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# Connecting BioPAT® MFCS to Endress+Hauser Raman via OPC UA

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## Abstract

This application note describes the connection between BioPAT® MFCS and an Endress+Hauser Raman Rxn analyzer. It outlines in detail the steps required to configure a BioPAT® MFCS (4.8 and above) system to connect to a Raman Rxn analyzer via OPC UA and acquire process data from the device.

# Introduction

This application note is intended to be used by customers who want to connect an Endress+Hauser Raman Rxn analyzer for data acquisition of univariate data that can be used by BioPAT® MFCS for automated process control, process monitoring and defining alarm limits. The connection of the Raman Rxn analyzer is performed via OPC UA, a platform independent standard, that enables secure exchange of information between industrial systems.

How to apply a SIMCA® model to the Raman Rxn analyzer, how to manage the device is, or the model related to the OPC UA namespace structure is not within the scope of this application note.

# Materials

## **Sartorius Software**

BioPAT® MFCS Core Software

## **Third Party Instruments**

Endress+Hauser Raman Rxn Analyzers

# Methods

## BioPAT® MFCS Requirements | Prerequisites

To connect a Raman Rxn analyzer to the BioPAT® MFCS system, several prerequisites have to be met. These prerequisites consist of software, hardware, and license components.

### **Software Prerequisites**

To communicate with a Raman Rxn device, it is recommended to use Raman RunTime v6.2.2 (embedded software for Raman Rxn analyzers) or above and BioPAT® MFCS v4.8 or above. Due to continuous improvements, it is always recommended to use the latest version of Raman RunTime and BioPAT® MFCS.

### **Hardware Prerequisites**

Connectivity between BioPAT® MFCS and the Raman Rxn analyzer utilizes an ethernet based connection. The MFCS host system as well as the Raman Rxn analyzer should be connected to the same network.

### **BioPAT® MFCS License Prerequisites**

BioPAT® MFCS consist of a core application and functional modules. To connect the BioPAT® MFCS system to a Raman Rxn analyzer, the BioPAT® MFCS OPC Client Module must be licensed. This will allow the collection, visualization and reporting of the collected parameters.

BioPAT® MFCS has many more options to maximize the use of the connected Raman analyzer which may require the following modules:

- The Recipe Control Module is required to utilize the measured parameters supplied by the Raman Rxn analyzer in controlling a running batch.
- A Calculation Module license is needed to use the collected data for calculations e.g., if the Raman system is measuring glucose values which are in turn used to calculate the volume of a feed bolus.
- The 21 CFR part 11 module is mandatory, if the BioPAT® MFCS system is being used in a GMP environment, supporting an audit trail of all automated and manual actions.

# BioPAT® MFCS Configuration Connectivity

BioPAT® MFCS can connect to multiple PAT analyzers supporting different connection protocols. For the purpose of this application note the Raman Rxn will be treated as an OPC UA device in BioPAT® MFCS.

The general approach of configuring a device in BioPAT® MFCS to any OPC UA device is described in the OPC Client Manual.

Specific connectivity parameters for connecting the Raman Rxn to the BioPAT® MFCS system are described below.

## Endress+Hauser Raman Rxn Specific Parameters

<b>Parameter</b>	Device Type
<b>Value</b>	OPC UA

The device type defines the communication protocol to be used for the communication.

<b>Parameter</b>	OPC UA server address
<b>Value</b>	A network address of the Raman Rxn device
<b>Format (IP)</b>	opc.tcp://IP-Address:4840
<b>Format (Host)</b>	opc.tcp://Hostname:4840

The OPC UA server address can be either an IP address or a valid hostname. The correct parameters can be found under **Options → System → Network** in the Raman RunTime embedded software application.

The Raman Rxn system contains 2 configurable IP addresses. Depending on the configuration of the network adapters, the IP address is either static or assigned by a DHCP server. In both cases, the IP address is shown on the screen. To be able to connect the BioPAT® MFCS system to the Raman Rxn device, the BioPAT® MFCS system as well as the Raman Rxn system have to be part of the same subnet. Furthermore, in windows-based networks the computer name can be used as hostname. The computer name can be shown and edited in the Network options screen of the Raman Rxn software application.

<b>Parameter</b>	Authentication Mode
<b>Value</b>	Username

The Raman Rxn device does not support anonymous access.

<b>Parameter</b>	Username
<b>Value</b>	The Raman Rxn OPC UA username
<b>Format (IP)</b>	opc.tcp://IP-Address:4840
<b>Format (Host)</b>	opc.tcp://Hostname:4840

The username for OPC UA communication is shown under **Options → System → Automation** in the Raman RunTime interface. By default, it is set to **kaiser-opc**

<b>Parameter</b>	Password
<b>Value</b>	The Raman Rxn OPC UA password

The password for OPC UA communication can be set under **Options → System → Automation** in the Raman RunTime interface. By default, it is set to **opc**

# BioPAT® MFCS Configuration Unit

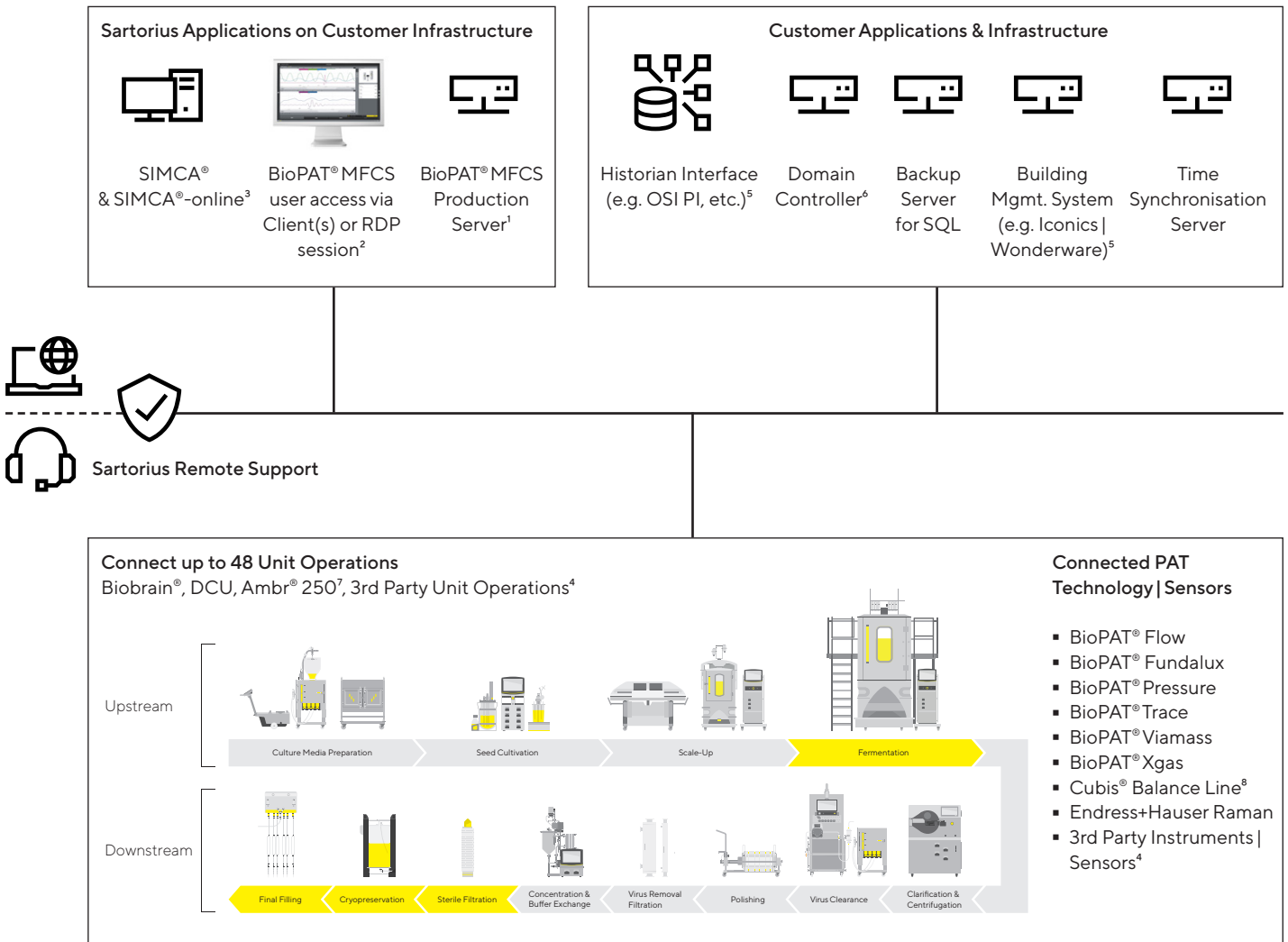
Depending on the process needs, the user can associate the Process Variables and Controllers for a connected PAT device. For the Raman Rxn analyzer the user must select the OPC UA NodeIDs that are required to be used. For further information on how to configure see BioPAT® MFCS OPC Client Module manual.

# OPC UA Namespace

The OPC UA server on a Raman Rxn contains a set of static NodeIDs and a set of NodeIDs, which are dynamically created based on the applied SIMCA® model. This chapter only lists the static NodeIDs. The NodeIDs supported are dependent on the Raman RunTime version.

Please contact Endress+Hauser support for a list of key NodeIDs supported by BioPAT® MFCS.

## Simplifying Your Process – The Sartorius EcoSystem



<sup>1</sup> BioPAT® MFCS server application deployed on a customer hosted virtual server

<sup>2</sup> BioPAT® MFCS client deployed on customer PC's or accessing server by Remote Desktop

<sup>3</sup> SIMCA® | SIMCA®-online connected using SimApi (part of MFCS core)

<sup>4</sup> BioPAT® MFCS needs OPC® UA client module

<sup>5</sup> BioPAT® MFCS needs OPC® UA server module

<sup>6</sup> BioPAT® MFCS needs user management module

<sup>7</sup> Ambr® 250 needs Kepware OPC® UA server

<sup>8</sup> Cubis® balance line via OPC® DA server (part number VF4844)

# Conclusion

This application note outlines how to connect Endress+Hauser Raman Rxn analyzers with BioPAT® MFCS via OPC UA.

The OPC UA client functionality of BioPAT® MFCS offers a flexible and standardized way of integrating any PAT analyzers without using proprietary communication protocols.

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