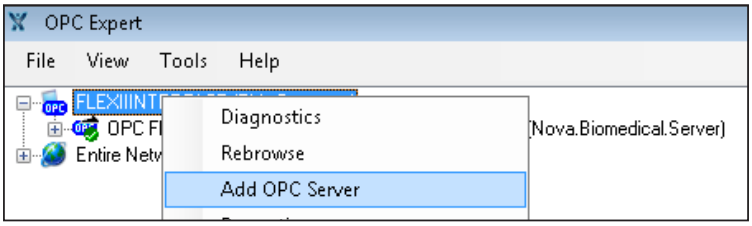

Figure 6.10 Right-click "This Computer" and Select "Add OPC Server"

5. In the *Type* drop-down, select **UA**. From the *Vendor* drop-down, select **Nova Biomedical**. The remaining fields should auto-fill. Ensure alignment with these fields, then select **OK** to confirm your OPC UA Server selection.

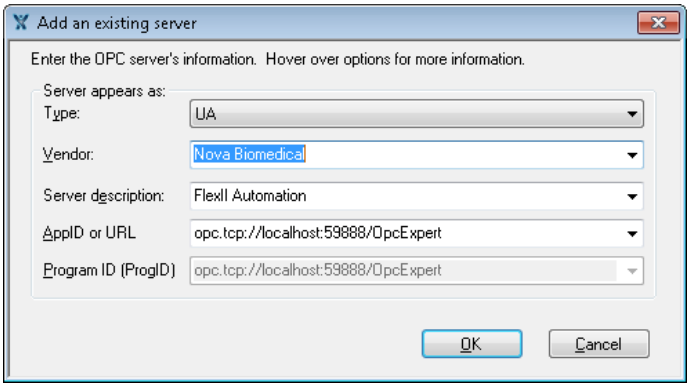

Figure 6.11 Add Existing Server Window

6. From the Browse Tree, expand the OPC UA Server with *opc.tpc://localhost:59888/OpcExpert* by double-clicking the server's name.

IMPORTANT: Confirm that you are utilizing the OPC UA Server stating the port 59888 within the ProgID/URL.

Figure 6.12 OPC UA Server V1.2.19066 Expansion

7. Browse the folder "localhost" and subscribe to the tags located under:
   a. OPCSystemObjects → CoreHeartbeat → UpTime

      Receives constant updates and indicates how long the analyzer has been up and running since the last shutdown.

   b. OPCSystemObjects → DateTime → DateTime

      Provides the current Date and Time from the Bridge Computer.
8. Verify that the tags listed above are operating correctly, with values that are regularly updated.

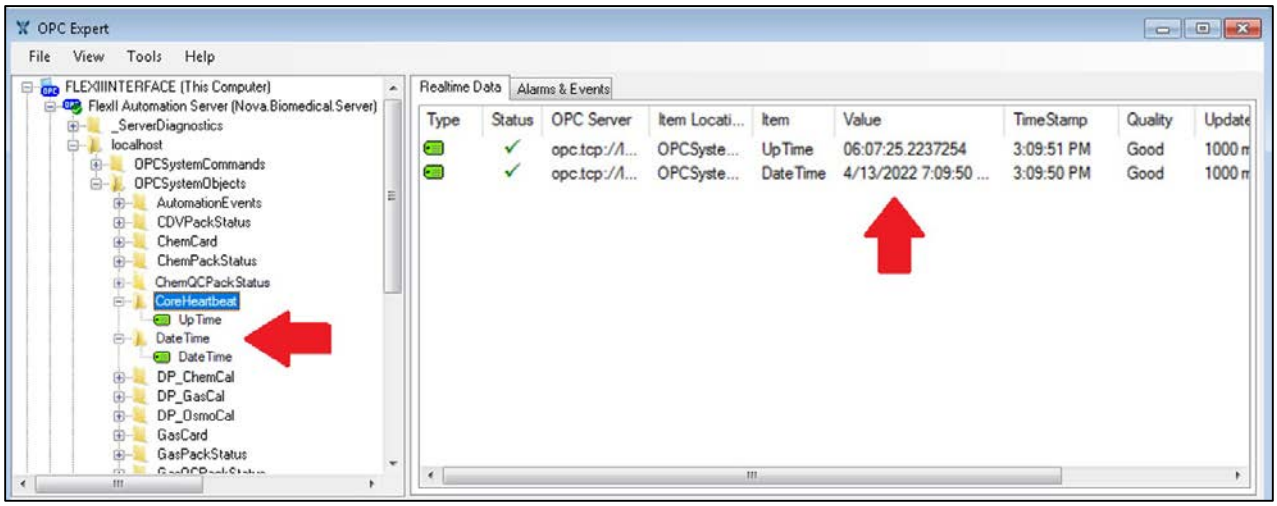

Figure 6.13 Browse the localhost Folder and Subscribe to Tags

A green checkmark ✓ in OPC Expert indicates proper communication functionality. If a yellow exclamation mark ! or red cross ✘ is displayed, it signifies an issue with your communication setup. Detailed descriptions and troubleshooting recommendations can be found by double-clicking a specific error message ⚠ found at the bottom of the application. If still unable to subscribe to tags, refer to *Section 8: Troubleshooting OPC Connectivity.*

6.2.2 OPC Server Version ≥ 3.0

1. Access the **Bridge Computer** by following the steps in Section 2.2.
2. Locate the third-party licensed client application, "OPC Expert," on the Bridge Computer by navigating to the following path:
   a. *C:\Program Files\OPC Expert*

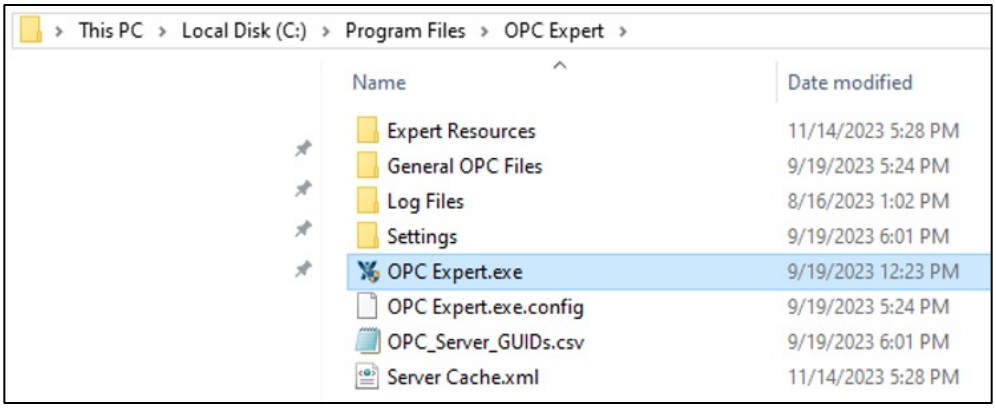

Figure 6.14 OPC Expert Application Location

3. Right-click on **OPC Expert.exe** and select **Run as Administrator**.
4. Within the application, browse for the OPC UA Server by double-clicking **This Computer** in the browse tree.

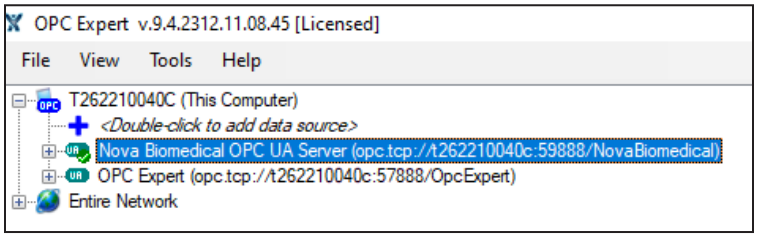

Figure 6.15 Expanding This Computer for UA Server V3.0 and Higher in Browse Tree

5. Expand the OPC UA Server with "Nova Biomedical OPC UA Server" by double-clicking the server's name.

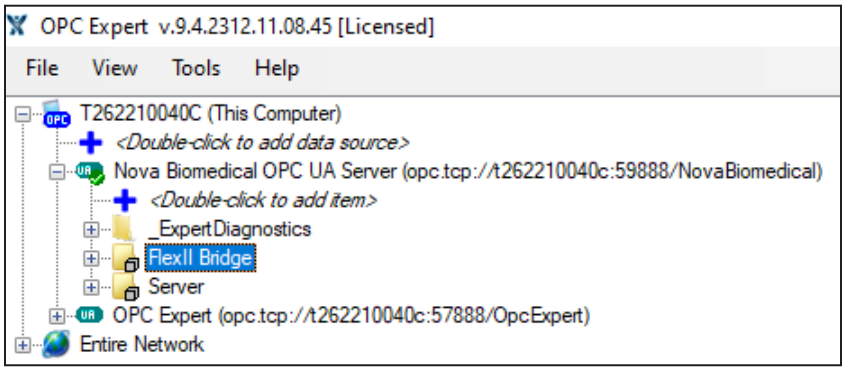

Figure 6.16 OPC UA Server V3.0 and Higher Expansion

6. Browse the folder "FlexII Bridge" and subscribe to the tags located under:
   a. OPCSystemObjects → CoreHeartbeat → UpTime

      Receives constant updates and indicates how long the analyzer has been up and running since the last shutdown.

   b. OPCSystemObjects → DateTime → DateTime

      Provides the current Date and Time from the Bridge Computer.

7. Verify that the two tags listed in Step 6 are operating correctly, with values that are regularly updated.

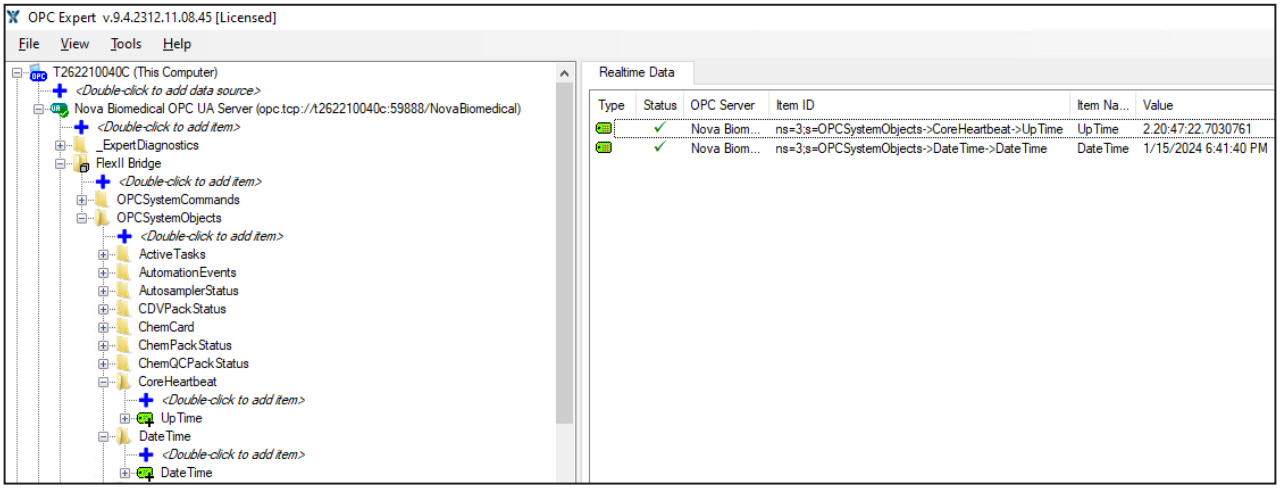

Figure 6.17 Browse the FlexII Bridge Folder and Subscribe to Tags

A green checkmark ✓ in OPC Expert indicates proper communication functionality. If a yellow exclamation mark ! or red cross ✘ is displayed, it signifies an issue with your communication setup. Detailed descriptions and troubleshooting recommendations can be found by double-clicking a specific error message ⚠ found at the bottom of the application. If still unable to subscribe to tags, refer to *Section 8: Troubleshooting OPC Connectivity.*

7 OPC Server Version 4.1

Tag Calculation functionality has been added to the OPC Server Version 4.1. This feature allows users to create new items within the Nova OPC Server. These items are accessible as standard tags within both the Nova OPC UA and DA servers.

IMPORTANT: ***The Calculations functionality is exclusive to the Bridge Computer, the location of the OPC Server installation. Users can utilize this capability through the licensed third-party OPC Client application, 'OPC Expert,' directly on the Bridge Computer.***

With the Tag Calculations functionality, users can generate items that do not currently exist based on the available items from the instrument. Moreover, this functionality offers the flexibility to modify the data type of all available items within the OPC Server. By creating new items with the output of the current item but with the desired data type, users can now tailor their communication needs via the connection to the Nova OPC Server.

7.1 Formulating Tag Calculations

When creating a calculation, you can either start from a clean slate or develop a calculation centered around an existing tag within the Nova OPC Server Tag List.

The Tag Calculations functionality has three variations: Simple, Multiple, and Complex Tag Calculations. Each variation offers a unique set of capabilities tailored to specific scenarios.

In the upcoming section, we will examine each variation individually and discuss their respective advantages.

7.1.1 Getting Started

To create a calculation tag using the OPC Expert client, located on the Bridge computer, you have two convenient options.

To Create a Calculation Tag – Option 1:

1. Within the OPC Expert Client, right-click on the folder “_Calculations” within the OPC Server and choose "Create Calculation" (Figure 7.1) to open the Calculations window (Figure 7.2).

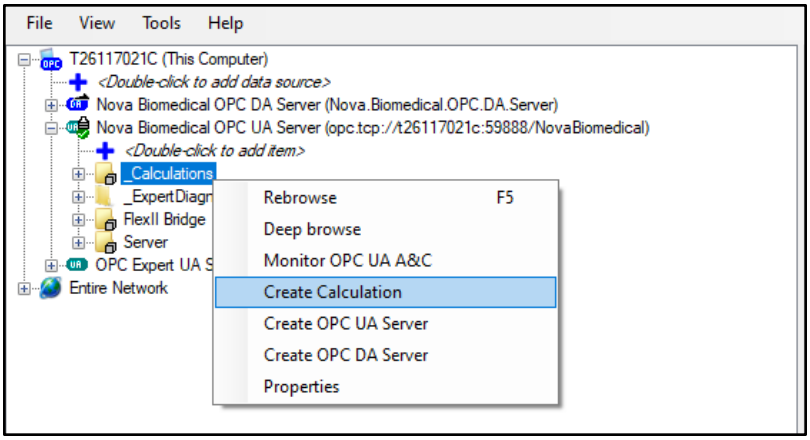

Figure 7.1 Create Calculation for Option 1

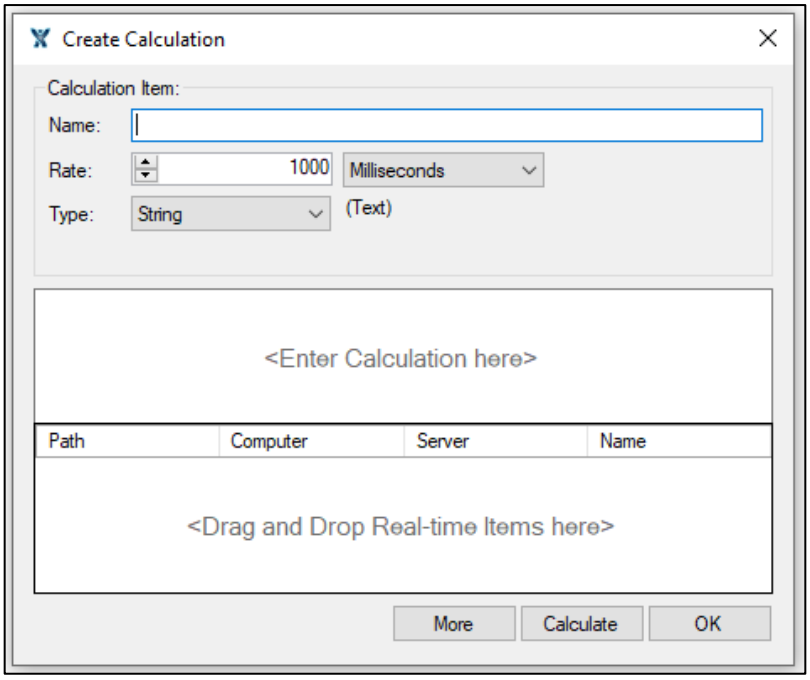

Figure 7.2 Calculation Window for Option 1

NOTE: ***In Figure 7.2, the dialog box labeled "<Drag and Drop Real-time Items here>" enables users to select and drag items that are subscribed and displayed within the 'Realtime Data' view in OPCExpert. This feature streamlines the process of referencing items during the development of scripting functions, as detailed in section 7.1.2.3.***

To Create a Calculation Tag – Option 2:

1. Within OPC Expert Client, subscribe to the tag(s) to populate them within the "Realtime Data" view.
2. Select the desired tags within the "Realtime Data" view, right-click, and choose "Create Calculation" (Figure 7.3) to open the Calculations window referencing the selected tags from "Realtime Data" view (Figure 7.4).

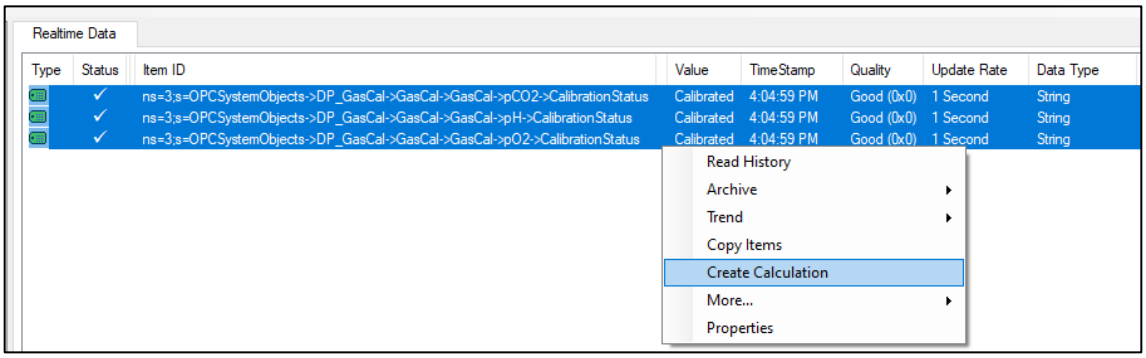

Figure 7.3 Create Calculation for Option 2

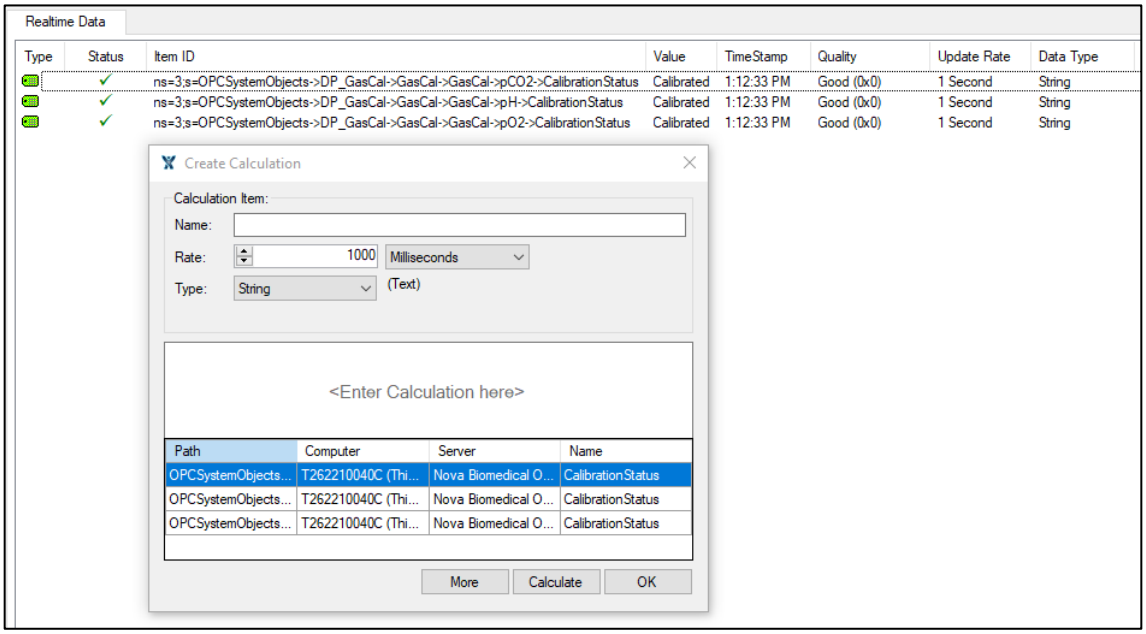

Figure 7.4 Calculation Window for Option 2

7.1.2 CREATING AN ITEM FROM THE CALCULATION WINDOW

To create an item using the Calculation Window, you need to define the 'Name,' 'Rate,' and 'Type' fields, and after, you can enter the calculation in the space marked "<Enter Calculation here>". For visual guidance on the location of these fields, please refer to Figure 7.5.

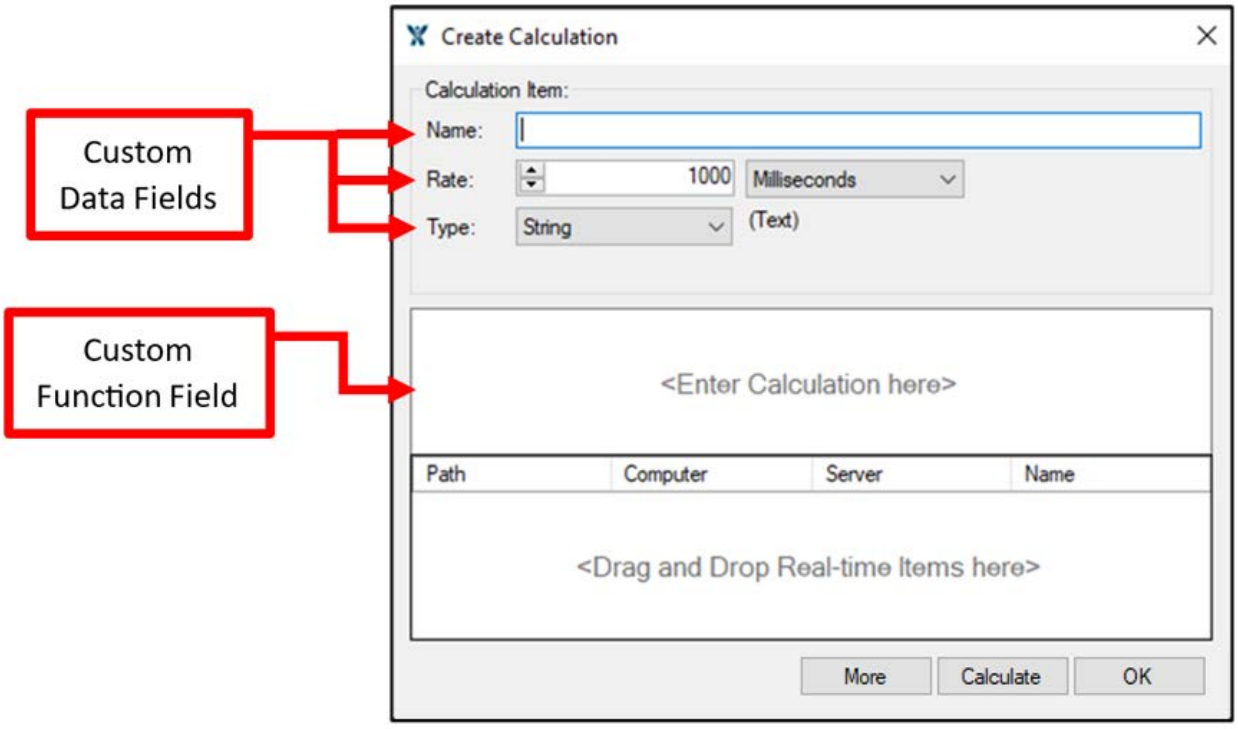

Figure 7.5 Location of Custom Fields

7.1.2.1 Defining the Custom Data Fields

1. The "**Name**" data field is customizable and defines the assigned word for addressing the Calculation Item when called upon. This data field does not allow for the use of special characters. When creating a Calculation Item with reference to a single already defined item, the default "Name" will be automatically set to match the original name of that item plus the term "Calculation" appended at the end of the name to distinguish it.
2. The "**Rate**" data field defines the publishing interval for the Calculation Item. This interval, measured in milliseconds, seconds, minutes, or hours, dictates how frequently the OPC Server delivers data change notifications to the OPC client. By customizing the "Rate" value, users can adjust the frequency at which the output is updated. The default setting for this field is configured to 1000 milliseconds, offering a balance between responsiveness and resource efficiency.
3. The "**Type**" data field serves the purpose of defining the data type associated with the Calculation Item. Data types serve as categorizations specifying the nature of data the item can accommodate within the context of programming. The assigned data type dictates the permissible operations on the data, the requisite memory allocation for storage, and the internal representation of the data. In instances where a Calculation Item is created with reference to a single predefined item, the default data type is automatically set to align with the original data type of the referenced item. This functionality is helpful when working with third-party software programs that require specific data type inputs.

7.1.2.2 Offered Data Types and Definitions

Table 7.1 Data Types Supported

DATA TYPE	DEFINITION	EXAMPLES
Boolean	True or False values.	0 (false) or 1 (true)
Byte	An unsigned 8-bit integer from 0 to 255.	0 or 200 or 54
Char	Unicode 16-bit character from U+0000 to U+ffff. A single letter or digit.	'a' or 'b' or 1
DateTime	An instant in time that is typically expressed as a date and time of day: format YYYY-MM-DD hh:mm:ss.	2099-12-30 05:32:49
Decimal	Represents a non-repeating decimal number.	0.3 or -1.17
Double	Represents a double-precision floating-point number.	3.141593
Int16	Signed 16-bit integer from -32,768 to 32,767.	30 or 504
Int32	Signed 32-bit integer from -2,147,483,648 to 2,147,483,647.	5,235 or -453
Int64	Signed 64-bit integer from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807.	10,232 or -5,672
SByte	Signed 8-bit integer from -128 to 127.	100
Single	Single-precision floating-point number. An approximation of the real number.	3.14
String	A sequence of characters or digits that are always treated as text.	'hello' or '12345hi'
UInt16	An unsigned 16-bit integer from 0 to 65,535.	50
UInt32	Unsigned 32-bit integer from 0 to 4,294,967,295.	2,300
UInt64	Unsigned 64-bit integer from 0 to 18,446,744,073,709,551,615.	82,489

7.1.2.3 Defining the Custom Function Field

The Calculation Items Custom Function Input Field, as illustrated in Figure 7.5, acts as the workspace where you can script the desired output for the Calculation Item. Additionally, there's a pre-built library that includes examples of all supported functions, organized by category, for your reference. To access this library, click on the "More" button, as indicated in Figure 7.6, and then choose the "Advanced" tab (Figure 7.7). It's important to note that clicking the "More" button will toggle its display to show the button as "Less."

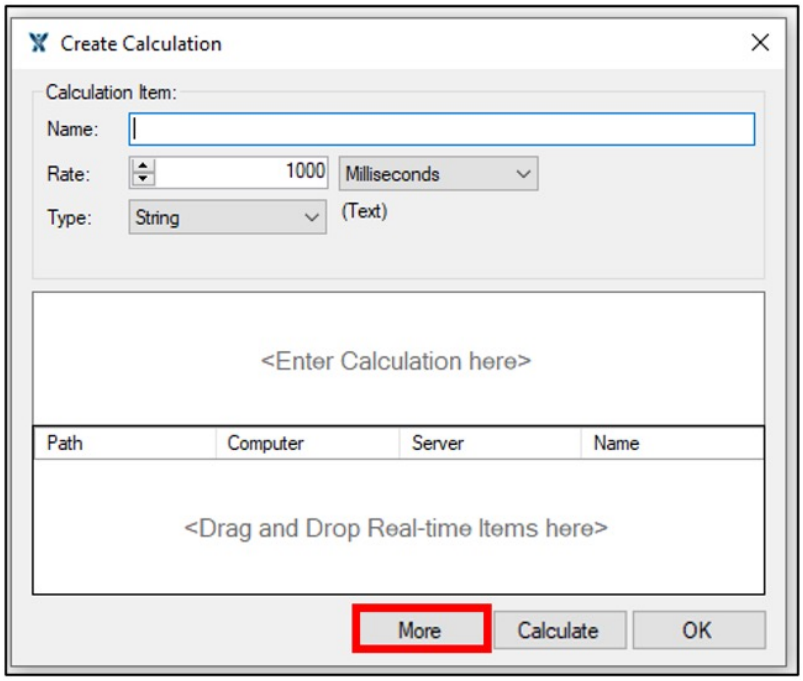

Figure 7.6 Location of the "More" Button

The Custom Function Input Field can interpret a diverse array of functions across several categories, including Bitwise, Comparison, Item Output, Logical, Math/Trigonometry, and Miscellaneous, as depicted in Figure 7.7.

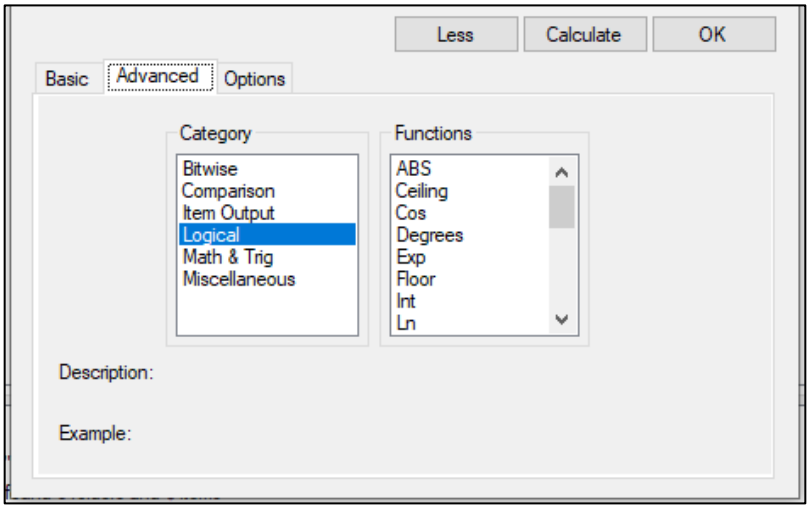

Figure 7.7 Advanced Tab Functions Displayed

These functions encompass standard logical operators such as the "If" statement and miscellaneous functions like the "Switch" statement, alongside conventional logical comparison operators such as "<," "==," ">," and ">=."

IMPORTANT: The function input field excludes the use of nesting other item calculations.

7.1.3 EVALUATING THE FUNCTION OF THE CALCULATION ITEM

The “Calculate” button compiles the function entered in the custom function input field at that specific moment. After selecting the “Calculate” button, a new window will appear with the results for your evaluation/debug needs (refer to Figure 7.8). It is highly recommended to utilize the "Calculate" button before saving to ensure that your Calculated Item will produce the intended results.

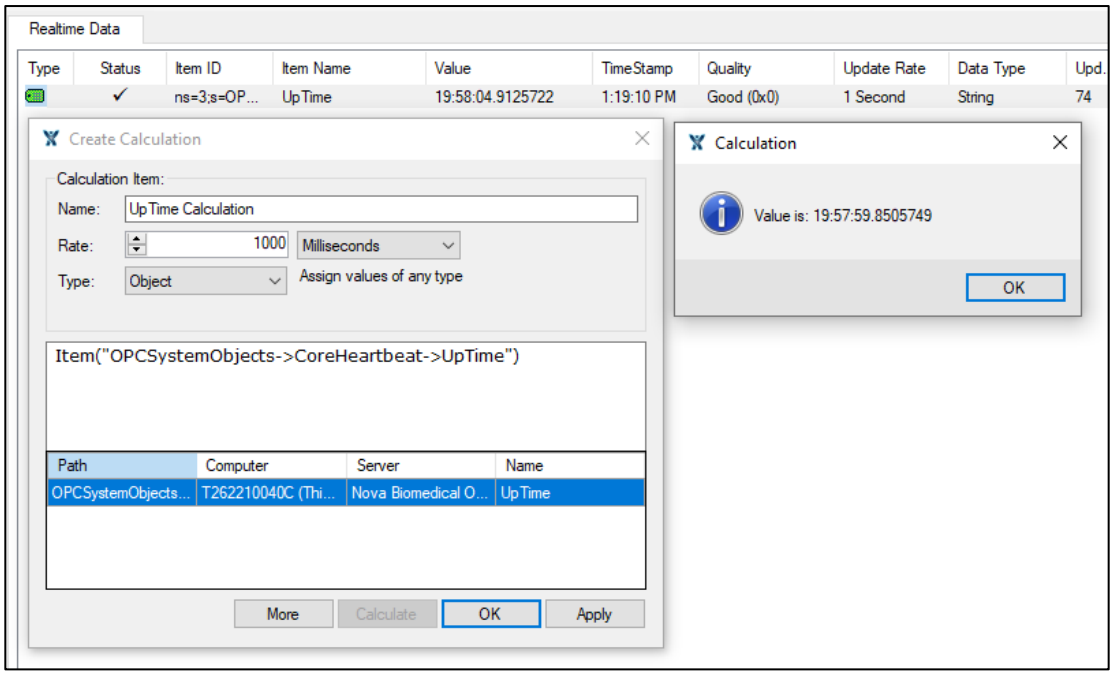

Figure 7.8 Compiled Result from the "Calculate" Button

In case of any misconfiguration, in the compiled item calculation, pressing the "Calculate" button will prompt an error message, providing insights into the nature of the error.

IMPORTANT: ***If a Calculated Item is saved despite a compiled error being detected, it will be displayed in red within the Realtime Data window, with a Quality indication of "Bad" and a potential value of null when a value is otherwise expected (as illustrated in Figure 7.9).***

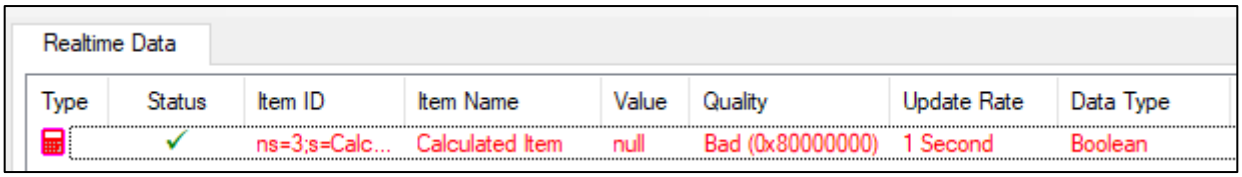

Figure 7.9 Saved Calculation Item with a Compiled Error

7.1.4 Saving and Confirming the Calculation Items

When creating a calculation item, you have one primary option to save the settings: "OK." When editing a calculation item, you have two primary options to modify the settings: "OK" and "Apply" (Figure 7.10). Choosing "OK" confirms the changes made and closes the dialogue window, while "Apply" saves the changes without closing the dialogue window. This enables real-time observation of the modifications, allowing for continued adjustments if necessary.

DISCLAIMER: Calculation items will show in local time and not in UTC.

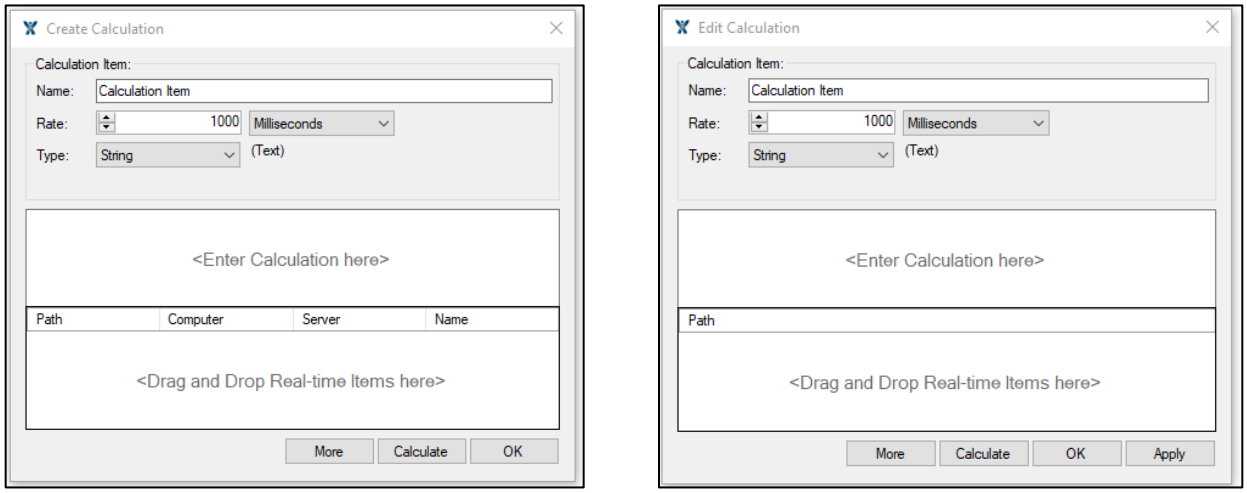

Figure 7.10 Saving and Committing Modifications

7.1.5 Calculation Item Function Field Examples

The Calculation Items Custom Function Input Field provides users with a dedicated workspace to write scripts using programming syntax or languages supported by the software. Within this workspace, users can create three distinct types of items: Simple, Multiple Item, and Complex Calculation items. Below are examples of each item type along with the associated benefits of their capabilities.

Simple Calculation

The Simple Calculation item type is advantageous when there is a requirement to alter the output format of the data type. In the example below, we take a single item and produce the same item with a different data type (Figure 7.11).

DATA FIELD	VALUE
Name	GasCard SamplesRemaining Calculation
Rate	1000 Milliseconds
Type	The default "Int32" to "String".
Function	Item("OPCSystemObjects->GasCard->SamplesRemaining")

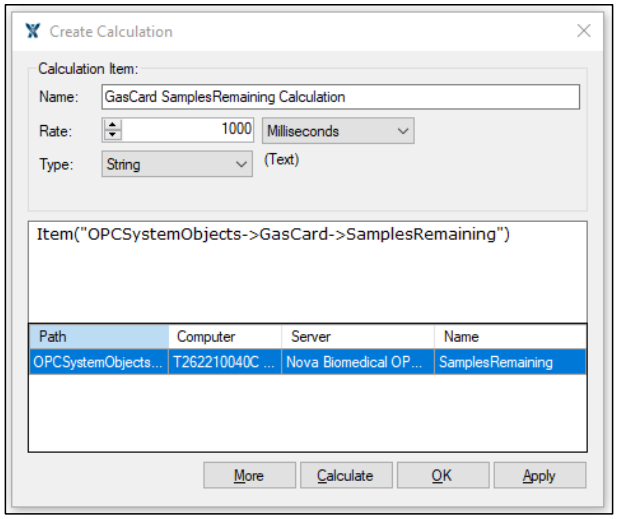

Figure 7.11 Simple Calculation Item Example

Simple Calculation Example Output: The original item's value is returned as a data type "String."

Complex Calculation

The Complex Calculation item type is advantageous when there is a need to modify the output format of the data type and apply a mathematical algorithm to the output. In the example below, we take a single item and generate the same item with a different data type while subtracting 15 from the results (Figure 7.12).

DATA FIELD	VALUE
Name	GasCard Low SamplesRemaining Calculation
Rate	1000 Milliseconds
Type	The default "Int32" to "String".
Function	Item("OPCSystemObjects->GasCard->SamplesRemaining") – 15

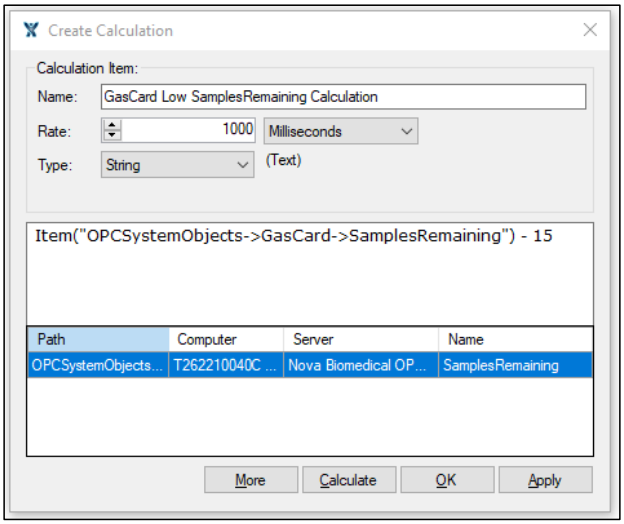

Figure 7.12 Complex Calculation Item Example

Complex Calculation Example Output: The original item's value is returned as a data type "String" with 15 subtracted.

Multiple Item Calculation

The Multiple Item Calculation type is advantageous when there is a need to modify the output format of the data type, apply a mathematical algorithm to the output, and/or reference the same item or other items repeatedly. In the example below, we have changed the data type of the reference item to a String and referenced the same single item multiple times. We then compare it to various numbers to determine if the samples remaining for the GasCard are Low, Medium, or High (Figure 7.13).

DATA FIELD	VALUE
Name	GasCard LowMedHigh SamplesRemaining Calculation
Rate	1000 Milliseconds
Type	The default "Int32" to "String".
Function	if(Item("OPCSystemObjects->GasCard->SamplesRemaining")<=15, "LOW", if(Item("OPCSystemObjects->GasCard->SamplesRemaining")>15 && Item("OPCSystemObjects->GasCard->SamplesRemaining")<=200, "MEDIUM", "HIGH"))

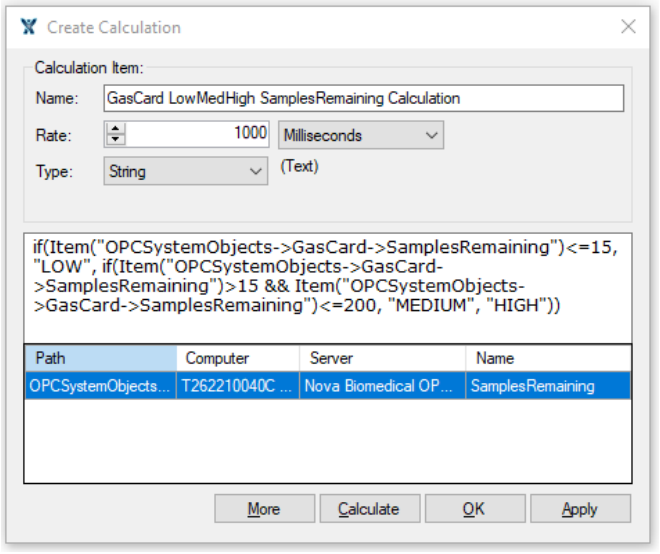

Figure 7.13 Multiple Item Calculation Example

Multiple Item Calculation Example Output: A returned data type of "String" with a result determined based on the original item's value as follows:

- If the value is less than or equal to 15, the result is LOW.
- If the value is between 16 and 200, the result is MEDIUM.
- If the value is higher than 200, the result is HIGH.

7.1.6 Editing and Deleting Calculation Items

Once an Item Calculation is created, you can modify or remove them as needed. The Item Calculations are dynamic and adaptable to changing requirements. Following is how to edit or delete a Calculated Item.

Editing Item Calculations

1. Within the OPC Expert Client, locate the item within the “_Calculations” folder located on the left side or select the item from the “Realtime Data” area.
2. Right-click the item and select “Edit Calculation”.
3. In the new window titled “Edit Calculation”, modify the relevant fields or functions according to your requirements. This could involve updating formulas, adjusting the input items, or changing the output configurations (Name, Rate, or Type).
4. Once the necessary edits have been made, save the changes by selecting the “OK” or “Apply” button.

IMPORTANT: ***When editing and saving the name of a calculation item, it's crucial to refresh the client to clear the outdated item from the OPC client memory/ cache. This is indicated when the Quality of the outdated item shows as "BadObjectDeleted," as depicted in Figure 7.14.***

Figure 7.14 Calculation Item Showing Quality as "BadObjectDeleted"

Deleting Item Calculations

1. Within the OPC Expert Client, locate the item within the “_Calculations” folder located on the left side or select the item from the “Realtime Data” area.
2. Right-click the item and select “Delete Calculation”.

8 TROUBLESHOOTING OPC CONNECTIVITY

When troubleshooting OPC Server communication issues, a thorough analysis may be needed to help determine the root cause. The OPC communication involves multiple components that may require assistance from your IT team and/or your Automation team to troubleshoot and resolve the observed issue(s). Outlined in this section are general guidance and steps for how to begin troubleshooting an OPC communication issue.

8.1 CONFIRM OPC SERVER FUNCTIONALITY

To initiate the troubleshooting process for any OPC issue, regardless of the OPC Server version, the primary step involves testing and verifying the OPC Server functionality.

1. Confirm an OPC Server License has been purchased and installed on this analyzer.
2. To confirm an OPC Server License has been installed:
   a. If prompted, log in to the analyzer to gain access to the User Interface (UI).
   b. Navigate to the second home screen by swiping to the left on the UI.
   c. On the right-hand side of the home screen of the analyzer, select *"Settings."*

NOTE: ***For instruments operating on software versions preceding Version 4.3, simply choose the OPC button within the Settings drop-down menu in Step 2c. No further action is required for Steps 2d and 2e; you can seamlessly move on to Step 2f..***

   d. Select *"Licensing"* from the Settings drop-down menu.

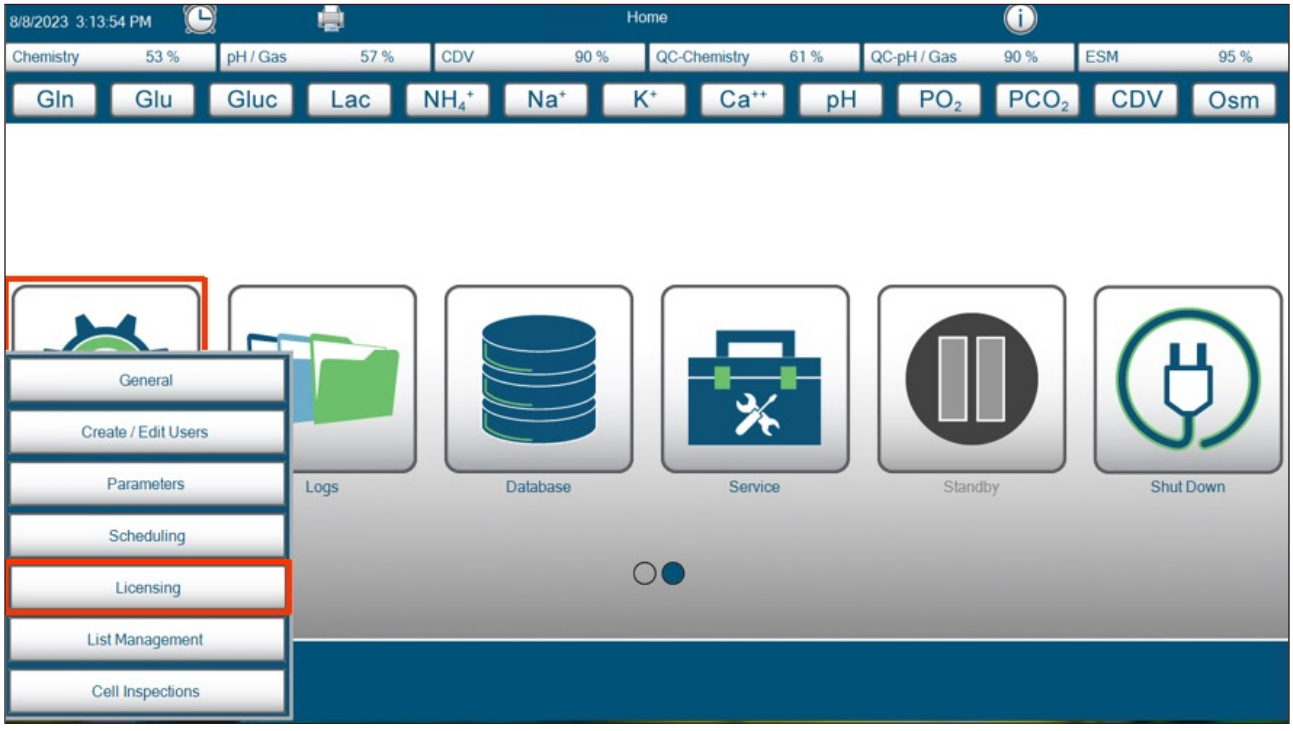

Figure 8.1 Settings → Licensing

e. On the *Licensing* screen, select **OPC**.

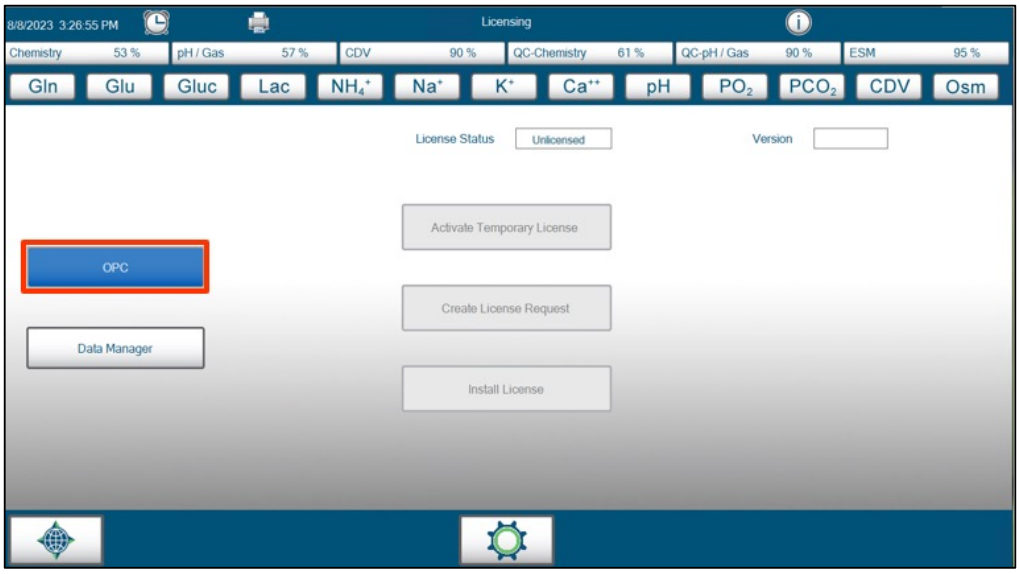

Figure 8.2 Licensing → OPC

f. On the *Licensing* screen, confirm the *License Status* states "**Licensed**."

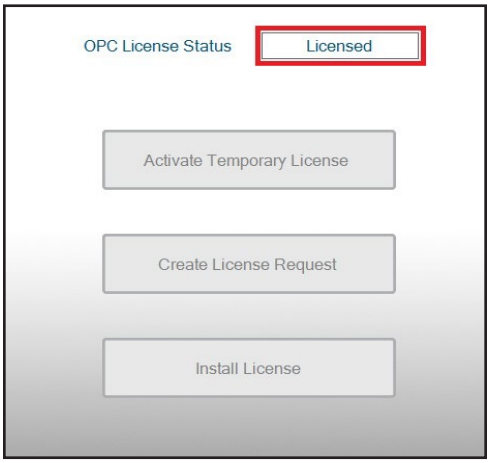

Figure 8.3 OPC License Status Box

Confirm the OPC Server is operating properly with the local third-party licensed client application, OPC Expert, on the Bridge Computer. Refer to *Section 6 Confirming the FLEX2 OPC UA/DA Server is Updating* prior to advancing to the following troubleshooting steps.

8.2 Troubleshooting OPC Server Version 1.2.19066

8.2.1 Uninstall and Reinstall the OPC Server Version 1.2.19066

If the Nova OPC Server doesn't reflect updates on the local third-party licensed client application on the Bridge Computer, OPC Expert, even after following the previous troubleshooting steps, consider uninstalling and reinstalling the OPC Server. This process can help ensure that there were no errors during the initial installation.

To uninstall the OPC Server:

1. On the Bridge Computer, open the Windows File Explorer and navigate to the following path: *C:\FlexII_OPC\FlexII_OPC_0000\OPC Service.*

NOTE: For assistance accessing the Bridge Computer, refer to Section 2.2.1.

2. Right-click on the file titled "*UnInstallScript.bat*" and select **Run as Administrator**.

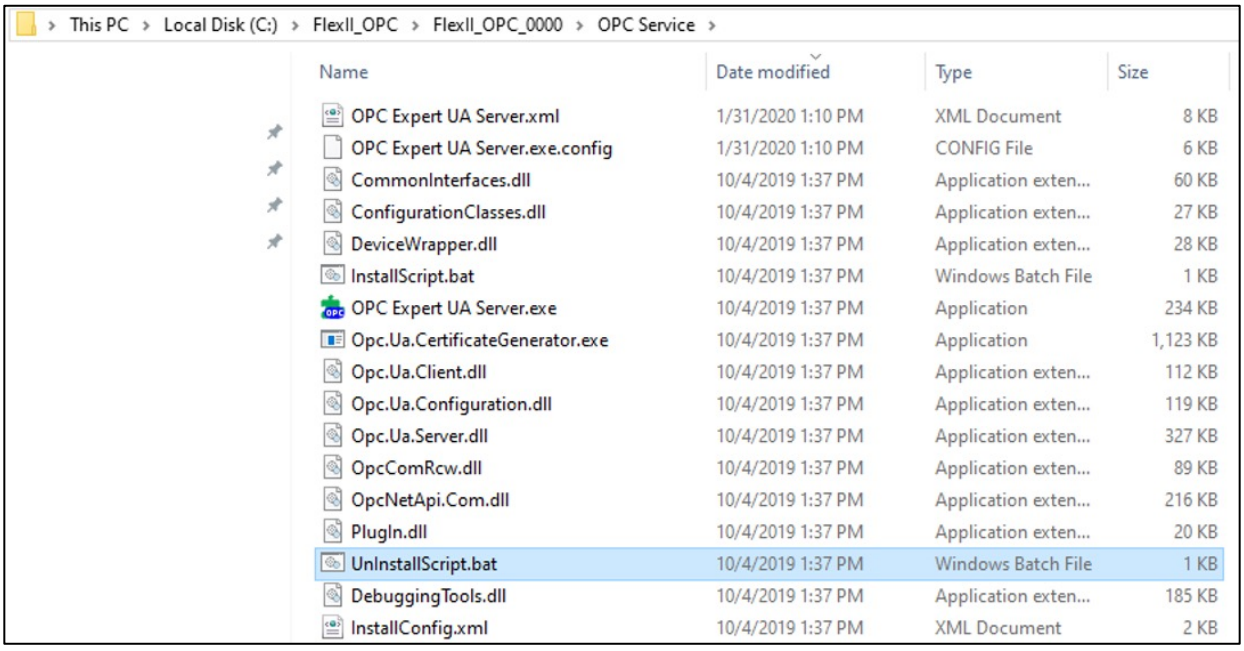

Figure 8.4 UnInstallScript.bat Application

3. Adhere to the prompts displayed in the Command Prompt window to finalize the uninstallation sequence.

To reinstall the OPC Server:

1. On the Bridge Computer, open the Windows File Explorer and navigate to the following path: *C:\FlexII_OPC\FlexII_OPC_0000\OPC Service.*
2. Right-click on the file titled "*InstallScript.bat*" and select **Run as Administrator**.

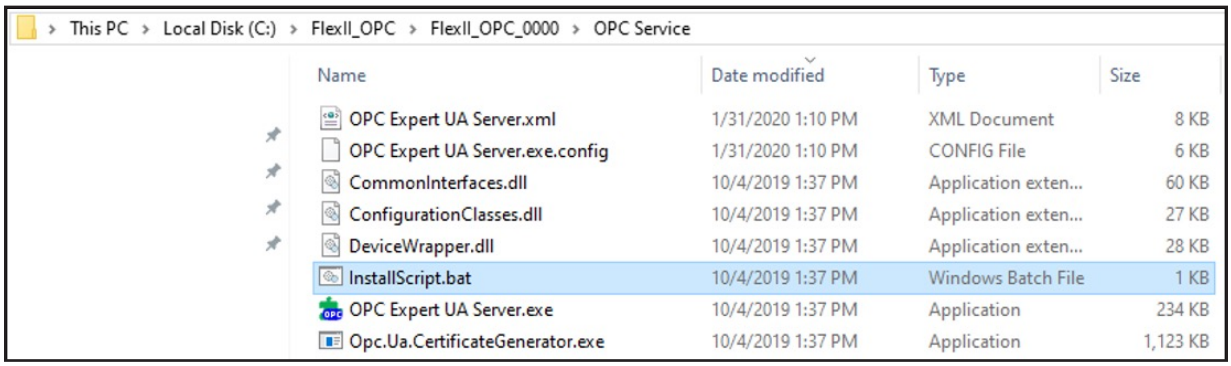

Figure 8.5 InstallScript.bat Application

3. Adhere to the prompts displayed in the Command Prompt window to finalize the installation sequence.
4. Confirm the OPC Server is operating properly with the local third-party licensed client application, OPC Expert, on the Bridge Computer. Refer to *Section 6 Confirming the FLEX2 OPC UA/DA Server is Updating* prior to advancing to the following troubleshooting steps. If still unable to subscribe to tags, contact Nova Biomedical Technical Support via email at OPCSupport@novabio.com.

8.3 Troubleshooting OPC Server Version ≥ 3.0

8.3.1 Establish OPC Server Communication with the OPC Expert Local Client

If the local third-party licensed client application, OPC Expert, is not communicating properly with the OPC Server on the FLEX2 Bridge Computer, you will need to re-establish the OPC communication locally prior to advancing to a client on an external computer.

Services on the Bridge Computer

For the OPC server to function properly, it requires a few services to run on the Bridge Computer to ensure proper communication. These services are:

- *FLEXII AutomationService* – required for both the UA and the DA servers;
- *Nova Biomedical OPC UA Server.exe* – required for both the UA and DA server;
- *Nova Biomedical OPC DA Server.exe* – required for the DA server.

IMPORTANT: The "FLEXII AutomationService" and the "Nova Biomedical OPC UA Server.exe" are required to always run.

To check if the services are running:

1. On the Bridge Computer, open the **Windows Task Manager** and select the **Details** tab.

NOTE: For assistance accessing the Bridge Computer, refer to Section 2.2.1.

2. Search for the three services, *"FLEXII AutomationService," "Nova Biomedical OPC UA Server.exe,"* and *"Nova Biomedical OPC DA Server.exe."* Ensure that all three services are running.

NOTE: You do not need to have the "Nova Biomedical OPC DA Server.exe" service running if you are only using the OPC UA Server.

8.3.1.1 Restart the FLEXII Automation Service (Version ≥ 3.0)

The FLEXII Automation Service is responsible for transmitting the data between the Host and Bridge Computers to populate the tags within the Nova OPC UA/DA Server via TCP/IP ports. If data is not being transmitted properly, the service "*AutomationService.exe*" should be restarted.

To restart the Automation Service:

1. On the Bridge Computer, open the **Windows Task Manager** and select the **Details** tab.

NOTE: For assistance accessing the Bridge Computer, refer to Section 2.2.1.

2. Select and highlight the process titled *"AutomationService.exe,"* right-click and select **End task**.
3. A prompt may appear stating "Do you want to end AutomationService.exe?" Select **End process** to confirm.

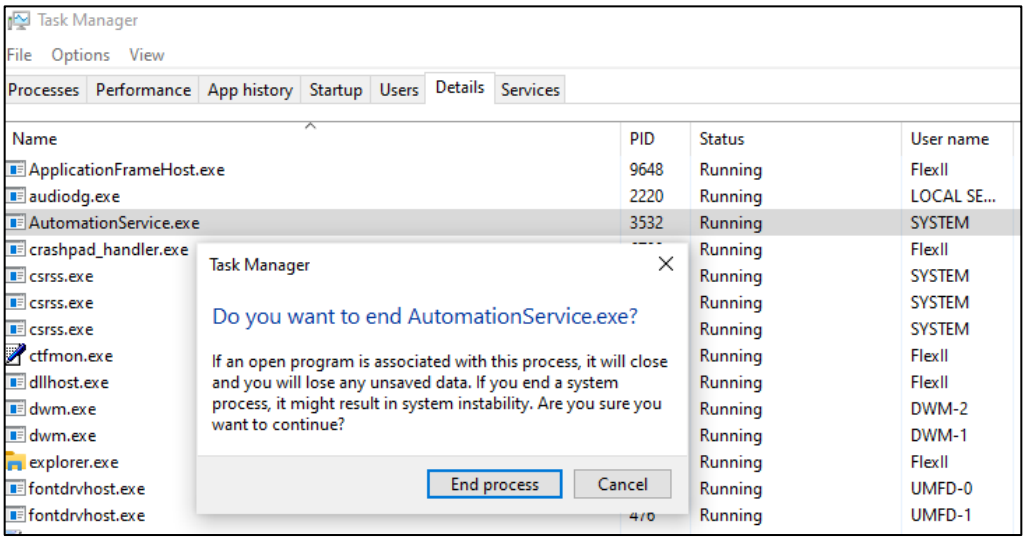

Figure 8.6 Ending AutomationService.exe Task

DISCLAIMER: The "AutomationService.exe" service will automatically restart within a few seconds. You can confirm the service restart by observing the change in the Program Identity (PID) number.

4. Confirm the OPC Server is operating properly with the local third-party licensed client application, OPC Expert, on the Bridge Computer. Refer to Section 6 for steps on how to confirm the OPC Server is updating the tags correctly prior to advancing to the following troubleshooting steps.

8.3.1.2 RESTART THE NOVA OPC UA/DA SERVER (VERSION ≥ 3.0)

In some cases, if the OPC UA Server initiates before the *"AutomationService.exe,"* during the startup of the Bridge Computer, the OPC Server will not be identified by the FLEXII Automation Service.

IMPORTANT: The Nova OPC UA Server is required to have a status of running to populate the Nova OPC DA Server.

To restart the OPC Server:

1. On the Bridge Computer, open the **Windows Task Manager** and select the **Details** tab.

NOTE: For assistance accessing the Bridge Computer, refer to Section 2.2.1.

2. Select and highlight the process titled *"Nova Biomedical OPC UA Server.exe,"* right-click and select **End task**.
3. A prompt may appear stating “Do you want to end Nova Biomedical OPC UA Server.exe?” Select **End process** to confirm.

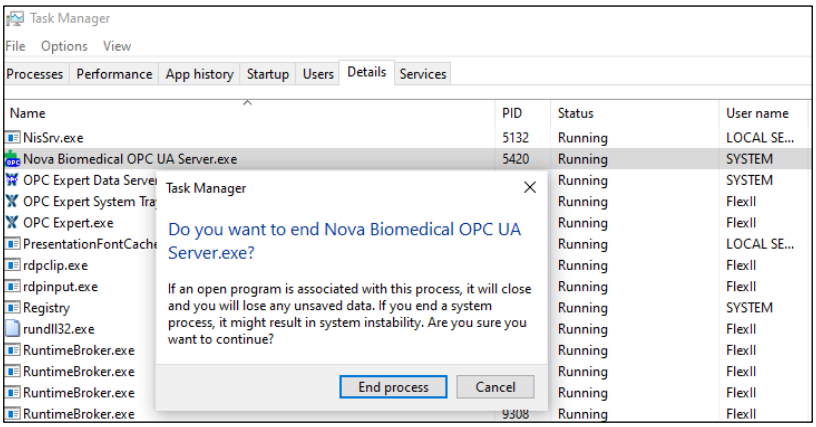

Figure 8.7 Ending the UA Server Task

DISCLAIMER: The "Nova Biomedical OPC UA Server.exe" service will automatically restart within a few seconds. You can confirm the service restart by observing the change in the Program Identity (PID) number.

4. Confirm the OPC Server is operating properly with the local third-party licensed client application, OPC Expert, on the Bridge Computer. Refer to *Section 6 Confirming the FLEX2 OPC UA/DA Server is Updating* prior to advancing to the following troubleshooting steps.

8.3.2 Uninstall and Reinstall the OPC Server (Version ≥ 3.0)

If the Nova OPC Server doesn't reflect updates on the local third-party licensed client application, OPC Expert, even after following the previous troubleshooting steps, consider uninstalling and reinstalling the OPC Server. This process can help ensure that there were no errors during the initial installation.

8.3.2.1 UNINSTALL THE OPC SERVER (VERSION ≥ 3.0)

1. On the Bridge Computer, open the Windows File Explorer and navigate to the following path: *C:\FlexII_OPC\FlexII_OPC_XXXX*, where "XXXX" is greater than "0000" and the largest number present.

NOTE: For assistance accessing the Bridge Computer, refer to Section 2.2.1.

2. Right-click on the file titled *"Uninstall Nova Biomedical Service.bat"* and select **Run as Administrator**.

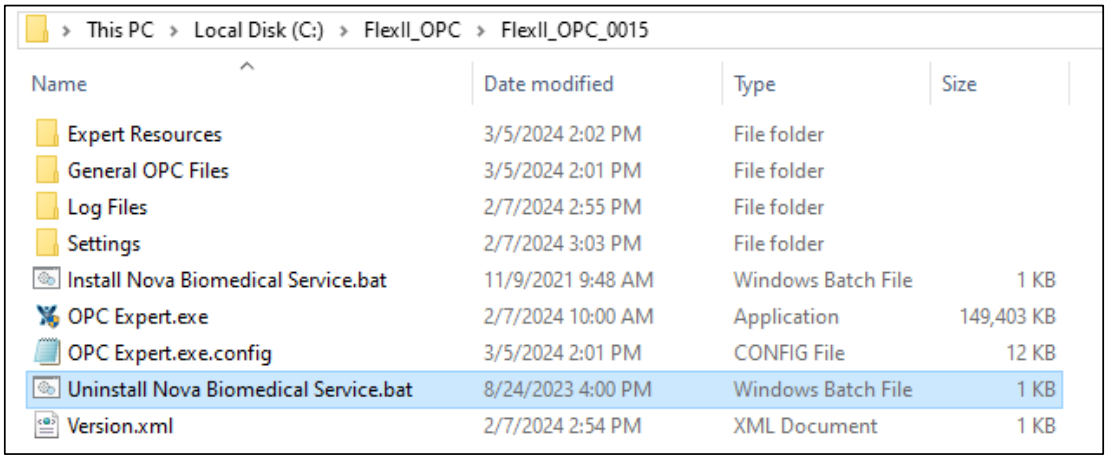

Figure 8.8 Uninstall Nova Biomedical Service.bat Location

3. Adhere to the prompts displayed in the Command Prompt window to finalize the uninstallation sequence.

8.3.2.2 REINSTALL THE OPC SERVER (VERSION ≥ 3.0)

1. On the Bridge Computer, open the Windows File Explorer and navigate to the following path: *C:\FlexII_OPC\FlexII_OPC_XXXX*, where "XXXX" is greater than "0000" and the largest number present.

NOTE: For assistance accessing the Bridge Computer, refer to Section 2.2.1.

2. Right-click on the file titled *Install Nova Biomedical Service.bat* and select **Run as Administrator**.
3. Adhere to the prompts displayed in the Command Prompt window to finalize the installation sequence.
4. Confirm the OPC Server is operating properly with the local third-party licensed client application, OPC Expert, on the Bridge Computer. Refer to *Section 6 Confirming the FLEX2 OPC UA/DA Server is Updating* prior to advancing to the following troubleshooting steps.

8.3.3 Set a Delay to the OPC Server (Version ≥ 3.0)

In some cases, if the OPC UA Server initiates before the *"AutomationService.exe"* during the startup of the Bridge Computer, the OPC Server will not be identified by the FLEXII Automation Service. Verifying and establishing a delayed start for the OPC Server startup will ensure that both services launch in the proper order.

To set a delay to the OPC server:

1. On the Bridge Computer, open the **Windows Services** application.

NOTE: For assistance accessing the Bridge Computer, refer to Section 2.2.1.

2. Scroll through the list of services to find **"Nova Biomedical OPC UA Server"** and **"Nova Biomedical OPC DA Server."**
3. Right-click on each and select **Properties**.
4. In the *Properties* Window, navigate to the **General** tab. From the dropdown menu for *Startup Type*, ensure that it is set to **Automatic (Delayed Start)**.

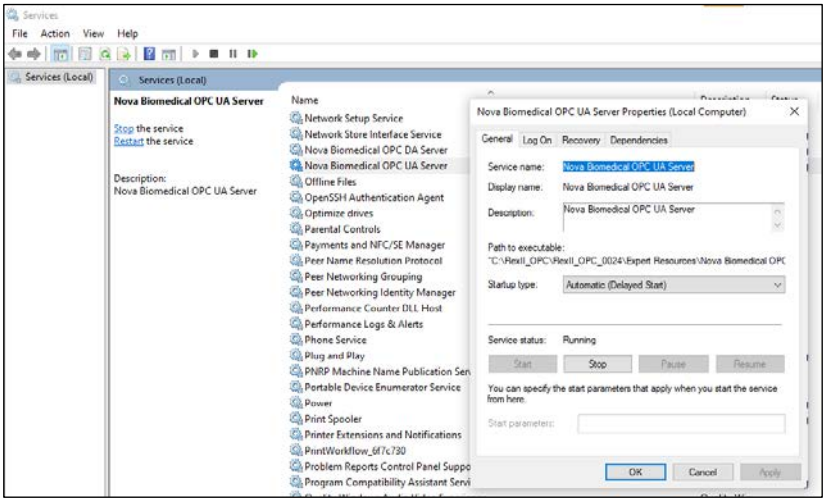

Figure 8.9 Setting Startup Type to Automatic (Delayed Start)

5. Select **OK** to finalize the *Startup Type* change and restart the FLEX2 analyzer.
6. Wait five minutes before confirming the OPC Server is operating properly with the local third-party licensed client application, OPC Expert, on the Bridge Computer. Refer to *Section 6 Confirming the FLEX2 OPC UA/DA Server is Updating* prior to advancing to the following troubleshooting steps. If still unable to subscribe to tags, contact Nova Biomedical Technical Support via email at OPCSupport@novabio.com.

8.3.4 Establish a Connection Between the Nova OPC Server and Your OPC-Compliant Device

If the local third-party licensed client application, OPC Expert, on the Bridge Computer is successfully communicating, displaying connected tags to the Nova OPC Server, and receiving updates as outlined in *Section 6 Confirming the FLEX2 OPC UA/DA Server is Updating*, this confirms the operational status of the Nova OPC Server. Subsequent steps involve troubleshooting connectivity issues related to your remote OPC-compliant device or client. For further assistance, reach out to your internal IT team or Automation team.

9 BioProfile FLEX2 OPC Tag List

This section includes Tag Names, Data Types, and Descriptions.

IMPORTANT: ***Please be aware that the Historical Sample Result Object Tags retrieves all Sample Result Object Tag records, regardless of how the sample was initiated. For your specific goal of gathering data from sample analysis results, it is recommended to use the Historical Sample Result Object Tags.***

DISCLAIMER: ***To ensure the availability and functionality of all tags listed within the OPC System Objects and Command Tags, it is required to utilize the latest released OPC Server and FLEX2 Software.***

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System Object Tags are non-writable data tags that display real-time information, including but not limited to: system statuses, consumable statuses, parameter information, quality control data, sample result data, and Nova Biomedical Online AutoSampler (OLS).

Object Tag Path	Data Type	Description
System Information Object Tags		
<-OPCSystemObjects->ActiveTasks-**>Task**	String	Displays current tasks that are active on the analyzer.
<-OPCSystemObjects->CoreHeartbeat-**>UpTime**	String	Time since analyzer was last restarted
<-OPCSystemObjects->DateTime-**>DateTime**	DateTime	The current date and UTC.
<-OPCSystemObjects->SampleTypeNames-**>SampleTypeNames**	String	Listing of user-defined sample type names configured on the analyzer.
<-OPCSystemObjects->SampleTypes-**>SampleTypes**	String	Listing of user-defined sample types configured on the analyzer.
<-OPCSystemObjects->ScheduledTasks-**>Task**	String	Listing of scheduled and due time of tasks configured on the analyzer.
<-OPCSystemObjects->Settings-**>AnalyzerID**	String	The user entered the analyzer identifier.
<-OPCSystemObjects->Settings-**>Location**	String	The user entered the analyzer location.
<-OPCSystemObjects->SoftwareVersion-**>SoftwareVersion**	String	The current version of installed analyzer software.
<-OPCSystemObjects->TimeSync->LastSync-**>LocalTimeZone**	String	Displays the name of the local time zone of the analyzer.
<-OPCSystemObjects->TimeSync->LastSync-**>LocalTZOffset**	String	Displays the local time zone offset relative to the UTC.
Consumable Status Object Tags		
Cell Density Pack Status Object Tags		
<-OPCSystemObjects->CDVPackStatus-**>Empty**	Boolean	Indicates if the CDV calibrator pack is empty using a True/ False statement.
<-OPCSystemObjects->CDVPackStatus-**>ExpirationDate**	DateTime	The installed CDV calibrator pack's expiration date is displayed as a date/time.
<-OPCSystemObjects->CDVPackStatus-**>Expired**	Boolean	Indicates if the CDV calibrator pack is expired using a True/ False statement.
<-OPCSystemObjects->CDVPackStatus-**>FluidRemaining**	Int32	Displays the estimated amount of percent fluid remaining in the installed CDV calibrator pack.
<-OPCSystemObjects->CDVPackStatus-**>InstallationDate**	DateTime	The installed CDV calibrator pack's installed date is displayed as a date/time.

Object Tag Path	Data Type	Description
<-OPCSystemObjects->CDVPackStatus-**>Installed**	Boolean	Indicates if the CDV calibrator pack is installed using a True/ False statement.
<-OPCSystemObjects->CDVPackStatus-**>LotNumber**	String	The installed CDV calibrator pack's Lot Number is displayed as a numeric string.
<-OPCSystemObjects->CDVPackStatus-**>SamplesRemaining**	Int32	Displays the estimated number of samples remaining of the installed CDV calibrator pack.
<-OPCSystemObjects->CDVPackStatus-**>SamplesRemainingPercent**	Int32	Displays the estimated percent of samples remaining of the installed CDV calibrator pack.
Chemistry MicroSensor Card Status Object Tags		
<-OPCSystemObjects->ChemCard-**>ExpirationDate**	DateTime	The installed chemistry sensor card's expiration date is displayed as a date/time.
<-OPCSystemObjects->ChemCard-**>Expired**	Boolean	Indicates if the chemistry sensor card is expired using a True/False statement.
<-OPCSystemObjects->ChemCard-**>Hydrated**	Boolean	Indicates if the chemistry sensor card is hydrated using a True/False statement.
<-OPCSystemObjects->ChemCard-**>InstallationDate**	DateTime	The installed chemistry sensor card's installed date is displayed as a date/time.
<-OPCSystemObjects->ChemCard-**>Installed**	Boolean	Indicates if the chemistry sensor card is installed using a True/False statement.
<-OPCSystemObjects->ChemCard-**>LotNumber**	String	The installed chemistry sensor card's Lot Number is displayed as a numeric string.
<-OPCSystemObjects->ChemCard-**>SamplesRemaining**	Int32	Displays the estimated number of samples remaining of the installed chemistry sensor card.
Chemistry Calibrator Pack Status Object Tags		
<-OPCSystemObjects->ChemPackStatus-**>Empty**	Boolean	Indicates if the chemistry calibrator pack is empty using a True/False statement.
<-OPCSystemObjects->ChemPackStatus-**>ExpirationDate**	DateTime	The installed chemistry calibrator pack's expiration date is displayed as a date/time.
<-OPCSystemObjects->ChemPackStatus-**>Expired**	Boolean	Indicates if the chemistry calibrator pack is expired using a True/False statement.
<-OPCSystemObjects->ChemPackStatus-**>FluidRemaining**	Int32	Displays the estimated amount of percent fluid remaining in the installed chemistry calibrator pack.

Object Tag Path	Data Type	Description
<-OPCSystemObjects->ChemPackStatus-**>InstallationDate**	DateTime	The installed chemistry calibrator pack's installed date is displayed as a date/time.
<-OPCSystemObjects->ChemPackStatus-**>Installed**	Boolean	Indicates if the chemistry calibrator pack is installed using a True/False statement.
<-OPCSystemObjects->ChemPackStatus-**>LotNumber**	String	The installed chemistry calibrator pack's Lot Number is displayed as a numeric string.
<-OPCSystemObjects->ChemPackStatus-**>SamplesRemaining**	Int32	Displays the estimated number of samples remaining of the installed chemistry calibrator pack.
<-OPCSystemObjects->ChemPackStatus-**>SamplesRemainingPercent**	Int32	Displays the estimated percent of samples remaining of the installed chemistry calibrator pack.
Chemistry QC Pack Status Object Tags		
<-OPCSystemObjects->ChemQCPackStatus-**>Empty**	Boolean	Indicates if the onboard chemistry quality control pack is empty using a True/False statement.
<-OPCSystemObjects->ChemQCPackStatus-**>ExpirationDate**	DateTime	The installed onboard chemistry quality control pack's expiration date is displayed as a date/time.
<-OPCSystemObjects->ChemQCPackStatus-**>Expired**	Boolean	Indicates if the onboard chemistry quality control pack is expired using a True/False statement.
<-OPCSystemObjects->ChemQCPackStatus-**>FluidRemaining**	Int32	Displays the estimated amount of percent fluid remaining in the installed onboard chemistry quality control pack.
<-OPCSystemObjects->ChemQCPackStatus-**>InstallationDate**	DateTime	The installed chemistry quality control pack's installed date is displayed as a date/time.
<-OPCSystemObjects->ChemQCPackStatus-**>Installed**	Boolean	Indicates if the onboard chemistry quality control pack is installed using a True/False statement.
<-OPCSystemObjects->ChemQCPackStatus-**>LotNumber**	String	The installed onboard chemistry quality control pack's Lot Number is displayed as a numeric string.

Object Tag Path	Data Type	Description
<-OPCSystemObjects->ChemQCPackStatus-**>SamplesRemaining**	Int32	Displays the estimated number of samples remaining of the installed onboard chemistry quality control pack.
<-OPCSystemObjects->ChemQCPackStatus-**>SamplesRemainingPercent**	Int32	Displays the estimated percent of samples remaining of the installed onboard chemistry quality control pack.
pH/Gas MicroSensor Card Status Object Tags		
<-OPCSystemObjects->GasCard-**>ExpirationDate**	DateTime	For the installed pH/Gas sensor cards the expiration date is displayed as a date/time.
<-OPCSystemObjects->GasCard-**>Expired**	Boolean	Indicates if the pH/Gas sensor card is expired using a True/ False statement.
<-OPCSystemObjects->GasCard-**>Hydrated**	Boolean	Indicates if the pH/Gas sensor card is hydrated using a True/ False statement.
<-OPCSystemObjects->GasCard-**>InstallationDate**	DateTime	The installed pH/Gas sensor card's installed date is displayed as a date/time.
<-OPCSystemObjects->GasCard-**>Installed**	Boolean	Indicates if the pH/Gas sensor card is installed using a True/ False statement.
<-OPCSystemObjects->GasCard-**>LotNumber**	String	The installed pH/Gas sensor card's Lot Number is displayed as a numeric string.
<-OPCSystemObjects->GasCard-**>SamplesRemaining**	Int32	Displays the estimated number of samples remaining of the installed pH/Gas sensor card.
pH/Gas Calibrator Pack Status Object Tags		
<-OPCSystemObjects->GasPackStatus-**>Empty**	Boolean	Indicates if the pH/Gas calibrator pack is empty using a True/False statement.
<-OPCSystemObjects->GasPackStatus-**>ExpirationDate**	DateTime	The installed pH/Gas calibrator pack's expiration date is displayed as a date/time.
<-OPCSystemObjects->GasPackStatus-**>Expired**	Boolean	Indicates if the pH/Gas calibrator pack is expired using a True/False statement.
<-OPCSystemObjects->GasPackStatus-**>FluidRemaining**	Int32	Displays the estimated amount of percent fluid remaining in the installed pH/Gas calibrator pack.
<-OPCSystemObjects->GasPackStatus-**>InstallationDate**	DateTime	The installed pH/Gas calibrator pack's installed date is displayed as a date/time.

Object Tag Path	Data Type	Description
<-OPCSystemObjects->GasPackStatus-**>Installed**	Boolean	Indicates if the pH/Gas calibrator pack is installed using a True/False statement.
<-OPCSystemObjects->GasPackStatus-**>LotNumber**	String	The installed pH/Gas calibrator pack's Lot Number is displayed as a numeric string.
<-OPCSystemObjects->GasPackStatus-**>SamplesRemaining**	Int32	Displays the estimated number of samples remaining of the installed pH/Gas calibrator pack.
<-OPCSystemObjects->GasPackStatus-**>SamplesRemainingPercent**	Int32	Displays the estimated percent of samples remaining of the installed pH/Gas calibrator pack.
pH/Gas QC Pack Status Object Tags		
<-OPCSystemObjects->GasQCPackStatus-**>Empty**	Boolean	Indicates if the onboard pH/Gas quality control pack is empty using a True/False statement.
<-OPCSystemObjects->GasQCPackStatus-**>ExpirationDate**	DateTime	The installed onboard pH/Gas quality control pack's expiration date is displayed as a date/time.
<-OPCSystemObjects->GasQCPackStatus-**>Expired**	Boolean	Indicates if the onboard pH/Gas quality control pack is expired using a True/False statement.
<-OPCSystemObjects->GasQCPackStatus-**>FluidRemaining**	Int32	Displays the estimated amount of percent fluid remaining in the installed onboard pH/Gas quality control pack.
<-OPCSystemObjects->GasQCPackStatus-**>InstallationDate**	DateTime	The installed onboard pH/Gas quality control pack's installed date is displayed as a date/time.
<-OPCSystemObjects->GasQCPackStatus-**>Installed**	Boolean	Indicates if the onboard pH/Gas quality control pack is installed using a True/False statement.
<-OPCSystemObjects->GasQCPackStatus-**>LotNumber**	String	The installed onboard pH/Gas quality control pack's Lot Number is displayed as a numeric string.
<-OPCSystemObjects->GasQCPackStatus-**>SamplesRemaining**	Int32	Displays the estimated number of samples remaining of the installed onboard pH/Gas quality control pack.
<-OPCSystemObjects->GasQCPackStatus-**>SamplesRemainingPercent**	Int32	Displays the estimated percent of samples remaining of the installed onboard pH/Gas quality control pack.

Object Tag Path	Data Type	Description
Analyzer Module Status Object Tags		
<-OPCSystemObjects->Modules-**>InstalledUnits->Autosampler**	String	Indicates if the Autosampler (OLS) module is connected when displays Ready.
<-OPCSystemObjects->Modules-**>InstalledUnits->CDV**	String	Indicates if the Cell Density Viability (CDV) module is connected when displays Ready.
<-OPCSystemObjects->Modules-**>InstalledUnits->ESM**	String	Indicates if the External Sampling Module (ESM) is connected when displays Ready.
<-OPCSystemObjects->Modules-**>InstalledUnits->Osmo**	String	Indicates if the Osmometer is connected when displays Ready.
<-OPCSystemObjects->Modules-**>InstalledUnits->RetainCollector**	String	Indicates if the Sample Retain Collector (SRC) is connected when displays Ready.
Analyzer Resource Object Tags		
<-OPCSystemObjects->OsmoState-**>CleanTubes**	Int32	The value indicates the number of clean Osmometer tubes available.
<-OPCSystemObjects->Resources->Wells-**>CDVWell**	String	Indicates if the CDV Well is clear when displays "WellState. Clear."
<-OPCSystemObjects->Resources->Wells-**>ChemistryWell**	String	Indicates if the Chemistry Well is clear when displays "WellState.Clear."
<-OPCSystemObjects->Resources->Wells-**>WasteWell**	String	Indicates if the Waste Well is clear when displays "WellState. Clear."
Sensor/Module Status Object Tags		
<-OPCSystemObjects->Parameters-**>pH->Alert**	Boolean	The indicated sensor will display False when no alert is present and be available for analysis.
<-OPCSystemObjects->Parameters-**>pCO2->Alert**	Boolean	
<-OPCSystemObjects->Parameters-**>pO2->Alert**	Boolean	
<-OPCSystemObjects->Parameters-**>Na->Alert**	Boolean	
<-OPCSystemObjects->Parameters-**>K->Alert**	Boolean	
<-OPCSystemObjects->Parameters-**>Ca->Alert**	Boolean	
<-OPCSystemObjects->Parameters-**>NH4->Alert**	Boolean	
<-OPCSystemObjects->Parameters-**>Gln->Alert**	Boolean	
<-OPCSystemObjects->Parameters-**>Glu->Alert**	Boolean	
<-OPCSystemObjects->Parameters-**>Gluc->Alert**	Boolean	
<-OPCSystemObjects->Parameters-**>Lac->Alert**	Boolean	
<-OPCSystemObjects->Parameters-**>Osmo->Alert**	Boolean	
<-OPCSystemObjects->Parameters-**>CDV->Alert**	Boolean	

Object Tag Path	Data Type	Description
<-OPCSystemObjects->Parameters-**>pH->Warning**	Boolean	The indicated sensor will display False when no warning is present and be available for analysis.
<-OPCSystemObjects->Parameters-**>pCO2->Warning**	Boolean	
<-OPCSystemObjects->Parameters-**>pO2->Warning**	Boolean	
<-OPCSystemObjects->Parameters-**>Na->Warning**	Boolean	
<-OPCSystemObjects->Parameters-**>K->Warning**	Boolean	
<-OPCSystemObjects->Parameters-**>Ca->Warning**	Boolean	
<-OPCSystemObjects->Parameters-**>NH4->Warning**	Boolean	
<-OPCSystemObjects->Parameters-**>Gln->Warning**	Boolean	
<-OPCSystemObjects->Parameters-**>Glu->Warning**	Boolean	
<-OPCSystemObjects->Parameters-**>Gluc->Warning**	Boolean	
<-OPCSystemObjects->Parameters-**>Lac->Warning**	Boolean	
<-OPCSystemObjects->Parameters-**>Osmo->Warning**	Boolean	
<-OPCSystemObjects->Parameters-**>CDV->Warning**	Boolean	
Sensor/Module Calibration Status Object Tags		
<-OPCSystemObjects->DP_GasCal->GasCal->GasCal-**>pH->CalibrationStatus**	String	Displays the calibration status of each available analyte, either Calibrated or Uncalibrated.
<-OPCSystemObjects->DP_GasCal->GasCal->GasCal-**>pCO2->CalibrationStatus**	String	
<-OPCSystemObjects->DP_GasCal->GasCal->GasCal-**>pO2->CalibrationStatus**	String	
<-OPCSystemObjects->DP_ChemCal->ChemCal->ChemCal-**>Na->CalibrationStatus**	String	
<-OPCSystemObjects->DP_ChemCal->ChemCal->ChemCal-**>K->CalibrationStatus**	String	
<-OPCSystemObjects->DP_ChemCal->ChemCal->ChemCal-**>Ca->CalibrationStatus**	String	
<-OPCSystemObjects->DP_ChemCal->ChemCal->ChemCal-**>NH4->CalibrationStatus**	String	
<-OPCSystemObjects->DP_ChemCal->ChemCal->ChemCal-**>Gln->CalibrationStatus**	String	
<-OPCSystemObjects->DP_ChemCal->ChemCal->ChemCal-**>Glu->CalibrationStatus**	String	
<-OPCSystemObjects->DP_ChemCal->ChemCal->ChemCal-**>Gluc->CalibrationStatus**	String	
<-OPCSystemObjects->DP_ChemCal->ChemCal->ChemCal-**>Lac->CalibrationStatus**	String	
<-OPCSystemObjects->DP_OsmoCal->OsmoCal-**>OsmoCal->CalibrationStatus**	String	
<-OPCSystemObjects->DP_CdvCal->CdvCal-**>CdvCal->CalibrationStatus**	String	
<-OPCSystemObjects->OsmoState-**>CalibrationStatus**	String	

Object Tag Path	Data Type	Description
Parameter Unit of Measure Object Tags		
<-OPCSystemObjects->ParametersConfiguration-**>pH->Units**	String	Displays the selected unit of measurement for each of the available analytes.
<-OPCSystemObjects->ParametersConfiguration-**>pCO2->Units**	String	
<-OPCSystemObjects->ParametersConfiguration-**>pO2->Units**	String	
<-OPCSystemObjects->ParametersConfiguration-**>Na->Units**	String	
<-OPCSystemObjects->ParametersConfiguration-**>K->Units**	String	
<-OPCSystemObjects->ParametersConfiguration-**>Ca->Units**	String	
<-OPCSystemObjects->ParametersConfiguration-**>NH4->Units**	String	
<-OPCSystemObjects->ParametersConfiguration-**>Gln->Units**	String	
<-OPCSystemObjects->ParametersConfiguration-**>Glu->Units**	String	
<-OPCSystemObjects->ParametersConfiguration-**>Gluc->Units**	String	
<-OPCSystemObjects->ParametersConfiguration-**>Lac->Units**	String	
<-OPCSystemObjects->ParametersConfiguration-**>Osmo->Units**	String	Displays the selected unit of measurement for each of the available analytes.
<-OPCSystemObjects->ParametersConfiguration-**>Density->Units**	String	
Historical Sample Results Object Tags ***NOTE:*** *Displays results for all sample analyses except quality control.*		
Historical Sample Results Start Tags		
<-OPCSystemObjects->HistoricalSampleResults->StartTags-**>AutosamplerPort**	String	Displays the Autosampler RSM port used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags-**>SampleSource**	String	Displays the source of the sample analysis. E.g., "Manual"
<-OPCSystemObjects->HistoricalSampleResults->StartTags-**>DispenseVolume**	Int32	Displays the dispensed volume used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags-**>Operator**	String	Displays the operator logged into the analyzer during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags-**>SampleType**	String	Displays the selected sample type during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags-**>TrayLocation**	Int32	Displays the sample tray location used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags-**>FollowWithRetain**	Boolean	Displays, if a sample retained collection, were set to True or False for the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags-**>RetainVolume**	Double	Displays the volume specified in units of mL of the sample retain collection, if the FollowWithRetain command tag was set to True.
Historical Sample Results Module Information Object Tags		
<-OPCSystemObjects->HistoricalSampleResults->StartTags->ModuleInformation-**>CellDensityDilutionRatio**	String	Displays the cell density dilution ratio used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->ModuleInformation-**>CellInspection**	String	Displays the cell inspection type used during the analysis.

Object Tag Path	Data Type	Description
<-OPCSystemObjects->HistoricalSampleResults->StartTags->ModuleInformation-**>ChemistryDilutionRatio**	String	Displays the selected chemistry dilution ratio used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->ModuleInformation->Modules-**>CDV**	Boolean	Displays True when the CDV module is used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->ModuleInformation->Modules-**>Chemistry**	Boolean	Displays True when the Chemistry module is used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->ModuleInformation->Modules-**>Gas**	Boolean	Displays True when the pH/Gas module is used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->ModuleInformation->Modules-**>Osmo**	Boolean	Displays True when the Osmo module is used during the analysis.
Historical Sample Results Sample Information Object Tags		
<-OPCSystemObjects->HistoricalSampleResults->StartTags->SampleInformation-**>BatchID**	String	Displays the Batch ID used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->SampleInformation-**>CellType**	String	Displays the cell type used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->SampleInformation-**>PreDilutionMultiplier**	Double	Displays the predilution multiplier used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->SampleInformation-**>SampleID**	String	Displays the Sample ID used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->SampleInformation-**>SpargingO2**	Double	Displaying the Sparging O_2 (%) value used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->SampleInformation-**>VesselID**	String	Displays the Vessel ID used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->SampleInformation-**>VesselPressure**	Double	Displays the vessel pressure (psi) value used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->SampleInformation-**>VesselTemperature**	Double	Displays the vessel temperature (ºC) used during the analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CellDensity->FlowTimeData->FlowTime**	Double	Displays the CDV module sample result flowtime.
<-OPCSystemObjects->HistoricalSampleResults-**>Chem->FlowTimeData->FlowTime**	Double	Displays the Chemistry module sample result flowtime.
<-OPCSystemObjects->HistoricalSampleResults-**>Gas->FlowTimeData->FlowTime**	Double	Displays the pH/Gas module sample result flowtime.
Historical Sample Results Flowtime Object Tags		
<-OPCSystemObjects->HistoricalSampleResults-**>CellDensity->FlowTimeData->FlowTime**	Double	Displays the CDV module sample result flowtime.
<-OPCSystemObjects->HistoricalSampleResults-**>Chem->FlowTimeData->FlowTime**	Double	Displays the Chemistry module sample result flowtime.

Object Tag Path	Data Type	Description
<-OPCSystemObjects->HistoricalSampleResults-**>Gas->FlowTimeData->FlowTime**	Double	Displays the pH/Gas module sample result flowtime.
Historical Sample Results Date and Time Object Tags		
<-OPCSystemObjects->HistoricalSampleResults-**>ModifiedTime**	DateTime	Displays the modified date and time of sample analysis. ***NOTE:*** *A deferred modified time will occur if CDV images are reanalyzed or any changes are made after the analysis was completed.*
<-OPCSystemObjects->HistoricalSampleResults-**>SampleTime**	DateTime	Displays the date and time of when the analysis was started.
<-OPCSystemObjects->HistoricalSampleResults-**>TimeInTray**	String	Displays the time from when the sample tray analysis started to the current sample analysis started.
<-OPCSystemObjects->HistoricalSampleResults-**>TimeStamp**	DateTime	Displays the date and time of when the analysis was started.
Historical Sample Results Lower Range Object Tags		
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>pH->LowerLimit**	Double	Displays the indicated analytes' lower measurement limit from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>pCO2->LowerLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>pO2->LowerLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Na->LowerLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>K->LowerLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Ca->LowerLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>NH4->LowerLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Gln->LowerLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Glu->LowerLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Gluc->LowerLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Lac->LowerLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Osmo->LowerLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>TotalDensity->LowerLimit**	Double	

Object Tag Path	Data Type	Description
Historical Sample Results Upper Range Object Tags		
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>pH->UpperLimit**	Double	Displays the indicated analytes' upper measurement limit from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>pCO2->UpperLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>pO2->UpperLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Na->UpperLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>K->UpperLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Ca->UpperLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>NH4->UpperLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Gln->UpperLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Glu->UpperLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Gluc->UpperLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Lac->UpperLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Osmo->UpperLimit**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>TotalDensity->UpperLimit**	Double	
Historical Sample Results Offset Intercept Range Object Tags		
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>pH->OffsetIntercept**	Double	Displays the indicated analytes' correlation offset intercept factor from the current sample analysis. ***NOTE:*** *No offset is applied when the offset intercept is set to 0.*
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>pCO2->OffsetIntercept**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>pO2->OffsetIntercept**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Na->OffsetIntercept**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>K->OffsetIntercept**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Ca->OffsetIntercept**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>NH4->OffsetIntercept**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Gln->OffsetIntercept**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Glu->OffsetIntercept**	Double	

Object Tag Path	Data Type	Description
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Gluc->OffsetIntercept**	Double	Displays the indicated analytes' correlation offset intercept factor from the current sample analysis. **NOTE:** No offset is applied when the offset intercept is set to 0.
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Lac->OffsetIntercept**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Osmo->OffsetIntercept**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>TotalDensity->OffsetIntercept**	Double	
Historical Sample Results Offset Multiplier Range Object Tags		
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>pH->OffsetMultiplier**	Double	Displays the indicated analytes' correlation offset multiplier factor from the current sample analysis. ***NOTE:*** *No offset is applied when the OffsetMultiplier is set to 1.*
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>pCO2->OffsetMultiplier**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>pO2->OffsetMultiplier**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Na->OffsetMultiplier**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>K->OffsetMultiplier**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Ca->OffsetMultiplier**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>NH4->OffsetMultiplier**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Gln->OffsetMultiplier**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Glu->OffsetMultiplier**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Gluc->OffsetMultiplier**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Lac->OffsetMultiplier**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>Osmo->OffsetMultiplier**	Double	
<-OPCSystemObjects->HistoricalSampleResults->StartTags->Ranges-**>TotalDensity->OffsetMultiplier**	Double	
Historical Sample Results Object Tags		
<-OPCSystemObjects->HistoricalSampleResults->Gas-**>pH->Result**	Double	Displays the indicated analytes' results from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults->Gas-**>pCO2->Result**	Double	
<-OPCSystemObjects->HistoricalSampleResults->Gas-**>pO2->Result**	Double	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Na->Result**	Double	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>K->Result**	Double	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Ca->Result**	Double	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>NH4->Result**	Double	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Gln->Result**	Double	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Glu->Result**	Double	

Object Tag Path	Data Type	Description
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Gluc->Result**	Double	Displays the indicated analytes' results from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Lac->Result**	Double	
<-OPCSystemObjects->HistoricalSampleResults-**>Osmo->Result**	Double	
Historical Sample Results Unit Object Tags		
<-OPCSystemObjects->HistoricalSampleResults->Gas-**>pH->Units**	String	Displays the indicated analytes' unit of measurement from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults->Gas-**>pCO2->Units**	String	
<-OPCSystemObjects->HistoricalSampleResults->Gas-**>pO2->Units**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Na->Units**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>K->Units**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Ca->Units**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>NH4->Units**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Gln->Units**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Glu->Units**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Gluc->Units**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Lac->Units**	String	
<-OPCSystemObjects->HistoricalSampleResults-**>Osmo->Units**	String	
Historical Sample Results Error Status Object Tags		
<-OPCSystemObjects->HistoricalSampleResults-**>Errors**	String	An error is displayed if a sample error occurs in the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults->Gas-**>pH->ErrorStatus**	String	Displays the indicated analytes' error status from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults->Gas-**>pCO2->ErrorStatus**	String	
<-OPCSystemObjects->HistoricalSampleResults->Gas-**>pO2->ErrorStatus**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Na->ErrorStatus**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>K->ErrorStatus**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Ca->ErrorStatus**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>NH4->ErrorStatus**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Gln->ErrorStatus**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Glu->ErrorStatus**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Gluc->ErrorStatus**	String	
<-OPCSystemObjects->HistoricalSampleResults->Chem-**>Lac->ErrorStatus**	String	
<-OPCSystemObjects->HistoricalSampleResults-**>Osmo->ErrorStatus**	String	

Object Tag Path	Data Type	Description
Historical Sample Results Calculated Object Tags		
<-OPCSystemObjects->HistoricalSampleResults-**>CalculatedResults->CO2Saturation**	Double	Displays the calculated CO_2 saturation from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CalculatedResults->HCO3**	Double	Displays the calculated bicarbonate from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CalculatedResults->O2Saturation**	Double	Displays the calculated O_2 saturation from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CalculatedResults->pCO2Corrected**	Double	Displays the temperature-corrected pCO_2 result from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CalculatedResults->pHCorrected**	Double	Displays the temperature-corrected pH result from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CalculatedResults->pO2Corrected**	Double	Displays the temperature-corrected pO_2 result from the current sample analysis.
Historical Sample Results Calculated Units Object Tags		
<-OPCSystemObjects->HistoricalSampleResults-**>CalculatedResults->CO2SaturationUnits**	String	Displays the indicated analytes' unit of measurement from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CalculatedResults->HCO3Units**	String	
<-OPCSystemObjects->HistoricalSampleResults-**>CalculatedResults->O2SaturationUnits**	String	
<-OPCSystemObjects->HistoricalSampleResults-**>CalculatedResults->pCO2CorrectedUnits**	String	
<-OPCSystemObjects->HistoricalSampleResults-**>CalculatedResults->pO2CorrectedUnits**	String	
Historical Sample Results Cell Density Viability Object Tags		
<-OPCSystemObjects->HistoricalSampleResults-**>CellDensity->AvgLiveDiameter**	Double	Displays the calculated average live diameter determined from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CellDensity->GoodImageCount**	Int32	Displays the number of images used in the CDV result determination from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CellDensity->LiveStdDeviation**	Double	Displays the calculated live standard deviation from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CellDensity->TotalCellCount**	Int32	Displays the calculated total cell count from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CellDensity->TotalDensity**	Double	Displays the calculated total density from the current sample analysis.

Object Tag Path	Data Type	Description
<-OPCSystemObjects->HistoricalSampleResults-**>CellDensity->TotalDensityUnits**	String	Displays the unit of measurement for the total density from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CellDensity->TotalLiveCount**	Int32	Displays the calculated total live count from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CellDensity->Viability**	Double	Displays the calculated viability from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CellDensity->ViableDensity**	Double	Displays the calculated viability density from the current sample analysis.
<-OPCSystemObjects->HistoricalSampleResults-**>CellDensity->ViableDensityUnits**	String	Displays the unit of measurement for the viable density from the current sample analysis.
Historical Sample Results Sample Retain Collector (SRC) Object Tags		
<-OPCSystemObjects->HistoricalSampleResults-**>RetainCount**	Int32	Displays the number of retains collected after the scheduled autosampler analysis.
Quality Control Sample Result Object Tags ***NOTE:*** *Displays results for all external and internal QC sample analyses.*		
Quality Control Result Start Tags		
<-OPCSystemObjects->QCResults->StartTags-**>ExpirationDate**	DateTime	Displays the expiration date of the quality control material from the current QC analysis.
<-OPCSystemObjects->QCResults->StartTags-**>Level**	String	Displays the Level of the quality control material from the current QC analysis.
<-OPCSystemObjects->QCResults->StartTags-**>LotNumber**	String	Displays the Lot Number of the quality control material from the current QC analysis.
<-OPCSystemObjects->QCResults->StartTags-**>Operator**	String	Displays the operator of the quality control material from the current QC analysis.
Quality Control Result Flowtime Object Tags		
<-OPCSystemObjects->QCResults-**>CellDensity->FlowTimeData->FlowTime**	Double	Displays the CDV module QC result flowtime.
<-OPCSystemObjects->QCResults-**>Chem->FlowTimeData->FlowTime**	Double	Displays the Chemistry module QC result flowtime.
<-OPCSystemObjects->QCResults-**>Gas->FlowTimeData->FlowTime**	Double	Displays the pH/Gas module QC result flowtime.

Object Tag Path	Data Type	Description
Quality Control Result Date and Time Object Tags		
<-OPCSystemObjects->QCResults-**>SampleTime**	DateTime	Displays the date and time of when the QC analysis was started.
<-OPCSystemObjects->QCResults-**>TimeStamp**	DateTime	Displays the date and time of when the QC analysis was started.
Quality Control Result Lower Range of Object Tags		
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>pH->LowerLimit**	Double	Displays the indicated analytes' lower quality control limit from the current QC analysis.
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>pCO2->LowerLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>pO2->LowerLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Na->LowerLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>K->LowerLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Ca->LowerLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>NH4->LowerLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Gln->LowerLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Glu->LowerLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Gluc->LowerLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Lac->LowerLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Osmo->LowerLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>TotalDensity->LowerLimit**	Double	
Quality Control Result Upper Range of Object Tags		
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>pH->UpperLimit**	Double	Displays the indicated analytes' upper-quality control limit from the current QC analysis.
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>pCO2->UpperLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>pO2->UpperLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Na->UpperLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>K->UpperLimit**	Double	

Object Tag Path	Data Type	Description
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Ca->UpperLimit**	Double	Displays the indicated analytes' upper-quality control limit from the current QC analysis.
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>NH4->UpperLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Gln->UpperLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Glu->UpperLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Gluc->UpperLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Lac->UpperLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>Osmo->UpperLimit**	Double	
<-OPCSystemObjects->QCResults->StartTags->Ranges-**>TotalDensity->UpperLimit**	Double	
Quality Control Result Offset Intercept Range Object Tags		
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>pH->OffsetIntercept**	Double	Displays the indicated analytes' correlation offset intercept factor from the current QC analysis. ***NOTE:*** *No offset is applied when the offset intercept is set to 0.*
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>pCO2->OffsetIntercept**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>pO2->OffsetIntercept**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Na->OffsetIntercept**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>K->OffsetIntercept**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Ca->OffsetIntercept**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>NH4->OffsetIntercept**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Gln->OffsetIntercept**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Glu->OffsetIntercept**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Gluc->OffsetIntercept**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Lac->OffsetIntercept**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Osmo->OffsetIntercept**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>TotalDensity->OffsetIntercept**	Double	

Object Tag Path	Data Type	Description
Quality Control Result Offset Multiplier Range Object Tags		
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>pH->OffsetMultiplier**	Double	Displays the indicated analytes' correlation offset multiplier factor from the current QC analysis. ***NOTE:*** *No offset is applied when the OffsetMultiplier is set to 1.*
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>pCO2->OffsetMultiplier**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>pO2->OffsetMultiplier**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Na->OffsetMultiplier**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>K->OffsetMultiplier**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Ca->OffsetMultiplier**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>NH4->OffsetMultiplier**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Gln->OffsetMultiplier**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Glu->OffsetMultiplier**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Gluc->OffsetMultiplier**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Lac->OffsetMultiplier**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>Osmo->OffsetMultiplier**	Double	
<-OPCSystemObjects->QcResults->StartTags->Ranges-**>TotalDensity->OffsetMultiplier**	Double	
Quality Control Result Object Tags		
<-OPCSystemObjects->QCResults->Gas-**>pH->Result**	Double	Displays the indicated analytes' results from the current quality control analysis.
<-OPCSystemObjects->QCResults->Gas-**>pCO2->Result**	Double	
<-OPCSystemObjects->QCResults->Gas-**>pO2->Result**	Double	
<-OPCSystemObjects->QCResults->Chem-**>Na->Result**	Double	
<-OPCSystemObjects->QCResults->Chem-**>K->Result**	Double	
<-OPCSystemObjects->QCResults->Chem-**>Ca->Result**	Double	
<-OPCSystemObjects->QCResults->Chem-**>NH4->Result**	Double	
<-OPCSystemObjects->QCResults->Chem-**>Gln->Result**	Double	
<-OPCSystemObjects->QCResults->Chem-**>Glu->Result**	Double	
<-OPCSystemObjects->QCResults->Chem-**>Gluc->Result**	Double	
<-OPCSystemObjects->QCResults->Chem-**>Lac->Result**	Double	
<-OPCSystemObjects->QCResults-**>Osmo->Result**	Double	
<-OPCSystemObjects->QCResults-**>CellDensity->TotalDensity**	Double	
<-OPCSystemObjects->QCResults-**>CellDensity->GoodImageCount**	Int32	Displays the number of images used in the CDV result determination from the current QC analysis.

Object Tag Path	Data Type	Description
Quality Control Result Unit Object Tags		
<-OPCSystemObjects->QCResults->Gas-**>pH->Units**	Single	Displays the indicated analytes' unit of measurement from the current quality control analysis.
<-OPCSystemObjects->QCResults->Gas-**>pCO2->Units**	Single	
<-OPCSystemObjects->QCResults->Gas-**>pO2->Units**	Single	
<-OPCSystemObjects->QCResults->Chem-**>Na->Units**	Single	
<-OPCSystemObjects->QCResults->Chem-**>K->Units**	Single	
<-OPCSystemObjects->QCResults->Chem-**>Ca->Units**	Single	
<-OPCSystemObjects->QCResults->Chem-**>NH4->Units**	Single	
<-OPCSystemObjects->QCResults->Chem-**>Gln->Units**	Single	
<-OPCSystemObjects->QCResults->Chem-**>Glu->Units**	Single	
<-OPCSystemObjects->QCResults->Chem-**>Gluc->Units**	Single	
<-OPCSystemObjects->QCResults->Chem-**>Lac->Units**	Single	
<-OPCSystemObjects->QCResults-**>Osmo->Units**	Single	
<-OPCSystemObjects->QCResults-**>CellDensity->Units**	Single	
Quality Control Result Error Status Object Tags		
<-OPCSystemObjects->QCResults-**>Errors**	String	An error is displayed if a sample error occurred during the current quality control sample analysis.
<-OPCSystemObjects->QCResults->Gas-**>pH->ErrorStatus**	String	Displays the indicated analytes' error status from the current quality control sample analysis.
<-OPCSystemObjects->QCResults->Gas-**>pCO2->ErrorStatus**	String	
<-OPCSystemObjects->QCResults->Gas-**>pO2->ErrorStatus**	String	
<-OPCSystemObjects->QCResults->Chem-**>Na->ErrorStatus**	String	
<-OPCSystemObjects->QCResults->Chem-**>K->ErrorStatus**	String	
<-OPCSystemObjects->QCResults->Chem-**>Ca->ErrorStatus**	String	
<-OPCSystemObjects->QCResults->Chem-**>NH4->ErrorStatus**	String	
<-OPCSystemObjects->QCResults->Chem-**>Gln->ErrorStatus**	String	
<-OPCSystemObjects->QCResults->Chem-**>Glu->ErrorStatus**	String	
<-OPCSystemObjects->QCResults->Chem-**>Gluc->ErrorStatus**	String	
<-OPCSystemObjects->QCResults->Chem-**>Lac->ErrorStatus**	String	
<-OPCSystemObjects->QCResults-**>Osmo->ErrorStatus**	String	
<-OPCSystemObjects->QCResults-**>CellDensity->ErrorStatus**	String	
Sample Results Object Tags ***NOTE:*** *Displays results for all sample analyses except quality control.*		
Sample Result Start Tags		
<-OPCSystemObjects->SampleResults->StartTags-**>AutosamplerPort**	String	Displays the autosampler RSM port used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags-**>SampleSource**	String	Displays the source of the sample analysis. E.g., "Manual"
<-OPCSystemObjects->SampleResults->StartTags-**>DispenseVolume**	Int32	Displays the dispensed volume used during the analysis.

Object Tag Path	Data Type	Description
<-OPCSystemObjects->SampleResults->StartTags-**>Operator**	String	Displays the operator logged into the analyzer during the analysis.
<-OPCSystemObjects->SampleResults->StartTags-**>SampleType**	String	Displays the selected sample type used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags-**>TrayLocation**	Int32	Displays the sample tray location used during the analysis.
Sample Result Module Information Object Tags		
<-OPCSystemObjects->SampleResults->StartTags->ModuleInformation-**>CellDensityDilutionRatio**	String	Displays the cell density dilution ratio used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->ModuleInformation-**>CellInspection**	String	Displays the cell inspection type used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->ModuleInformation-**>ChemistryDilutionRatio**	String	Displays the selected chemistry dilution ratio used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->ModuleInformation->Modules-**>CDV**	Boolean	Displays True when the CDV module is used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->ModuleInformation->Modules-**>Chemistry**	Boolean	Displays True when the Chemistry module is used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->ModuleInformation->Modules-**>Gas**	Boolean	Displays True when the pH/Gas module is used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->ModuleInformation->Modules-**>Osmo**	Boolean	Displays True when the Osmo module is used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->SampleInformation-**>BatchID**	String	Displays the batch ID used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->SampleInformation-**>CellType**	String	Displays the cell type used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->SampleInformation-**>PreDilutionMultiplier**	Double	Displays the predilution multiplier used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->SampleInformation-**>SampleID**	String	Displays the sample ID used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->SampleInformation-**>SpargingO2**	Double	Displays the sparging O_2 (%) value used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->SampleInformation-**>VesselID**	String	Displays the vessel ID used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->SampleInformation-**>VesselPressure**	Double	Displays the vessel pressure (psi) value used during the analysis.
<-OPCSystemObjects->SampleResults->StartTags->SampleInformation-**>VesselTemperature**	Double	Displays the vessel temperature (°C) value used during the analysis.

Object Tag Path	Data Type	Description
Sample Result Flowtime Object Tags		
<-OPCSystemObjects->SampleResults-**>CellDensity->FlowTimeData->FlowTime**	Double	Displays the CDV module sample result flowtime.
<-OPCSystemObjects->SampleResults-**>Chem->FlowTimeData->FlowTime**	Double	Displays the Chemistry module sample result flowtime.
<-OPCSystemObjects->SampleResults-**>Gas->FlowTimeData->FlowTime**	Double	Displays the pH/Gas module sample result flowtime.
Sample Result Date and Time Object Tags		
<-OPCSystemObjects->SampleResults-**>ModifiedTime**	DateTime	Displays the modified date and time of sample analysis. ***NOTE:*** *A deferred modified time will occur if CDV images are reanalyzed or any changes are made after the analysis was completed.*
<-OPCSystemObjects->SampleResults-**>SampleTime**	DateTime	Displays the date and time of when the analysis was started.
<-OPCSystemObjects->SampleResults-**>TimeInTray**	String	Displays the time from when the sample tray analysis started to the current sample analysis started.
<-OPCSystemObjects->SampleResults-**>TimeStamp**	DateTime	Displays the date and time of when the analysis was started.
Sample Result Lower Range Object Tags		
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>pH->LowerLimit**	Double	Displays the indicated analytes' lower measurement limit from the current sample analysis.
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>pCO2->LowerLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>pO2->LowerLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Na->LowerLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>K->LowerLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Ca->LowerLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>NH4->LowerLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Gln->LowerLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Glu->LowerLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Gluc->LowerLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Lac->LowerLimit**	Double	

Object Tag Path	Data Type	Description
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Osmo->LowerLimit**	Double	Displays the indicated analytes' lower measurement limit from the current sample analysis.
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>TotalDensity->LowerLimit**	Double	
Sample Result Upper Range Object Tags		
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>pH->UpperLimit**	Double	Displays the indicated analytes' upper measurement limit from the current sample analysis.
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>pCO2->UpperLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>pO2->UpperLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Na->UpperLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>K->UpperLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Ca->UpperLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>NH4->UpperLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Gln->UpperLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Glu->UpperLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Gluc->UpperLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Lac->UpperLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Osmo->UpperLimit**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>TotalDensity->UpperLimit**	Double	
Sample Result Offset Intercept Range Object Tags		
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>pH->OffsetIntercept**	Double	Displays the indicated analytes' correlation offset intercept factor from the current sample analysis. ***NOTE:*** *No offset is applied when the offset intercept is set to 0.*
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>pCO2->OffsetIntercept**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>pO2->OffsetIntercept**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Na->OffsetIntercept**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>K->OffsetIntercept**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Ca->OffsetIntercept**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>NH4->OffsetIntercept**	Double	

Object Tag Path	Data Type	Description
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Gln->OffsetIntercept**	Double	Displays the indicated analytes' correlation offset intercept factor from the current sample analysis. ***NOTE:*** *No offset is applied when the offset intercept is set to 0.*
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Glu->OffsetIntercept**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Gluc->OffsetIntercept**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Lac->OffsetIntercept**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Osmo->OffsetIntercept**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>TotalDensity->OffsetIntercept**	Double	
Sample Result Offset Multiplier Range Object Tags		
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>pH->OffsetMultiplier**	Double	Displays the indicated analytes' correlation offset multiplier factor from the current sample analysis. ***NOTE:*** *No offset is applied when the OffsetMultiplier is set to 1.*
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>pCO2->OffsetMultiplier**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>pO2->OffsetMultiplier**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Na->OffsetMultiplier**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>K->OffsetMultiplier**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Ca->OffsetMultiplier**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>NH4->OffsetMultiplier**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Gln->OffsetMultiplier**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Glu->OffsetMultiplier**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Gluc->OffsetMultiplier**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Lac->OffsetMultiplier**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>Osmo->OffsetMultiplier**	Double	
<-OPCSystemObjects->SampleResults->StartTags->Ranges-**>TotalDensity->OffsetMultiplier**	Double	
Sample Result Object Tags		
<-OPCSystemObjects->SampleResults->Gas-**>pH->Result**	Double	Displays the indicated analytes' results from the current sample analysis.
<-OPCSystemObjects->SampleResults->Gas-**>pCO2->Result**	Double	
<-OPCSystemObjects->SampleResults->Gas-**>pO2->Result**	Double	
<-OPCSystemObjects->SampleResults->Chem-**>Na->Result**	Double	
<-OPCSystemObjects->SampleResults->Chem-**>K->Result**	Double	

Object Tag Path	Data Type	Description
<-OPCSystemObjects->SampleResults->Chem-**>Ca->Result**	Double	Displays the indicated analytes' results from the current sample analysis.
<-OPCSystemObjects->SampleResults->Chem-**>NH4->Result**	Double	
<-OPCSystemObjects->SampleResults->Chem-**>Gln->Result**	Double	
<-OPCSystemObjects->SampleResults->Chem-**>Glu->Result**	Double	
<-OPCSystemObjects->SampleResults->Chem-**>Gluc->Result**	Double	
<-OPCSystemObjects->SampleResults->Chem-**>Lac->Result**	Double	
<-OPCSystemObjects->SampleResults-**>Osmo->Result**	Double	
Sample Result Unit Object Tags		
<-OPCSystemObjects->SampleResults->Gas-**>pH->Units**	String	Displays the indicated analytes' unit of measurement from the current sample analysis.
<-OPCSystemObjects->SampleResults->Gas-**>pCO2->Units**	String	
<-OPCSystemObjects->SampleResults->Gas-**>pO2->Units**	String	
<-OPCSystemObjects->SampleResults->Chem-**>Na->Units**	String	
<-OPCSystemObjects->SampleResults->Chem-**>K->Units**	String	
<-OPCSystemObjects->SampleResults->Chem-**>Ca->Units**	String	
<-OPCSystemObjects->SampleResults->Chem-**>NH4->Units**	String	
<-OPCSystemObjects->SampleResults->Chem-**>Gln->Units**	String	
<-OPCSystemObjects->SampleResults->Chem-**>Glu->Units**	String	
<-OPCSystemObjects->SampleResults->Chem-**>Gluc->Units**	String	
<-OPCSystemObjects->SampleResults->Chem-**>Lac->Units**	String	
<-OPCSystemObjects->SampleResults-**>Osmo->Units**	String	
Sample Result Error Status Object Tags		
<-OPCSystemObjects->SampleResults-**>Errors**	String	An error is displayed if a sample error occurs in the current sample analysis.
<-OPCSystemObjects->SampleResults->Gas-**>pH->ErrorStatus**	String	Displays the indicated analytes' error status from the current sample analysis.
<-OPCSystemObjects->SampleResults->Gas-**>pCO2->ErrorStatus**	String	
<-OPCSystemObjects->SampleResults->Gas-**>pO2->ErrorStatus**	String	
<-OPCSystemObjects->SampleResults->Chem-**>Na->ErrorStatus**	String	
<-OPCSystemObjects->SampleResults->Chem-**>K->ErrorStatus**	String	
<-OPCSystemObjects->SampleResults->Chem-**>Ca->ErrorStatus**	String	
<-OPCSystemObjects->SampleResults->Chem-**>NH4->ErrorStatus**	String	
<-OPCSystemObjects->SampleResults->Chem-**>Gln->ErrorStatus**	String	
<-OPCSystemObjects->SampleResults->Chem-**>Glu->ErrorStatus**	String	
<-OPCSystemObjects->SampleResults->Chem-**>Gluc->ErrorStatus**	String	
<-OPCSystemObjects->SampleResults->Chem-**>Lac->ErrorStatus**	String	
<-OPCSystemObjects->SampleResults-**>Osmo->ErrorStatus**	String	

Object Tag Path	Data Type	Description
Sample Result Calculated Object Tags		
<-OPCSystemObjects->SampleResults-**>CalculatedResults->CO2Saturation**	Double	Displays the calculated CO_2 saturation from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CalculatedResults->HCO3**	Double	Displays the calculated bicarbonate from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CalculatedResults->O2Saturation**	Double	Displays the calculated O_2 saturation from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CalculatedResults->pCO2Corrected**	Double	Displays the temperature-corrected pCO_2 result from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CalculatedResults->pHCorrected**	Double	Displays the temperature-corrected pH result from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CalculatedResults->pO2Corrected**	Double	Displays the temperature-corrected pO_2 result from the current sample analysis.
Sample Result Calculated Units Object Tags		
<-OPCSystemObjects->SampleResults-**>CalculatedResults->CO2SaturationUnits**	String	Displays the indicated analytes' unit of measurement from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CalculatedResults->HCO3Units**	String	
<-OPCSystemObjects->SampleResults-**>CalculatedResults->O2SaturationUnits**	String	
<-OPCSystemObjects->SampleResults-**>CalculatedResults->pCO2CorrectedUnits**	String	
<-OPCSystemObjects->SampleResults-**>CalculatedResults->pO2CorrectedUnits**	String	
Sample Result Cell Density Viability Object Tags		
<-OPCSystemObjects->SampleResults-**>CellDensity->AvgLiveDiameter**	Double	Displays the calculated average live diameter determined from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CellDensity->GoodImageCount**	Int32	Displays the number of images used in the CDV result determination from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CellDensity->LiveStdDeviation**	Double	Displays the calculated live standard deviation from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CellDensity->TotalCellCount**	Int32	Displays the calculated total cell count from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CellDensity->TotalDensity**	Double	Displays the calculated total density from the current sample analysis.

Object Tag Path	Data Type	Description
<-OPCSystemObjects->SampleResults-**>CellDensity->TotalDensityUnits**	String	Displays the unit of measurement for the total density from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CellDensity->TotalLiveCount**	Int32	Displays the calculated total live count from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CellDensity->Viability**	Double	Displays the calculated viability from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CellDensity->ViableDensity**	Double	Displays the calculated viability density from the current sample analysis.
<-OPCSystemObjects->SampleResults-**>CellDensity->ViableDensityUnits**	String	Displays the unit of measurement for the viable density from the current sample analysis.
Automation Event Object Tags ***NOTE:*** *Displays the date and time for specific events during an analysis involving ESM or external OLS etc.*		
<-OPCSystemObjects->AutomationEvents->Automation-**>ESMRequestDispenseRemaining**	DateTime	Displays the date and time the event is triggered.
<-OPCSystemObjects->AutomationEvents->Automation-**>ESMRequestInitialDispense**	DateTime	
<-OPCSystemObjects->AutomationEvents->Automation-**>EXT_OLSRequestSample**	DateTime	
<-OPCSystemObjects->AutomationEvents->Automation-**>EXT_OLSSampleAspirated**	DateTime	
ESM Pack Status Object Tags		
<-OPCSystemObjects->ESMPackStatus-**>Empty**	Boolean	Indicates if the ESM reagent pack is empty using a True/False statement.
<-OPCSystemObjects->ESMPackStatus-**>ExpirationDate**	DateTime	The installed ESM reagent pack's expiration date is displayed as a date/time.
<-OPCSystemObjects->ESMPackStatus-**>Expired**	Boolean	Indicates if the ESM reagent pack is expired using a True/False statement.
<-OPCSystemObjects->ESMPackStatus-**>FluidRemaining**	Int32	Displays the estimated amount of percent fluid remaining in the installed ESM reagent pack.
<-OPCSystemObjects->ESMPackStatus-**>InstallationDate**	DateTime	The installed ESM reagent pack's installed date is displayed as a date/time.
<-OPCSystemObjects->ESMPackStatus-**>Installed**	Boolean	Indicates if the ESM reagent pack is installed using a True/False statement.

Object Tag Path	Data Type	Description
<-OPCSystemObjects->ESMPackStatus-**>LotNumber**	String	The installed ESM reagent pack's Lot Number is displayed as a numeric string.
<-OPCSystemObjects->ESMPackStatus-**>SamplesRemaining**	Int32	Displays the estimated number of samples remaining of the installed ESM reagent pack.
<-OPCSystemObjects->ESMPackStatus-**>SamplesRemainingPercent**	Int32	Displays the estimated percent of samples remaining of the installed ESM reagent pack.
Nova Online Autosampler (OLS) Bank A Object Tags ***NOTE:*** *Displays information pertaining to the Bank A Autosampler System.*		
<-OPCSystemObjects->AutosamplerStatus-**>AutosamplerBank_A->Initialized**	Boolean	Indicates if the autosampler Bank-A STM is initialized using a True/False statement.
<-OPCSystemObjects->AutosamplerStatus-**>AutosamplerBank_A->Status**	String	Indicates if the autosampler Bank-A STM is available for use by displaying the ready or not ready status.
OLS Bank A Expiration Date and Time Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A1->ExpirationDate**	DateTime	Displays the date and time of the indicated RSM's calibrator pack's expiration.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A2->ExpirationDate**	DateTime	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A3->ExpirationDate**	DateTime	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A4->ExpirationDate**	DateTime	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A5->ExpirationDate**	DateTime	
OLS Bank A Fluid Remaining Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A1->FluidRemaining**	Int32	Displays the estimated amount of percent fluid remaining for the indicated RSM's calibrator pack.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A2->FluidRemaining**	Int32	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A3->FluidRemaining**	Int32	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A4->FluidRemaining**	Int32	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A5->FluidRemaining**	Int32	

Object Tag Path	Data Type	Description
OLS Bank A Initialized Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A1->Initialized**	Boolean	Displays True for the indicated RSM when initialized.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A2->Initialized**	Boolean	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A3->Initialized**	Boolean	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A4->Initialized**	Boolean	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A5->Initialized**	Boolean	
OLS Bank A Pack Status Object Tags		
<-OPCSystemObjects->AutosamplerStatus**->RSM_A1->PackStatus**	String	Displays the calibrator pack status as ready or not ready for the indicated RSM.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A2->PackStatus**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A3->PackStatus**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A4->PackStatus**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A5->PackStatus**	String	
OLS Bank A Reactor-Primed Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A1->ReactorPrimed**	Boolean	Displays True when the reactor line is primed for the indicated RSM.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A2->ReactorPrimed**	Boolean	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A3->ReactorPrimed**	Boolean	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A4->ReactorPrimed**	Boolean	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A5->ReactorPrimed**	Boolean	
OLS Bank A Sample Line Status Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A1->SampleLineStatus**	String	Displays ready or not ready for the sample line of the indicated RSM when available.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A2->SampleLineStatus**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A3->SampleLineStatus**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A4->SampleLineStatus**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A5->SampleLineStatus**	String	

Object Tag Path	Data Type	Description
OLS Bank A Sample Status Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A1->Status**	String	The indicated RSM displays are ready or not ready depending on the availability for use.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A2->Status**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A3->Status**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A4->Status**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_A5->Status**	String	
Nova Online Autosampler (OLS) Bank B Object Tags ***NOTE:*** *Displays information pertaining to the Bank B Autosampler System.*		
<-OPCSystemObjects->AutosamplerStatus-**>AutosamplerBank_B->Initialized**	Boolean	Indicates if the autosampler Bank-B STM is initialized using a True/False statement.
<-OPCSystemObjects->AutosamplerStatus-**>AutosamplerBank_B->Status**	String	Indicates if the autosampler Bank-B STM is available for use by displaying the ready or not ready status.
OLS Bank B Expiration Date and Time Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B1->ExpirationDate**	DateTime	Displays the date and time of the indicated RSM's calibrator pack's expiration.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B2->ExpirationDate**	DateTime	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B3->ExpirationDate**	DateTime	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B4->ExpirationDate**	DateTime	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B5->ExpirationDate**	DateTime	
OLS Bank B Fluid Remaining Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B1->FluidRemaining**	Int32	Displays the estimated amount of percent fluid remaining for the indicated RSM's calibrator pack.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B2->FluidRemaining**	Int32	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B3->FluidRemaining**	Int32	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B4->FluidRemaining**	Int32	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B5->FluidRemaining**	Int32	
OLS Bank B Initialized Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B1->Initialized**	Boolean	Displays True for the indicated RSM when initialized.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B2->Initialized**	Boolean	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B3->Initialized**	Boolean	

Object Tag Path	Data Type	Description
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B4->Initialized**	Boolean	Displays True for the indicated RSM when initialized.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B5->Initialized**	Boolean	
OLS Bank B Pack Status Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B1->PackStatus**	String	Displays the calibrator pack status as ready or not ready for the indicated RSM.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B2->PackStatus**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B3->PackStatus**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B4->PackStatus**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B5->PackStatus**	String	
OLS Bank B Reactor-Primed Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B1->ReactorPrimed**	Boolean	Displays True when the reactor line is primed for the indicated RSM.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B2->ReactorPrimed**	Boolean	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B3->ReactorPrimed**	Boolean	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B4->ReactorPrimed**	Boolean	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B5->ReactorPrimed**	Boolean	
OLS Bank B Sample Line Status Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B1->SampleLineStatus**	String	Displays ready or not ready for the sample line of the indicated RSM when available.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B2->SampleLineStatus**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B3->SampleLineStatus**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B4->SampleLineStatus**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B5->SampleLineStatus**	String	
OLS Bank B Sample Status Object Tags		
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B1->Status**	String	The indicated RSM displays are ready or not ready depending on the availability for use.
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B2->Status**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B3->Status**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B4->Status**	String	
<-OPCSystemObjects->AutosamplerStatus-**>RSM_B5->Status**	String	

System Command Tags are data writable tags that allow for remotely triggerable automated system functions including but not limited to: calibrations, onboard quality control analyses, initiations of external sample analyses from the External Sampling Module (ESM), Nova Biomedical Online AutoSampler (OLS), and Sample Retain Collector (SRC).

Command Tag Path	Data Type	Description
System Maintenance Command Tags		
<-OPCSystemCommands->DeproWells-**>DeproWells**	Boolean	Write a 1 to this tag to initiate the internal 10% bleach solution well-cleaning sequence.
<-OPCSystemCommands->ClearWells-**>ClearWells**	Boolean	Write a 1 to this tag to initiate the clear wells sequence.
<-OPCSystemCommands->ClearScheduledTasks-**>ClearScheduledTasks**	Boolean	Write a 1 to this tag to clear any pending scheduled tasks.
Chemistry and pH/Gas Calibration Command Tags		
<-OPCSystemCommands->ChemistryCalibration-**>ChemistryCalibration**	Boolean	Write a 1 to this tag to initiate a Chemistry Module 2-point calibration sequence.
<-OPCSystemCommands->GasCalibration-**>GasCalibration**	Boolean	Write a 1 to this tag to initiate a pH/Gas Module 2-point calibration sequence.
Onboard Chemistry and pH/Gas Quality Control Command Tags		
<-OPCSystemCommands->ChemistryQcLevel1-**>ChemistryQcLevel1**	Boolean	Write a 1 to this tag to initiate a Chemistry Module Level 1 Auto-QC sequence.
<-OPCSystemCommands->ChemistryQcLevel2-**>ChemistryQcLevel2**	Boolean	Write a 1 to this tag to initiate a Chemistry Module Level 2 Auto-QC sequence.
<-OPCSystemCommands->GasQcLevel1-**>GasQcLevel1**	Boolean	Write a 1 to this tag to initiate a pH/Gas Module Level 1 Auto-QC sequence.
<-OPCSystemCommands->GasQcLevel2-**>GasQcLevel2**	Boolean	Write a 1 to this tag to initiate a pH/Gas Module Level 2 Auto-QC sequence.
Cell Density Viability Command Tags		
<-OPCSystemCommands->AdjustIntensity-**>AdjustIntensity**	Boolean	Write a 1 to this tag to initiate a CDV Adjust Intensity sequence.
Nova Online Autosampler (OLS) Maintenance Command Tags		
<-OPCSystemCommands->AutosamplerCleanup-**>AutosamplerPort**	String	Write a single RSM: A1, A2, A3… A5 or alternatively B1, B2, B3… B5 to be set to be used as the port for the AutosamplerCleanup command tag.
<-OPCSystemCommands->AutosamplerCleanup-**>AutosamplerCleanup**	Boolean	Write a 1 to this tag to initiate the autosampler cleanup sequence for the specified port.

Command Tag Path	Data Type	Description
<-OPCSystemCommands->AutosamplerDeproSystem-**>AutosamplerDeproSystem**	Boolean	Write a 1 to this tag to initiate a 10% bleach solution cleaning sequence on the autosampler system.
Autosampler RSM and STM Initialization Command Tags		
<-OPCSystemCommands->AutosamplerInitializeRSM-**>AutosamplerInitializeRSM**	Boolean	Write a 1 to this tag to initiate the initialization sequence of the specified autosampler RSM. Checks fluid levels and primes the RSM to prepare it for use.
<-OPCSystemCommands->AutosamplerInitializeSTM-**>AutosamplerInitializeSTM**	Boolean	Write a 1 to this tag to initiate the initialization sequence of the autosampler STM. Checks fluid levels and primes the STM to prepare it for use.
Autosampler Priming Command Tags		
<-OPCSystemCommands->AutosamplerPrimePack-**>AutosamplerPort**	String	Write a single RSM: A1, A2, A3… A5 or alternatively B1, B2, B3… B5 is to be set to be used as the port for the AutosamplerPrimePack command tag.
<-OPCSystemCommands->AutosamplerPrimePack-**>AutosamplerPrimePack**	Boolean	Write a 1 to this tag to initiate the priming sequence of the specified autosampler RSM calibrator pack.
<-OPCSystemCommands->AutosamplerPrimeReactor-**>AutosamplerPort**	String	Write a single RSM: A1, A2, A3… A5 or alternatively B1, B2, B3… B5 to be set to be used as the port for the AutosamplerPrimeReactor command tag.
<-OPCSystemCommands->AutosamplerPrimeReactor-**>AutosamplerPrimeReactor**	Boolean	Write a 1 to this tag to initiate the priming sequence of the specified autosampler RSM reactor line.
<-OPCSystemCommands->AutosamplerScheduleAnalysis-**>AutosamplerPort**	String	Write a single RSM: A1, A2, A3… A5 or alternatively B1, B2, B3… B5 to be set to be used as the port for the AutosamplerScheduleAnalysis command tag.
<-OPCSystemCommands->AutosamplerScheduleAnalysis-**>AutosamplerScheduleAnalysis**	Boolean	Write a 1 to this tag to initiate the analysis sequence of the specified autosampler RSM.

Command Tag Path	Data Type	Description
<-OPCSystemCommands->AutosamplerScheduleAnalysis-**>DueTime**	DateTime	Write a future time (UTC) to initiate the AutosamplerScheduleAnalysis tag to run an OLS analysis at the written time. If blank or in the past the OLS analysis will execute immediately. AutosamplerScheduleAnalysis must be set to True after the DueTime is set for autosampler to analyze.
<-OPCSystemCommands->AutosamplerScheduleAnalysis-**>Operator**	String	Write the username of the individual performing the autosampler scheduled analysis. The default operator is "Auto".
<-OPCSystemCommands->AutosamplerScheduleAnalysis-**>SampleType**	String	Write a sample type from those configured on the analyzer to be used for the autosampler scheduled analysis (case sensitive). The default sample type is "Default".
<-OPCSystemCommands->AutosamplerScheduleAnalysis-**>RetainVolume**	Double	Write a volume (ml) of the retain to be collected for the SRC after the scheduled analysis of the autosampler.
<-OPCSystemCommands->AutosamplerScheduleAnalysis-**>NumberOfRetains**	Double	Write a number for the retains to be collected for the SRC after the scheduled analysis of the autosampler.
<-OPCSystemCommands->AutosamplerScheduleAnalysis-**>FollowWithRetain**	Boolean	Write a 1 to this tag to initiate a retain for the SRC to follow the scheduled analysis of the autosampler is complete.
<-OPCSystemCommands->AutosamplerTerminate-**>AutosamplerTerminate**	Boolean	Write a 1 to this tag to terminate a scheduled analysis of the autosampler.
Autosampler Scheduled Analysis Sample Information Command Tags		
<-OPCSystemCommands->AutosamplerScheduleAnalysis->SampleInformation-**>BatchID**	String	Write an alphanumeric indicator to appear in the batch ID field of the scheduled analysis of the autosampler. E.g., "BatchID"
<-OPCSystemCommands->AutosamplerScheduleAnalysis->SampleInformation-**>CdvDilutionRatio**	String	Write a CDV dilution ratio for the scheduled analysis of the autosampler. The CDV dilution ratio is pre-defined by the sample type.

Command Tag Path	Data Type	Description
<-OPCSystemCommands->AutosamplerScheduleAnalysis->SampleInformation-**>CellInspection**	String	Write a cell inspection type from those configured on the analyzer for the scheduled analysis of the autosampler. The cell inspection type is pre-defined by the sample type.
<-OPCSystemCommands->AutosamplerScheduleAnalysis->SampleInformation-**>CellType**	String	Write an alphanumeric indicator to appear in the cell type for the scheduled analysis of the autosampler. E.g., "CellType"
<-OPCSystemCommands->AutosamplerScheduleAnalysis->SampleInformation-**>ChemistryDilutionRatio**	String	Write a chemistry dilution ratio for the scheduled analysis of the autosampler. The chemistry dilution ratio is pre-defined by the sample type.
<-OPCSystemCommands->AutosamplerScheduleAnalysis->SampleInformation-**>PreDilutionMultiplier**	Double	Write a number to be used for the predilution multiplier on the scheduled analysis of the autosampler. If no predilution multiplier write "1". E.g., "1"
<-OPCSystemCommands->AutosamplerScheduleAnalysis->SampleInformation-**>SampleID**	String	Write an alphanumeric indicator to appear in the sample ID for the scheduled analysis of the autosampler. E.g., "SampleID"
<-OPCSystemCommands->AutosamplerScheduleAnalysis->SampleInformation-**>SpargingO2**	Double	Write a number (%) to be used as the sparging O_2 value on the scheduled analysis of the autosampler. The recommended default value is 20.9%. E.g., "20.9 "
<-OPCSystemCommands->AutosamplerScheduleAnalysis->SampleInformation-**>VesselID**	String	Write an alphanumeric indicator to appear in the vessel ID for the scheduled analysis of the autosampler. E.g., "VesselID"
<-OPCSystemCommands->AutosamplerScheduleAnalysis->SampleInformation-**>VesselPressure**	Double	Write a number (psi) to be used as the vessel pressure for the scheduled analysis of the autosampler. The recommended default value is 0psi. E.g., "0"
<-OPCSystemCommands->AutosamplerScheduleAnalysis->SampleInformation-**>VesselTemperature**	Double	Write a number (°C) to be used as the vessel temperature for the scheduled analysis of the autosampler. The recommended default value is 37°C. E.g., "37"

Command Tag Path	Data Type	Description
FLEX2 External Sampling Module (ESM) Command Tags		
<-OPCSystemCommands->ESMClean-**>ESMClean**	Boolean	Write a 1 to this tag to initiate an automated cleaning sequence on the ESM.
<-OPCSystemCommands->ESMInitialize-**>ESMInitialize**	Boolean	Write a 1 to this tag to initialize the ESM. Checks fluid levels and primes the ESM to prepare it for use.
<-OPCSystemCommands->ESMScheduleAnalysis-**>DueTime**	DateTime	Write a future time (UTC) and initiate the ESMScheduleAnalysis tag to run an ESM analysis at the written time. If blank or in the past the ESM analysis will execute immediately. ESMScheduleAnalysis must be set to True after the DueTime is set for autosampler to analyze.
<-OPCSystemCommands->ESMScheduleAnalysis-**>ESMScheduleAnalysis**	Boolean	Write a 1 to this tag to initiate an ESM analysis.
<-OPCSystemCommands->ESMScheduleAnalysis-**>Operator**	String	Write the username of the individual performing the ESM analysis. The default operator is "Auto".
<-OPCSystemCommands->ESMScheduleAnalysis-**>SampleType**	String	Write a sample type from those configured on the analyzer to be used for the ESM scheduled analysis (case sensitive). The default sample type is "Default".
<-OPCSystemCommands->ESMTerminate-**>ESMTerminate**	Boolean	Write a 1 to this tag to terminate an ESM analysis.
ESM Scheduled Analysis Sample Information Command Tags		
<-OPCSystemCommands->ESMScheduleAnalysis->SampleInformation-**>BatchID**	String	Write an alphanumeric indicator to appear in the batch ID field of the scheduled analysis of the ESM. E.g., "BatchID"
<-OPCSystemCommands->ESMScheduleAnalysis->SampleInformation-**>CdvDilutionRatio**	String	Write a CDV dilution ratio for the scheduled analysis of the ESM. The CDV dilution ratio is pre-defined by the sample type.
<-OPCSystemCommands->ESMScheduleAnalysis->SampleInformation-**>CellInspection**	String	Write a cell inspection type from those configured on the analyzer for the scheduled analysis of the ESM. The cell inspection type is pre-defined by the sample type.

Command Tag Path	Data Type	Description
<-OPCSystemCommands->ESMScheduleAnalysis->SampleInformation-**>CellType**	String	Write an alphanumeric indicator to appear in the cell type for the scheduled analysis of the ESM. E.g., "CellType"
<-OPCSystemCommands->ESMScheduleAnalysis->SampleInformation-**>ChemistryDilutionRatio**	String	Write a chemistry dilution ratio for the scheduled analysis of the ESM. The chemistry dilution ratio is pre-defined by the sample type.
<-OPCSystemCommands->ESMScheduleAnalysis->SampleInformation-**>PreDilutionMultiplier**	Double	Write a number to be used for the predilution multiplier on the scheduled analysis of the ESM. If no predilution multiplier write "1". E.g., "1"
<-OPCSystemCommands->ESMScheduleAnalysis->SampleInformation-**>SampleID**	String	Write an alphanumeric indicator to appear in the sample ID for the scheduled analysis of the ESM. E.g., "SampleID"
<-OPCSystemCommands->ESMScheduleAnalysis->SampleInformation-**>SpargingO2**	Double	Write a number (%) to be used as the sparging O_2 value on the scheduled analysis of the ESM. The recommended default value is 20.9%. E.g., "20.9 "
<-OPCSystemCommands->ESMScheduleAnalysis->SampleInformation-**>VesselID**	String	Write an alphanumeric indicator to appear in the vessel ID for the scheduled analysis of the ESM. E.g., "VesselID"
<-OPCSystemCommands->ESMScheduleAnalysis->SampleInformation-**>VesselPressure**	Double	Write a number (psi) to be used as the vessel pressure for the scheduled analysis of the ESM. The recommended default value is 0psi. E.g., "0"
<-OPCSystemCommands->ESMScheduleAnalysis->SampleInformation-**>VesselTemperature**	Double	Write a number (°C) to be used as the vessel temperature for the scheduled analysis of the ESM. The recommended default value is 37°C. E.g., "37"
External Online Sampler (EXT_OLS) Command Tags		
<-OPCSystemCommands->EXT_OLSScheduleAnalysis-**>DispenseTimeout**	Int32	The amount of time in minutes the analyzer will wait to receive the sample delivered by the EXT_OLS before generating a "Dispense Timeout" error. Valid values are between 10 and 30 and the default timeout is set to 25mins.

Command Tag Path	Data Type	Description
<-OPCSystemCommands->EXT_OLSScheduleAnalysis-**>DueTime**	DateTime	Write a future time (UTC) and initiate the EXT_ OLSScheduleAnalysis tag to run an OLS analysis at the written time. If blank or in the past the OLS analysis will execute immediately. EXT_OLSScheduleAnalysis must be set to True after the DueTime is set for autosampler to analyze.
<-OPCSystemCommands->EXT_OLSScheduleAnalysis-**>EXT_ OLSScheduleAnalysis**	Boolean	Write a 1 to this tag to initiate an OLS analysis.
<-OPCSystemCommands->EXT_OLSScheduleAnalysis-**>Operator**	String	Write the username of the individual performing the EXT_OLS analysis. The default operator is "Auto".
<-OPCSystemCommands->EXT_OLSScheduleAnalysis-**>SampleType**	String	Write a sample type from those configured on the analyzer to be used for the EXT_OLS scheduled analysis (case sensitive). The default sample type is "Default".
<-OPCSystemCommands->EXT_OLSTerminate-**>EXT_ OLSTerminate**	Boolean	Write a 1 to this tag to terminate an external autosampler analysis.
EXT_OLS Scheduled Analysis Sample Information Command Tags		
<-OPCSystemCommands->EXT_OLSScheduleAnalysis->SampleInformation-**>BatchID**	String	Write an alphanumeric indicator to appear in the batch ID field of the scheduled analysis of the EXT_OLS. E.g., "BatchID"
<-OPCSystemCommands->EXT_OLSScheduleAnalysis->SampleInformation-**>CdvDilutionRatio**	String	Write a CDV dilution ratio for the scheduled analysis of the EXT_OLS. The CDV dilution ratio is pre-defined by the sample type.
<-OPCSystemCommands->EXT_OLSScheduleAnalysis->SampleInformation-**>CellInspection**	String	Write a cell inspection type from those configured on the analyzer for the scheduled analysis of the EXT_OLS. The cell inspection type is pre-defined by the sample type.
<-OPCSystemCommands->EXT_OLSScheduleAnalysis->SampleInformation-**>CellType**	String	Write an alphanumeric indicator to appear in the cell type for the scheduled analysis of the EXT_OLS. E.g., "CellType"

Command Tag Path	Data Type	Description
<-OPCSystemCommands->EXT_OLSScheduleAnalysis->SampleInformation-**>ChemistryDilutionRatio**	String	Write a chemistry dilution ratio for the scheduled analysis of the EXT_OLS. The chemistry dilution ratio is pre-defined by the sample type.
<-OPCSystemCommands->EXT_OLSScheduleAnalysis->SampleInformation-**>PreDilutionMultiplier**	Double	Write a number to be used for the predilution multiplier on the scheduled analysis of the EXT_OLS. If no predilution multiplier write "1". E.g., "1"
<-OPCSystemCommands->EXT_OLSScheduleAnalysis->SampleInformation-**>SampleID**	String	Write an alphanumeric indicator to appear in the sample ID for the scheduled analysis of the EXT_OLS. E.g., "SampleID"
<-OPCSystemCommands->EXT_OLSScheduleAnalysis->SampleInformation-**>SpargingO2**	Double	Write a number (%) to be used as the sparging O2 value on the scheduled analysis of the EXT_OLS. The recommended default value is 20.9%. E.g., "20.9 "
<-OPCSystemCommands->EXT_OLSScheduleAnalysis->SampleInformation-**>VesselID**	String	Write an alphanumeric indicator to appear in the vessel ID for the scheduled analysis of the EXT_OLS. E.g., "VesselID"
<-OPCSystemCommands->EXT_OLSScheduleAnalysis->SampleInformation-**>VesselPressure**	Double	Write a number (psi) to be used as the vessel pressure for the scheduled analysis of the EXT_OLS. The recommended default value is 0psi. E.g., "0"
<-OPCSystemCommands->EXT_OLSScheduleAnalysis->SampleInformation-**>VesselTemperature**	Double	Write a number (°C) to be used as the vessel temperature for the scheduled analysis of the EXT_OLS. The recommended default value is 37°C. E.g., "37"
SetSyncEvent Command Tags Allows the execution of specific events that are crucial for the optional ESM and EXT_OLS Modules		
<-OPCSystemCommands->SetSyncEvent-**>Event**	String	Write an automation tag from the list: "ESMRequestDispenseRemaining", "ESMRequestInitialDispense", "EXT_OLSRequestSample", or "EXT_OLSSampleAspirated".
<-OPCSystemCommands->SetSyncEvent-**>SetSyncEvent**	Boolean	Write a 1 to this tag to execute the action in the Event command.