

# Series 9 OPC UA Server

## Supplement

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Issue B

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## **Series 9 OPC UA Server Supplement**

Part Number: 120/16995-01

Issue: B

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# Contact NDC

## Online Support

You can access the NDC Customer Support portal, myNDC at <https://ndc.custhelp.com>.

myNDC is a cloud-based portal that allows you to get product support by phone, ask a question, provide feedback, submit an RMA request or access information in our on-line knowledge database. You can browse the myNDC site or create a myNDC account.

- To create a myNDC account, click **Log In** or **Sign Up**. After creating the account, you will be immediately logged in. To log in on subsequent visits to myNDC, click **Log In**, enter your user name and password, and then click **LOG IN**.
- To submit an RMA, click on **RMA Request** and follow the on-screen instructions.

The screenshot shows the myNDC Customer Support portal homepage. At the top, the NDC Technologies logo is on the left, and navigation links for 'Log In', 'Sign Up', 'Contact', 'Help & Support', 'Careers', and 'News' are on the right. Below the navigation links are 'Support Home', 'Answers', and 'Ask a Question'. The main banner features the text 'Welcome to myNDC' and a search bar with the placeholder 'Enter a question or FAQ#'. Below the banner, the heading 'We're here to help' is followed by a welcome message. A row of icons represents various support services: Manuals and Guides, Radioactive Materials, Support Agreements & Training, Technical Support, Preventative Maintenance, On-site Support & Spare Parts, Calibration Services, Remote Support, Search Knowledge Base, and RMA Request. The 'RMA Request' icon is highlighted with a red box.

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Support Home Answers Ask a Question

INTELLIGENCE THAT TRANSFORMS THE WORLD

# Welcome to myNDC

Enter a question or FAQ#

## We're here to help

Welcome to service in the cloud with myNDC. Please use the menu below to search help topics, create RMA's, use the search box, options above to access answers or contact us.

- Manuals and Guides
- Radioactive Materials
- Support Agreements & Training
- Technical Support
- Preventative Maintenance
- On-site Support & Spare Parts
- Calibration Services
- Remote Support
- Search Knowledge Base
- RMA Request

# NDC Contact Numbers

Please have your sales order number at hand before contacting NDC.

Americas	+1 626 939 3855
Asia Pacific	<p>NDC Asia Pacific Customer Service Toll-free contact numbers:</p> <ul style="list-style-type: none"><li>• Thailand: 1800 012 048</li><li>• Indonesia: 00 1803 016 4969</li><li>• Korea: 00 7981 420 30749</li><li>• Malaysia: 1800 81 9290</li><li>• Taiwan: 00 801 128 027</li><li>• India: 000 800 0402 514</li></ul> <p>Singapore non toll-free number: +65 6579 2411</p> <p>Email ID: <a href="mailto:osc-apac@ndc.com">osc-apac@ndc.com</a></p>
Japan	+81 (0)3 3255 8157
China	+86 21 61133609
EMEA (Europe, Middle East, Africa)	Germany: 0800 1123194
	Italy: +39 0331 454 207
	<p>All other countries (English speaking): +44 1621 852244</p> <p>Please select option 2 to be connected to the service team</p>

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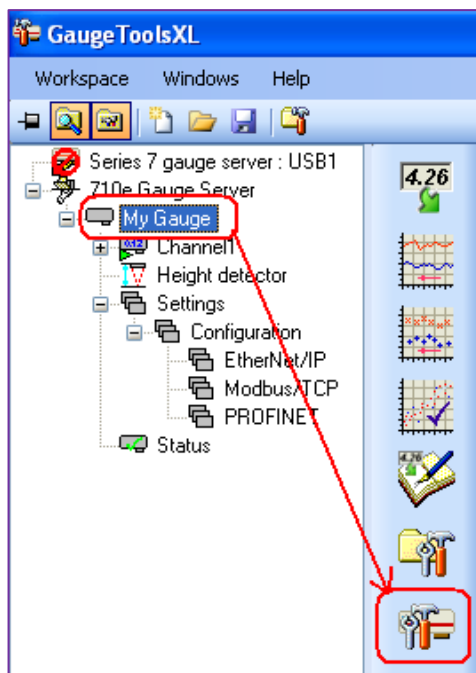
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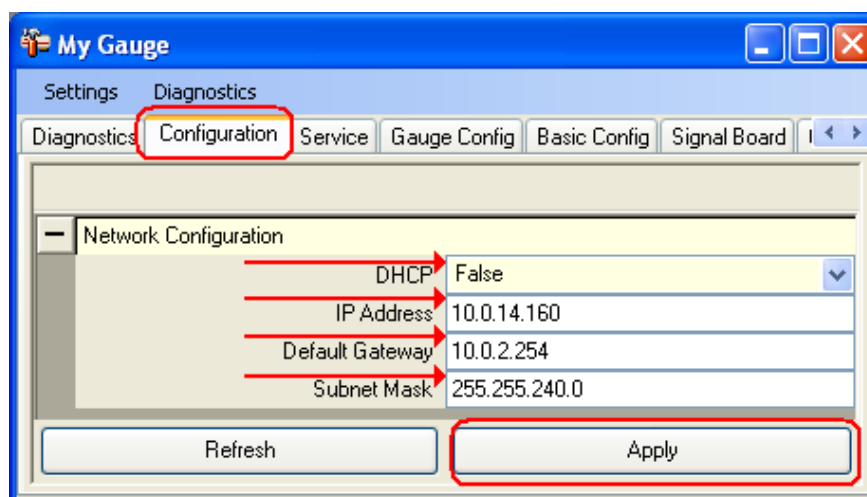
# Setting the IP Address on the Series 9

The Series 9 IP address can be confirmed or changed through **GaugeToolsXL** as follows:

1. Start **GaugeToolsXL** and drag the Gauge node to the “Gauge Utility” icon.



2. Select the **Configuration** tab and enter the required values.



3. Click **Apply** to use the new settings.

# Overview

The OPC UA communications functionality is a built-in service of the Series 9 gauge.

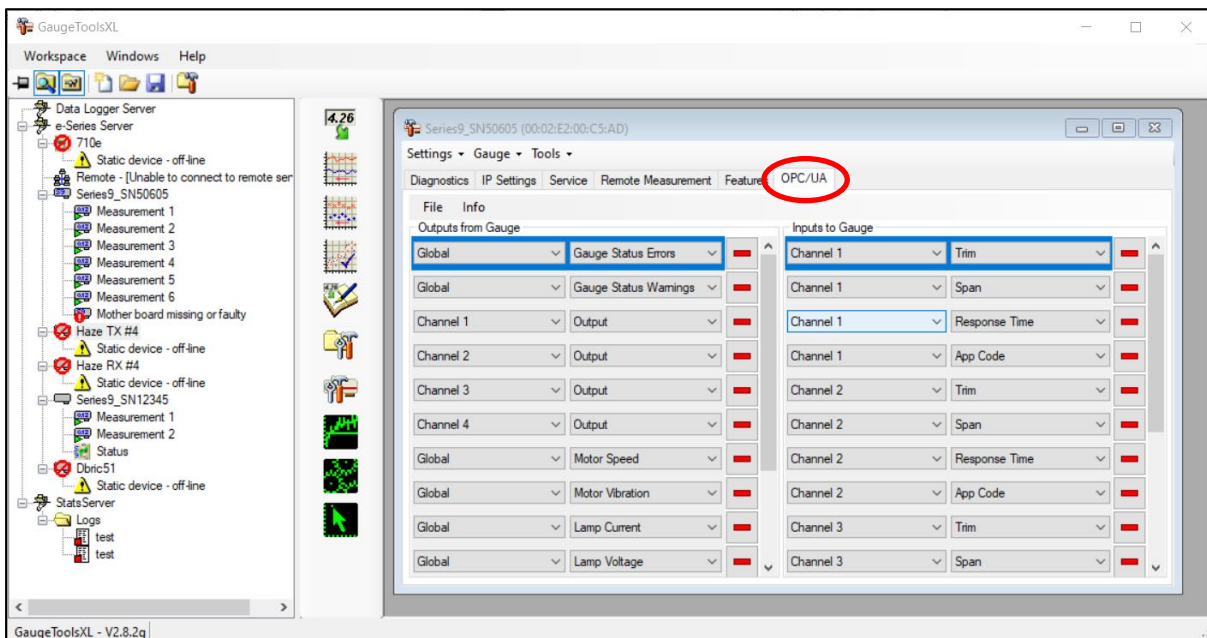
OPC UA utilizes the regular Ethernet network. The OPC UA service is started automatically by a system script.

The Series 9 OPC UA has the following properties:

- Uses the server/client role, and does not implement security
- Nano Embedded Device Server Profile

## Configuration in GaugeToolsXL

OPC UA is configurable in GaugeToolsXL via the **OPC/UA** tab of the Utility tool.



**Note:** This configuration does not affect the fixed set of parameters exposed by the server (listed in the [OPC UA Parameters](#) section). It only determines which OPC UA Server variables will provide live data.

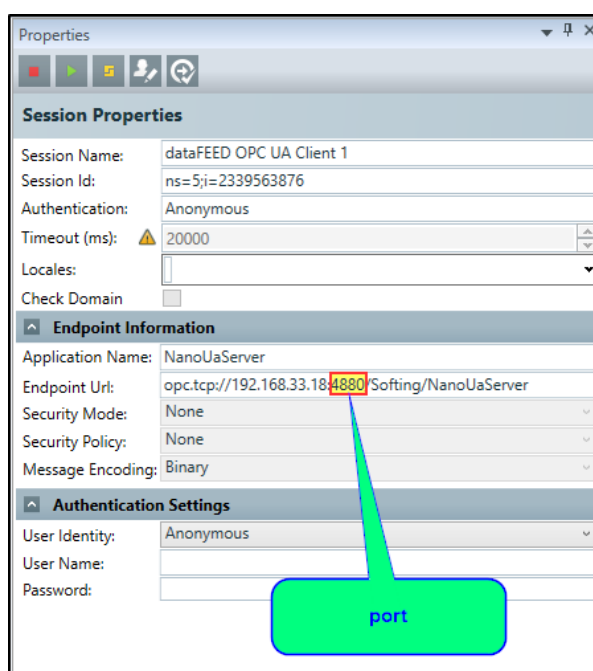
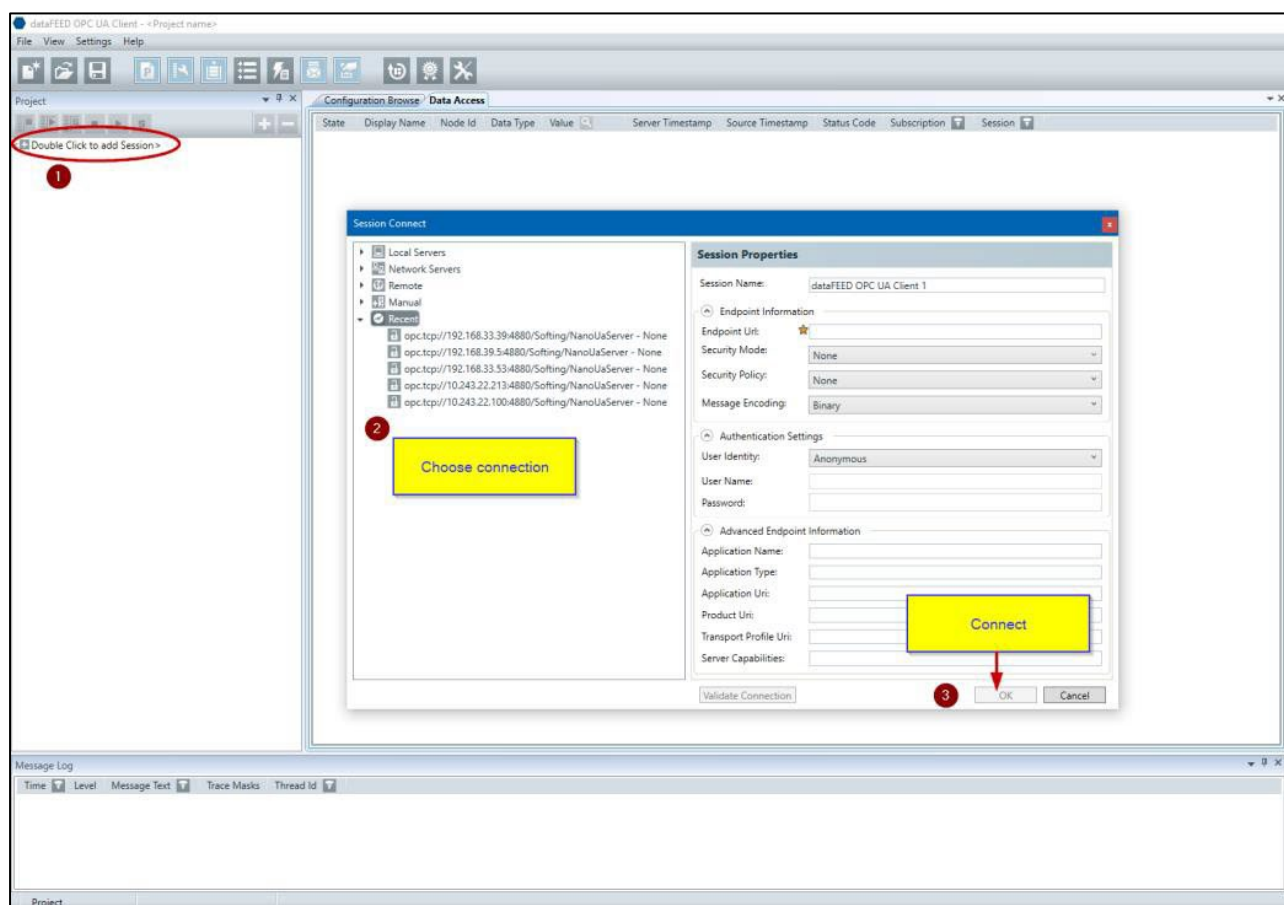
For example, if the Motor Speed parameter is not configured in GaugeToolsXL, then an OPC UA client only receives 0 for the fixed Motor Speed variable.



# Connecting Via Softing OPC UA Client

The Series 9 OPC UA Server was tested using Softing's dataFEED OPC UA client

<https://industrial.softing.com/products/opc-ua-and-opc-classic-sdks/opc-ua-demo-client.html>



Below is a screenshot of a sample session.

The screenshot displays the dataFEED OPC UA Client interface. The Configuration Browser on the left shows a tree structure of parameters under 'dataFEED OPC UA Client 1'. A green callout box labeled 'exposed parameters' points to this list. The Properties panel on the right shows details for 'Channel\_1\_Output', including its Node Id, Browse Name, and various attributes like Data Type (Float) and Access Level. A green callout box labeled 'parameter properties' points to these attributes. Below the Properties panel, a green callout box labeled 'parameter read/write buttons' points to the 'Read' and 'Write' buttons. The Message Log at the bottom shows a series of messages related to browsing and reading nodes. A green callout box labeled 'parameter value and read/write status' points to the 'Value' and 'Status' fields in the 'Channel\_1\_Output' section.

Below is a screenshot of the parameters that are exposed via the OPC UA connection.

The screenshot displays the dataFEED OPC UA Client interface. The Configuration Browser on the left shows a tree structure of parameters under 'dataFEED OPC UA Client 1'. A green callout box labeled 'connection address' points to the 'dataFEED OPC UA Client 1 - opc.tcp://10.243.22.213:4880' entry. A green callout box labeled 'exposed parameters/data objects' points to the list of parameters. The Properties panel on the right shows details for 'Channel 4 Appcode', including its Node Id, Browse Name, and various attributes like Data Type (UInt32) and Access Level. A green callout box labeled 'connection address' points to the 'dataFEED OPC UA Client 1 - opc.tcp://10.243.22.213:4880' entry.

Below is a screenshot of another sample session.

The screenshot displays the 'dataFEED OPC UA Client' interface. The 'Data Access' table is the central focus, showing the following data:

State	Display Name	Node Id	Data Type	Value	Server Timestamp	Source Timestamp	Status Code	Subscription	Session
	Root\Objects\Channel_1_Output	ns=2;i=1	Single	1.89	1:37:24.444 PM	1:37:24.444 PM	Good	Subscription 1	dataFEED OPC UA Client 1
	Root\Objects\Channel_3_Appcode	ns=2;i=12	UInt32	16009007	12:57:28.260 PM	12:57:28.260 PM	Good	Subscription 1	dataFEED OPC UA Client 1
	Root\Objects\Channel_1_Output	ns=2;i=1	Single	1.89	1:40:09.160 PM	1:40:09.160 PM	Good	Subscription 1	dataFEED OPC UA Client 1
	Root\Objects\Channel_3_Appcode	ns=2;i=12	UInt32	16009007	12:57:33.622 PM	12:57:33.622 PM	Good	Subscription 1	dataFEED OPC UA Client 1

Red circles highlight the 'Display Name' and 'Value' columns. Green callout boxes labeled 'parameters' and 'values' point to these columns respectively.

The Message Log at the bottom shows the following entries:

Time	Level	Message Text	Trace Masks	Thread Id
1:45:05.222 PM	Info	Browse result for NodeId ns=2;i=1 returned 1 result(s)	SoOpcCit	1
1:45:05.222 PM	Info	Browse operation returned 1 results for NodeId ns=2;i=1.	ClientAPI	1
1:45:05.121 PM	Info	ReadNode for NodeId ns=2;i=1	SoOpcCit	16
1:45:05.121 PM	Info	Read node operation completed for node ns=2;i=1.	ClientAPI	16
1:43:27.056 PM	Info	Browse result for NodeId ns=2;i=1 returned 1 result(s)	SoOpcCit	1

# OPC UA Parameters

The following is a description of parameters that are exposed by the OPC UA Server.

## ❖ **Output** (read only)

Measurement value of the specified channel.

The Units of the measured value depend on the target material and the application (e.g. moisture [%]).

## ❖ **Span**

Multiplier factor for the output: **Output = (Span \* X) + Trim**

(where **X** is the raw measurement value).

This parameter is available for all measurements, including temperature.

## ❖ **Trim**

Offset for the output: **Output = (Span \* X) + Trim**

(where **X** is the raw measurement value).

This parameter is available for all measurements, including temperature.

## ❖ **Application Code**

This 32-bit integer code is used to select the appropriate algorithm in the gauge for the intended measurement – consult NDC for list of codes that can be used with the specific gauge.

**Note:** An application code of zero will disable the channel measurements.

## ❖ **Response Time**

Output smoothing using an exponential factor [0...3600].

## ❖ **Lamp Current [A]** (read only)

Current through the lamp.

## ❖ **Lamp Voltage [V]** (read only)

Voltage across the lamp.

## ❖ **Motor Speed [rpm]** (read only)

The current speed of the Filter Wheel (motor) in the gauge.

❖ **Motor vibration** (read only)

Vibration near the Filter Wheel (motor) in raw units.

❖ **Window Contamination** (read only)

The Window Contamination level as seen by the user.

(A clean window will be close to zero and a dirty window > 0.5.)

❖ **Air flow monitor** (if option fitted)

The air flow to the Air Purge Window in Liters per minute.

❖ **Internal Temperature [degC]** (read only)

The internal temperature of the gauge.

❖ **Gauge Status<sup>1</sup>** (read only)

Bit encoded 32-bit word of status condition. See bit definitions below.

❖ **Gauge Warnings<sup>2</sup>** (read only)

Bit encoded 32-bit word of warning condition. See bit definitions below.

<sup>1</sup>**Note: Status Output** is a bit-encoded word

**Bit 0:** STATUS\_BIT\_MOTOR: Fault with main filter wheel motor

**Bit 1:** STATUS\_BIT\_LAMP: Lamp error

**Bit 2:** STATUS\_BIT\_SIGNAL\_LOW: Light signals received by gauge are too low to make a good reading

**Bit 3:** STATUS\_BIT\_SIGNAL\_HIGH: Light signals received by gauge are too high to make a good reading

**Bit 4:** STATUS\_BIT\_WINDOW: Window is contaminated, error threshold of 1.0 reached

**Bit 5:** STATUS\_BIT\_TEMPERATURE: The internal temperature of the gauge has exceeded the error level. Can also be triggered for a low temperature error (i.e. gauge is too cold to operate correctly)

**Bit 6:** STATUS\_BIT\_INTERNALREF: The internal reference system has failed

**Bit 7:** STATUS\_BIT\_VOLTAGE: A bad voltage has been detected on one of the PCBs

**Bit 8:** STATUS\_BIT\_SLAVEHEAD: Unable to access slave head (only applies to double headed gauges like the Haze gauge)

**Bit 9:** STATUS\_BIT\_AIRFLOW: The air pressure is out of range, suggesting air flow to the air purge is incorrect

**Bit 10:** STATUS\_BIT\_SYNC\_PULSE: Unable to detect the synchronisation pulse (only applies to double-headed gauges like the Haze gauge)

**Bit 11:** STATUS\_BIT\_AUTOSAMPLER: Auto sampler system has failed (only applies to gauges with PowderVision sampling enabled)

**Bit 16:** STATUS\_BIT\_SELF\_TEST: General hardware error detected at start up

<sup>2</sup>**Note:** Status Warnings is a bit-encoded word

**Bit 4:** STATUS\_BIT\_WINDOW: Window is contaminated, warning threshold of 0.60 reached

**Bit 5:** STATUS\_BIT\_TEMPERATURE: The internal temperature of the gauge has exceeded the warning level. Can also be triggered for a low temperature warning (i.e. gauge is too cold to operate correctly)