IP21 SimApi User Guide

1. Introduction

This document is the user guide for the *IP21 SimApi* from MKS Umetrics.

It connects to an AspenTech IP21 data source through ODBC. It does not connect to IP21 Batch, there is a separate SimApi for that, available on the below web site.

For a detailed list of changes in different versions of this SimApi, see the *Version Info.txt* file that comes with the installation.

This SimApi can be used by SIMCA-online, SIMCA-Batch On-Line, SIMCA-4000, or SIMCA.

For more information on available SimApis, see www.umetrics.com/simapi.

1.1 Features

- ODBC connection string authentication with a user name and password or Windows authentication.

- Customizable set of tables to expose through the SimApi.

- Reading process data, current and historical.

- Supports both numerical and text data for tags.

- Reads interpolated historical data by default. This can be changed per tag so read raw data is used instead.

- Support for multiple instances of the SimApi. Used to connect to multiple IP21 data sources from the same SIMCA-online server. Also see http://www.umetrics.com/kb/multiple-instances-same-simapi-simca-online-server.

Note that this SimApi reads only continuous process data, it does not handle batch data or discrete data.

1.1.1 Customizable set of tables

This SimApi by defaults reads from the IP21 tables IP_AnalogDef and IP_DiscreteDef. If additional data tables should be exposed through the SimApi you can use the ExtraTables setting, see 2.3.4 on how to configure this.

1.1.2 Text Tags

Text tags are supported by this SimApi, but to be able to read historical text data each text tag must be identified in the XML file, as described in 2.3.5 below.

1.1.3 Read raw data instead of Interpolated data

Historical data is interpolated by default by the SimApi. This means that an estimated value will be returned depending on the sample time. This is explained in more detail in the SIMCA-online Technical Guide http://www.umetrics.com/kb/simca-online-technical-guide.

If you don't want this behaviour, such as for tags that must have an exact value, this can be configured per tag using the <readrawvaluetag> setting, as described in 2.3.6 below. Configuring tags in this section will force the SimApi to read raw values (last know good value) for those tags[1].

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[1] Technical, the SimApi will add *STEPPED=1* in the SQL query that asks for historical data.

1.2 Prerequisites

In order for the IP21 SimApi to work with your database you must install the ODBC drivers for AspenTech IP21. Refer to the documentation provided from AspenTech. MKS Umetrics does not provide these drivers.

1.3 Installation

The SimApi comes in a 32-bit (x86) and a 64-bit (x64) version. Use the one that matches the program (for example SIMCA-online or SIMCA) you will use the SimApi in.

1. (Don't forget to install the ODBC drivers as mentioned in 1.2 above)

2. Run the SimApi setup program to install the SimApi on your computer where you want to use it.

3. Configure the ODBC Data source as described in 1.4 below.

4. Set up the SimApi as described in 2 below.

Also refer to the following sections for information on important locations for log- and settings files and troubleshooting tips.

1.4 Configure ODBC Data Sources

The data source should be configured as a System DSN in the ODBC Data Sources control panel in Windows.

Note that there are two versions of this tool on 64-bit Windows: one for 32-bit applications and one for 64-bit[2].

In the ODBC configuration wizard for SQL Server you can select how to authenticate users (log in):

- *SQL Server Authentication* which means that the database is authenticating users using a user name and password. This username and password can be given in the ODBC wizard, or in the configuration file by filling in the credentials dialog as part of the configuration (see below).

- *Windows authentication*. Windows authentication means that the user account (typically in Active Directory) of the program using the SimApi is used to connect to the database. This user account needs to have appropriate rights in the database.

Windows authentication with a SIMCA-online server means that the service account of the SIMCA-online Server service is used (LocalSystem by default, but can be changed to a specific account by the administrator, see The SIMCA-online Technical Guide for more information).

Windows Authentication with SIMCA means that the user account of the person that is running SIMCA will be used.

Verify the connection to the database with the Test Data Source button at the end of the ODBC configuration wizard. As noted above, for Window Authentication this tests with your own user account, and not necessarily with the SIMCA-online service account.

1.5 Configuration file and log file locations

The SimApi stores its settings in a XML settings file named IP21Configuration.xml in the *Program Data* folder[3]. This folder is located in different places depending on the Windows version:

Window Vista and Windows Server 2008 and later: C:\ProgramData\Umetrics\SimApi

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[2] On 64-bit Windows you can start the 32-bit ODBC Data Sources program by launching it manually from the SysWow64-folder, typically C:\Windows\SysWOW64. If you just start ODBC Data Sources from the start menu in 64-bit Windows 7 it will launch the 64-bit version.

[3] This folder is normally hidden in Windows so in order to see it in Windows Explorer you should configure Windows Explorer to show hidden files. Note that you still can navigate to a hidden folder by copying and pasting the folder path to Explorer's address bar.

Windows XP and Windows Server 2003: C:\Documents and Settings\All Users\Application Data\Umetrics\SimApi

This folder also contains the log file that the SimApi writes. This log file is named IP21SimApiLog.log and is useful for troubleshooting.

1.5.1 File names when multiple instances are used with SIMCA-online 13.1 or later

When multiple instances are used with SIMCA-online 13.1 or later versions, each configuration get its own configuration file and log file. The naming of these files corresponds to the name the configuration is given on the SimApi tab in the SIMCA-online server options dialog and are therefore a bit different than what is mentioned in the previous section. The following example shows the naming of these files.

Configuration name given when the instance is added: *Server1*
Configuration file name: IP21_*Server1*Configuration.xml
Log file name: IP21_ *Server1*SimApiLog.log

Note that the generic file IP21SimApi.log file still is used. This log file contains entries that for technical reasons cannot be directed to the log file of the instances.
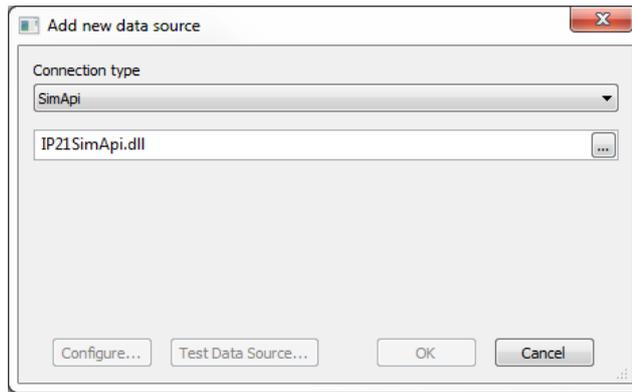
2. Setting up

In order for SIMCA or SIMCA-online to be able to use the SimApi you need to configure it as described here.

2.1 Setting up the SimApi for use in SIMCA

1. Start the database import in SIMCA with either:

   - *File->New Regular Project or New Batch Project*. If the database import wizard is not opened automatically, open it from *File->New Spreadsheet->From Database*.

   - Import Dataset on the Data tab of an open SIMCA project.

2. Click on *Add data source*:
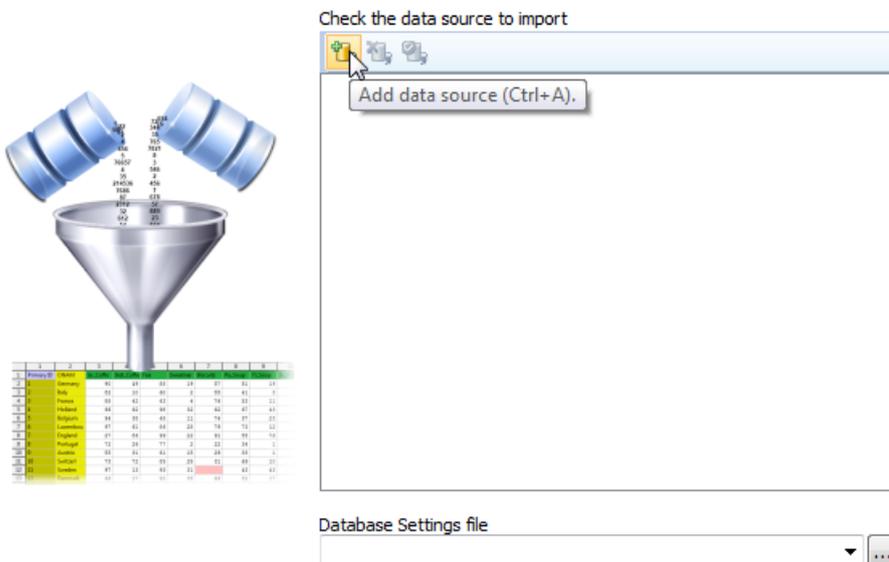
3. Select *SimApi* as the connection type, click the …-button and located the IP21SimApi.dll, and click Open.

4. Continue to 2.2 and follow the steps 3 to 5 (configuring the setting in the SimApi) before clicking OK (to avoid an error message).

5. Click the Test data source connection to verify that you can connect to the database.

2.2 Setting up the SimApi for use in SIMCA-online

1. Start the SIMCA-online Server Options utility from the start menu. Go to the SimApi tab and click *Add...*
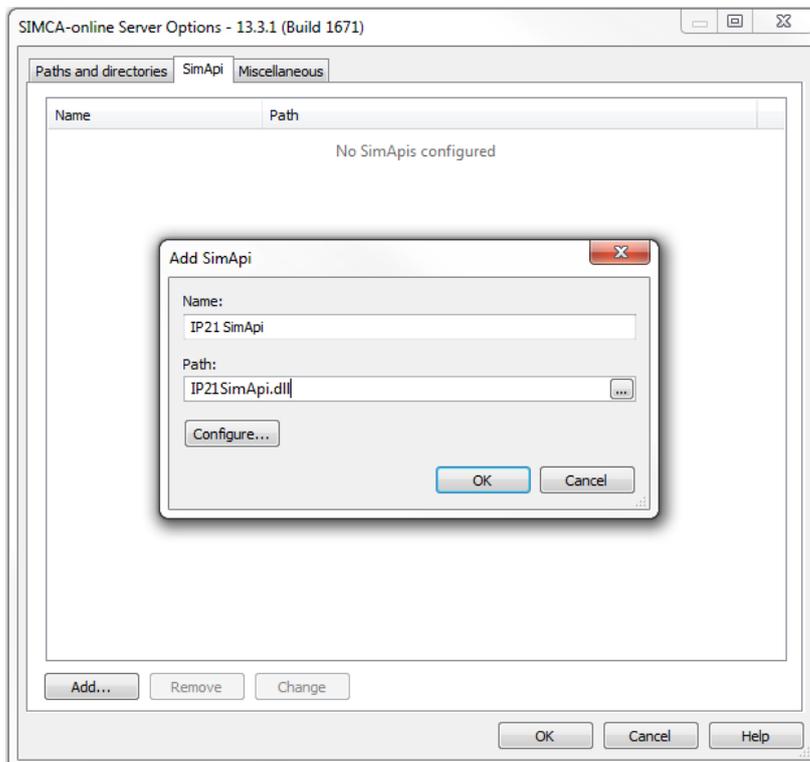
2. Give this instance of the SimApi a name and then click the …-button to browse to and select the IP21SimApi.dll.

3. Click the Configure-button. This shows the following dialog:

If your database is using database authentication in ODBC. The user name and password is stored encrypted in the configuration file.

On the other hand if you are using Windows Authentication you can leave user name and password blank.

4. When you click OK the SimApi creates the default XML configuration file (if it already existed, all settings remain, and only the username and password is updated if you changed it). Complete the settings in configuration in the XML file using a text editor as described in 2.3 and onwards.

5. Start the SIMCA-online server service, verify it starts (if not look for errors in the SimApi log files and update the XML configuration file to correct any errors). Use a SIMCA-online client and use Extract on the File-tab to test that the SimApi works as expected.

6. If you want to configure multiple instance of this SimApi, then repeat the above steps and use unique names for each instance. Tip: copy and paste settings from the XML configuration file for the first instance to the second instance XML-file and use those settings as the starting point. Read more about the different log and configuration files for the instances in 1.5.1.

2.3 The XML Configuration File

The XML configuration file is a text file, it can be edited with Notepad for example, although it might be easier with a text editor that understands XML, such as Notepad++. The file has the following settings:

2.3.1 Log File Specific Settings

- LogFileSize – The maximum allowed size of the log file before the file is truncated.
- LogLevel – The higher the value the more information is printed to the log file. Maximum value is 4 and minimum value is 0. (0=Critical, 1=Error, 2=Warning, 3=Information, 4=Debug).

2.3.2 Connection Specific Settings

- DSN – Data Source Name as set up in the Windows *ODBC Administrator* tool. See 1.4 above.
- Credentials – The user name and password for the database (if applicable) encrypted. Both are configured in the Credentials configuration dialog that is displayed when configuring the SimApi.
- QueryTimeout – The time before a query or connection to the database will time out and fail.

2.3.3 Maximum Length for Text Tags

- MaxTextSize   –Specifies the maximum number of characters that should be read for text tags. Default is 80 characters. If a string is longer than this limit, it will be truncated when read by the SimApi.

2.3.4 Extra tables except IP_AnalogDef and IP_DiscreteDef

- ExtraTables   – Additional tables where the SimApi should look for data. Separate multiple tables with the pipe ('|') character. Example with two additional tables:
  <setting key="ExtraTables" value="Table1|Table2" />

2.3.5 Text tags

- TextTag   – Any tag that reads text data should be configured in this section. One <TextTag> element for each tag. This must be done in order to read historical data for a text tag otherwise only current data will be available.

```
<TextTags>
        <TextTag Table="IP_TextDef" Tag="Batch ID" />
        <TextTag Table="IP_TextDef" Tag="Phase Trigger" />
</TextTags>
```

2.3.6 Read raw value for tag(s)

- ReadRawValueTag   – Interpolated historical values are read for all tags by default, if read raw should be used instead for a tag it must configured in this section. There should be one <readrawvaluetag> element for each tag:

```
<readrawvaluetags>
        <readrawvaluetag Table="IP_AnalogDef" Tag="Phase1 Trigger" />
        <readrawvaluetag Table="IP_AnalogDef" Tag="Phase2 Trigger" />
</readrawvaluetags>
```

3. Support

See http://www.umetrics.com/support