



SIMATIC HMI

WinCC V7.3 WinCC/IndustrialDataBridge Getting Started

Getting Started

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Printout of the Online Help

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Task

Introduction

Welcome to the "IndustrialDataBridge V7.3 Getting Started". Getting Started uses example projects to show you the easy operation of IDB V7.3. This "Getting Started" takes you through the configuration process of the IndustrialDataBridge by means of practical examples and enables the data transfer process during runtime using these examples.

The included WinCC project "idb_getting_started.MCP" and IDB Getting Started project "IndustrialDataBridge" provides you with an environment that helps to make your first steps with the IndustrialDataBridge application.

Note

Language

The Getting Started examples are available only in English language. In WinCC Explorer or in IDB V7.3, even if you change the language, you will observe that the Getting Started example in WinCC Runtime will be displayed in English language.

Example Project

The example project that is provided along with this Getting Started includes 2 examples.

Example 1

The example included demonstrates the data transfer within a plant environment. This example deals with the data transfer of process value archive to user archive. The archived alarm data existing in process value archive can be further transferred to a CSV file. The user archive containing updated data is transferred to OPC Data Access.

Example 2

This example describes a simple production process that uses a recipe. The example deals with a scenario specific to a plant environment. In the example, the number of pieces including the recipe data - color attribute and quantity to be manufactured are retrieved from the database. This information will be stored in the User Archive. Thereby, it is taken into consideration that the production process is started. After completion of production, the results of the production are entered in the text box fields. The information entered is stored in a separate User Archive. IDB application ensures data transfer wherein the results entered are successfully transferred to the database.

Task

You will learn the following procedures:

- The creation of project, links, performing link settings and connections in IDB CS.
- To use the configuration in IDB Runtime required for initiating the data transfer.
- Open Getting Started project (idb_getting_started.MCP), activate project and view Getting Started examples in WinCC Runtime.

Note

The option "IndustrialDataBridge" is indicated with the abbreviation IDB in the subsequent chapters.

Procedure

Perform the following steps to get through Getting Started. The detailed procedure for performing these steps are outlined in the subsequent chapters.

1. Create and configure the links in IDB; Export XML file.
2. Install the WinCC project "IDB_Getting_Started".
3. Define the computer properties in the WinCC project.
4. Export reference XML file from WinCC project.
5. Activate the WinCC project.
6. Adapt the reference configuration for the WinCC project.
7. Prepare environment for Getting Started project.
8. Enable data transfer and start download and upload of recipe data.

Prerequisites

Introduction

This chapter provides information about the hardware requirements and software requirements required for working with Getting Started. The prerequisites for IndustrialDataBridge V7.3 are provided in the IDB Information System within Chapter "WinCC/IndustrialDataBridge Installation Notes".

The IDB Information System can be accessed by navigating to the below mentioned folder path.

'C:\Program Files (x86)\Siemens\Automation\IndustrialDataBridge\Help\'

Hardware Requirements

The same hardware requirements apply for the Getting Started project as for other IDB projects. Observe the IDB V7.3 installation notes.

Software requirements

The same software requirements apply for the Getting Started project as for other IDB projects. Observe the IDB V7.3 installation notes.

The following conditions also apply:

- WinCC V7.3 is installed.
- IDB V7.3 is installed.

3

The WinCC Project

3.1 Overview

Overview

The WinCC project "idb_getting_started" provides data that is transferred by IDB. The transfers are triggered by a trigger event, which is created by clicking on a button. When a trigger event occurs, the data is transferred in accordance with the configuration. This is shown in Getting Started example1 that uses process values for data transfer and example 2 includes a recipe example that uses a simple plant production scenario. The Getting Started example uses "idb_getting_started.xml" as the reference configuration file.

Structure of the WinCC project

The WinCC project is developed exclusively for preparing an environment for the IndustrialDataBridge V7.3. The WinCC project therefore contains the following elements:

- Start picture with buttons, selection fields, input fields and display fields.
- Database in which IDB accesses the Getting Started project.

The idb_getting_started.MCP file along with other resources required for WinCC project is provided within the "idb_getting_started" folder. These examples can be viewed in WinCC Runtime after the Getting Started project is activated in WinCC.

The project required for working with IndustrialDataBridge CS along with the database, XML file can be accessed from "IndustrialDataBridge" folder available at the following location:

For Windows 7 / Windows 8 / Windows Server 2008 / Windows Server 2012 Operating System:

'C:\Users\Public\PublicDocuments\Siemens\IndustrialDataBridge\idb_getting_started\IndustrialDataBridge\'

After the installation, you need to adapt the computer properties in the WinCC project, e.g. computer name and path. This procedure is described in Chapter 4.2 "Preparing the environment for Getting Started" (Page 9).

3.2 Preparing the environment for Getting Started Project

Introduction

This chapter provides the steps for adapting the computer properties and lists the information specific to the steps to be performed for opening the project "ldb_getting_started" using WinCC. Hence, after activating the project in WinCC, the WinCC Runtime displays the Getting Started examples.

Prerequisites

- The Getting Started project is installed during IDB V7.3 installation.
- IDB Configuration System and IDB Runtime application is installed on the computer.
- WinCC V7.3 is installed.

Adapting the computer properties in WinCC

To work with Getting Started project in the computer wherever WinCC is installed, it is required to adapt the computer properties. Follow the steps given below to adapt the computer properties:

1. Start WinCC Explorer.
2. In WinCC Explorer window, select "File" > "Open" and choose the ldb_getting_started.MCP file from the location wherever Getting Started is installed.

Note

Getting Started project folder

If you have selected Getting Started project as part of IDB V7.3 installation, it will be installed in the following location:

For Windows 7 / Windows 8 / Windows Server 2008 / Windows Server 2012 Operating System:

'C:\Users\Public\PublicDocuments\Siemens\IndustrialDataBridge\'

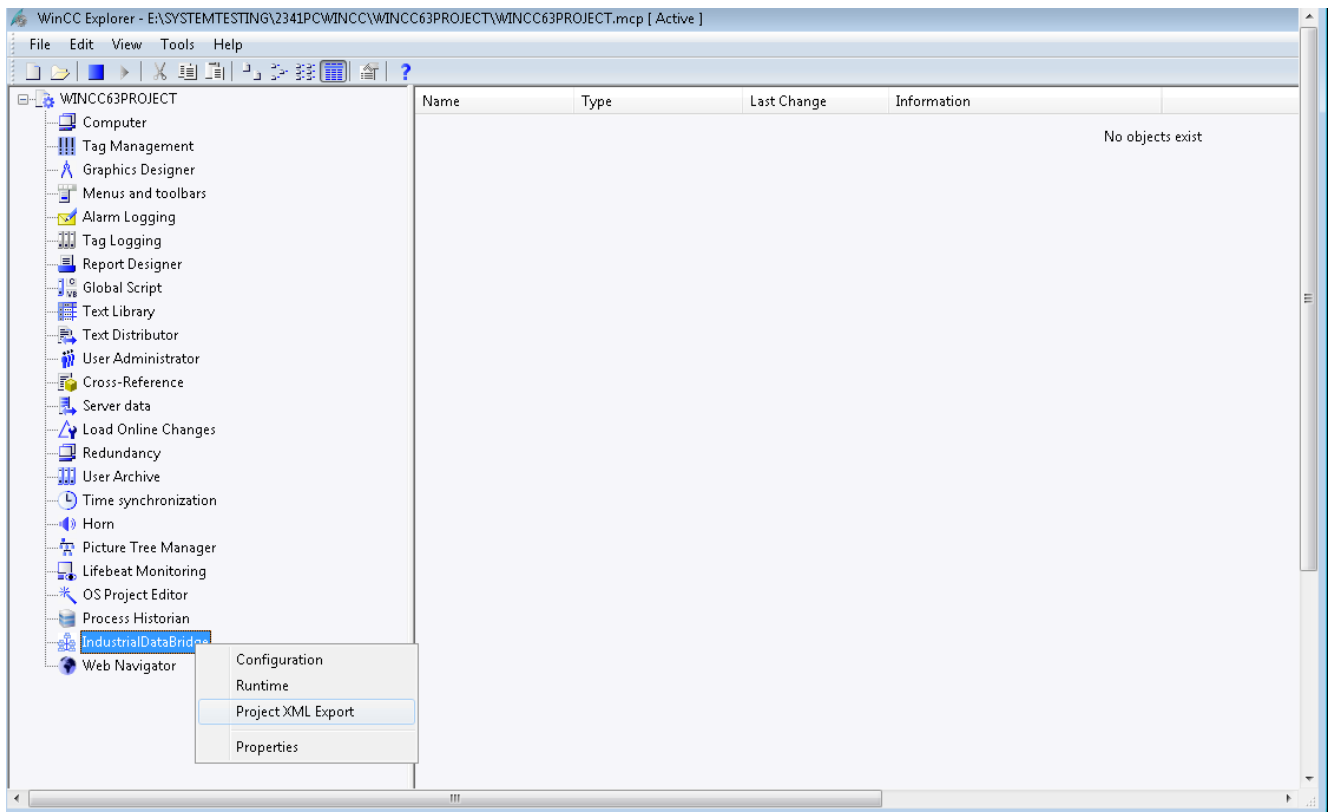
The MCP file and other Getting Started resources are available in this folder.

3. The button "Start server locally" will be displayed. Click "Start server locally" to accept local computer name.

4. However, you need to adjust the computer properties in WinCC Explorer to reflect these changes.
 - In WinCC Explorer, right click on "Computer" icon and select "Properties" option. The "Computer List Properties" window will be displayed.
 - The "Computer List Properties" window displays a list of computers in 'Computer List' field. Select the computer name and choose "Properties" button to open the "Computer properties" dialog window.
 - The Computer name of the local machine will be displayed in a text box next to the "Computer Name" field. Click the button "Use Local Computer Name" button and select OK.
 - Next, click OK to save the changes. This will close the "Computer List Properties" window.
5. In WinCC Explorer, close the opened project and restart WinCC for the changes to take effect.
6. After restarting WinCC, open the IDB project in WinCC Explorer by selecting by the "idb_getting_started.MCP" file.
7. Next, activate the IDB Getting Started project "idb_getting_started" in WinCC. You will observe that the Getting Started examples will be started automatically in WinCC Runtime.

Export XML file in WinCC

In order for WinCC OLEDB to access WinCC User Archives, the XML file has to be exported from the computer that has WinCC installed. This XML Export file will be used for configuring WinCC OLEDB as a provider while using Process Archive or Message Archive.



Follow the steps given below to export XML file in WinCC:

1. Start WinCC Explorer.
2. Open the MCP file "idb_getting_started.MCP" and activate the project.
3. In left hand side navigation of WinCC Explorer, right click on "IndustrialDataBridge" and select "Project XML Export" option to export XML file.
4. The XML file will be exported to the following path:

For Windows 7 / Windows 8 / Windows Server 2008 / Windows Server 2012 Operating System:

'C:\Users\Public\PublicDocuments\Siemens\IndustrialDataBridge\idb_getting_started\IndustrialDataBridge\Reports

Result

You have prepared the environment for working with the IndustrialDataBridge Getting Started examples. To access IDB Runtime using WinCC controls, refer Chapter 4.3 "Accessing IDB Runtime using WinCC". The steps for working with the provided examples to enable data transfer are provided in Chapter 6 "Getting Started and Examples" (Page 19).

3.3 Accessing IDB Runtime using WinCC Controls

Overview

WinCC IDB Runtime application can be accessed using WinCC controls. This is possible by adding WinCC ActiveX control "IDB Runtime Control" as an OCX in Graphics Designer. This will help WinCC users to start IDB Runtime within their environment.

The look and feel of IDB Runtime as an OCX is almost similar to the IDB Runtime as an executable. However, there are few additional changes to IDB Runtime as an OCX and these changes are covered in the subsequent sections.

Accessing IDB Runtime

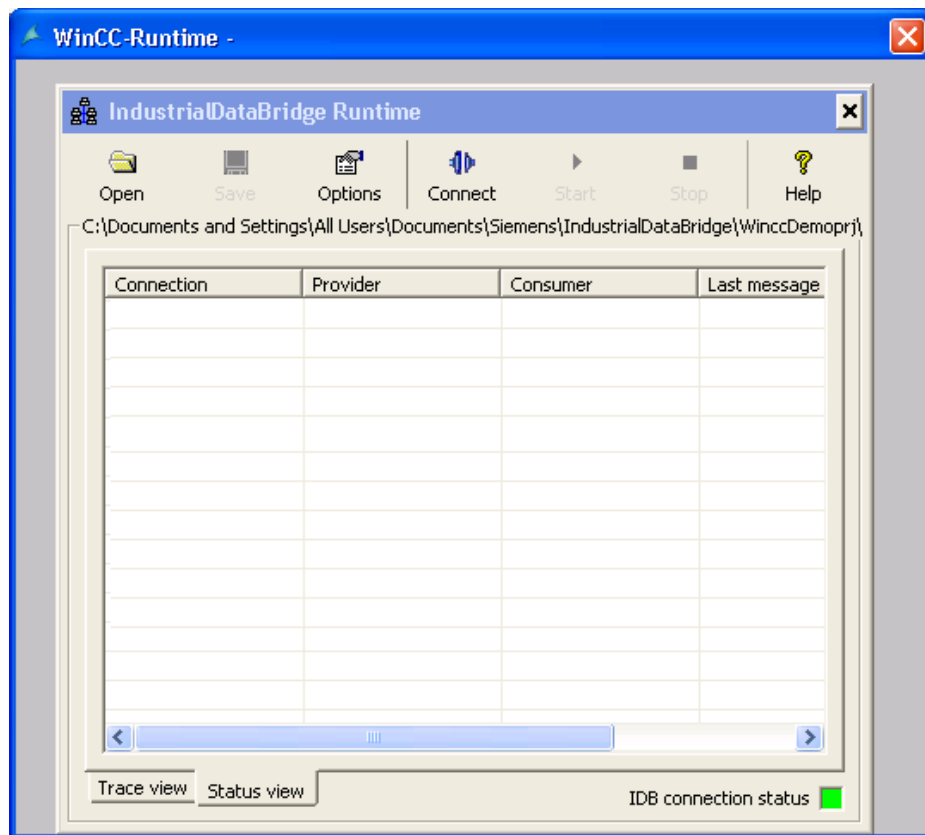
To access IDB Runtime control as ActiveX control in WinCC, follow the steps given below:

1. Start WinCC Explorer.
2. In WinCC Explorer, double click "Graphics Designer" element from navigation window to open Graphics Designer.
3. In Graphics Designer, Select File > New to create a new PDL file.
4. Navigate to Object Palette and select controls tab. Highlight "ActiveX controls" from the list.
5. Expand the ActiveX controls tree to view a list of available controls.

Note

If you are unable to view the controls after expanding the list, right click on ActiveX controls and select "Add/Remove" option. The "Select OCX Controls" window is displayed that provides a list of available controls. Select "IDB Runtime control" and click OK.

6. IDB Runtime control should be available as an OCX within the controls list.
7. Drag and drop this OCX control to the container area within the PDL file window.
8. Once this control is added to the container, save the PDL file and click Runtime control in Standard toolbar to activate Runtime mode.
9. The IDB Runtime control is displayed / opened on the WinCC Runtime screen.



Buttons and Views

The toolbar buttons and views in IDB Runtime as OCX are exactly same as IDB Runtime application. The Trace view and Status view is provided in IDB Runtime Application window.

Note

Views

The screenshots provided in chapter "Views" are not valid for IDB Runtime as an OCX control. While accessing IDB Runtime as an ActiveX control in WinCC, you will observe that the IDB Runtime menu bar will not be displayed.

Note

"Password check" and "Trace logging" options

The "Password check" and "Trace logging" menu items existing within "Options" menu in IDB Runtime application is available in "Password" tab and "Trace" tab as separate check boxes.

Options

Select "Options" toolbar button from IDB Runtime application to access Runtime Configuration. The "Runtime Configuration" provides the following tabs:

- Startup Option
- Trace
- Password
- License
- NT Service

Note

Changes to the Runtime interface can be performed only if the IDB Service has been started.

The options provided within each of these tabs are same as the options in IDB Runtime application. However, there are some additional features that are provided with IDB Runtime as WinCC control. These features are highlighted below:

IDB Runtime Application Menus:

The IDB Runtime Application window does not include menu based navigation. The required operations can be performed using the GUI buttons existing on the application toolbar.

Language Option:

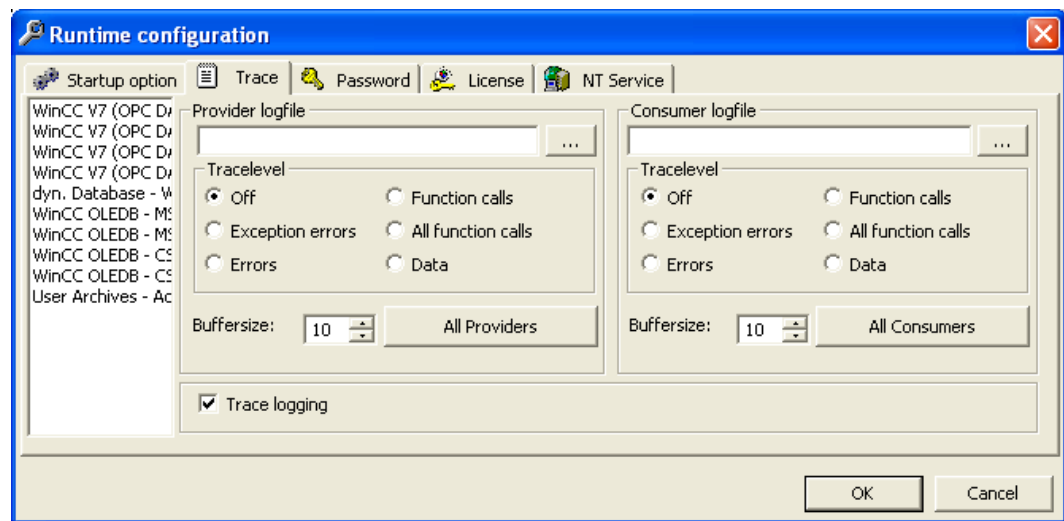
The IDB Runtime application provides language support. It supports 7 languages - English, Spanish, German, Italian, Chinese, Japanese and French. While accessing IDB Runtime as OCX control on WinCC Runtime screen, the language changes when the language of WinCC Runtime has been changed.

The language option of IDB runtime control is not linked to IDB Runtime application or any other IDB runtime control. This means that language change in IDB runtime control does not change the language of other controls or IDB Runtime application and viceversa.

Trace Logging:

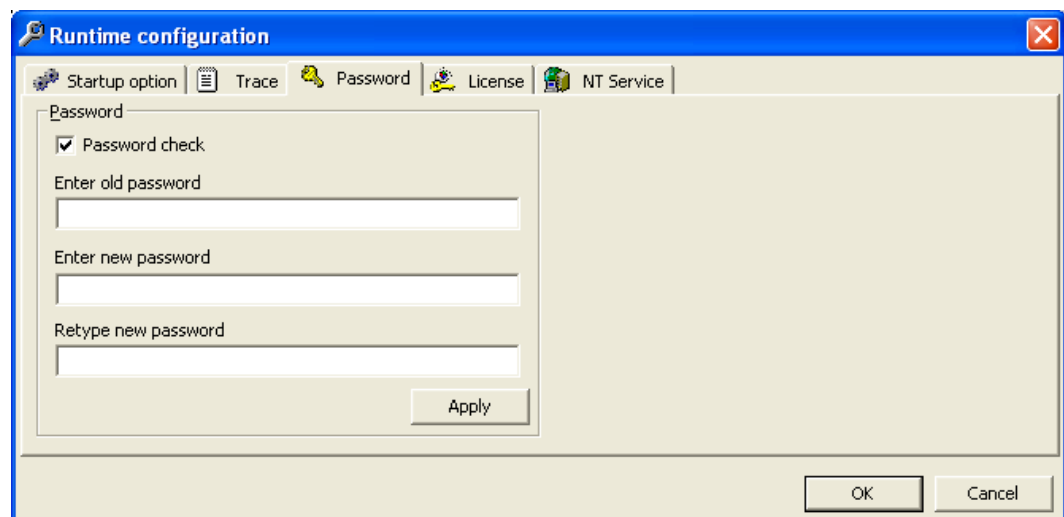
The Trace tab is provided next to Startup option tab. This tab is displayed only after you have loaded the configuration file in IDB Runtime window.

The "Trace Logging" check box is available within the "Trace" tab of Runtime Configuration window. Upon enabling this check box, it allows to save the trace messages generated both from provider and consumer side. Within the Trace tab, the "Provider log file" and "Consumer log file" sections provide options to specify the file name for logging the trace messages. At a later point of time, the trace log files can be used to view these trace messages.



Password Check:

The "Password Check" check box is provided within "Password" tab of Runtime Configuration window. Once this check box is enabled, it generates a dialog box asking you to enter the password each time an operation is performed within each of the tabs in Runtime Configuration.



Open dialog box:

The Open button and Startup Option tab provides options to select configuration XML file in order to activate the connection during runtime. Select "Browse" button to invoke the "Open" dialog window.



In IDB Runtime as OCX, the following points are valid with respect to the actions performed within Open dialog box.

- Open dialog box is opened only in Read mode. You will be able to open only an XML file.
- Option to delete a file or folder is not provided within this dialog box.
- Options to cut/paste a file or folder and creation of new file/folder are not available.
- Menu pop-up on right mouse-click within the window area cannot be performed.
- Drag and drop of file or folder within the dialog box cannot be done.
- Options to rename file or folder using F2 key cannot be performed.

4

The IDB Project

4.1 Overview

Overview

The "IndustrialDataBridge" project provides you with the resources that is required for working with the Getting Started examples. If you have selected "Getting Started" project during IDB V7.3 installation, the Getting Started project will be installed at the following location:

For Windows 7 / Windows 8 / Windows Server 2008 / Windows Server 2012 Operating System:

'C:\Users\Public\PublicDocuments\Siemens\IndustrialDataBridge\idb_getting_started\'

The "IndustrialDataBridge" folder includes IDBProject, XML file, Access database and other required resources for running the examples. The "IndustrialDataBridge" project can be accessed from the following folder location:

For Windows 7 / Windows 8 / Windows Server 2008 / Windows Server 2012 Operating System:

'C:\Users\Public\PublicDocuments\Siemens\IndustrialDataBridge\idb_getting_started\IndustrialDataBridge\'

This "IndustrialDataBridge" folder includes the following files:

- IDBProject
- Reports
- getting_started_alarms.csv
- idb_getting_started_configfile.xml
- IDBGettingStarted.accdb

The "IDBProject" folder lists the required files for viewing the project in IDB Configuration System. The IDBProject can be opened in IDB CS application by importing the XML file "idb_getting_Started_configfile.xml" provided within "IndustrialDataBridge" folder or by opening the .ip73 project file provided in the "IDBProject" folder.

Note

Folder Structure

The folder structure path mentioned below is respective to Windows 7 / Windows 8 / Windows Server 2008 / Windows Server 2012 Operating System. Please use the folder locations mentioned below to navigate to the respective files or folders.

- IDBProject that contains .ip73 and related files:
'C:\Users\Public\PublicDocuments\Siemens\IndustrialDataBridge\idb_getting_started\IndustrialDataBridge\IDBProject'
- XML file exported from WinCC:
'C:\Users\Public\PublicDocuments\Siemens\IndustrialDataBridge\idb_getting_started\IndustrialDataBridge\Reports'
- IndustrialDataBridge folder containing XML file, database and other resources:
'C:\Users\Public\PublicDocuments\Siemens\IndustrialDataBridge\idb_getting_started\IndustrialDataBridge'

Note

Reports

After exporting the XML file from WinCC project, by default the XML file will be exported within the 'Reports' folder. This folder exists within the "IndustrialDataBridge\Reports" folder. The Reports folder includes the exported XML file.

Structure

In IDB CS, a configuration is created and contained within a project. A project consists of link which in turn includes the provider, consumer, settings and connections. The definition of each of these items are provided below:

- Project: A project is used to plan, organize, manage and control IDB CS configuration and other settings.
- Link: A link represents an entity and contains several connections.
- Connection: A connection represents a unique mapping between provider and consumer types.

Getting Started and Examples

5.1 Overview

Overview

The Getting Started project uses WinCC project, IDB project and IDB Runtime environment to demonstrate the data transfer behavior in IndustrialDataBridge with the help of examples. The projects are provided within the "idb_getting_started" folder. The Getting Started examples and its functionality can be viewed in WinCC Runtime environment. The example project uses process value example and recipe example to help you understand with the data transfer process using IDB V7.3

Note

Use the examples only as a suggestion for realizing the Getting Started project.

The example project helps you in getting to use IndustrialDataBridge V7.3 Configuration interface, create configuration file and load configuration during Runtime. It also helps to understand the data transfer flow with the help of a simple plant scenario.

The Getting Started project

The Getting Started project includes 2 example projects. The 2 example projects are explained in detail in "Getting Started Example 1" and "Getting Started Example 2" chapters.

- The "Getting Started Example 1" includes an introduction to the example project and provides steps for configuring the project. The instructions for viewing the Example 1 project in WinCC Runtime is also provided in this chapter.
- The "Getting Started Example 2" includes an introduction to the example project along with steps for project configuration. It also includes the information about viewing Example 2 project in WinCC Runtime.

The "IndustrialDataBridge" project includes IDBProject, XML file, Access database and other required resources for running the examples. The "IndustrialDataBridge" project can be accessed from the following folder location:

For Windows 7 / Windows Server 2008 Operating System:

*'C:\Users\Public\Public
Documents\Siemens\IndustrialDataBridge\idb_getting_started\IndustrialDataBridge\'*

Note

IDB Getting Started project

The IDB Getting Started project provided as part of the installation includes all required files necessary for viewing the example projects. A fully created working configuration is provided that can be opened in IDB CS application.

The XML configuration file "idb_getting_started_configfile.xml" is common for both the example projects.

Note

Viewing example in WinCC

An example that includes the required fields and user interface controls can be viewed in WinCC Runtime environment. To view the example in WinCC, you need to open the WinCC project (idb_getting_started.MCP) in WinCC Explorer and activate the respective project.

The Getting Started example screen includes a navigation control button that helps you to switch between Example 1 and Example 2.

Note

Time zone

This note is specific to the time zone settings within "WinCC OLEDB transfer options" tab.

If the project is created in Windows XP operating system and if you import the configuration XML file in Windows 7 or Windows 2008 Server operating system or viceversa, it is strongly recommended to set the time zone accordingly.

Working with Oracle database

The Getting Started examples uses Microsoft Access as the database. This database is provided on IDB V7.3 DVD within the "IndustrialDataBridge" project folder.

For Windows 7 / Windows Server 2008 Operating System:

*'C:\Users\Public\Public
Documents\Siemens\IndustrialDataBridge\idb_getting_started\IndustrialDataBridge\'*

The entry path for IndustrialDataBridge Getting Started project "idb_getting_started" can be accessed from the following folder location:

For Windows 7 / Windows Server 2008 Operating System:

'C:\Users\Public\Public Documents\Siemens\IndustrialDataBridge\'

Installation prerequisites:

If you wish to use Oracle as the database, you need to separately install this software in the computer wherever IDB V7.3 is installed. It is suggested to install Oracle 10g / 11g / 12c via driver "Oracle provider for OLE DB". Using other versions is basically possible but has not been tested.

To work with Oracle 12c, you need to install Oracle client in the local computer even though the Oracle server edition is installed. Oracle client for 12c (32 bit) is required to be installed for correct working of the database in IDB V7.3. This will register 'OraOLEDB.Oracle.1' provider in the local computer which will then connect to the Oracle database.

The following components need to be selected while installing Oracle client:

- Optional dependencies (Oracle client)
 - Oracle provider for OLEDB 12.1.0.1.0
- Oracle client dependency
 - Oracle instant client 12.1.0.1.0

User credentials:

After installing Oracle, you need to set the user credentials. By default, the user name "anonymous" is created. Under "anonymous" user, create a database. Enter the service name that is to be used for the database connection. Type this service name in "Server" field. The service name refers specifically to a configuration and can be created in the "tnsnames.ora" file. You will find information on the host, protocol and database in this file.

1. Create a database in Oracle.
2. Create 2 tables with 2 columns containing some key data.
3. Next, create the tables that contains the same fields similar to the tables provided along with Getting Started project.
4. Open IDB CS application and import the XML configuration file "idb_getting_started_configfile.xml".
5. In Database provider, select Oracle as database type. In Server name field, enter the service name that was defined in Oracle.
6. Set the user name as "anonymous" and type in the password.

Note

- In provider transfer options, the Schema name is automatically selected if you use Oracle as the database type. The list of tables will be provided in the "Table" field.
 - While performing connection mapping, follow the steps as described in the respective chapters.
-

5.2 Getting Started Example 1

5.2.1 Introduction

Introduction

This Getting Started example helps you to understand the data transfer between process archive values and WinCC User Archive. The recipe number containing the process values can be generated using the buttons provided in example screen and can be transferred or updated in the WinCC User Archive. The archived alarm data within the Process Archive can be filtered based on "start date" and "end date". The alarm data based on filtered condition can be updated in the CSV file. A list of ingredients produced are finally transferred to the OPC Data Access from WinCC User Archive. This is shown in the Getting Started Example 1.

Note

Example project - IDBProject

The example that includes the complete configuration provided along with Getting Started project contains a fully defined configuration, provider transfer options that are set along with connections that have already been created.

The Getting Started example 1 helps you to understand managing the production process data using a recipe example and perform data transfer. This example provides the options to select the available recipe, transfer alarm data and send the final ingredient values to the consumer.

Example 1 uses the following configuration available as a link. In example 1, you will create 3 links - Send_process_values, Send_alarm_data and Receive_recipe.

You can view this configuration in IDB CS application.

- Process Archive (WinCC OLEDB as provider), WinCC User Archive as consumer
- Message Archive (WinCC OLEDB as provider), CSV/TXT as consumer
- WinCC User Archive as provider, OPC Data Access as consumer

- **Process Archive - WinCC User Archive**
Transfers the process values (from the selected recipe) entered by user to WinCC User Archive by the click of a button.
- **Message Archive - CSV/TXT**
Based on "Start date" and "End date" entered in the fields, the archived alarm data within process archive is transferred to a CSV file by click of a button.
- **WinCC User Archive - OPC Data Access**
The individual recipe items are transferred from WinCC User Archive to OPC Data Access.

However, in order to make you understand better, the following chapters provide information about the steps in detail for creating or configuring the connections. Each chapter includes a series of steps listed as Step 1, Step 2, Step 3 and Step 4 that guides you through the detailed procedure.

- Process Archive - WinCC User Archive
- Message Archive - CSV/TXT
- WinCC User Archive - OPC Data Access

Note

Important information

If you do not wish to perform the steps given in above mentioned chapters, and you wish to view the example in WinCC Runtime directly, it is strongly recommended to perform the steps mentioned in the chapter "Viewing Example 1 in WinCC Runtime (Page 100)".

5.2.2 Process Archive - WinCC User Archive

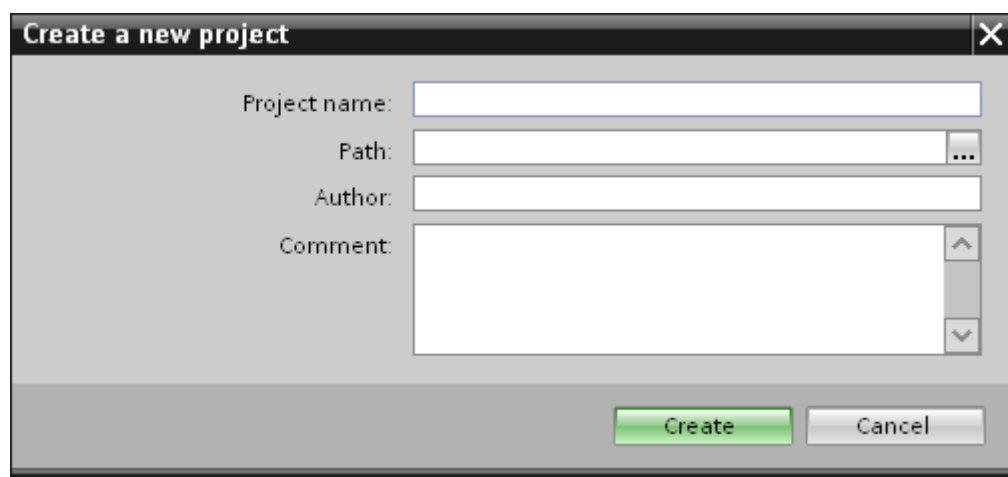
5.2.2.1 Step 1: Create Project and Link

Introduction

This chapter provides you with the complete steps for creating a project and link in IDB Configuration System application. The objective here is to create a project with corresponding link having WinCC OLEDB (Process Archive) as provider and WinCC User Archive as consumer.

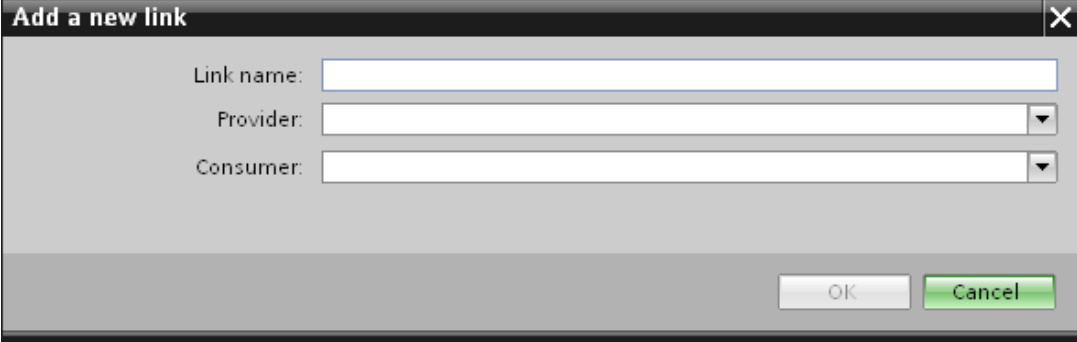
Procedure

1. Open IDB Configuration and create a project by following the steps mentioned below:



- In IDB Configuration menu, select "Project" > "Create" to create a new project.
 - In the "Create new project" dialog box, specify a project name, click [...] button and select the folder location wherever the project needs to be saved.
 - After entering the required information, select "Create" button. This creates a new project.
2. The project name will be listed within the "Project tree".

3. The next step is to create a link. Follow the steps mentioned below to create a link between provider and consumer:



The screenshot shows a dialog box titled "Add a new link" with a close button (X) in the top right corner. Inside the dialog, there are three input fields: "Link name:" followed by a text box, "Provider:" followed by a dropdown menu, and "Consumer:" followed by a dropdown menu. At the bottom right of the dialog, there are two buttons: "OK" and "Cancel".

- Right click on project name node in the tree structure and select "Add new link" option.
After creating a project, by default a new node "Add new link" is displayed in project tree below project name node.
Alternatively, you can create a new link by double clicking the "Add new link" node in project tree.
 - In the "Add new link" dialog that is displayed, enter a unique link name.
 - Select the provider type as WinCC OLEDB, target type as WinCC User Archive and click OK button.
 - The created link will be displayed below the project name in project tree.
4. The corresponding entries - *Provider*, *Consumer*, *Settings* and *Connections* are created as nodes that exist below the new link in the tree structure.

Result

You have created a project that consists of a link having WinCC OLEDB as provider and WinCC User Archive as consumer.

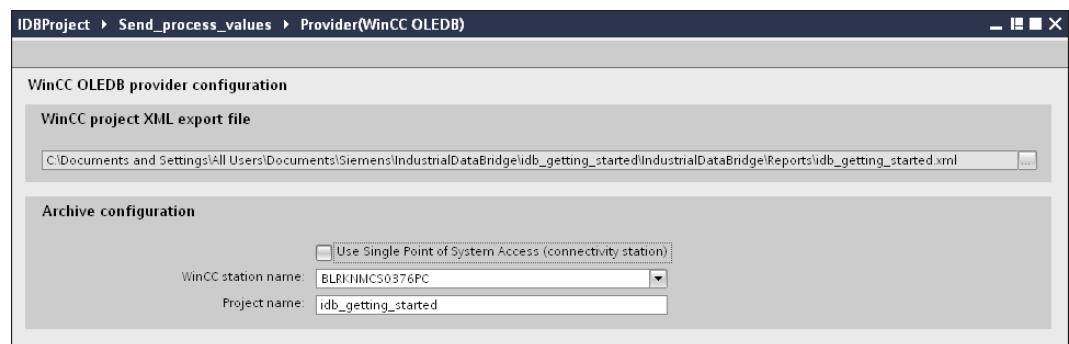
5.2.2.2 Step 2: Configuring an Interface

Introduction

In this chapter, you will configure the respective provider/consumer configuration along with transfer behaviour settings.

Procedure

1. In project tree, open the Provider configuration window by double clicking the Provider node.



In Provider configuration window, click on [...] button and select the WinCC project XML file that you have exported from WinCC.

Note

WinCC Project XML export file

While selecting the WinCC project XML export file, please remember to choose the appropriate WinCC project XML file. Export the XML file from the computer that has WinCC installed. In WinCC Explorer, select "IndustrialDataBridge" > "Project XML Export" option to export the XML file.

For IDB CS to be used on a WinCC station, ensure that you do not mark the "Use Single point of system access" for selection.

- In "Archive configuration" section, select the WinCC station name of the selected provider.
-

Note

WinCC Station

- The WinCC station name is listed in the drop down list box of "WinCC station name" field that displays the station name wherever the WinCC XML file exists. Choose the WinCC station name by selecting from list.
 - The project name is automatically displayed based on the WinCC project XML file that is selected in "WinCC project XML file" text box.
-

2. Next, double click the Consumer node in project tree to open the consumer configuration window.

IDBProject > Send_process_values > Consumer(WinCC User Archive)

WinCC User Archive consumer configuration

Connection string

Provider=SQLOLEDB.1;Data Source=.WinCC;Initial Catalog=CC_idb_gett_13_02_05_13_00_39R;Persist Security Info=False;Integrated Security=SSPI;

Server: .WinCC

☒ Use automatic Windows authentication

Enter information to log on to the database

User name:

Password:

☐ Blank password

☒ Allow saving password

Database: CC_idb_gett_13_02_05_13_00_39R

Test...

Note

Connecting String

In "Consumer configuration window", the "Connection string" field (at top position) displays the database connection string parameters after the selection of database type.

In Consumer configuration window, perform the following settings:

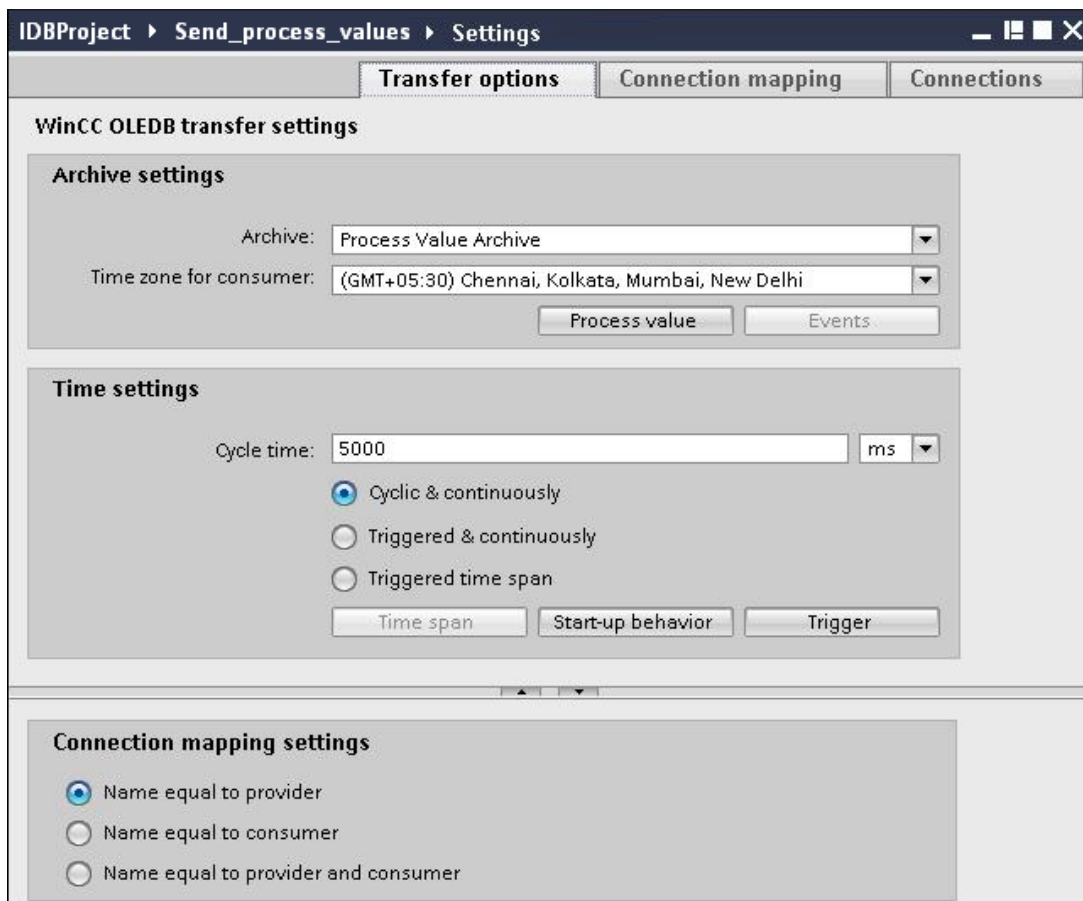
- Enter the server name and/or complete path of WinCC User Archive database.
- Select the database name from the list that is displayed in the "Database" field. Click on the drop down list box to view this list.
- If you wish to enable windows authentication automatically, select the check box "Use automatic windows authentication".
- Within the section area that provides options to logon to the database, enter the user name and password.

This information is required to logon to the WinCC User Archive database.

- Click Test button to test the connection. It tests the user archive database connection string and verifies the selected user archive database.

Performing link settings

1. In project tree, double click the Settings node to open Settings window in the work area. The Settings window consists of 3 tabs - *Transfer options*, *Connection Mapping & Connections*.



2. Within the Transfer Options tab, you can configure the archive settings and transfer behavior settings for provider.
3. In "Archive settings" section, choose the Archive type. In "Archive" field, select whether data is to be transferred from 'Process value archive' or from 'Alarm message archive'.
Depending on the archive type selected, the "Process value" button and "Events" button will be shown in disable or enable state.
4. Click on "Process value" button open the "Variable Filter" window. The "Events filter" window can be opened by clicking on the "Events" button.
More information about configuring these filter settings is provided in "Configuration of the transfer behavior (Page 33)".
5. Select the appropriate time zone in the "Time zone for consumer" field.

6. In "Time settings" section, enter the cycle time and choose metric (milli seconds / seconds / minutes / hours) by selecting the drop down list box.

7. Next, select the type of data transfer:

- Cyclic & Continuously

Here, transfer time is set with a timer. This enables an hours transfer to be started for instance.

The time period is defined using the last two timer times.

- Triggered & Continuously

In the type, the transfer time is defined using a trigger condition with OPC tags. The time period is defined using the last two trigger times. The IDB marks the last transfer time and reads the interval between two trigger times.

- Triggered time span

In this type, the transfer time is defined using a trigger condition with OPC tags. The time period, which is read from the WinCC archive, is defined using two other OPC tags.

Note**Transfer type**

Based on transfer type, the buttons "Time span", "Start-up behavior" and "Trigger" will be in enable or disable state.

- If option "Cyclic & Continuously" or "Triggered & Continuously" is selected, both the "Start-up behavior" and "Trigger" buttons can be used.
 - With option "Triggered time span", only the Timespan and Trigger buttons can be used.
-

8. Configure the "Trigger" and "Time span" or the "Start-up behavior" in the dialog window that you open by clicking the respective button.

More information about the transfer setting capabilities and their options are provided in chapter "Step 3: Configuration of the transfer behavior (Page 33)".

9. The transfer behavior settings for WinCC OLEDB as provider will be saved automatically.

Note**Saving changes**

A save operation is not required every time whenever changes are performed within the editor window in the work area. The changes made to these settings are automatically saved. However, once the project is created, at any point of time, you can save the project by selecting the "Project" > "Save" menu option.

Result

You have configured the WinCC OLEDB interface and WinCC User Archive as a consumer. These elements are displayed in the tree structure of the configuration interface.

5.2.2.3 Step 3: Configuration of Transfer Behavior

Introduction

This chapter highlights the key information related to WinCC OLEDB transfer setting capabilities and their options.

Configuration options

The Settings window provides user interface controls in form of drop down list box or buttons or radio buttons that are used to perform "Archive type settings" and "Transfer type settings". The configuration settings and their options existing within these dialog windows are explained below.

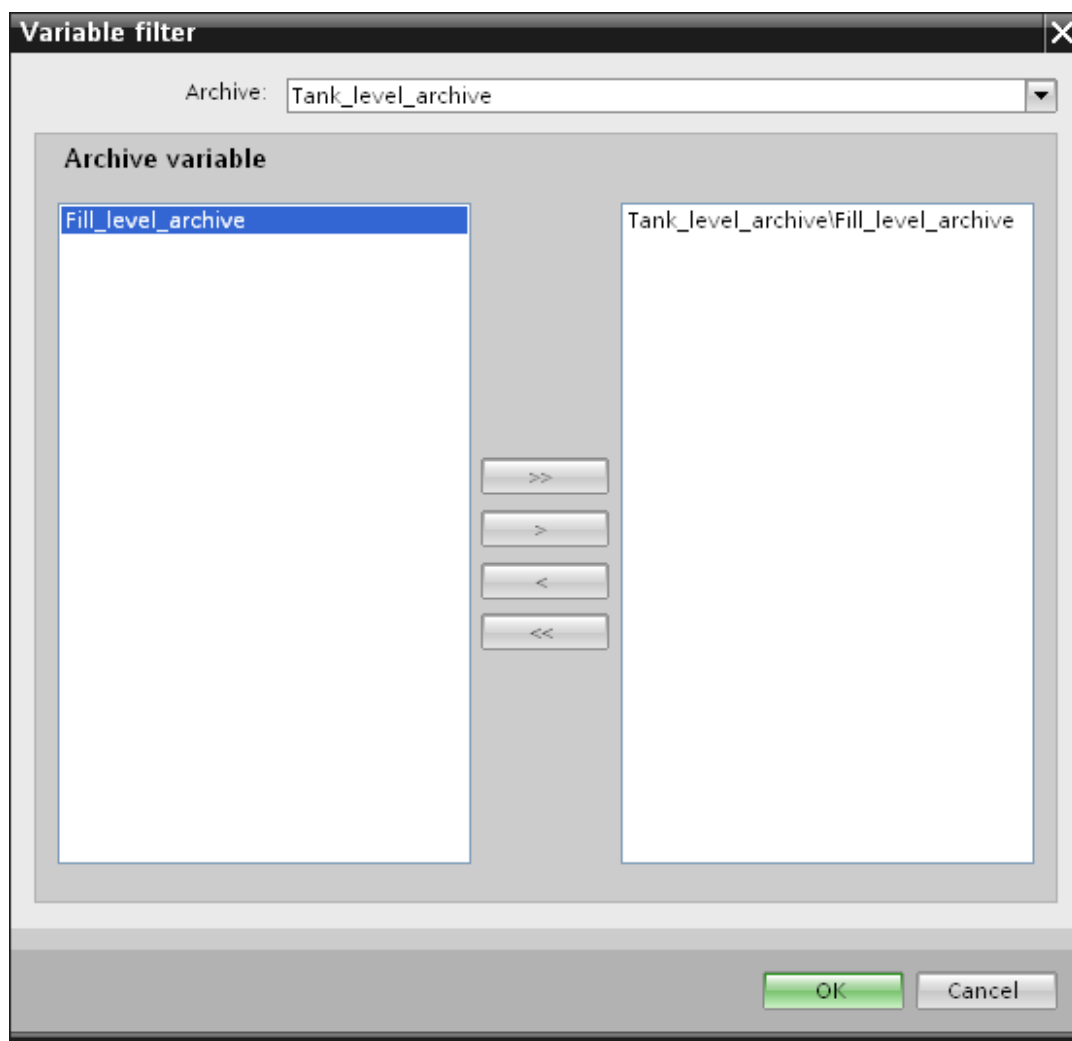
Archive type settings

There are two archive types that are supported in WinCC OLEDB as a provider. The "Process value" button or "Events" button is activated depending on selection of the archive type ("Process value archive", "Alarm message archive").

- Process value archive tags
- Alarm message archive tags

Process value archive tags

Click on "Process value" button to open "Variable filter" window that provides options to configure or limit the selection of process value archive tags whose value will be transferred.



1. In "Archive" field, select the archive for which you wish to transfer the data by choosing from the drop down list.
2. The "Archive variable" section displays a list of archive variables. Select one or more tags from the list that is displayed at left hand side of the window.
3. Transfer these tags to the selection field on right side with ">" or use ">>" to transfer all tags in the list.
Use "<" or "<<" to delete the selected or all tags from the selection field on right side.
4. Confirm this selection by clicking the "OK" button.

Alarm message archive tags

Click on "Events" button to open "Events filter" window that provides options to configure the Alarm message numbers that trigger the events. The values of individual message numbers or a message number range for which you want to transfer can be selected in the "Events filter" dialog window.



1. Enter a message number in the "Single Event" field text box and click "Include" button. This will be added to the "Chosen events" list.
2. To specify a message number range, enter the start range and end range in "From" and "To" text box. Then, click "Include" button to add this event range.
3. To exclude any event from the list, select the event within the list and click "Exclude" button. To clear all the events displayed within the "Chosen events" field, click "Delete list" button.
4. You can select the archive language by choosing the "Archive language" field drop down list box. This will display the archive messages in the selected language.
5. Once you have performed the changes, confirm this selection by clicking the "OK" button.

Transfer type settings

WinCC OLEDB supports three transfer type settings that can be selected by choosing the appropriate radio button. The "Time span" or "Start-up behavior" or "Trigger" buttons are activated depending on the radio button option you have selected within "Time settings" section area. Clicking on the respective button will open the dialog window. The information about the configuration options available within each of these dialog windows are explained below.

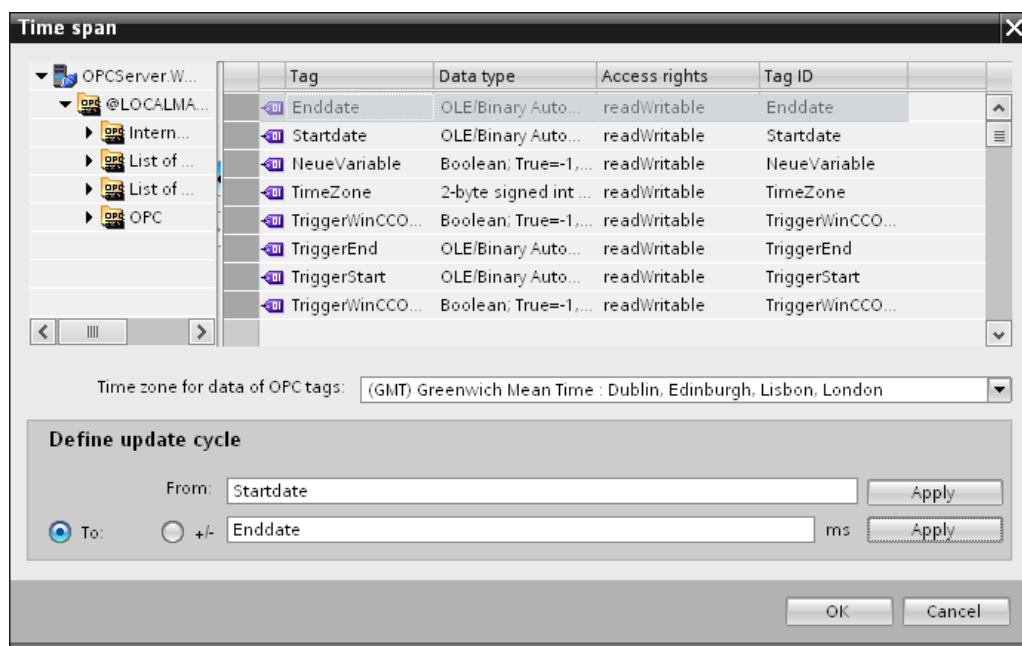
- Time span
- Start-up behavior
- Trigger

Time span

The "Time span" button is activated only if you have selected the radio button option "Triggered time span". Click "Time span" button to open the "Time span" dialog window. The transfer time period for selected tags is defined in this "Time span" window. The selection is controlled through tags of the OPC Server provided within the OPC tag browser.

In "Time span" window, "Define update cycle" section area, the time period can be defined using two different ways:

- With a Start time and an End time (using "From" and "To" selection)
- With a Start time and Time period (using "+/-" selection)



Procedure

To define the transfer time period, follow these steps:

1. Select the tags that define the Start time by performing selection within the OPC tag browser.
2. Confirm the selection by clicking the "Apply" button in the "From" line. The selected tag is added within the "From" text box.
3. Define whether you want to define an End time or a period of time by selecting the appropriate radio button.
4. Select the tags that define End time or the time span in the OPC tag browser. The tag selection will be added to the text box below "From" field.
5. Confirm the selection by clicking the "Apply" button in the "To" line or "+/-".
6. Click OK button after performing the required changes.

Note**Tag type**

The tags that define a time span must be of the type "VT_I4" or be present as string that can be converted into the type "VT_I4" by the OPC server. With the time span, the preceding sign determines whether the period of time is before (-) or after (+) the start time (From).

Note**No Time period defined**

If no transfer time period is selected within the "From" and "To" or "+/-" fields, all available data is transferred.

Different number format in provider and consumer types

If the date format of the operating system deviates from the date format of the string to be converted, you will have to adapt the XML configuration file. Otherwise, you may experience conversion errors.

Example: German operating system / 'Date' as string saved in English format.

In this case, you will have to amend the entry `<Link UID="Ref-1" Name="Linkname">` to `<Link UID="Ref-1" Name="Linkname" LCID="1033">` in the XML configuration file.

The attribute LCID (LocalID) indicates the format in which the string content will be saved. During conversion, it will be converted into the format of the operating system. The language name and its LCID attribute value are mentioned below:

- English; LCID="1033"
- German; LCID="1031"
- French; LCID="1036"
- Italian; LCID="1040"
- Spanish; LCID="1034"
- Chinese; LCID="2052"
- Japanese; LCID="1041"

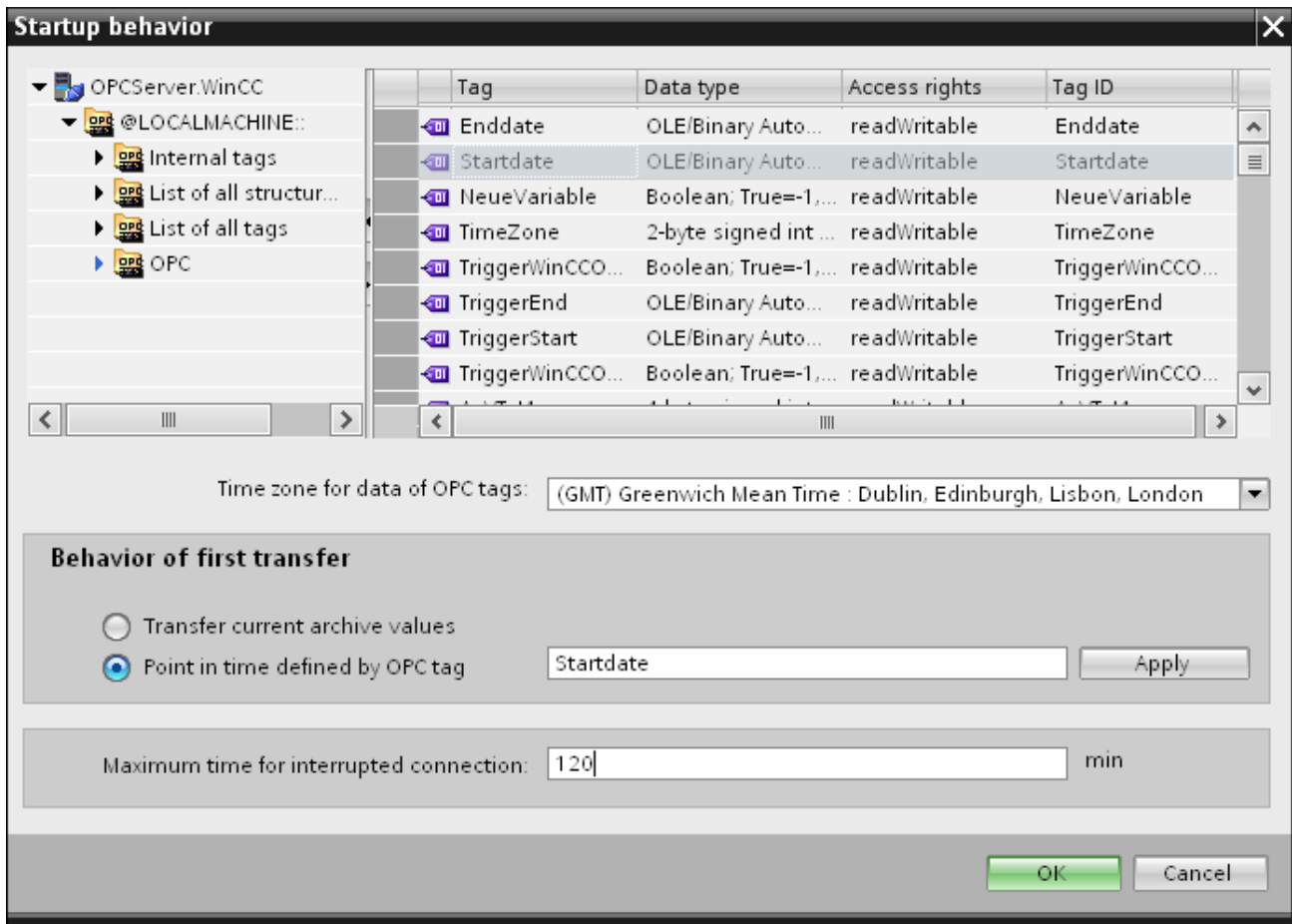
Additional values for LCID are available under <http://www.microsoft.com> when you enter the search term "LCID".

Time Zone for Data of the OPC Tags

Define a time zone for the data of the selected OPC tags by selecting the time zone from drop down list box. This field "Time zone for data of OPC variables" is provided below the OPC tag browser and includes a drop down list box that allows you to select the time zone. The default setting for the time zone is the local time on the computer, on which the configuration was performed. If the OPC server is in another time zone, select the respective time zone. After performing the required changes, select OK button.

Start-up behavior

The "Start-up behavior" button is activated if any one of the transfer types "Cyclic & continuously" or "Triggered & continuously" is selected. To open the "Start-up behavior" dialog window, select "Start-up behavior" button. The settings mentioned here will be used during start of the IndustrialDataBridge Runtime.



Procedure

To configure the behavior of first transfer, follow these steps:

1. Choose one of the listed options provided within the "Behavior of first transfer" section area.
2. If you have selected "Point in time defined by OPC tag", mark the respective tag in OPC tag browser and click "Apply" button.
3. The selected tag is added within the "Point in time defined by OPC tag" text box.

4. Select the time zone for data transfer of OPC tags in "Time zone for data of OPC tag" drop down list field.
5. Click "Ok" button after performing the required changes.

Note**Tag type**

The tags that define a point in time must be of the type "VT_DATE" or be present as a string that can be converted into the type VT_DATE by the OPC Server.

Note**Transfer behavior**

- If the "*Transfer current archive values*" option is selected, it transfers the current values (either process values or alarm messages) from the time the data transfer has started.
 - With option "*Point in time defined by OPC tag*" selected, the data transfer will happen from the date defined by OPC tag (existing in text box) till current date.
-

Maximum time for interrupted connection

The continuity of data transfer is guaranteed throughout IDB CS application and is also supported even while IDB is stopped. The IDB CS application saves the time duration of last transfer so that even after a restart, a continuous transfer can be completed without missing the data. This function can be limited with the entry "Maximum time for interrupted connection" specified in minutes.

This value limits the time period, from which the data will be transferred after the start or a connection interruption. If the value is too small, it can restrict the continuity of the data transfer. Enter the maximum time for interrupted connection in minutes and select OK button.

Note**New or changed configuration file**

The functionality is only supported if no new or a changed configuration file is loaded in the IDB runtime environment.

Time zone for Data of the OPC Tags

You must define a time zone for the data of selected OPC tags. Define a time zone for the data of the selected OPC tags by selecting the time zone from drop down list box. This field "Time zone for data of OPC variables" is provided below the OPC tag browser and includes a drop down list box that allows you to select the time zone. The default setting for the time

zone is the local time on the computer, on which the configuration was performed. If the OPC server is in another time zone, select the respective time zone.

Note

UTC Time format

Since the data will be stored in UTC time format within the database, it is strongly recommended to follow or set the time zone to UTC time format.

Trigger

Configure the condition that triggers a data transfer for this link in the "Trigger Provider" dialog window. The description for this dialog window is provided in the chapter "Configuring a Trigger".

See also

Step 4: Configuring a Trigger (Page 41)

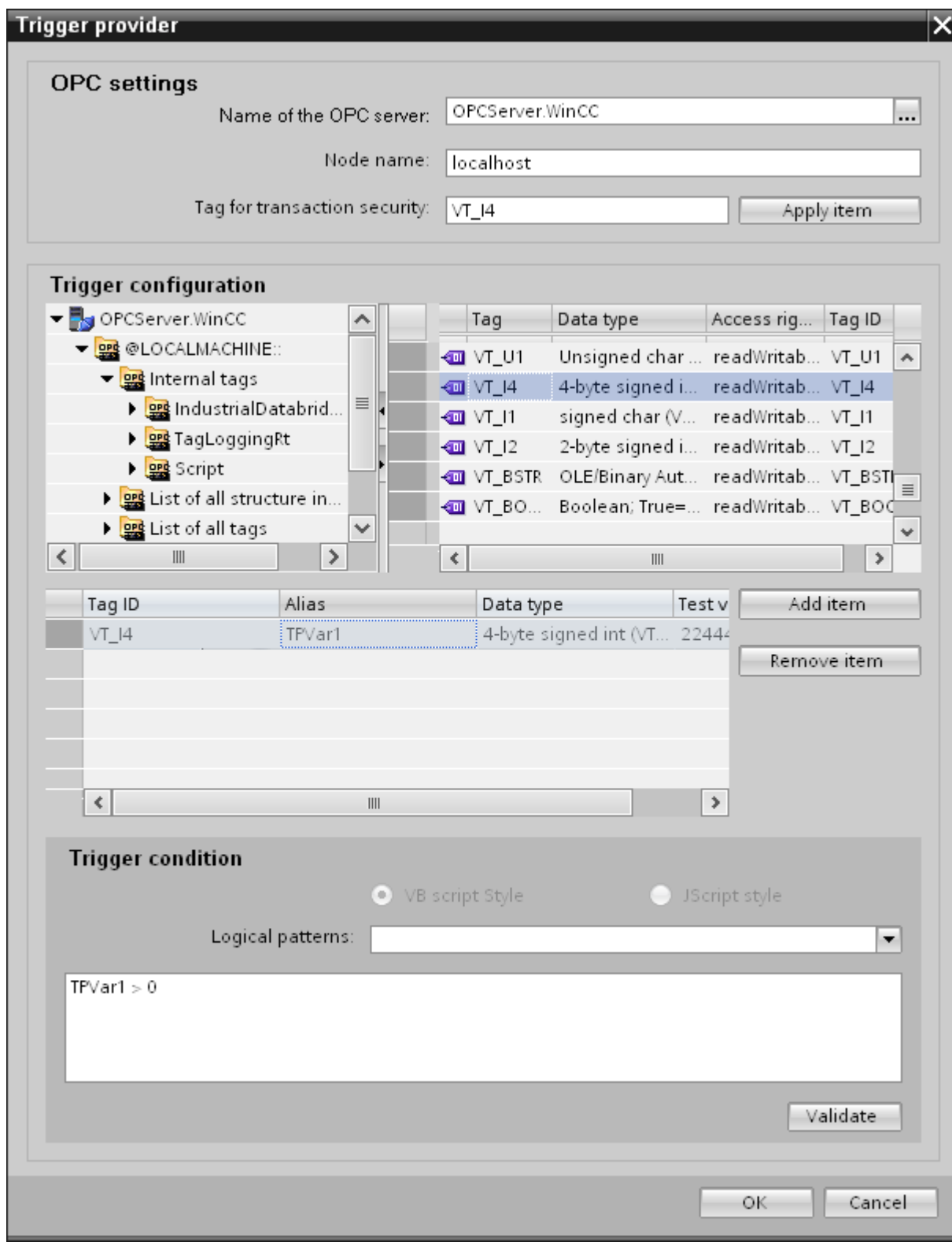
5.2.2.4 Step 4: Configuring a Trigger

Introduction

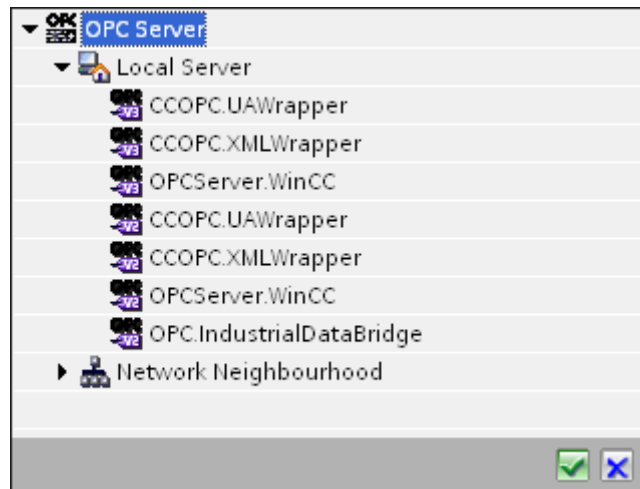
The "Trigger Provider" dialog window provides the OPC settings, Trigger configuration options and required fields that help you to configure the condition that triggers a data transfer. This dialog window is opened after clicking the "Trigger" button in *Transfer options* window.

Procedure

In "OPC settings" area, select the OPC server by clicking on the [...] button. The selection of the server is supported by an OPC tag browser. Next, click the button representing "tick mark" to accept the changes.



1. The browser shows the local OPC server. You can search for OPC servers in the network as well.



2. If this server is located on another computer, enter the computer name as well. The tree structure of OPC server is displayed within "Trigger Configuration" area.
3. You can define an OPC item on the trigger provider, in which the success-/failure-status of the data transfer will be stored in the "Tag for transaction security" field. This value should have 1 byte signed char (e.g. VT_I1). -1 indicates the success state and 0 indicates failure.
4. Select the tag of the OPC server, in which this information is to be saved in the tag browser and click on the "Apply item" button.
5. In "Trigger Configuration" area, select the desired tags individually and accept them by clicking on "Add item" each time.
6. Use the "Remove item" button to remove the marked item. If no item is marked for deletion, the last item from the list is deleted if you click the "Remove item" button. Details about the columns in the Tag list are located in section "Tag declaration".

Note

OPC Server

After selection of the tags and adding them to tag list, if you switch to another OPC Server in OPC Settings area, a dialog window is displayed that prompts the message whether you wish to discard previous settings.

7. In "Trigger condition" area, you can select the type of syntax with selection button "VB Style" or JScript Style". If a trigger condition is already created, this setting can no longer be changed. If the language is to be changed, the text in the "Configure Trigger Condition" field must be deleted.

Details on the programming languages are located in section "Programming Languages".

8. Create the trigger condition in the selected language. Use the Alias designations in the tag list for these tags. Within the text box displayed, enter the operator symbols using the keyboard or select them from the "Logical patterns" list box.

9. Test the created condition by clicking on "Validate". The trigger condition is calculated with the values that are entered in the "Test value" column. The result "TRUE" or "FALSE" is shown in a message box.
10. If the trigger condition provides the correct result and after confirming the changes, close the dialog by clicking on "OK" button.

Additional Information

Tag declaration

The columns for the tag declaration contain the following:

- **Data type:** Data type of the tag. If the data type defined here does not match that on the server, an attempt to convert the data type is made.
- **TagID:** The TagID of the tag on the OPC server
- **Alias:** The alias is used for creating the trigger condition. This name must be unique and it must correspond with the naming conventions of the allocated programming languages. For more detailed information about the naming conventions, see paragraph "Valid alias names".
- **Confirmation value:** The confirmation value is the value that the variable takes on after fulfilling the trigger condition and the values have been delivered to the consumer. The default value is "<Empty>", i.e., no confirmation value is written.
- **Test value:** This value is only for testing the trigger condition and has no influence on the later data exchange. The test values are to be selected and changed so that they test whether the trigger condition delivers the expected result in all operating conditions.

Note

Confirmation value

The confirmation value does not give any information on whether a transaction has been completed successfully.

Note

Necessity of Alias names

The OPC ItemID is not used because it may possibly not correspond with the tag validity criteria, for instance, a "Point" in the tag name is not allowed.

Valid Alias Names:

A valid alias must correspond with the following rules:

- Letters (no umlaut characters or ß), numbers and underscore character (_) are allowed.
- The first character must be a letter or underscore.
- An alias can be as long as you require.

- Key words from VB script or J script are not allowed. Note the respective language description for this.
- Case sensitive (upper and lower case letters).
("tag" is not the same as "Tag").

Programming languages

You can use VBScript or JScript for the trigger condition.

The following table shows the operator type and their symbols in both languages:

Type	VBScript	JScript
Logical NOT	NOT	!
Logical AND	AND	&&
Logical OR	OR	
multiplication	*	*
division	/	/
addition	+	+
subtraction	-	-
Not equal to	<>	!=
Less than	<	<
Greater than	>	>
Comparison	=	==
Assignment	<not possible>	=
True	true or True	true
Incorrect	false or False	false
string	<Quotation Marks>	<Quotation Marks>

It is recommended to use these operators only. Other operators can be found in the language descriptions for the respective language.

Note

Loss of Trigger Events

The triggering depends on the update speed of the OPC server. In this case, note that data changes that occur within an update cycle are not considered by the trigger. That means that a faster change of a tag from 1 - 0 - 1 is not necessarily indicated to the trigger provider by the OPC server, since the 1 exists at the end again and no value change exists at the check time. This means that a potentially true condition is not recognized as being true and therefore will not lead to a data transfer.

Configurations, with which the confirmation value is to set a "true" trigger condition to "false" again, are not secure because of the statement above. When data changes occur too quickly, the "true value" may stay the same or values can be left out.

5.2.2.5 Step 5: Connecting Tags

Introduction

This chapter provides the steps for performing a connection mapping between provider and consumer.

Connecting Tags

In "Settings" window, the "Connection mapping" tab includes the required fields to connect tags that have been sent from WinCC OLEDB interface with the selected data consumer. The Connection mapping tab divides the window into 3 sections.

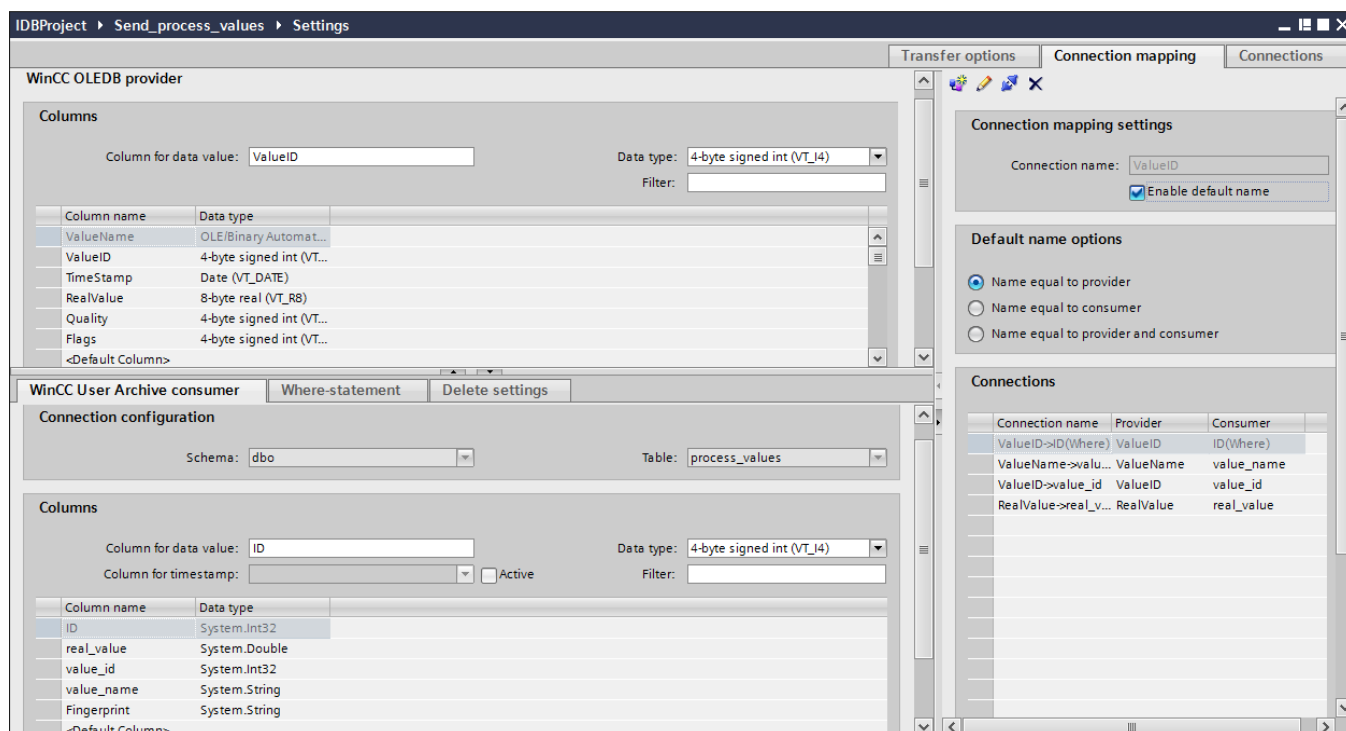
- WinCC OLEDB provider
- WinCC User Archive consumer
- Connection mapping properties

The "WinCC OLEDB provider" section is displayed at top left portion of "Connection mapping" tab. This section provides you with required options to choose column name from the list of columns displayed in "Columns" section area. The "WinCC User Archive consumer" section exists below the provider section and includes required options to choose schema, table name and column names that can be mapped with the columns existing within WinCC OLEDB interface.

A specific connection can be created between the WinCC OLEDB provider column and the column (belonging to WinCC User Archive consumer) selected in the Where statement tab. You can create a new connection or else modify an existing connection to apply Where statement on the selected column.

The separator between the provider and consumer section provides a resize handle that helps you to resize the height of the section in order to view the fields within the section clearly.

The "Connection mapping settings" section is displayed at right side of "Connection mapping" tab. This section helps you to provide a name for connection along with options for choosing default name for connection. The "Connect", "Modify connection", "Delete connection" and "Delete all connections" icons are provided at the top portion of this section.



1. In "WinCC OLEDB provider" section, select the column name from the list that is displayed within "Columns" section area.
2. Upon selection, the column name is displayed in "Column for data value" field. The data type is selected automatically based on selection of column name.
3. The "Filter" field provides you the option to filter the Column names based on single character or first few characters of column name.
For example, if you wish to view the column names starting with "S", type this character in "Filter" text box. All column names starting with "S" are displayed.
4. Next, configure the consumer column in the WinCC User Archive consumer" tab by following these steps:
 - The selected table is shown in the "Table" field. Select the Schema for database if applicable by selecting from the drop down list in "Schema" field.
 - The column names are displayed within "Columns" area. If the table has columns with respective data types, the time stamp can also be written to the table. In this case, select the respective "Active" check box and select the column within "Column for timestamp" field.
5. Select the Column name that you wish to connect with "WinCC OLEDB provider". The selected column is displayed in "Column for data value" field.

6. Check the name of the connection in the "Connection mapping settings" area to the right. Enter a unique name for the connection in the "Connection name" field or use the options within "Default name options". Click "Connect" button to confirm your entries.

Note

Data type conversion

If the provider column does not match with consumer column, IDB CS converts the data type to match with data type of provider. A status window is displayed to indicate this change.

7. Repeat steps 1 to 6 for all elements of the "WinCC OLEDB provider" that you wish to transfer.

"Where-statement" tab

The Where statement is required to be configured in order to select the column within the WinCC User Archive Consumer. The "Where-statement" tab mainly includes the "Where statement" configuration section and exception handling section.

Follow the steps given below to perform a connection mapping:

1. In the "WinCC OLEDB provider" section, at the (top left), select the column for which the where statement (WinCC User Archive consumer) needs to be applied.
2. Upon selection, the column name is displayed in "Column for data value" field. The data type is selected automatically based on selection of column name.
3. In the "Where-column" field, select the column that is to be used for the Where Statement. If a value needs to be written to the database, this column is compared with the connected provider column(s). Only lines in which both values match are updated.

4. The behavior is defined in the "Exceptional handling" section if the selection of the consumer row is not unique:
 - Error Message: No consumer rows lines are overwritten and an error message is given as an output in the trace view of IDB Runtime.
 - Change all rows: All selected consumer rows are overwritten.
 - Using the "Enable Insert" check box, you define the behavior if a line with the key (primary key) does not exist. If the option is selected, a new line with the respective key is created.

Note**Simultaneous utilization as Key and Consumer column**

In order to have more setting ability with the configuration, you can use a column as a key column and as a consumer column simultaneously. Take note that this causes the data in the database to be inconsistent and/or future access to the WinCC User Archive consumer may result in errors.

5. Check the name of the connection in the "Connection mapping settings" area (right). Enter a unique name for the connection in the "Connection name" field or use the options within "Default name options". Click "Connect" button to confirm your entries.

Delete settings tab

With "WinCC User Archive consumer", you are able to delete data records from the User Archive. This requires connecting a provider column with a consumer column. If the delete condition has been met, the data record of the consumer column is deleted from the user archive. Delete has priority over "Insert" and "Update" actions.

Follow the steps given below to perform a connection mapping:

1. In the "WinCC OLEDB provider" section, at the (top left), select the column for which the values should be compared.
2. Upon selection, the column name is displayed in "Column for data value" field. The data type is selected automatically based on selection of column name.
3. In "Delete settings" tab, enable the "Delete possible" check box and enter a value for the delete column in the "Value for delete variable" field.

If the connecting provider column takes on this value, the respective data record that contains this value is deleted from the User Archive based on the Where statement.

4. Check the name of the connection in the connection area (right). Enter a unique name for the connection in the Connection field or use the Default name convention. Click "Connect" button to confirm your entries.

Result

The connections that you have created are shown in the "Connections" tab of IDB CS Settings window as well as within the project tree node.

5.2.3 Message Archive - CSV/TXT

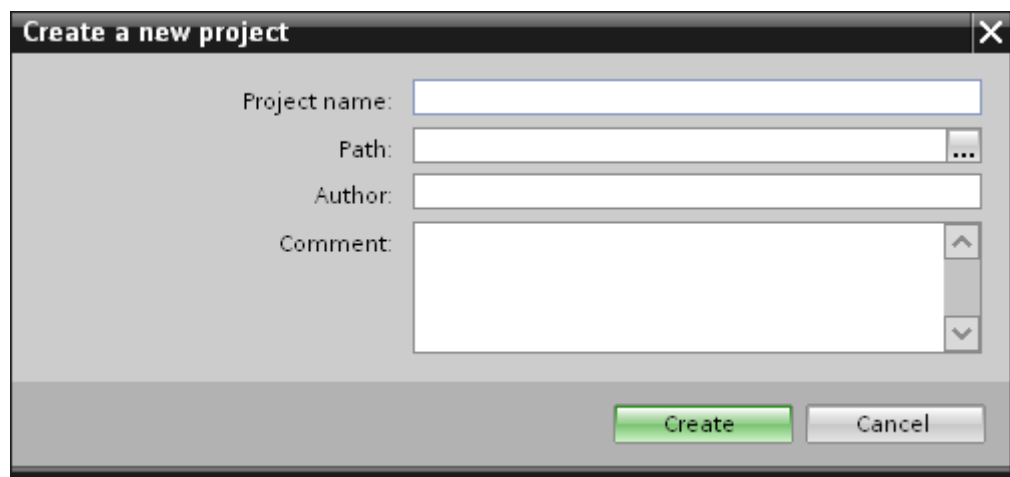
5.2.3.1 Step 1: Create Project and Link

Introduction

This chapter provides you with the complete steps for creating a project and link in IDB Configuration System application. The objective here is to create a project with corresponding link having WinCC OLEDB (Message Archive) as provider and CSV/TXT as consumer.

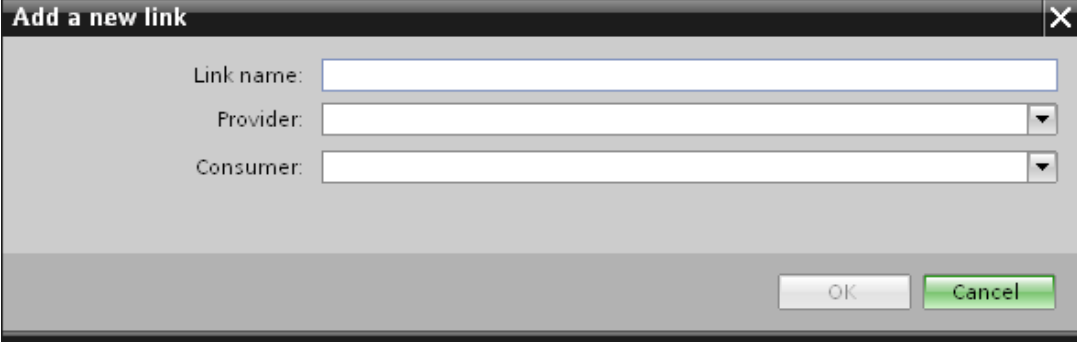
Procedure

1. Open IDB Configuration and create a project by following the steps mentioned below:



- In IDB Configuration menu, select "Project" > "Create" to create a new project.
 - In the "Create new project" dialog box, specify a project name, click [...] button and select the folder location wherever the project needs to be saved.
 - After entering the required information, select "Create" button. This creates a new project.
2. The project name will be listed within the "Project tree".

3. The next step is to create a link. Follow the steps mentioned below to create a link between provider and consumer:



- Right click on project name node in the tree structure and select "Add new link" option.
After creating a project, by default a new node "Add new link" is displayed in project tree below project name node.
Alternatively, you can create a new link by double clicking the "Add new link" node in project tree.
 - In the "Add new link" dialog that is displayed, enter a unique link name.
 - Select the provider type as WinCC OLEDB, target type as CSV/TXT and click OK button.
 - The created link will be displayed below the project name in project tree.
4. The corresponding entries - *Provider*, *Consumer*, *Settings* and *Connections* are created as nodes that exist below the new link in the tree structure.

Result

You have created a project that consists of a link having WinCC OLEDB as provider and CSV/TXT as consumer.

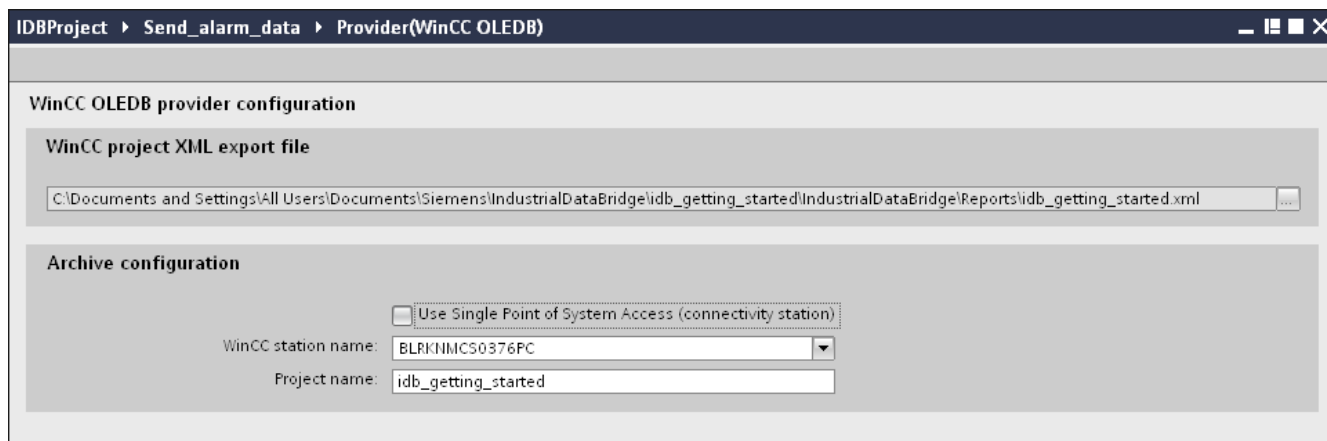
5.2.3.2 Step 2: Configuring an Interface

Introduction

In this chapter, you will configure the respective provider/consumer configuration along with transfer behaviour settings for provider.

Procedure

1. In project tree, open the Provider configuration window by double clicking the Provider node.



In Provider configuration window, click on [...] button and select the WinCC project XML file that you have exported from WinCC.

Note

WinCC Project XML export file

While selecting the WinCC project XML export file, please remember to choose the appropriate WinCC project XML file. Export the XML file from the computer that has WinCC installed. In WinCC Explorer, select "IndustrialDataBridge" > "Project XML Export" option to export the XML file.

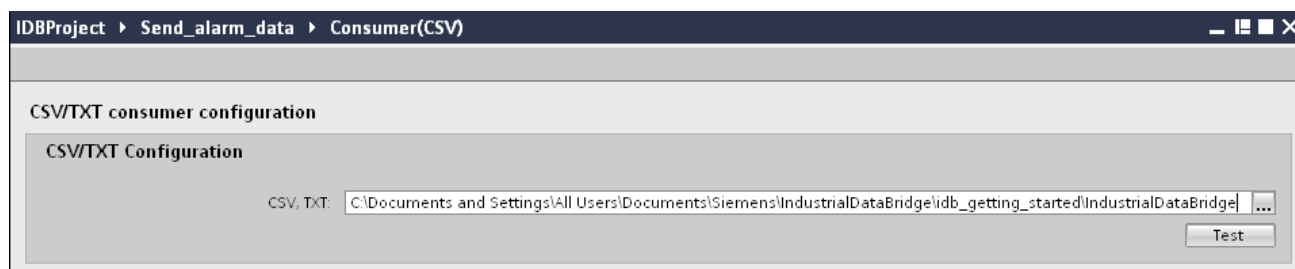
2. For IDB CS to be used on a WinCC station, ensure that you do not mark the "Use Single point of system access" for selection.
 - In "Archive configuration" section, select the WinCC station name of the selected provider.

Note

WinCC Station

- The WinCC station name is listed in the drop down list box of "WinCC station name" field that displays the station name wherever the WinCC XML file exists. Choose the WinCC station name by selecting from list.
- The project name is automatically displayed based on the WinCC project XML file that is selected in "WinCC project XML file" text box.

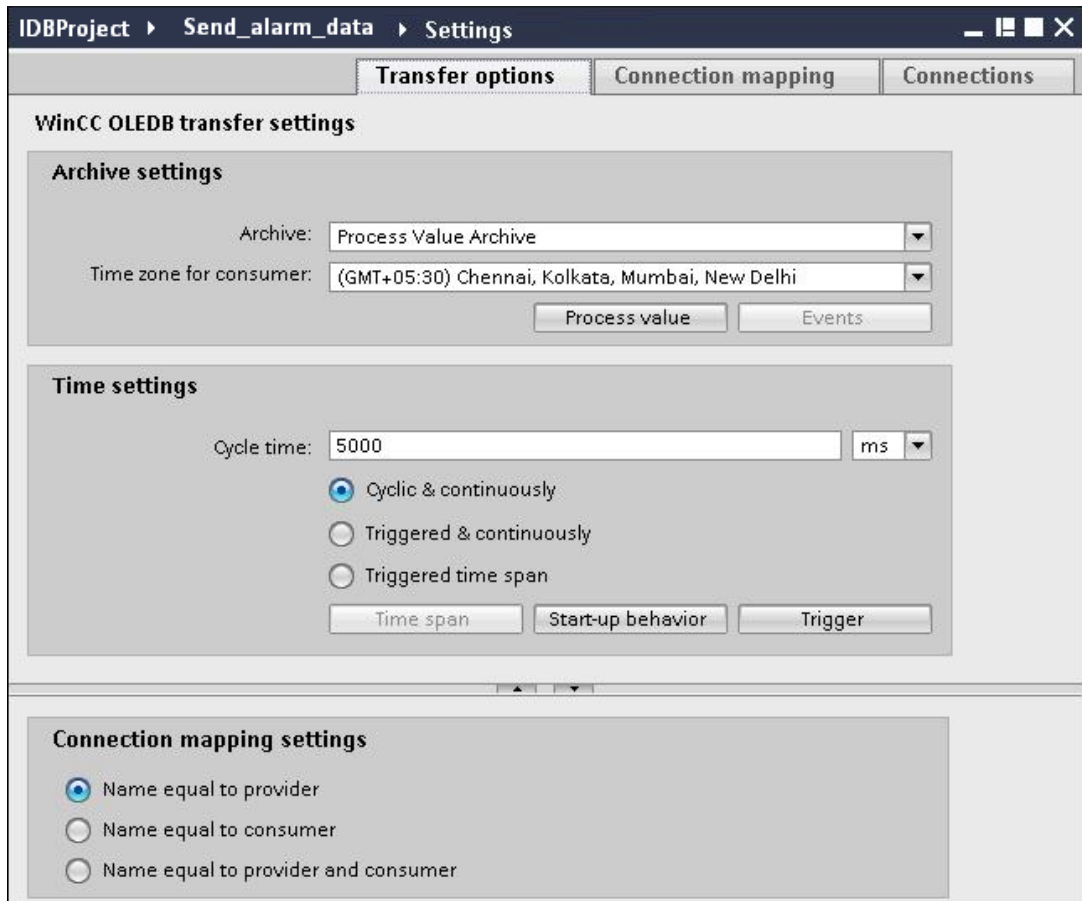
3. Next, double click the Consumer node in project tree to open the consumer configuration window.



- In "CSV/TXT Configuration" field, click [...] button and select the appropriate folder by browsing the folder structure.
- Click "Test" button to test the connection. The "Connection string" will be displayed in the Connection string text box displayed at top portion within this window.

Performing link settings

1. In project tree, double click the Settings node to open Settings window in the work area. The Settings window consists of 3 tabs - *Transfer options*, *Connection Mapping & Connections*.



2. Within the Transfer Options tab, you can configure the archive settings and transfer behavior settings for provider.
3. In "Archive settings" section, choose the Archive type. In "Archive" field, select whether data is to be transferred from 'Process value archive' or from 'Alarm message archive'.
Depending on the archive type selected, the "Process value" button and "Events" button will be shown in disable or enable state.
4. Click on "Process value" button open the "Variable Filter" window. The "Events filter" window can be opened by clicking on the "Events" button.
5. Select the appropriate time zone in the "Time zone for consumer" field.
6. In "Time settings" section, enter the cycle time and choose metric (milli seconds / seconds / minutes / hours) by selecting the drop down list box.

7. Next, select the type of data transfer:

- Cyclic & Continuously

Here, transfer time is set with a timer. This enables an hours transfer to be started for instance.

The time period is defined using the last two timer times.

- Triggered & Continuously

In the type, the transfer time is defined using a trigger condition with OPC tags. The time period is defined using the last two trigger times. The IDB marks the last transfer time and reads the interval between two trigger times.

- Triggered time span

In this type, the transfer time is defined using a trigger condition with OPC tags. The time period, which is read from the WinCC archive, is defined using two other OPC tags.

Note**Transfer type**

Based on transfer type, the buttons "Time span", "Start-up behavior" and "Trigger" will be in enable or disable state.

- If option "Cyclic & Continuously" or "Triggered & Continuously" is selected, both the "Start-up behavior" and "Trigger" buttons can be used.
 - With option "Triggered time span", only the Timespan and Trigger buttons can be used.
-

8. Configure the "Trigger" and "Time span" or the "Start-up behavior" in the dialog window that you open by clicking the respective button.

More information about the transfer setting capabilities and their options are provided in chapter "Step 3: Configuration of transfer behavior (Page 58)".

9. The transfer behavior settings for WinCC OLEDB as provider will be saved automatically.

Note**Saving changes**

A save operation is not required every time whenever changes are performed within the editor window in the work area. The changes made to these settings are automatically saved. However, once the project is created, at any point of time, you can save the project by selecting the "Project" > "Save" menu option.

Result

You have configured the WinCC OLEDB interface and CSV/TXT as a consumer. These elements are displayed in the tree structure of the configuration interface.

See also

Step 3: Configuration of Transfer Behavior (Page 33)

5.2.3.3 Step 3: Configuration of Transfer Behavior

Introduction

This chapter highlights the key information related to WinCC OLEDB transfer setting capabilities and their options.

Configuration options

The Settings window provides user interface controls in form of drop down list box or buttons or radio buttons that are used to perform "Archive type settings" and "Transfer type settings". The configuration settings and their options existing within these dialog windows are explained below.

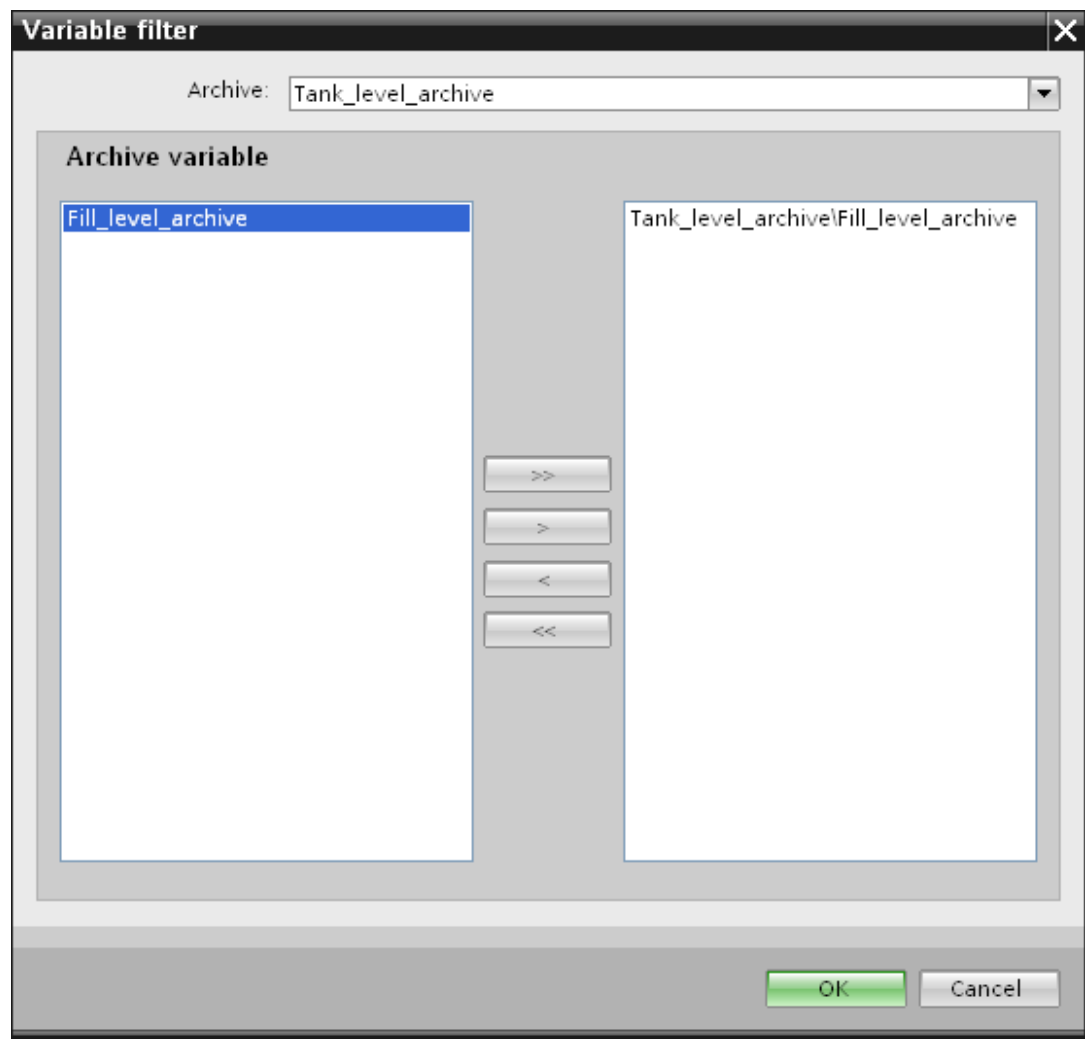
Archive type settings

There are two archive types that are supported in WinCC OLEDB as a provider. The "Process value" button or "Events" button is activated depending on selection of the archive type ("Process value archive", "Alarm message archive").

- Process value archive tags
- Alarm message archive tags

Process value archive tags

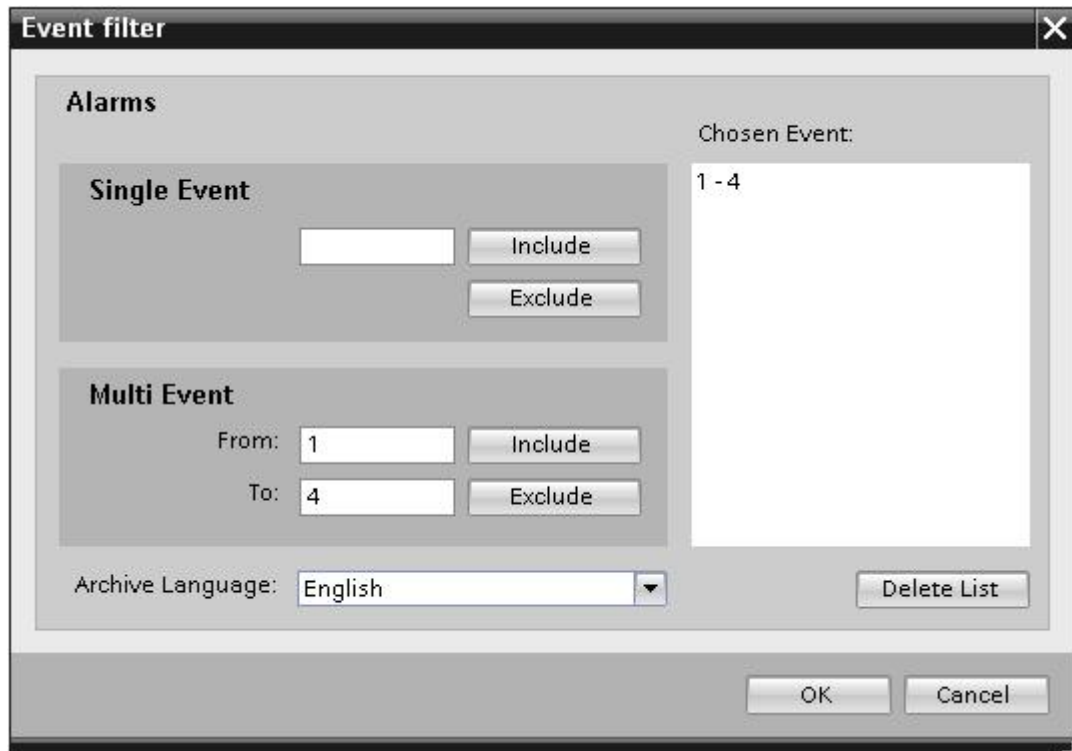
Click on "Process value" button to open "Variable filter" window that provides options to configure or limit the selection of process value archive tags whose value will be transferred.



1. In "Archive" field, select the archive for which you wish to transfer the data by choosing from the drop down list.
2. The "Archive variable" section displays a list of archive variables. Select one or more tags from the list that is displayed at left hand side of the window.
3. Transfer these tags to the selection field on right side with ">" or use ">>" to transfer all tags in the list.
Use "<" or "<<" to delete the selected or all tags from the selection field on right side.
4. Confirm this selection by clicking the "OK" button.

Alarm message archive tags

Click on "Events" button to open "Events filter" window that provides options to configure the Alarm message numbers that trigger the events. The values of individual message numbers or a message number range for which you want to transfer can be selected in the "Events filter" dialog window.



1. Enter a message number in the "Single Event" field text box and click "Include" button. This will be added to the "Chosen events" list.
2. To specify a message number range, enter the start range and end range in "From" and "To" text box. Then, click "Include" button to add this event range.
3. To exclude any event from the list, select the event within the list and click "Exclude" button. To clear all the events displayed within the "Chosen events" field, click "Delete list" button.
4. You can select the archive language by choosing the "Archive language" field drop down list box. This will display the archive messages in the selected language.
5. Once you have performed the changes, confirm this selection by clicking the "OK" button.

Transfer type settings

WinCC OLEDB supports three transfer type settings that can be selected by choosing the appropriate radio button. The "Time span" or "Start-up behavior" or "Trigger" buttons are activated depending on the radio button option you have selected within "Time settings" section area. Clicking on the respective button will open the dialog window. The information about the configuration options available within each of these dialog windows are explained below.

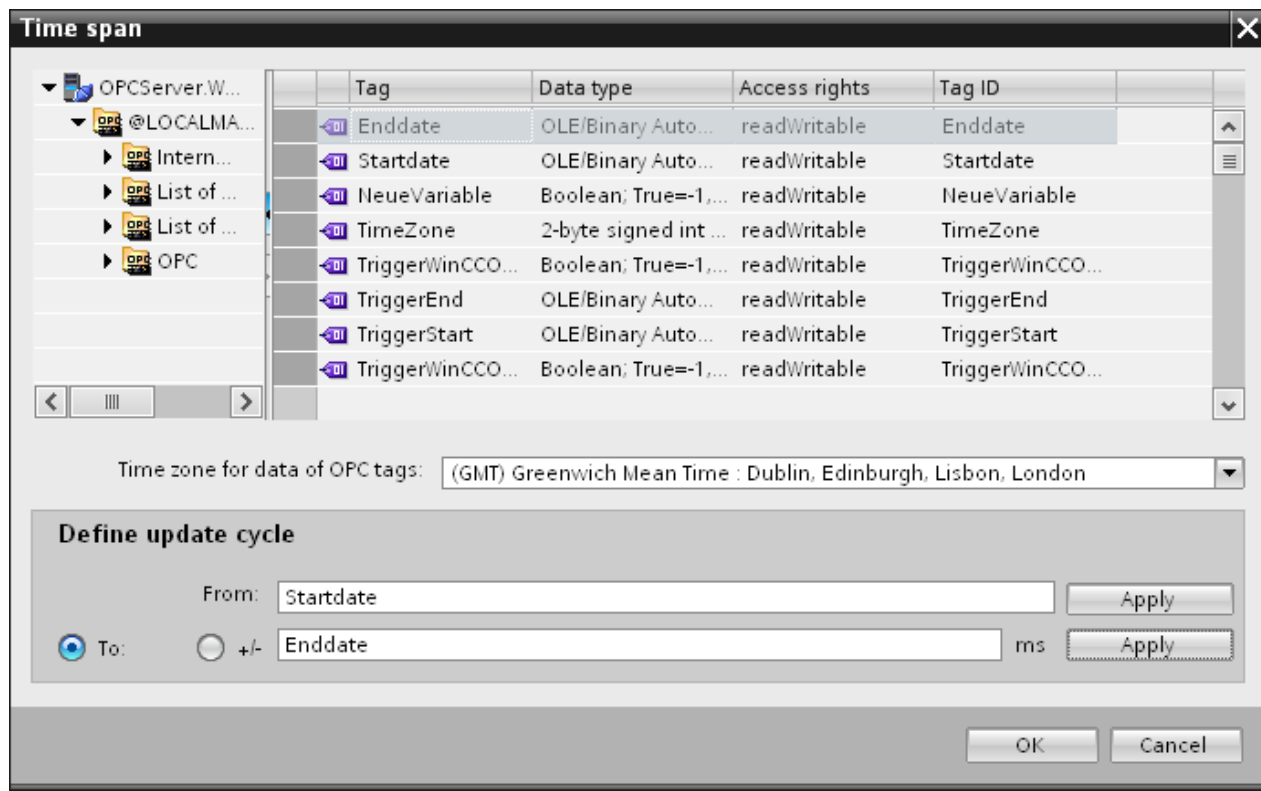
- Time span
- Start-up behavior
- Trigger

Time span

The "Time span" button is activated only if you have selected the radio button option "Triggered time span". Click "Time span" button to open the "Time span" dialog window. The transfer time period for selected tags is defined in this "Time span" window. The selection is controlled through tags of the OPC Server provided within the OPC tag browser.

In "Time span" window, "Define update cycle" section area, the time period can be defined using two different ways:

- With a Start time and an End time (using "From" and "To" selection)
- With a Start time and Time period (using "+/-" selection)



Procedure

To define the transfer time period, follow these steps:

1. Select the tags that define the Start time by performing selection within the OPC tag browser.
2. Confirm the selection by clicking the "Apply" button in the "From" line. The selected tag is added within the "From" text box.

3. Define whether you want to define an End time or a period of time by selecting the appropriate radio button.
4. Select the tags that define End time or the time span in the OPC tag browser. The tag selection will be added to the text box below "From" field.
5. Confirm the selection by clicking the "Apply" button in the "To" line or "+/-".
6. Click OK button after performing the required changes.

Note

Tag type

The tags that define a time span must be of the type "VT_I4" or be present as string that can be converted into the type "VT_I4" by the OPC server. With the time span, the preceding sign determines whether the period of time is before (-) or after (+) the start time (From).

Note

No Time period defined

If no transfer time period is selected within the "From" and "To" or "+/-" fields, all available data is transferred.

Different number format in provider and consumer types

If the date format of the operating system deviates from the date format of the string to be converted, you will have to adapt the XML configuration file. Otherwise, you may experience conversion errors.

Example: German operating system / 'Date' as string saved in English format.

In this case, you will have to amend the entry `<Link UID="Ref-1" Name="Linkname">` to `<Link UID="Ref-1" Name="Linkname" LCID="1033">` in the XML configuration file.

The attribute LCID (LocalID) indicates the format in which the string content will be saved. During conversion, it will be converted into the format of the operating system. The language name and its LCID attribute value are mentioned below:

- English; LCID="1033"
- German; LCID="1031"
- French; LCID="1036"
- Italian; LCID="1040"
- Spanish; LCID="1034"
- Chinese; LCID="2052"
- Japanese; LCID="1041"

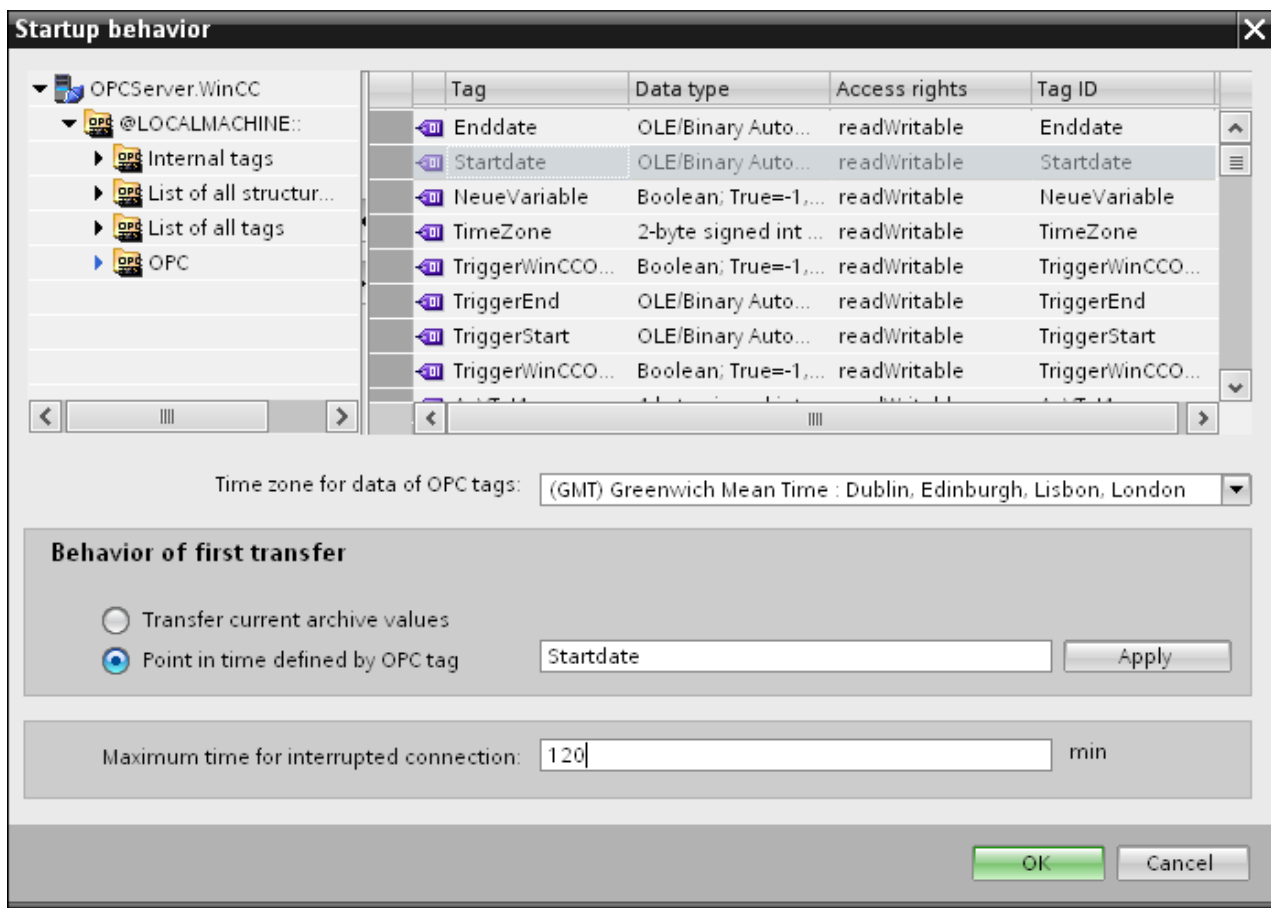
Additional values for LCID are available under <http://www.microsoft.com> (<http://www.microsoft.com>) when you enter the search term "LCID".

Time Zone for Data of the OPC Tags

Define a time zone for the data of the selected OPC tags by selecting the time zone from drop down list box. This field "Time zone for data of OPC variables" is provided below the OPC tag browser and includes a drop down list box that allows you to select the time zone. The default setting for the time zone is the local time on the computer, on which the configuration was performed. If the OPC server is in another time zone, select the respective time zone. After performing the required changes, select OK button.

Start-up behavior

The "Start-up behavior" button is activated if any one of the transfer types "Cyclic & continuously" or "Triggered & continuously" is selected. To open the "Start-up behavior" dialog window, select "Start-up behavior" button. The settings mentioned here will be used during start of the IndustrialDataBridge Runtime.



Procedure

To configure the behavior of first transfer, follow these steps:

1. Choose one of the listed options provided within the "Behavior of first transfer" section area.
2. If you have selected "Point in time defined by OPC tag", mark the respective tag in OPC tag browser and click "Apply" button.
3. The selected tag is added within the "Point in time defined by OPC tag" text box.
4. Select the time zone for data transfer of OPC tags in "Time zone for data of OPC tag" drop down list field.
5. Click "Ok" button after performing the required changes.

Note

Tag type

The tags that define a point in time must be of the type "VT_DATE" or be present as a string that can be converted into the type VT_DATE by the OPC Server.

Note

Transfer behavior

- If the "*Transfer current archive values*" option is selected, it transfers the current values (either process values or alarm messages) from the time the data transfer has started.
 - With option "*Point in time defined by OPC tag*" selected, the data transfer will happen from the date defined by OPC tag (existing in text box) till current date.
-

Maximum time for interrupted connection

The continuity of data transfer is guaranteed throughout IDB CS application and is also supported even while IDB is stopped. The IDB CS application saves the time duration of last transfer so that even after a restart, a continuous transfer can be completed without missing the data. This function can be limited with the entry "Maximum time for interrupted connection" specified in minutes.

This value limits the time period, from which the data will be transferred after the start or a connection interruption. If the value is too small, it can restrict the continuity of the data transfer. Enter the maximum time for interrupted connection in minutes and select OK button.

Note**New or changed configuration file**

The functionality is only supported if no new or a changed configuration file is loaded in the IDB runtime environment.

Time zone for Data of the OPC Tags

You must define a time zone for the data of selected OPC tags. Define a time zone for the data of the selected OPC tags by selecting the time zone from drop down list box. This field "Time zone for data of OPC variables" is provided below the OPC tag browser and includes a drop down list box that allows you to select the time zone. The default setting for the time zone is the local time on the computer, on which the configuration was performed. If the OPC server is in another time zone, select the respective time zone.

Note**UTC Time format**

Since the data will be stored in UTC time format within the database, it is strongly recommended to follow or set the time zone to UTC time format.

Trigger

Configure the condition that triggers a data transfer for this link in the "Trigger Provider" dialog window. The description for this dialog window is provided in the chapter "Configuring a Trigger (Page 66)".

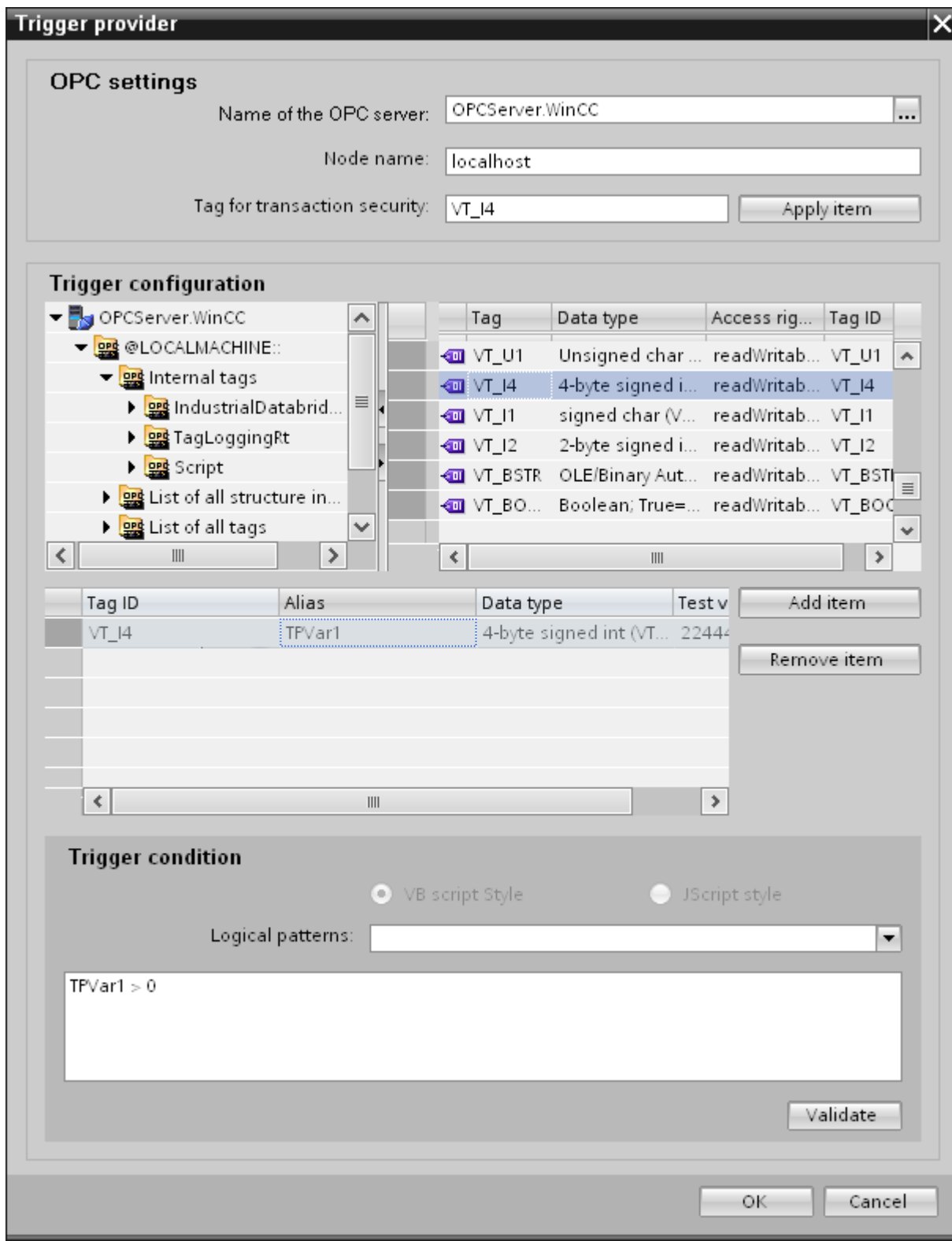
5.2.3.4 Step 4: Configuring a Trigger

Introduction

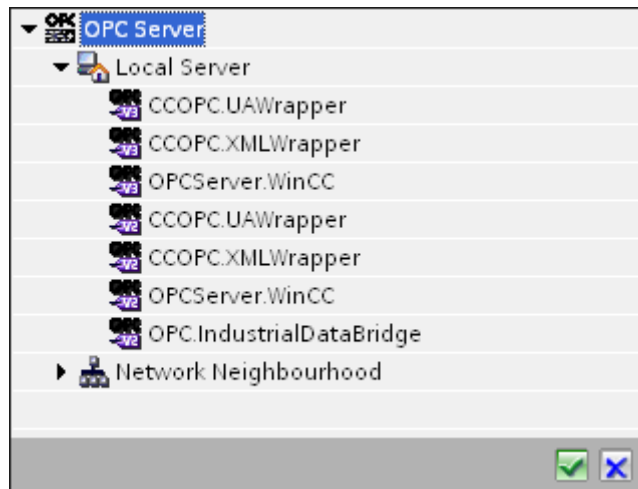
The "Trigger Provider" dialog window provides the OPC settings, Trigger configuration options and required fields that help you to configure the condition that triggers a data transfer. This dialog window is opened after clicking the "Trigger" button in *Transfer options* window.

Procedure

In "OPC settings" area, select the OPC server by clicking on the [...] button. The selection of the server is supported by an OPC tag browser. Next, click the button representing "tick mark" to accept the changes.



1. The browser shows the local OPC server. You can search for OPC servers in the network as well.



2. If this server is located on another computer, enter the computer name as well. The tree structure of OPC server is displayed within "Trigger Configuration" area.
3. You can define an OPC item on the trigger provider, in which the success-/failure-status of the data transfer will be stored in the "Tag for transaction security" field. This value should have 1 byte signed char (e.g. VT_I1). -1 indicates the success state and 0 indicates failure.
4. Select the tag of the OPC server, in which this information is to be saved in the tag browser and click on the "Apply item" button.
5. In "Trigger Configuration" area, select the desired tags individually and accept them by clicking on "Add item" each time.
6. Use the "Remove item" button to remove the marked item. If no item is marked for deletion, the last item from the list is deleted if you click the "Remove item" button. Details about the columns in the Tag list are located in section "Tag declaration".

Note

OPC Server

After selection of the tags and adding them to tag list, if you switch to another OPC Server in OPC Settings area, a dialog window is displayed that prompts the message whether you wish to discard previous settings.

7. In "Trigger condition" area, you can select the type of syntax with selection button "VB Style" or JScript Style". If a trigger condition is already created, this setting can no longer be changed. If the language is to be changed, the text in the "Configure Trigger Condition" field must be deleted.

Details on the programming languages are located in section "Programming Languages".

8. Create the trigger condition in the selected language. Use the Alias designations in the tag list for these tags. Within the text box displayed, enter the operator symbols using the keyboard or select them from the "Logical patterns" list box.

9. Test the created condition by clicking on "Validate". The trigger condition is calculated with the values that are entered in the "Test value" column. The result "TRUE" or "FALSE" is shown in a message box.
10. If the trigger condition provides the correct result and after confirming the changes, close the dialog by clicking on "OK" button.

Additional Information

Tag declaration

The columns for the tag declaration contain the following:

- **Data type:** Data type of the tag. If the data type defined here does not match that on the server, an attempt to convert the data type is made.
- **TagID:** The TagID of the tag on the OPC server
- **Alias:** The alias is used for creating the trigger condition. This name must be unique and it must correspond with the naming conventions of the allocated programming languages. For more detailed information about the naming conventions, see paragraph "Valid alias names".
- **Confirmation value:** The confirmation value is the value that the variable takes on after fulfilling the trigger condition and the values have been delivered to the consumer. The default value is "<Empty>", i.e., no confirmation value is written.
- **Test value:** This value is only for testing the trigger condition and has no influence on the later data exchange. The test values are to be selected and changed so that they test whether the trigger condition delivers the expected result in all operating conditions.

Note

Confirmation value

The confirmation value does not give any information on whether a transaction has been completed successfully.

Note

Necessity of Alias names

The OPC ItemID is not used because it may possibly not correspond with the tag validity criteria, for instance, a "Point" in the tag name is not allowed.

Valid Alias Names:

A valid alias must correspond with the following rules:

- Letters (no umlaut characters or ß), numbers and underscore character (_) are allowed.
- The first character must be a letter or underscore.
- An alias can be as long as you require.

- Key words from VB script or J script are not allowed. Note the respective language description for this.
- Case sensitive (upper and lower case letters).
("tag" is not the same as "Tag").

Programming languages

You can use VBScript or JScript for the trigger condition.

The following table shows the operator type and their symbols in both languages:

Type	VBScript	JScript
Logical NOT	NOT	!
Logical AND	AND	&&
Logical OR	OR	
multiplication	*	*
division	/	/
addition	+	+
subtraction	-	-
Not equal to	<>	!=
Less than	<	<
Greater than	>	>
Comparison	=	==
Assignment	<not possible>	=
True	true or True	true
Incorrect	false or False	false
string	<Quotation Marks>	<Quotation Marks>

It is recommended to use these operators only. Other operators can be found in the language descriptions for the respective language.

Note

Loss of Trigger Events

The triggering depends on the update speed of the OPC server. In this case, note that data changes that occur within an update cycle are not considered by the trigger. That means that a faster change of a tag from 1 - 0 - 1 is not necessarily indicated to the trigger provider by the OPC server, since the 1 exists at the end again and no value change exists at the check time. This means that a potentially true condition is not recognized as being true and therefore will not lead to a data transfer.

Configurations, with which the confirmation value is to set a "true" trigger condition to "false" again, are not secure because of the statement above. When data changes occur too quickly, the "true value" may stay the same or values can be left out.

5.2.3.5 Step 5: Connecting Tags

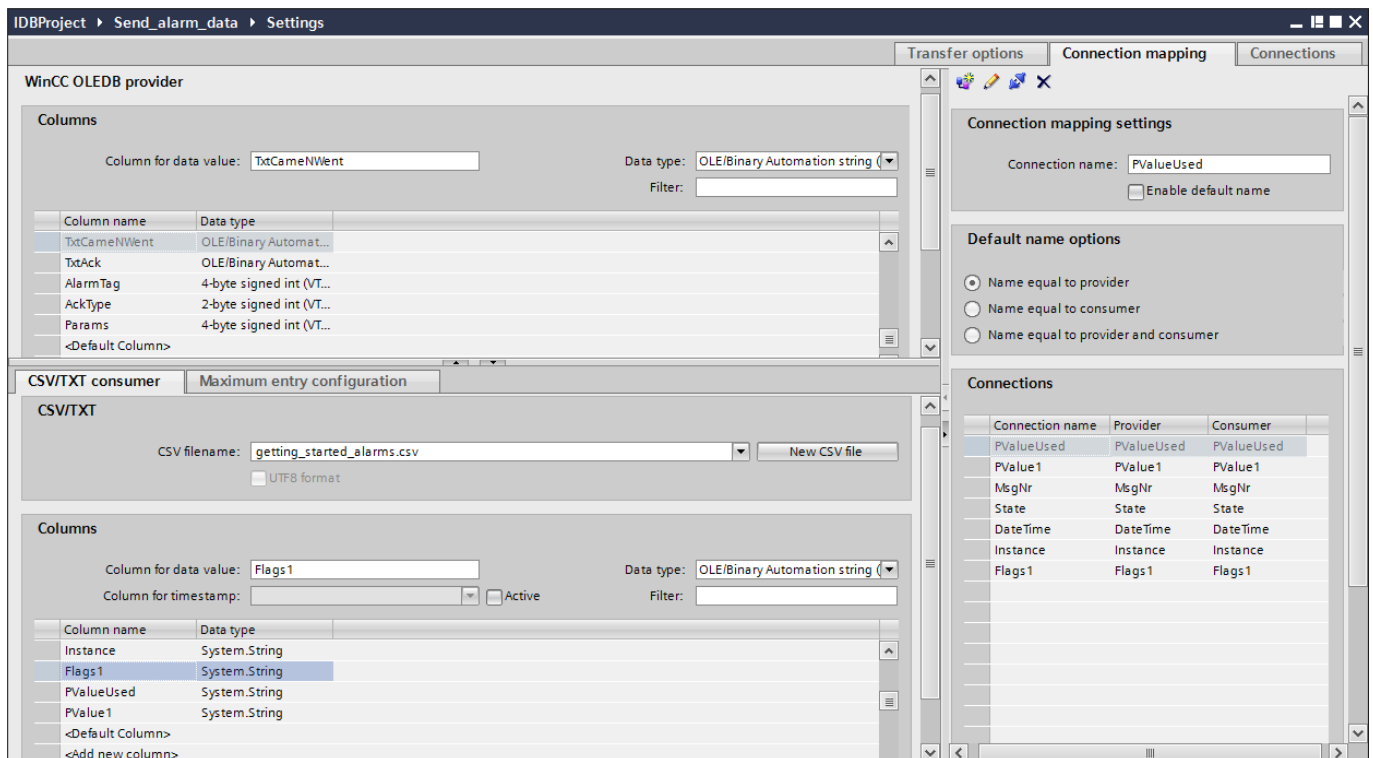
Introduction

This chapter provides the steps for performing a connection mapping between provider and consumer.

Connecting tags

In "Settings" window, the "Connection mapping" tab includes the required fields to connect tags that have been sent from WinCC OLEDB interface with the selected data consumer. The Connection mapping tab divides the window into 3 sections.

- WinCC OLEDB provider
- CSV/TXT consumer
- Connection mapping properties



WinCC OLEDB provider

The "WinCC OLEDB provider" section is displayed at top left portion of "Connection mapping" tab. This section provides you with required options to choose column name from the list of columns displayed in "Columns" section area.

The separator between the provider and consumer section provides a resize handle that helps you to resize the height of the section in order to view the fields within the section clearly.

The "Connection mapping settings" section is displayed at right side of "Connection mapping" tab. This section helps you to provide a name for connection along with options for choosing default name for connection. The "Connect", "Modify connection", "Delete connection" and "Delete all connections" icons are provided at the top portion of this section.

CSV/TXT consumer

The CSV/TXT consumer is displayed below the provider section and includes options for selecting the column within CSV/TXT file. It also provides options to create new CSV/TXT file with required columns.

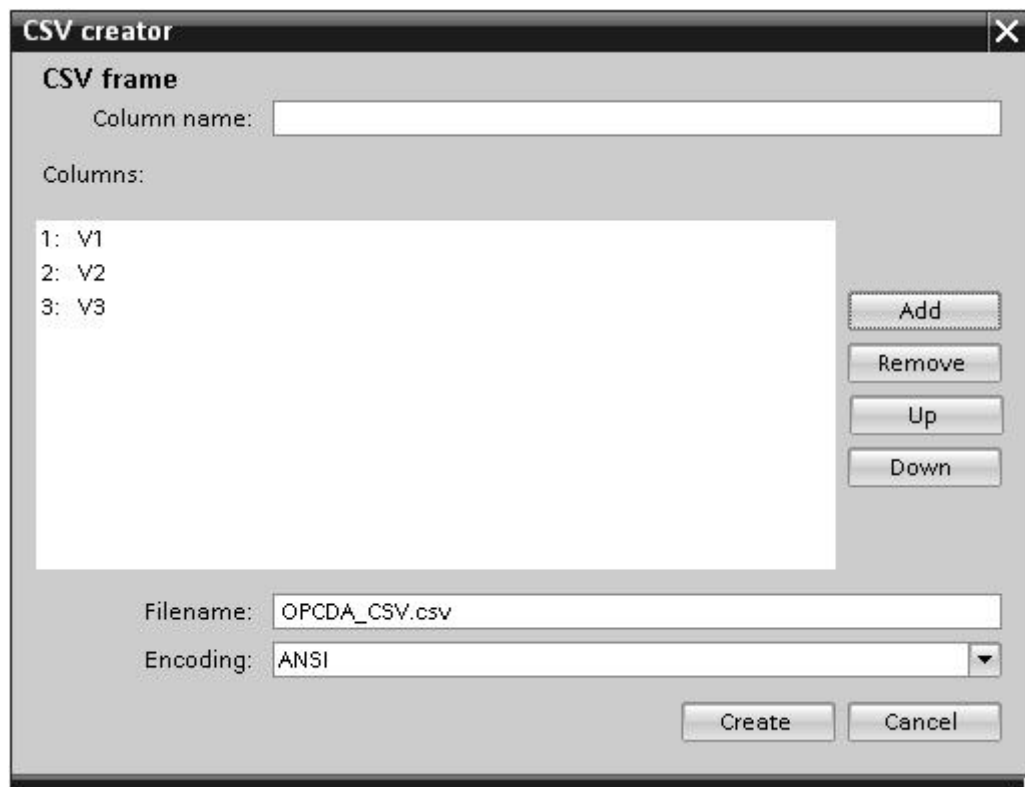
In the consumer section, "Maximum entry configuration" tab is displayed next to the "CSV/TXT consumer" tab. The "Maximum entry configuration" tab provides the required fields for archive file name generation.

The "CSV/TXT consumer" tab displays the "CSV/TXT" and "Columns" area.

The "CSV/TXT" area includes options to select the CSV/TXT file. The corresponding column names will be listed in the "Columns" area upon selection of this CSV, TXT file. CSV, TXT supports only one data type "OLE Automation string (VT_BSTR)". This data type is selected by default after the selection of respective column name within the "Columns" area.

Follow the steps provided below to select the CSV/TXT file and choose the required column name that needs to be mapped:

1. Within "CSV/TXT" area, the "CSV filename" list box is provided that displays a list of CSV or TXT files. Click the drop down arrow of "CSV filename" field and select the appropriate CSV file.
2. If the CSV/TXT file does not exist in the list, select "New CSV file" button. The "CSV Creator" dialog box opens thus providing options to create a new CSV file.



In the "CSV creator" dialog window, select "Add" button to create a column entry with default name. To define a custom name for the column, enter the column name in "Column name" field provided at top portion of this window. The created columns are displayed within the "Columns" text area. The "UP" and "DOWN" buttons allows in changing the column sequence.

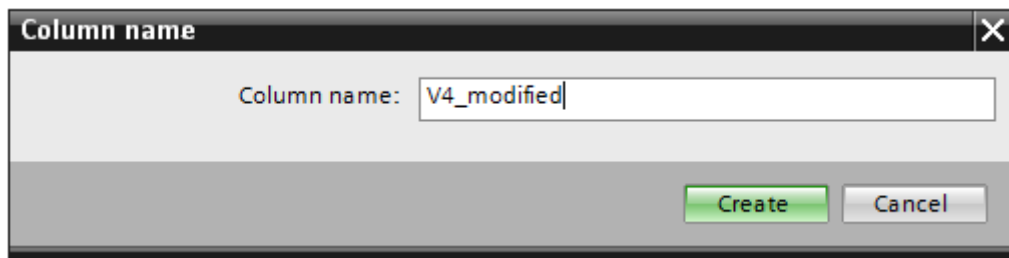
Note

The keyword "ID" written in capital letters should not be used for creating the first column name of CSV file. If "ID" is given as column name for the first column, then a warning message is displayed upon double clicking the CSV file. CSV files do not support this behavior.

3. Enter a file name in the "Filename" text box followed by file extension and select "Create" button to create the CSV file. The new CSV file will be now available in the file list.

If the file that is selected within the list is of type UTF-8 format, the check box "UTF-8" will be automatically enabled. If the file is of ANSI format, the check box remains unchecked.

4. In "CSV/TXT consumer" tab, select the CSV file that is displayed in the "CSV filename" field list box. The "Columns" area displays the "column name" along with its associated "Data type".
5. In "Columns" area, select the column name from the list. The selected column name is displayed in "Column for data value" field and the corresponding data type is selected and displayed in "Data type" field.
6. To add new columns to the selected CSV file, navigate to bottom portion of the column list and double click the row that contains the text "<Add new column>".



7. The "Column name" dialog box is displayed that allows you to enter the new column name. Enter a name for the new column and click "Create" button.

The new column will be listed within the list of column names. You can create any number of columns by repeating Steps 6 & 7.
8. If the column name has "Date/time" data type, the time stamp can be written to the specific column. In this case, select the respective "Active" check box and select the column in "Column for timestamp" field list box.
9. The "Filter" field provides you the option to filter the Column names based on single character or first few characters of column name.

For example, if you wish to view the column names starting with "S", type this character in "Filter" text box. All column names starting with "S" are displayed.

Maximum Entry Configuration:

The "Maximum Entry Configuration" tab provides options to archive the data. Continuous archiving can be handled or else options to archive once the maximum entries are reached are also supported. This also provides support for archive file name generation wherein several options are provided for selection that is used for generating the archive file name. The "Archive path" field allows for selecting the desired archive path.

CSV/TXT consumer **Maximum entry configuration**

☒ Archive file at maximum entry

Archive filename generation

Max entries: (Range: 0 to 2147483647, 0 = infinite)

☐ Use current date and time
☒ Use current date and serial number
☐ Use serial number

Archive path: ...

☒ Use dedicated filename

Select filename type: ▼

Custom filename:

Follow the steps given below to perform these archive settings:

1. Select the check box "Archive File at Maximum Entry" and specify a value in "Max. entries" text box. If this value is set to zero, you can write any number of lines into the file.

Note

- By default, the "Max. entries" field displays the value as 0. However, this value can be modified.
 - It is important to ensure that "Max. entries" field should not be left blank.
 - If "Max. entries" is set to a value less than zero or negative value entered or if the field is blank, an error message "*Value should be greater than or equal to zero*" is displayed.
 - The maximum value for Max. entries in CSV/TXT is 2147483647. Any value entered above this range will not be accepted and displays an error message as "Type conversion failed".
-

Note

- If this check box "Archive File at Maximum Entry" is unchecked, the Archive File Name Generation and other file name selection options within this tab will be in disable state.
-

2. In "Archive File Name Generation" area, options are provided for file name generation with respect to the archive file. Select any one of the following options by selecting the radio button.
 - Use current date and time
 - Use current date and serial number
 - Use serial number
3. Next, specify the Archive path in the text box provided. You can either enter the full path name in the text box or select the path using "...". If you provide the path in archive path text box, archived CSV files are generated at this path. By default, this text box has the same path where the base CSV file is present.

4. The "Use Dedicated File Name" check box allows for options to specify a dedicated file name in combination with a serial number and date or date and time or serial number. If this checkbox is unchecked, then the base CSV filename will be used for archiving.
5. The "Select filename type" field provides options to select custom file name.
 - To use custom file name, select filename type as "Use custom filename" and enter the custom file name in "Custom file name" text box.

Note

Serial number

A range of 1 - 999999999 is supported for the serial number. During runtime, if the serial number exceeds this maximum value, a trace log will be automatically created when this value is reached. Once this upper limit is reached, IDB will not create any new archive file. The same file will be updated continuously during data transfer.

Note

Upon selection of "Use Dedicated File Name" check box, the 'Select Filename Type' provides an option "Use custom filename" within the drop down list. Select this option and enter the customer filename in "Custom filename" text box.

The option "Use Filename from WinCC Tag" is provided only with providers that supports Tags.

Connection Mapping

To establish connection between the provider and consumer, a data column mapping is required to be performed. Defining a connection name is the first step towards the setup of a connection. The Connection window displays "Default connection name" options in order to specify a name for default connection. Connect, Modify connection, Delete connection and Delete all connections icons are provided below the "Default connection name" section. These buttons help in order to work with the connections.

Note

Modify connection

To modify an existing connection, perform the required changes and then select "Modify" button. The changes can be observed within the Connection window only after selecting the "Modify" button.

Follow these steps to perform column mapping between provider and consumer:

1. Select a tag name from "WinCC OLEDB provider" and choose the column name from "CSV/TXT consumer" column that needs to be mapped. Click "Connect" button.
2. If there is a data mismatch between the provider and consumer columns, IDB CS will modify the data type to VT_BSTR data type and displays the message "The provider data type was changed to fit the consumer type". Next, click OK.
3. Repeat steps 1 & 2 for all elements of the provider that you wish to transfer. A connection is created for each of the column values in provider and consumer.
4. To use dedicated file name, enable the "Use dedicated filename" check box and select "Use custom filename" in "Select filename type" field.
Enter custom filename in "Custom filename" text box.
5. Specify a connection name for this connection from the options provided within the "Default Connection name" area and click "Connect" button.

Note**Data type conversion**

If the provider column does not match with consumer column, IDB CS converts the data type to match with data type of provider. A status window is displayed to indicate this change.

6. The connection name including the provider and consumer data values will be displayed below the Connect button.
7. The list of connections will be displayed in the Connections tab.

Note**Column for time stamp**

The time stamp must be assigned before connecting the first tags. Afterwards, adding or changing is only possible if all items are deleted, the dialog is closed and reopened again. The time stamp is generated from the local time, if new data is transferred from the provider.

Result

The connections that you have created are shown in the "Connections" tab of IDB CS "Settings" window as well as within the project tree node.

5.2.4 WinCC User Archive - OPC Data Access

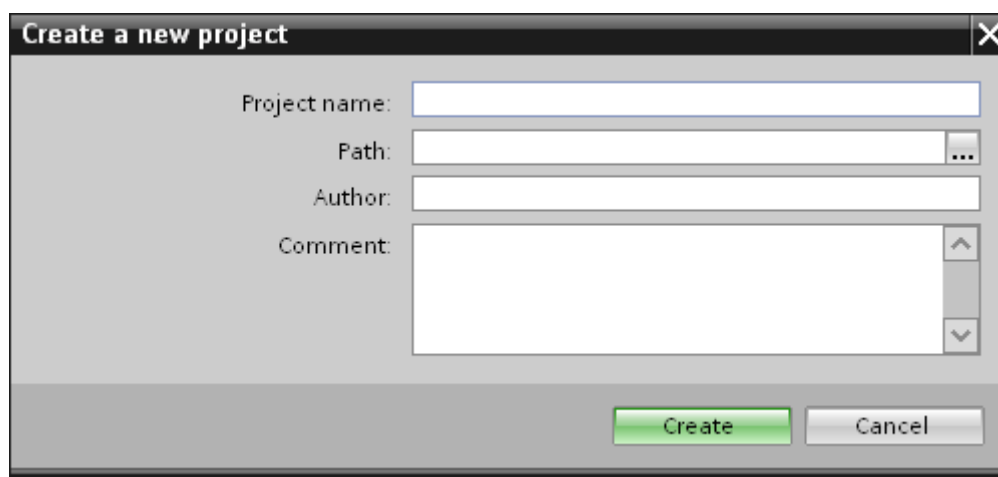
5.2.4.1 Step 1: Create Project and Link

Introduction

This chapter provides you with the complete steps for creating a project and link in IDB Configuration System application. The objective here is to create a project with corresponding link having WinCC User Archive as provider and OPC DataAccess as consumer.

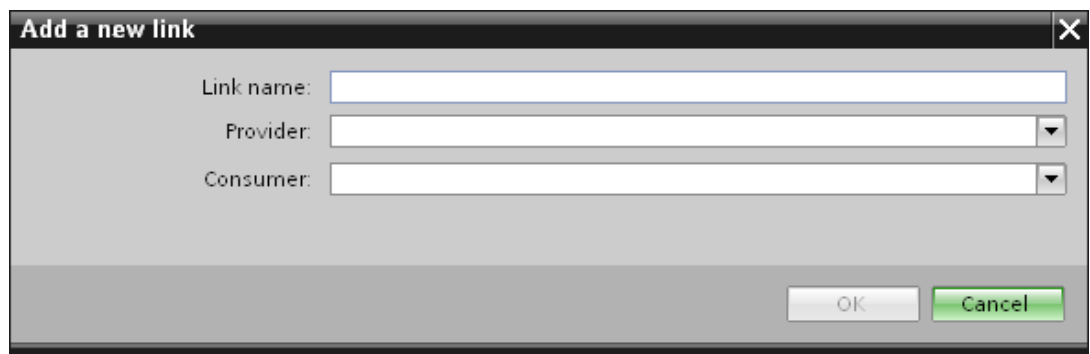
Procedure

1. Open IDB Configuration and create a project by following the steps mentioned below:



- In IDB Configuration menu, select "Project" > "Create" to create a new project.
 - In the "Create new project" dialog box, specify a project name, click [...] button and select the folder location wherever the project needs to be saved.
 - After entering the required information, select "Create" button. This creates a new project.
2. The project name will be listed within the "Project tree".

3. The next step is to create a link. Follow the steps mentioned below to create a link between provider and consumer:
 - Right click on project name node in the tree structure and select "Add new link" option.
After creating a project, by default a new node "Add new link" is displayed in project tree below project name node.
Alternatively, you can create a new link by double clicking the "Add new link" node in project tree.
 - In the "Add new link" dialog that is displayed, enter a unique link name.
 - Select the provider type as WinCC User Archive, consumer type as OPC DataAccess and click OK button.
 - The created link will be displayed below the project name in project tree.
4. The corresponding entries - *Provider*, *Consumer*, *Settings* and *Connections* are created as nodes that exist below the new link in the tree structure.



The screenshot shows a Windows-style dialog box titled "Add a new link". It has a close button (X) in the top right corner. The dialog contains three input fields: "Link name:" followed by a text box, "Provider:" followed by a dropdown menu, and "Consumer:" followed by a dropdown menu. At the bottom right of the dialog are two buttons: "OK" and "Cancel".

Result

You have created a project that consists of a link having WinCC User Archive as provider and OPC DataAccess as consumer.

5.2.4.2 Step 2: Configuring an Interface

Introduction

In this chapter, you will configure the respective provider/consumer configuration along with transfer behaviour settings.

Procedure

1. In project tree, open the Provider configuration window by double clicking the Provider node.

Note

Connection String

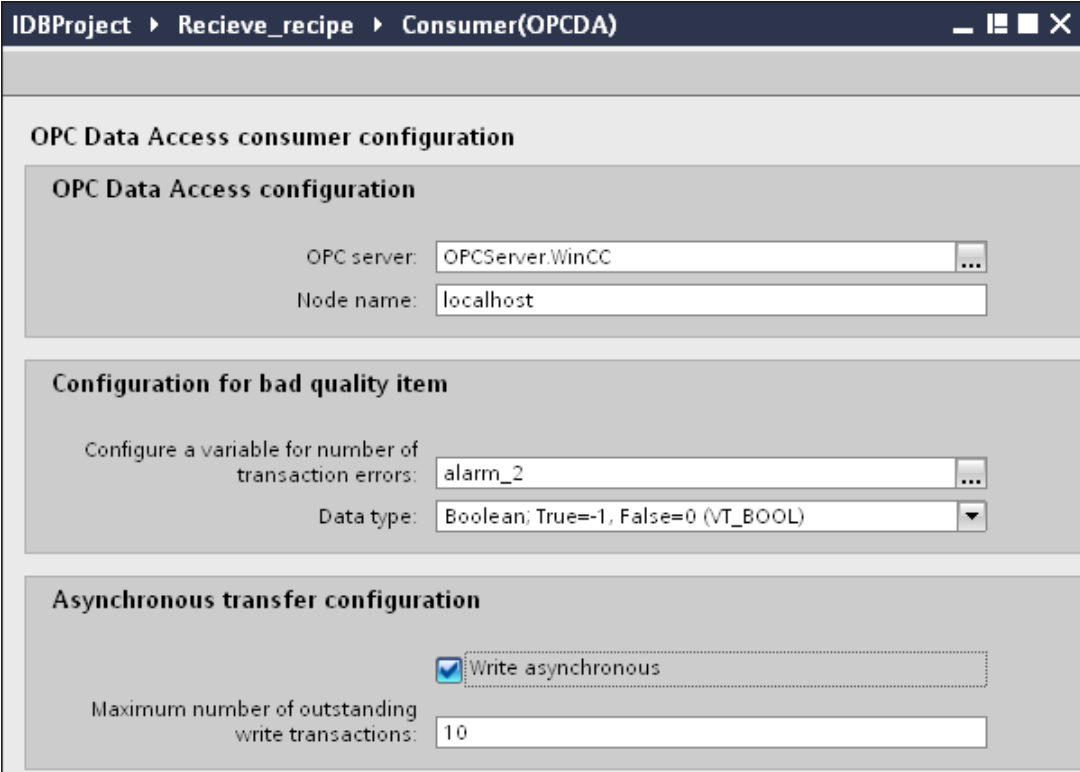
In "WinCC User Archive provider configuration" window, the "Connection string" field (at top portion) displays the database connection string parameters after the selection of database type.

2. In Provider configuration window, perform the following settings:
 - Enter the server name and/or complete path of WinCC User Archive database.
 - Select the database name from the list that is displayed in the "Database" field. Click on the drop down list box to view this list.
 - If you wish to enable windows authentication automatically, select the check box "Use automatic windows authentication".
 - Within the section area that provides options to logon to the database, enter the user name and password.
This information is required to logon to the WinCC User Archive database.
 - Click Test button to test the connection. Next, double click the Consumer node in project tree.

Note**User Archive**

Ensure that you enter the complete path of the computer wherever WinCC has been installed. If the path name is not valid, then the "Database" field will not display any tables. Also, it is important to verify that the user archive table contains one or more rows of data.

3. In Consumer configuration window, perform the following settings:



IDBProject > Recieve_recipe > Consumer(OPCDA)

OPC Data Access consumer configuration

OPC Data Access configuration

OPC server: OPCServer.WinCC

Node name: localhost

Configuration for bad quality item

Configure a variable for number of transaction errors: alarm_2

Data type: Boolean; True=-1, False=0 (VT_BOOL)

Asynchronous transfer configuration

☒ Write asynchronous

Maximum number of outstanding write transactions: 10

"OPC DataAccess configuration" section

- Browse for OPC Server by clicking the [...] button and select the OPC Server.

The selection of server is supported by an OPC tag browser.

- The node name is automatically displayed in "Node name" text box after selection of the OPC Server.

Note

Node name

For local OPC Server, the node name will display as "local host". In case of remote OPC Server, the remote computer name will be displayed after selection of OPC Server on the remote computer. This node name is required for searching the OPC Server from the remote computer.

The OPC tag browser does not display any content if node name is invalid.

Note

The "OPC Server" and "Node name" fields are provided as editable fields. If the information about OPC Server name and node name is known, you can directly enter the information in the "OPC Server" and "Node name" fields. If the node name / OPC Server name is invalid, there will be no content displayed within the OPC tag browser.

"Configuration for bad quality item" section

- In the "Configure a Variable number of transaction errors" field, click on [...] button and select a tag in OPC tag browser. Next, click the button representing "tick mark" to accept the changes. The amount of tags with errors is written with provider tags with QUALITY=BAD.
- Choose the specific data type by selecting from the drop down list box.

Note

OPC tags

Selection of the tag in OPC tag browser displays the corresponding data type in "Datatype" field. However, if you know the tag name, enter the tag name in "Configure a Variable for number of transaction errors" field and select the data type in "Datatype" field by selecting from the list.

"Asynchronous transfer configuration" section

- Enable the check box option "Write asynchronous" for asynchronous writing.
- Enter the permitted number of maximum outstanding write transactions in the text box.

Note

Asynchronous transfer

If the "Write asynchronous" check box is enabled, a default value of 10 is set and will be displayed within the "Maximum number of outstanding write transaction" text box. When this check box is disabled, the value will be reset to 0. You can type a value in this text box ranging from 1 - 40. If the value entered in this text box is not within the range, then an error message is displayed.

Note

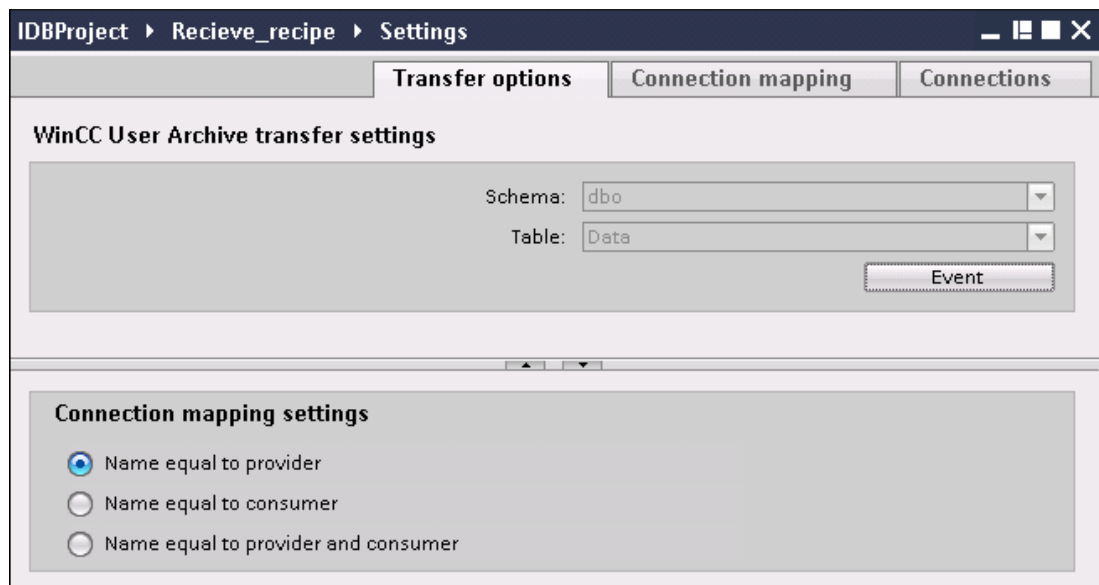
Asynchronous writing

The Asynchronous transfer configuration is useful to ensure the correctness of the actual data transfer that is happening.

Example: If you have configured the "Maximum number of outstanding write transaction" as 15 and if the data transfer is not happening correctly, after the failure of 15th transaction, a warning message will be displayed in the IDB Runtime Trace view.

Performing link settings

1. In project tree, double click the Settings node to open Settings window in the work area. The Settings window consists of 3 tabs - *Transfer options*, *Connection Mapping & Connections*.



2. Within the Transfer options tab, you can configure the transfer behavior settings for provider.
 - Select the Table name by selecting from the drop down list.

Note**Schema**

- In WinCC User Archive, a default schema is selected automatically in the Transfer options tab.
-

3. Click "Event" button to configure the trigger provider settings. The "Trigger provider" will be opened.

The description of the "Trigger provider" window is provided in chapter "Configuring a Trigger (Page 86)"

4. The transfer behavior settings for provider will be saved automatically.

Result

You have configured the WinCC User Archive interface and OPC DataAccess as consumer including the provider transfer options. These elements are displayed in the tree structure of the IDB configuration interface.

5.2.4.3 Step 3: Configuring a Trigger

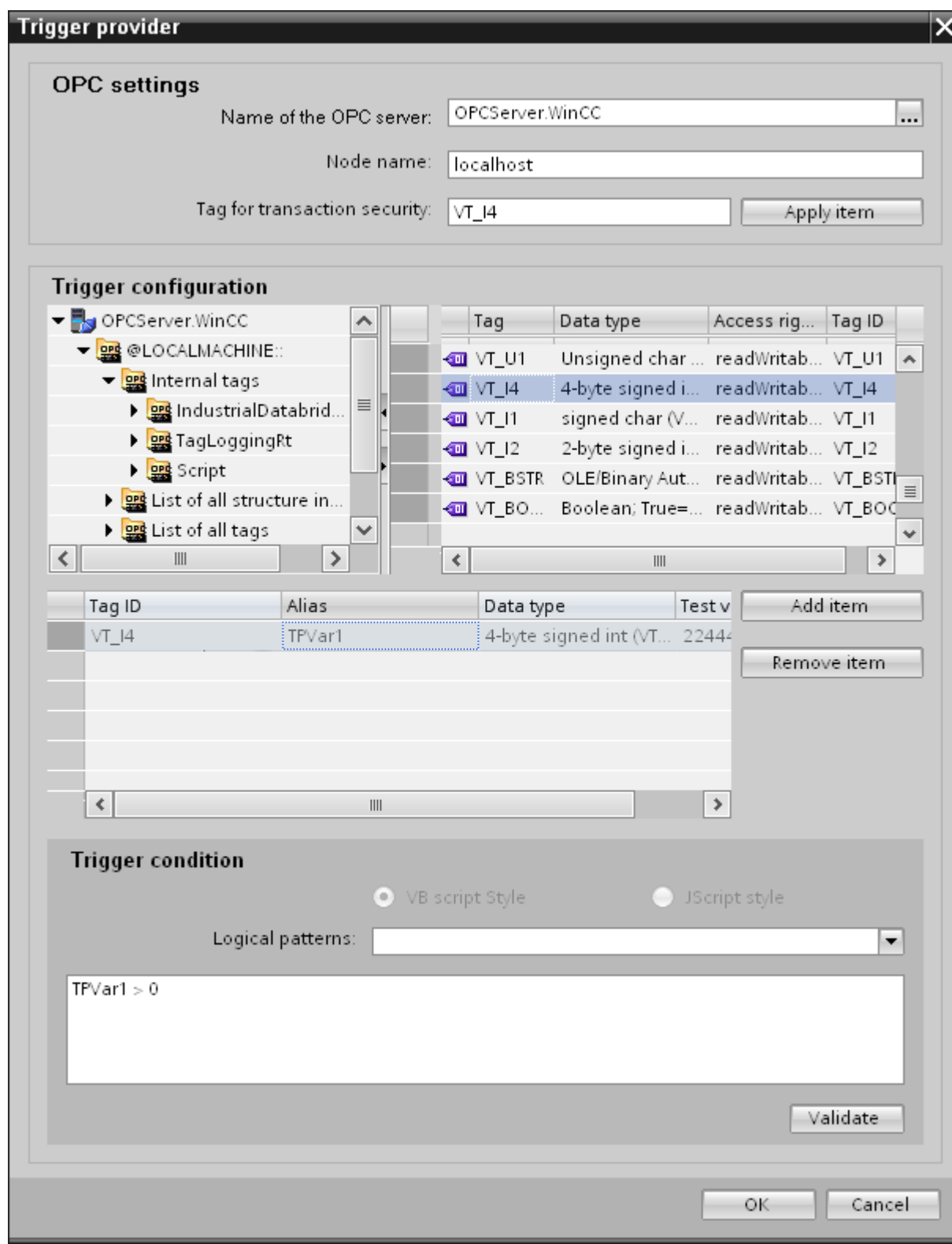
Introduction

The "Trigger Provider" dialog window provides the OPC settings, Trigger configuration options and required fields that help you to configure the condition that triggers a data transfer. This dialog window is opened after clicking the "Trigger" button in *Transfer options* window.

Note

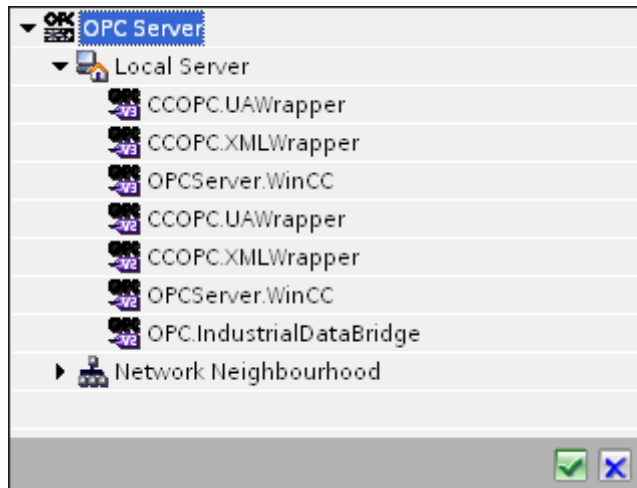
OPC tag browser

The OPC tags within "Trigger configuration" section will only be displayed if you have already selected the name of the OPC Server.



Procedure

1. In "OPC settings" area, select the OPC server by clicking on the [...] button. The selection of the server is supported by an OPC tag browser. Next, click the button representing "tick mark" to accept the changes.



2. If this server is located on another computer, enter the computer name as well. The tree structure of OPC server is displayed within "Trigger Configuration" area.

Note

Node name

For local OPC Server, the node name will display as "local host". In case of remote OPC Server, the remote computer name will be displayed after selection of OPC Server on the remote computer. This "Node name" is required for searching the OPC Server from the remote computer.

The OPC tag browser does not display any content if node name is invalid.

Note

The "OPC Server" and "Node name" fields are provided as editable fields.

If the information about OPC Server name and node name is known, you can directly enter the information in the "OPC Server" and "Node name" fields. If the node name / OPC Server name is invalid, there will be no content displayed within the OPC tag browser.

3. You can define an OPC tag on the trigger source, in which the success-/failure-status of the data transfer will be stored in the "Tag for transaction security" field. This value should have 1 byte signed char (e.g. VT_I1). -1 indicates the success state and 0 indicates failure.

Select the tag of the OPC server, in which this information is to be saved in the tag browser and click on the "Apply item" button.

4. In "Trigger Configuration" area, select the desired tags individually and accept them by clicking on "Add item" each time.

The selected tags are shown in the Tag list below.

5. Use the "Remove item" button to remove the marked item. If no item is marked for deletion, the last item from the list is deleted if you click the "Remove item" button. Details about the columns in the Tag list are located in section "Tag declaration".

Note**OPC Server**

After selection of the tags and adding them to tag list, if you switch to another OPC Server in OPC Settings area, a dialog window is displayed that prompts the message whether you wish to discard previous settings.

6. In "Trigger condition" area, you can select the type of syntax with selection button "VB Style" or JScript Style". If a trigger condition is already created, this setting can no longer be changed. If the language is to be changed, the text in the "Configure Trigger Condition" field must be deleted.

Details on the programming languages are located in section "Programming Languages".

7. Create the trigger condition in the selected language. Use the Alias designations in the tag list for these tags. Within the text box displayed, enter the operator symbols using the keyboard or select them from the "Logical patterns" list box.
8. Test the created condition by clicking on "Validate". The trigger condition is calculated with the values that are entered in the "Test value" column. The result "TRUE" or "FALSE" is shown in a message box.
9. If the trigger condition provides the correct result and after confirming the changes, close the dialog by clicking on "OK" button.

Additional Information

Tag declaration

The columns for the tag declaration contain the following:

- Data type: Data type of the tag. If the data type defined here does not match that on the server, an attempt to convert the data type is made.
- TagID: The TagID of the tag on the OPC server
- Alias: The alias is used for creating the trigger condition. This name must be unique and it must correspond with the naming conventions of the allocated programming languages. For more detailed information about the naming conventions, see paragraph "Valid alias names".

- Confirmation value: The confirmation value is the value that the variable takes on after fulfilling the trigger condition and the values have been delivered to the consumer. The default value is "<Empty>", i.e., no confirmation value is written.
- Test value: This value is only for testing the trigger condition and has no influence on the later data exchange. The test values are to be selected and changed so that they test whether the trigger condition delivers the expected result in all operating conditions.

Note

Confirmation value

The confirmation value does not give any information on whether a transaction has been completed successfully.

Note

Necessity of Alias names

The OPC ItemID is not used because it may possibly not correspond with the tag validity criteria, for instance, a "Point" in the tag name is not allowed.

Valid Alias names

A valid alias must correspond with the following rules:

- Letters (no umlaut characters or ß), numbers and underscore character (_) are allowed.
- The first character must be a letter or underscore.
- An alias can be as long as you require.
- Key words from VB script or J script are not allowed. Note the respective language description for this.
- Case sensitive (upper and lower case letters).
("tag" is not the same as "Tag").

Programming languages

You can use VBScript or JScript for the trigger condition.

The following table shows the operator type and their symbols in both languages:

Type	VBScript	JScript
Logical NOT	NOT	!
Logical AND	AND	&&
Logical OR	OR	
multiplication	*	*
division	/	/

Type	VBScript	JScript
addition	+	+
subtraction	-	-
Not equal to	<>	!=
Less than	<	<
Greater than	>	>
Comparison	=	==
Assignment	<not possible>	=
True	true or True	true
Incorrect	false or False	false
string	<Quotation Marks>	<Quotation Marks>

It is recommended to use these operators only. Other operators can be found in the language descriptions for the respective language

Note

Loss of Trigger Events

The triggering depends on the update speed of the OPC server. In this case, note that data changes that occur within an update cycle are not considered by the trigger. That means that a faster change of a tag from 1 - 0 - 1 is not necessarily indicated to the trigger provider by the OPC server, since the 1 exists at the end again and no value change exists at the check time. This means that a potentially true condition is not recognized as being true and therefore will not lead to a data transfer.

Configurations, with which the confirmation value is to set a "true" trigger condition to "false" again, are not secure because of the statement above. When data changes occur too quickly, the "true value" may stay the same or values can be left out.

5.2.4.4 Step 4: Connecting Tags

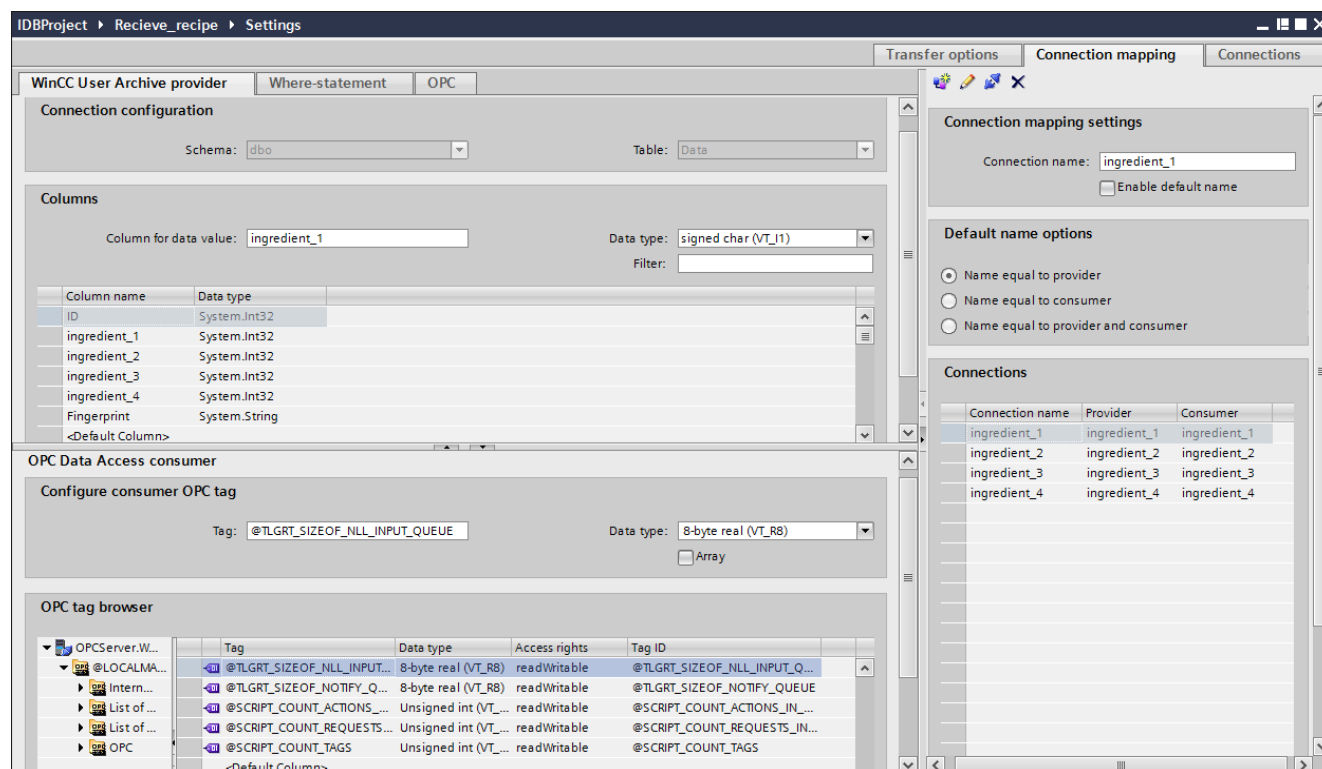
Introduction

This chapter provides the steps for performing connection mapping between provider and consumer.

Connecting Tags

In "Settings" window, the "Connection mapping" tab includes the required fields to connect tags that have been sent from the WinCC User Archives interface with the selected consumer. The Connection mapping tab divides the window into 3 sections

- WinCC User Archive Provider
- OPC Data Access consumer
- Connection mapping settings



The "WinCC User Archive Provider" section is displayed at top left portion of "Connection mapping" tab. This section provides you with required options to choose schema, table name and column name(s) to be mapped. The "OPC Data Access consumer" section is displayed at bottom left portion of "Connection mapping" tab. This section provides you with required options to choose the tag name from the list of OPC tags in the OPC tag browser that can be mapped with WinCC User Archive provider column.

The separator between the provider and consumer section provides a resize handle that helps you to resize the height of the section in order to view the fields within the section clearly.

The "Connection mapping settings" section is displayed at right side of "Connection mapping" tab. This section helps you to provide a name for connection along with options for choosing default name for connection. The "Connect", "Modify connection", "Delete connection" and "Delete all connections" icons are provided at the top position of this section.

Note**Connecting mapping tab**

To get a clear view of all fields in the sections within the "Connection mapping" tab, it is suggested to use the "Collapse" option within the Inspector window and Project tree. Once you click on "Collapse" icon, the window minimizes and provides with "Expand" option. At any point of time, to bring back the window, click on "Expand" icon.

The "WinCC User Archive Provider" section consists of 3 tabs:

- WinCC User Archive
- Where-Statement
- OPC

Note**Select OPC Server**

In order to configure the settings on the "Where Statement" tab, you must have selected an OPC server in the dialog "Trigger Provider (Page 86)". This dialog window is accessed by clicking on the "Event" button in "Transfer options" tab.

WinCC User Archive

1. In "WinCC User Archive provider", the selected archive is shown in the "Table" field. Select the Schema for database if applicable by selecting from the drop down list in "Schema" field.
2. The Column names are displayed within "Columns" area. Select a Column name from the list. The selected column is displayed in "Column for data value" field. The data type is shown automatically.
3. The "Filter" field provides you the option to filter the Column names based on single character or first few characters of column name.

For example, if you wish to view the column names starting with "S", type this character in "Filter" text box. All column names starting with "S" are displayed.

4. Next, configure the tag in the "OPC Data Access consumer" section by following these steps:
 - Select the tag name from the list that is displayed within "OPC tag browser". Upon selection of the tag within OPC tag browser, the tag name is displayed in "Tag ID" field. The data type is displayed in "Datatype" field based on selection of the tag.

Note

Data type conversion

If the provider tag data type does not match with consumer column, IDB CS converts the data type to match with data type of provider tag. A status window is displayed to indicate this change.

5. Check the name of the connection in the "Connection mapping settings" area to the right. Enter a unique name for the connection in the "Connection name" field or use the options within "Default name options". Click "Connect" button to confirm your entries.
6. Repeat steps 1 to 4 for all elements of the "WinCC User Archive Provider" that you wish to transfer.

Note

Array

If the WinCC User Archive provider tag has a data type selected other than array data type and if the OPC Data Access consumer tag has "Array" data type wherein the "Array" check box has been checked, then after clicking the "Connect" button, an error message is displayed. This will not allow to perform a connection mapping as "Array" data type might not be supported by the selected provider.

Where Statement

The SQL String that describes the access location for reading the data is shown on this tab. The "Where-statement" tab mainly includes the "WHERE" section and text area for displaying the "Resulting SQL-String".

Note

Columns

The Column names shown in screenshot below might vary depending on the table used within Where statement.

Where statement - Add columns

Column selection

Fieldname: Data type:

Fieldname	DB-Datatype
ID	System.Int32
Number	System.Int32
Name	System.String
Ingredient	System.Int32
Amount	System.Int32

WHERE

Select the OPC-variable

Tag: Data type:

Tag	Data type	Access rights	Tag ID
TimeZone	2-byte signed int ...	readWritable	TimeZone
TriggerWinCCO...	Boolean; True=-1,...	readWritable	TriggerWinCCO...
TriggerEnd	OLE/Binary Auto...	readWritable	TriggerEnd
TriggerStart	OLE/Binary Auto...	readWritable	TriggerStart
TriggerWinCCO...	Boolean; True=-1,...	readWritable	TriggerWinCCO...
A_VT_I4	4-byte signed int ...	readWritable	A_VT_I4
A_VT_R8	8-byte real (VT_R8)	readWritable	A_VT_R8
A_VT_R4	4-byte real (VT_R4)	readWritable	A_VT_R4

OK Cancel

Follow the steps given below to configure the Where statement:

1. Click "Add" button to open the dialog that provides you with options to select the column in order to compare the content.
2. Select the Fieldname you wish to check for a certain value. The selected field name is displayed in "Fieldname" field. The data type for this field name is automatically selected in the "Datatype" field.
3. This "Fieldname" is shown in the "WHERE" text box. Choose the operator symbol from the drop down list that is used for comparison.
4. In "OPC-variable" section, select the OPC tag, the value of which is compared with the previously selected column entry. Then, click OK button.
5. The condition is shown in the table within "Where" section and is entered in the "Resulting SQL String" field.

6. To remove an already existing "Resulting SQL String", click "Remove" button.

7. To define multiple conditions, repeat steps 1 to 5.

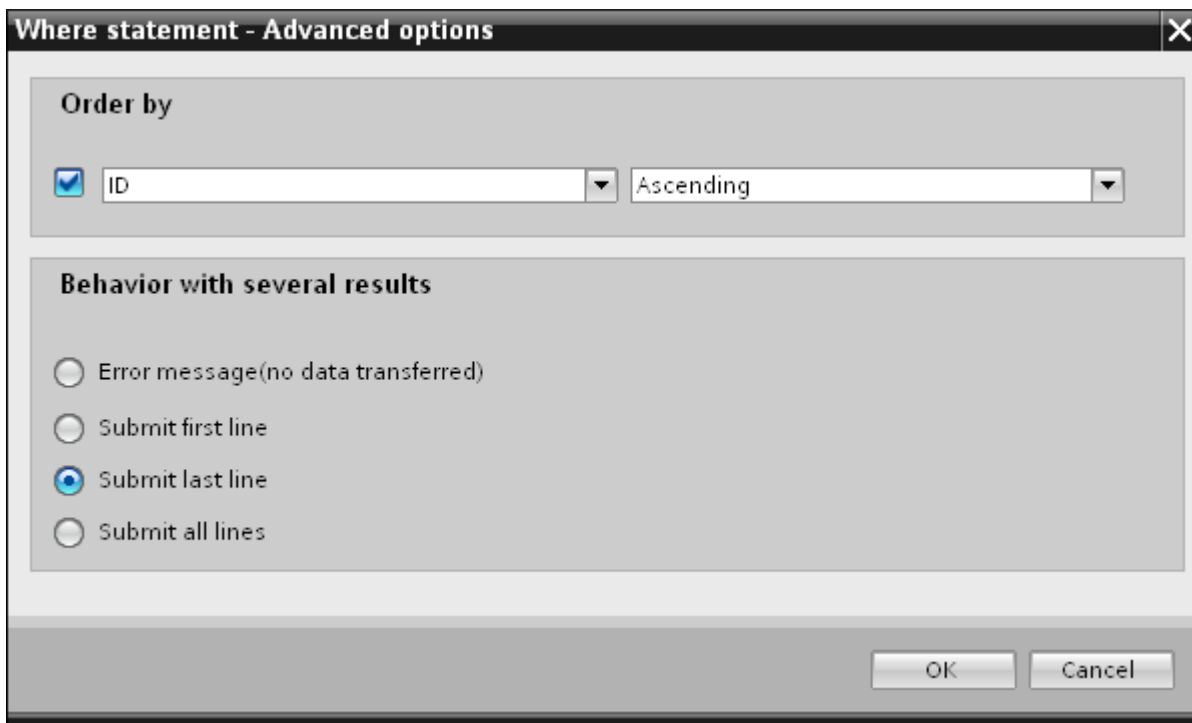
Note

SQL String

- If multiple conditions are configured, they are connected with a logical "AND".
 - Only data records (lines) are requested from the IDB and transferred in which all conditions have been met.
 - An optional connection is not possible with a logical "OR".
-

Advanced

Using button "Advanced", you can define the sort sequence and the behavior when multiple data records exist.



- **Order By**
Select the selection field. You can then define the column name and the sort direction.
- **Behavior with several results:**
Select one of the following option fields and click OK button. Based on selected radio button, you can decide the action to be performed:
 - Error message (no data transferred)
 - Submit first line
 - Submit last line
 - Submit all lines

Standard settings for these options are:

- No sorting
- Error message (no data transferred)

OPC tab

The "OPC" tab includes options to connect OPC tag(s) that have been sent from the WinCC User Archive interface with OPC Data Access consumer tag(s).

Note

Select OPC Server

In order to configure the settings on the "OPC" tab, you must have selected an OPC server in dialog "Trigger Provider (Page 86)". This dialog window is accessed by clicking on the "Event" button in "Transfer options" tab.

1. In the "WinCC User Archive Provider" area, within the OPC tab, the OPC tag browser is displayed. In tag browser, select the tag for which the values should be transferred. The selected tag is shown in the "Tag ID" field. The data type is chosen according to the selection.
2. If the selected tag has Array data type, then the "Array" check box is automatically enabled. This check box is provided below the "Datatype" field.
3. Next, configure the consumer column in the "Database consumer" section by following these steps:
 - The selected table is shown in the "Table" field. Select the Schema if applicable by selecting from the drop down list in "Schema" text box.
 - The column names are displayed within "Columns" area. If the table has columns with respective data types, the time stamp can also be written to the table. In this case, select the respective "Active" check box and select the column within "Column for timestamp" field.
4. Select the Column name that you wish to connect with the OPC tag. The selected column is displayed in "Column for data value" field.
5. Check the name of the connection in the "Connection mapping settings" area to the right. Enter a unique name for the connection in the "Connection name" field or use the options within "Default name options". Click "Connect" button to confirm your entries.

Note

Data type conversion

If the provider column does not match with consumer column, IDB CS converts the data type to match with data type of provider. A status window is displayed to indicate this change.

6. Repeat steps 1 to 5 for all elements of the "WinCC User Archive Provider" that you wish to transfer.

Note**Array**

If the WinCC User Archive provider column has a data type selected other than array data type and if the OPC Data Access consumer tag has "Array" data type wherein the "Array" check box has been checked, then after clicking the "Connect" button, an error message is displayed. This will not allow to perform a connection mapping as "Array" data type might not be supported by the selected provider.

Result

The connections that you have created are shown in the "Connections" tab of IDB CS "Settings" window as well as within the project tree node.

5.2.5 Viewing Example 1 in WinCC Runtime

Overview

This chapter provides information about the steps to be followed in order to view Getting Started Example 1 in WinCC Runtime environment. The Getting Started project provided along with the installation includes all the required resources for running the example project.

Prerequisites

- WinCC V7.3 is installed
- IDB Getting Started project "idb_getting_started.MCP" is loaded in WinCC and project is activated
- IDB CS application is open
- Getting Started project "IDBProject" is loaded in IDB CS application

Importing the configuration (XML file)

Follow the steps given below to import the configuration file provided along with IDB Getting Started and to configure the respective provider/consumer type:

1. In IDB CS, select Project > Import Runtime Configuration to import the configuration file.
2. In the "Open" dialog window displayed, browse for the IDB Getting Started folder (idb_getting_started) and select the configuration XML file "idb_getting_started_configfile.xml". Next, click "Open" button.
3. The IDB Getting Started project configuration will be imported in IDB CS with the project name displayed as "IDBProject".
4. The project tree on left hand side displays a tree structure that displays the project, links and their sub-nodes.

5. In IDB CS, perform the following settings in the respective provider/consumer modules that is part of Example1 project:

- In WinCC OLEDB provider configuration, select the WinCC project XML file that you have exported from WinCC.

Note**Reports**

After exporting the XML file from WinCC project, by default the XML file will be exported within the Reports folder. This folder exists within the "IndustrialDataBridge" folder. The Reports folder includes the exported XML file.

- In WinCC OLEDB provider configuration, for use on a WinCC station, select the WinCC station name by selecting the drop down list in "WinCC station name" field.
 - In WinCC User Archive provider /consumer configuration, enter the complete computer path wherever WinCC has been installed and choose the appropriate database.
 - Configure the Where statement and advanced options for WinCC User Archive provider / consumer in connection mapping tab and create connections.
6. After performing these steps, save the project and export the configuration XML file to the IDB Getting Started folder (idb_getting_started).

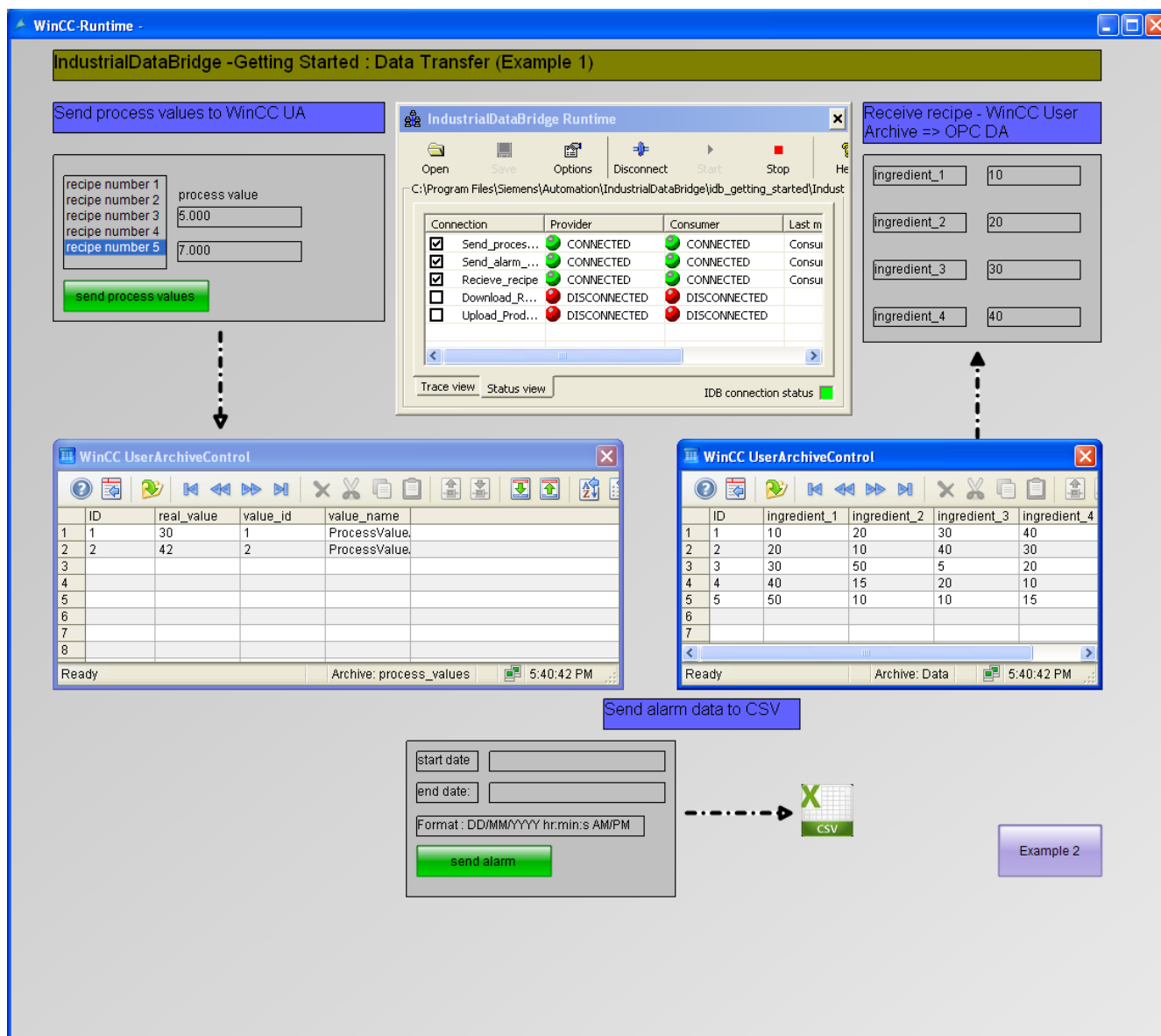
This XML file will be used in IDB Runtime application.

Note**Opening IDB configuration**

The IDB configuration required for Getting Started project can also be opened in IDB CS using "IDBProject.ip73" file. In IDB CS, click Project > Open project and click on Browse button to browse the folder structure. Select the .ip73 file existing within "IDBProject" folder by browsing the folder contents.

Viewing Example 1 in WinCC Runtime

The Example 1 displayed in WinCC Runtime includes several user controls and buttons that enables the data transfer. The text controls are provided to enter the required value in these fields. The IDB Runtime control is provided in the middle of the example screen that includes options to connect the links and initiate data transfer.



Follow the steps given below to connect the configuration and start data transfer:

1. In IDB Runtime control, select "Options" button to open the "Runtime configuration" window. In "NT Service" tab, click "Start service" button to start IDB Runtime service and click OK.
2. Next, load the configuration XML file by clicking on the Open button. Please remember to choose the appropriate configuration XML file that you exported to IDB Getting Started folder (idb_getting_started).
3. In the "Open" dialog window, browse the idb_getting_started folder contents and select the configuration file "idb_getting_started_configfile.xml". Click Open button once you have selected the XML file.

4. The list of connections will be displayed along with provider and consumer status.

Note**Connections displayed in IDB Runtime**

The IDB Runtime window displays the connections (links) that belongs to both Example 1 and Example 2. While working with each example, it is suggested to select the connections (links) that are used within the specific example.

5. Click "Connect" button to connect the provider and consumer types.
6. The status of provider and consumer will now be changed to green colour. Next, click "Start" button to start the data transfer.

Send process values to WinCC User Archive

7. In left hand portion of example screen, select the recipe from the list. Based on the selection, click "send process values" button to send the process values to WinCC User Archive.
8. The user archive values will be displayed in the "WinCC User Archive" control.

Send alarm data to CSV

9. Enter the start date and end date in "start date" and "end date" fields as per the format mentioned in the example screen.
10. Click "send alarm" button to filter the data in alarm message archive and transfer the filtered data to CSV file.

Recive recipe

11. Once data transfer is started in IDB Runtime, the ingredient values will be sent from WinCC User Archive to OPC Data Access.

Note**Switching between Example 1 and Example 2**

To switch from one example to other, click the button provided at bottom right hand portion of the example screen.

It is important to note that after switching to another example, before proceeding further, you need to stop the data transfer, disconnect the connection(s). Once you are ready, then you can start connecting the provider/consumer types and start the data transfer.

Result

You have performed the data transfer successfully and have understood the steps for connecting the configuration links and starting data transfer using IDB with the help of this example.

5.3 Getting Started Example 2

5.3.1 Introduction

Introduction

This Getting Started example helps you to understand the data transfer between process Dynamic database to WinCC User Archive using a simple recipe example. This is shown in the Getting Started Example 2.

This example helps you to perform data transfer based on the values you have entered. Further, the production results are inputted by user using the text box controls in Example 2. The production results can be updated to the Dynamic database.

Note

Example project - IDBProject

The example that includes the complete configuration provided along with Getting Started project contains a fully defined configuration, provider transfer options that are set along with connections that have already been created.

Example 2 uses the following configuration available as links. In example 2, you will create 2 links "Download_RecipeData" and "Upload_ProductionResult" within this example project.

You can view this configuration in IDB CS application.

- Dynamic Database as provider, WinCC User Archive as consumer
- WinCC User Archive as provider, Dynamic Database as consumer

- Dynamic Database - WinCC User Archive

Clicking on a button transfers or retrieves ingredients for a selected recipe from the database into the WinCC User Archive.

These ingredients are displayed in the "WinCC User Archive" in example screen.

- WinCC User Archive - Dynamic Database

Clicking on a button writes the production results (after processing the ingredients) entered by user to the database

However, in order to make you understand better, the following chapters provide information about the steps in detail for creating or configuring the connections. Each chapter includes a series of steps listed as Step 1, Step 2, Step 3 and Step 4 that guides you through the detailed procedure.

- Dynamic Database - WinCC User Archive
- WinCC User Archive - Dynamic Database

Note**Important information**

In case you do not want to perform the steps given in above mentioned chapters, and you wish to view the example in WinCC Runtime directly, it is strongly recommended to perform the steps mentioned in the chapter "Viewing Example 2 in WinCC Runtime (Page 149)".

5.3.2 Dynamic Database - WinCC User Archive

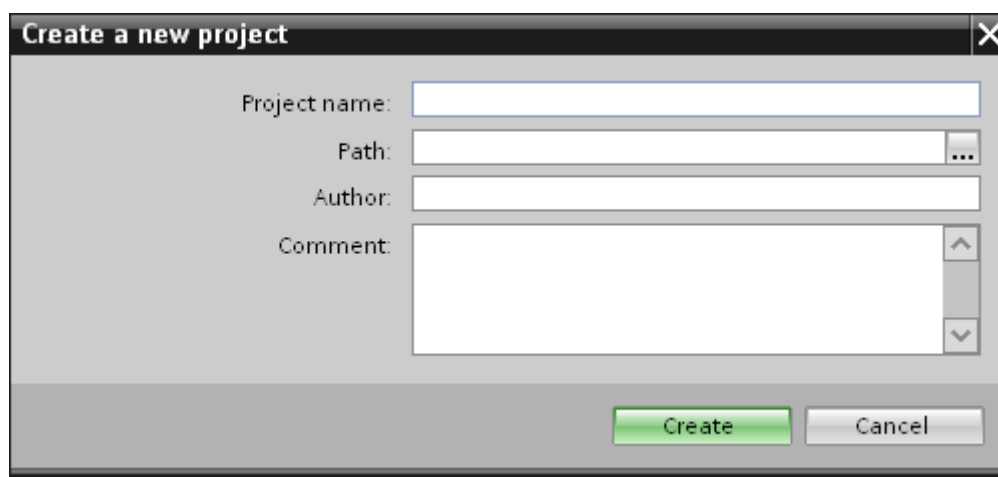
5.3.2.1 Step 1: Create Project and Link

Introduction

This chapter provides you with the complete steps for creating a project and link in IDB Configuration System application. The objective here is to create a project with corresponding link having Dynamic Database as provider and WinCC User Archive as consumer.

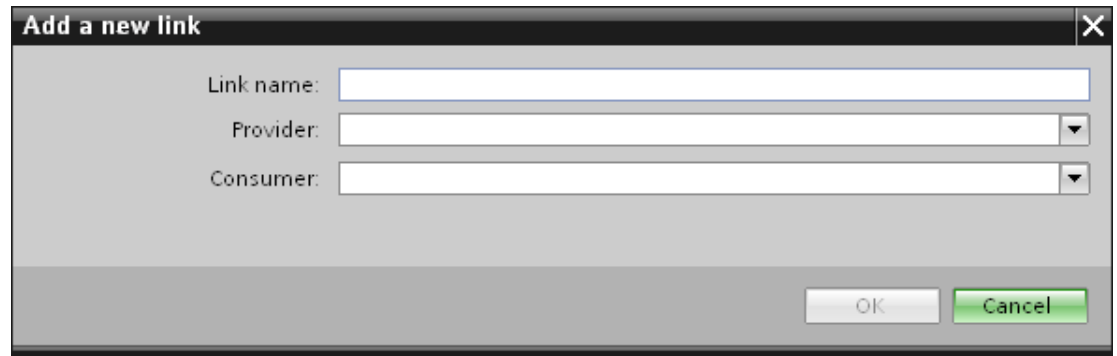
Procedure

1. Open IDB Configuration and create a project by following the steps mentioned below:



- In IDB Configuration menu, select "Project" > "Create" to create a new project.
 - In the "Create new project" dialog box, specify a project name, click [...] button and select the folder location wherever the project needs to be saved.
 - After entering the required information, select "Create" button. This creates a new project.
2. The project name will be listed within the "Project tree".

3. The next step is to create a link. Follow the steps mentioned below to create a link between provider and consumer:



- Right click on project name node in the tree structure and select "Add new link" option.
After creating a project, by default a new node "Add new link" is displayed in project tree below project name node.
Alternatively, you can create a new link by double clicking the "Add new link" node in project tree.
 - In the "Add new link" dialog that is displayed, enter a unique link name.
 - Select the provider type as Dynamic Database, consumer type as WinCC User Archive and click OK button.
 - The created link will be displayed below the project name in project tree.
4. The corresponding entries - *Provider*, *Consumer*, *Settings* and *Connections* are created as nodes that exist below the new link in the tree structure.

Result

You have created a project that consists of a link having Dynamic Database as provider and WinCC User Archive as consumer.

5.3.2.2 Step 2: Configuring an Interface

Introduction

In this chapter, you will configure the respective provider/consumer configuration along with transfer behavior settings for provider.

Procedure

1. In project tree, open the Provider configuration window by double clicking the Provider node.

Dynamic database provider configuration

Connection string

Provider=Microsoft.Jet.OLEDB.4.0;Data Source=C:\Documents and Settings\All Users\Documents\Siemens\IndustrialDataBridge\ldb_getting_started\IndustrialDataBridge

OLE DB provider(s)

☒ Microsoft Access
☐ Microsoft SQL server
☐ Oracle database
☐ MySQL

Microsoft Access

Server:

☐ Use automatic Windows authentication

Enter information to log on to the database

User name:

Password:

☐ Blank password
☒ Allow saving password

Database:

2. In Provider configuration window, perform the following settings:
 - Select the type of database by choosing the appropriate radio button.
 - If the database exists on a server location, enter the server name in "Server" field.
If you wish to enable windows authentication automatically, select the check box "Use automatic Windows authentication".
 - In "Database" field, click on [...] button and select the database from the list or from the folder structure.

Note

Server name

The "Server" field for entering the Server name, "Use automatic Windows authentication" check box and fields for entering the logon information are enabled only if you have selected a database other than Microsoft Access.

- If a user name and password has been set for the database, enter the user name and password in the "User name" and "Password" fields respectively.
If you wish to set a blank password, enable the check box "Allow saving password".
 - Click Test button to test the connection. The application tests the database connection string and verifies the selected database.
3. In Consumer configuration window, perform the following settings:

The screenshot shows the 'WinCC User Archive consumer configuration' dialog box. The 'Connection string' field is populated with a SQL Server connection string. The 'Server' field is set to '.\WinCC' and the 'Use automatic Windows authentication' checkbox is checked. In the 'Enter information to log on to the database' section, the 'User name' and 'Password' fields are empty. The 'Blank password' checkbox is unchecked, and the 'Allow saving password' checkbox is checked. The 'Database' dropdown menu is set to 'CC_idb_gett_13_02_05_13_00_39R'. A 'Test...' button is located at the bottom right of the dialog.

- Enter the server name and/or complete path of WinCC User Archive database.
- Select the database name from the list that is displayed in the "Database" field. Click on the drop down list box to view this list.
- If you wish to enable windows authentication automatically, select the check box "Use automatic Windows authentication".
- Within the section area that provides options to logon to the database, enter the user name and password.
This information is required to logon to the WinCC User Archive database.
- Click Test button to test the connection.

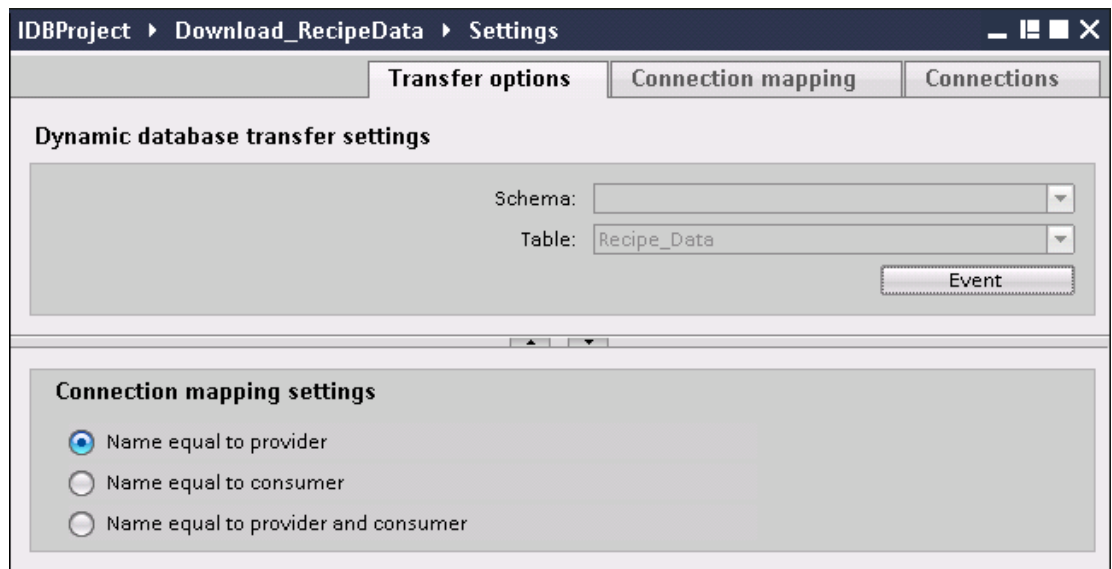
Note

User Archive

Ensure that you enter the complete path of the computer wherever WinCC has been installed. If the path name is not valid, then the "Database" field will not display any tables. Also, it is important to verify that the user archive table contains one or more rows of data.

Performing link settings

1. In project tree, double click the Settings node to open Settings window in the work area. The Settings window consists of 3 tabs - *Transfer options*, *Connection Mapping & Connections*.



2. Within the Transfer options tab, you can configure the transfer behavior settings for provider.

Note

Selecting Schema

- If you are using a database other than Microsoft Access, selection of Schema is mandatory before choosing the Table name.
- While using Microsoft Access as database, the "Schema" field is displayed in disable state and does not allow any selection of Schema.

- Select the Schema firstly (if applicable for the database) and then choose the Table name by selecting from the drop down list.
- Click "Event" button to configure the trigger provider settings. The "Trigger provider" window will be opened.

The description of the "Trigger provider" is provided in chapter "Configuring a Trigger (Page 113)".

3. The transfer behavior settings for provider will be saved automatically.

Note

Saving changes

A save operation is not required every time whenever changes are performed within the editor window in the work area. The changes made to these settings are automatically saved. However, once the project is created, at any point of time, you can save the project by selecting the "Project" > "Save" menu option.

Result

You have configured the Dynamic Database interface and WinCC User Archive as consumer. These elements are displayed in the tree structure of the configuration interface.

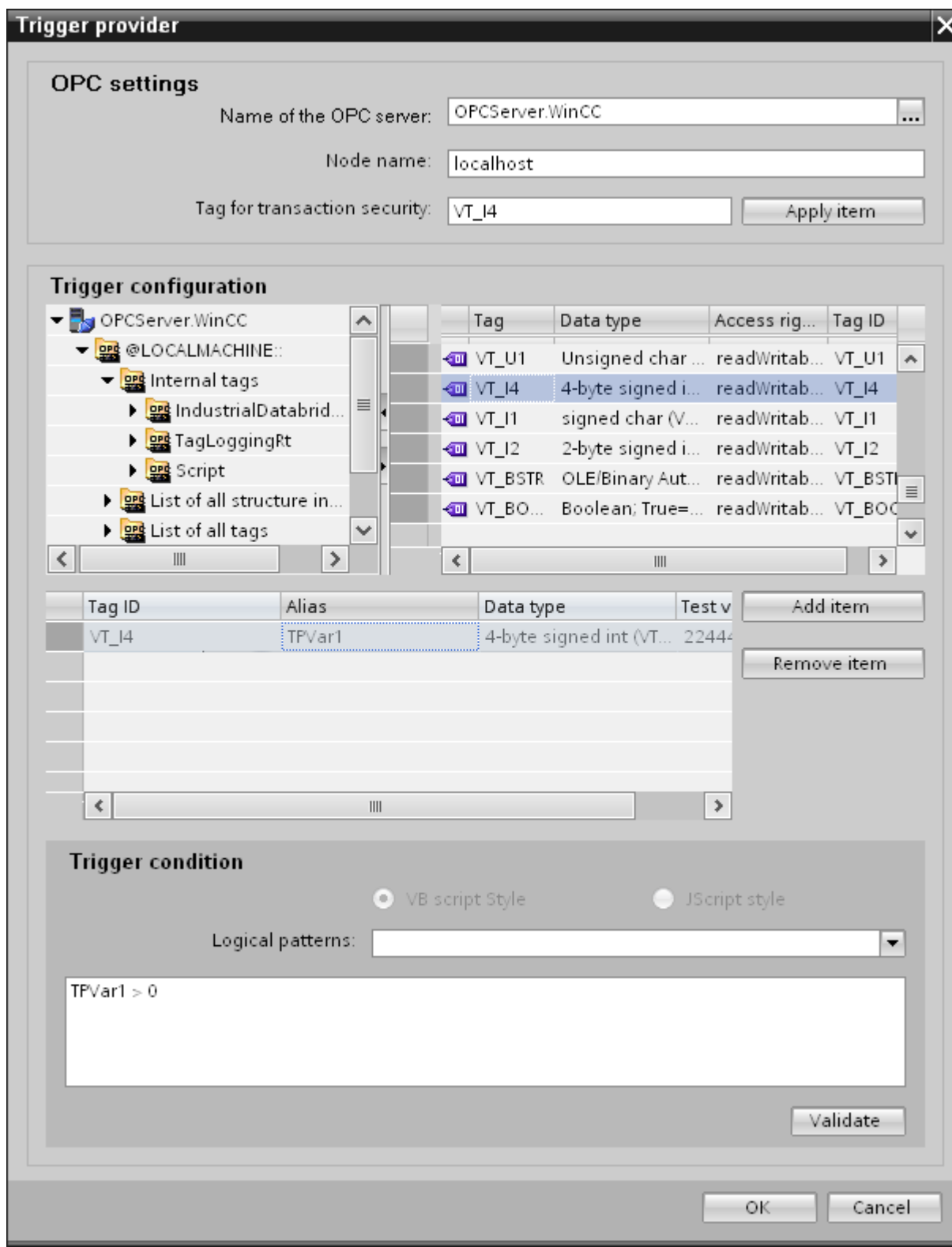
5.3.2.3 Step 3: Configuring a Trigger

Introduction

The "Trigger Provider" dialog window provides the OPC settings, Trigger configuration options and required fields that help you to configure the condition that triggers a data transfer. This dialog window is opened after clicking the "Trigger" button in *Transfer options* window.

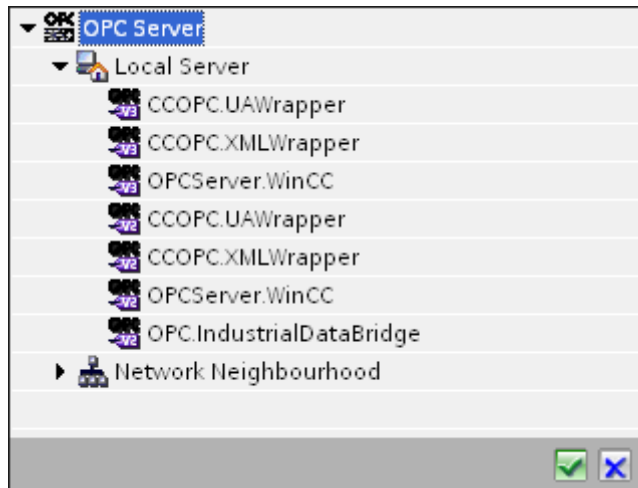
Note**OPC tag browser**

The OPC tags within "Trigger configuration" section will only be displayed if you have already selected the name of the OPC Server.



Procedure

1. In "OPC settings" area, select the OPC server by clicking on the [...] button. The selection of the server is supported by an OPC tag browser. Next, click the button representing "tick mark" to accept the changes.



2. If this server is located on another computer, enter the computer name as well. The tree structure of OPC server is displayed within "Trigger Configuration" area.

Note

Node name

For local OPC Server, the node name will display as "local host". In case of remote OPC Server, the remote computer name will be displayed after selection of OPC Server on the remote computer. This "Node name" is required for searching the OPC Server from the remote computer.

The OPC tag browser does not display any content if node name is invalid.

Note

The "OPC Server" and "Node name" fields are provided as editable fields.

If the information about OPC Server name and node name is known, you can directly enter the information in the "OPC Server" and "Node name" fields. If the node name / OPC Server name is invalid, there will be no content displayed within the OPC tag browser.

3. You can define an OPC tag on the trigger source, in which the success-/failure-status of the data transfer will be stored in the "Tag for transaction security" field. This value should have 1 byte signed char (e.g. VT_I1). -1 indicates the success state and 0 indicates failure.

Select the tag of the OPC server, in which this information is to be saved in the tag browser and click on the "Apply item" button.

4. In "Trigger Configuration" area, select the desired tags individually and accept them by clicking on "Add item" each time.

The selected tags are shown in the Tag list below.

5. Use the "Remove item" button to remove the marked item. If no item is marked for deletion, the last item from the list is deleted if you click the "Remove item" button. Details about the columns in the Tag list are located in section "Tag declaration".

Note

OPC Server

After selection of the tags and adding them to tag list, if you switch to another OPC Server in OPC Settings area, a dialog window is displayed that prompts the message whether you wish to discard previous settings.

6. In "Trigger condition" area, you can select the type of syntax with selection button "VB Style" or JScript Style". If a trigger condition is already created, this setting can no longer be changed. If the language is to be changed, the text in the "Configure Trigger Condition" field must be deleted.

Details on the programming languages are located in section "Programming Languages".

7. Create the trigger condition in the selected language. Use the Alias designations in the tag list for these tags. Within the text box displayed, enter the operator symbols using the keyboard or select them from the "Logical patterns" list box.
8. Test the created condition by clicking on "Validate". The trigger condition is calculated with the values that are entered in the "Test value" column. The result "TRUE" or "FALSE" is shown in a message box.
9. If the trigger condition provides the correct result and after confirming the changes, close the dialog by clicking on "OK" button.

Additional Information

Tag declaration

The columns for the tag declaration contain the following:

- Data type: Data type of the tag. If the data type defined here does not match that on the server, an attempt to convert the data type is made.
- TagID: The TagID of the tag on the OPC server
- Alias: The alias is used for creating the trigger condition. This name must be unique and it must correspond with the naming conventions of the allocated programming languages. For more detailed information about the naming conventions, see paragraph "Valid alias names".

- **Confirmation value:** The confirmation value is the value that the variable takes on after fulfilling the trigger condition and the values have been delivered to the consumer. The default value is "<Empty>", i.e., no confirmation value is written.
- **Test value:** This value is only for testing the trigger condition and has no influence on the later data exchange. The test values are to be selected and changed so that they test whether the trigger condition delivers the expected result in all operating conditions.

Note**Confirmation value**

The confirmation value does not give any information on whether a transaction has been completed successfully.

Note**Necessity of Alias names**

The OPC ItemID is not used because it may possibly not correspond with the tag validity criteria, for instance, a "Point" in the tag name is not allowed.

Valid Alias names

A valid alias must correspond with the following rules:

- Letters (no umlaut characters or ß), numbers and underscore character (_) are allowed.
- The first character must be a letter or underscore.
- An alias can be as long as you require.
- Key words from VB script or J script are not allowed. Note the respective language description for this.
- Case sensitive (upper and lower case letters).
("tag" is not the same as "Tag").

Programming languages

You can use VBScript or JScript for the trigger condition.

The following table shows the operator type and their symbols in both languages:

Type	VBScript	JScript
Logical NOT	NOT	!
Logical AND	AND	&&
Logical OR	OR	
multiplication	*	*
division	/	/

Type	VBScript	JScript
addition	+	+
subtraction	-	-
Not equal to	<>	!=
Less than	<	<
Greater than	>	>
Comparison	=	==
Assignment	<not possible>	=
True	true or True	true
Incorrect	false or False	false
string	<Quotation Marks>	<Quotation Marks>

It is recommended to use these operators only. Other operators can be found in the language descriptions for the respective language

Note**Loss of Trigger Events**

The triggering depends on the update speed of the OPC server. In this case, note that data changes that occur within an update cycle are not considered by the trigger. That means that a faster change of a tag from 1 - 0 - 1 is not necessarily indicated to the trigger provider by the OPC server, since the 1 exists at the end again and no value change exists at the check time. This means that a potentially true condition is not recognized as being true and therefore will not lead to a data transfer.

Configurations, with which the confirmation value is to set a "true" trigger condition to "false" again, are not secure because of the statement above. When data changes occur too quickly, the "true value" may stay the same or values can be left out.

5.3.2.4 Step 4: Connecting Tags

Introduction

This chapter provides the steps for performing connection mapping between provider and consumer.

Connecting Tags

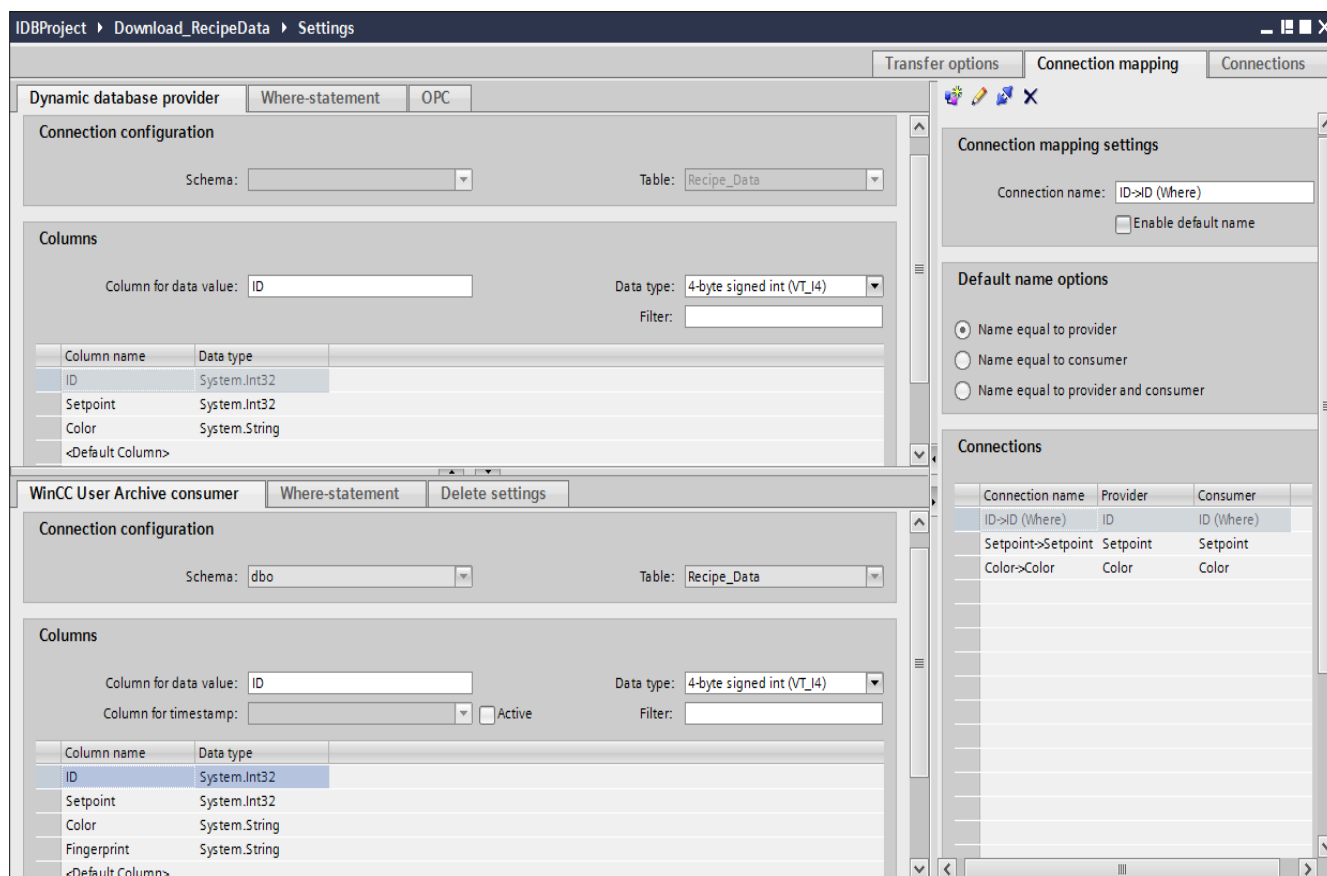
In "Settings" window, the "Connection mapping" tab includes the required fields to connect tags that have been sent from the Dynamic database interface with the selected data consumer. The Connection mapping tab divides the window into 3 sections

- Dynamic database provider
- WinCC User Archive consumer
- Connection mapping settings

Note

Select OPC Server

In order to configure the settings in the "Where Statement" tab, you must have selected an OPC server in the link settings in dialog "Trigger Provider (Page 113)". This dialog window is accessed by clicking on the "Event" button in "Transfer options" tab.



Dynamic Database

The "Dynamic database provider" section is displayed at top left portion of "Connection mapping" tab. This section provides you with required options to choose schema, table name and column names to be mapped. The "WinCC User Archive Consumer" section is displayed to bottom left portion of "Connection mapping" tab. This section provides you with required options to choose schema, table name and column names to be mapped with the columns existing within Dynamic Database (provider).

The separator between the provider and consumer section provides a resize handle that helps you to resize the height of the section in order to view the fields within the section clearly.

The "Connection mapping settings" section is displayed at right side of "Connection mapping" tab. This section helps you to provide a name for connection along with options for choosing default name for connection. The "Connect", "Modify connection", "Delete connection" and "Delete all connections" icons are provided at the top portion of this section.

Note

Selecting Schema

- If you are using a database other than Microsoft Access, selection of Schema is mandatory before choosing the Table name.
 - While using Microsoft Access as database, the "Schema" field is displayed in disable state and does not allow any selection of Schema.
-

The "Dynamic Database provider" section consists of 3 tabs:

- Dynamic Database provider
- Where-Statement
- OPC

Where-statement

Note

Select OPC Server

In order to configure the settings in the "Where Statement" tab, you must have selected an OPC server in the link settings in dialog "Trigger Provider". This dialog window is accessed by clicking on the "Event" button in "Transfer options" tab.

Note

Columns

The column names displayed as shown in screenshot might vary depending on the table that is being used in Where statement.

Where statement - Add columns

Column selection

Fieldname: Data type:

Fieldname	DB-Datatype
ID	System.Int32
Number	System.Int32
Name	System.String
Ingredient	System.Int32
Amount	System.Int32

WHERE

Select the OPC-variable

Tag: Data type:

Tag	Data type	Access rights	Tag ID
TimeZone	2-byte signed int ...	readWritable	TimeZone
TriggerWinCCO...	Boolean; True=-1,...	readWritable	TriggerWinCCO...
TriggerEnd	OLE/Binary Auto...	readWritable	TriggerEnd
TriggerStart	OLE/Binary Auto...	readWritable	TriggerStart
TriggerWinCCO...	Boolean; True=-1,...	readWritable	TriggerWinCCO...
A_VT_I4	4-byte signed int ...	readWritable	A_VT_I4
A_VT_R8	8-byte real (VT_R8)	readWritable	A_VT_R8
A_VT_R4	4-byte real (VT_R4)	readWritable	A_VT_R4

OK Cancel

The SQL String that describes the access location for reading the data is shown on this tab. The "Where-statement" tab mainly includes the "WHERE" section and text area for displaying the "Resulting SQL-String".

Follow the steps provided below to configure the Where statement:

1. Within Where statement tab, click "Add" button to open the dialog that provides you with options to select the column in order to compare the content.
2. Select the Fieldname you wish to check for a certain value. The selected field name is displayed in "Fieldname" field. The data type for this field name is automatically selected in the "Data type" field.
3. This "Fieldname" is shown in the "WHERE" text box. Choose the operator symbol from the drop down list that is used for comparison.
4. In "OPC-variable" section, select the OPC tag, the value of which is compared with the previously selected column entry. Then, click OK button.

5. The condition is shown in the table within "Where" section and is entered in the "Resulting SQL String" field.
6. To remove an already existing "Resulting SQL String", click "Remove" button.
7. To define multiple conditions, repeat steps 1 to 5.

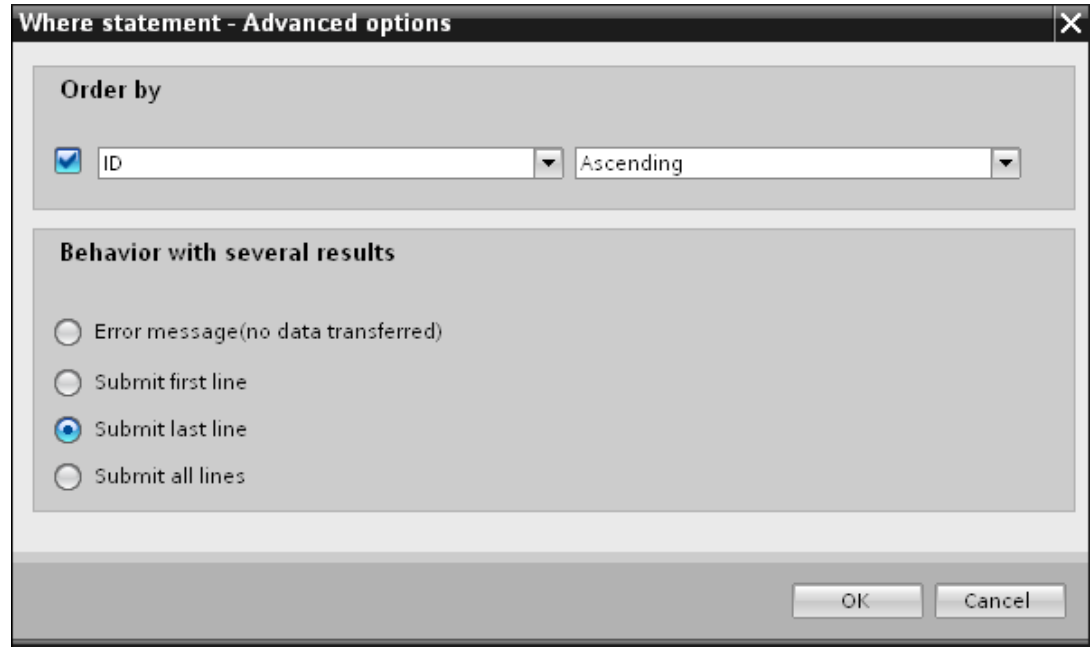
Note

SQL String

- If multiple conditions are configured, they are connected with a logical "AND".
 - Only data records (lines) are requested from the IDB and transferred in which all conditions have been met.
 - An optional connection is not possible with a logical "OR".
-

Advanced:

Using button "Advanced", you can define the sort sequence and the behavior when multiple data records exist.



- **Order By**
Select the selection field. You can then define the column name and the sort direction.
- **Behaviour with several results:**
Select one of the following option fields and click OK button. Based on selected radio button, you can decide the action to be performed:
 - Error message (no data transferred)
 - Submit first line
 - Submit last line
 - Submit all lines

Standard settings for these options are:

- No sorting
- Error message (no data transferred)

OPC tab

Note

Select OPC Server

In order to configure the settings on the "OPC" tab, you must have selected an OPC server in the link settings in dialog "Trigger Provider (Page 113)". This dialog window is accessed by clicking on the "Event" button in "Transfer options" tab.

1. In the "Dynamic database provider" area, navigate to OPC tab. The OPC tab mainly includes the OPC tag browser and "Configure provider OPC tag" area.
2. In OPC tag browser, select the tag for which the values should be transferred. The selected tag is shown in the "TagID" field. The data type is chosen according to the selection.
3. If the selected tag has Array data type, then the "Array" check box is automatically enabled. This check box is provided below the "Data type" field.
4. Next, configure the consumer tag in the "Database consumer" section by following these steps:
 - The selected table is shown in the "Table" field. The schema (if selected at provider side) is displayed in the "Schema" field.
 - The column names are displayed within "Columns" area. If the table has columns with respective data types, the time stamp can also be written to the table. In this case, select the respective "Active" check box and select the column within "Column for timestamp" field.

5. Select the Column name that you wish to connect with the OPC tag. The selected column is displayed in "Column for data value" field of WinCC User Archive consumer.
6. Check the name of the connection in the "Connection mapping settings" area to the right. Enter a unique name for the connection in the "Connection name" field or use the options within "Default name options". Click "Connect" button to confirm your entries.
7. Repeat steps 1 to 5 for all elements of the "Dynamic database" that you wish to transfer.

Note**Array**

If the OPC provider tag has a data type of array data type and if the database consumer column has data type other than array data type, after clicking on the Connect button, the "Array" check box in the "OPC tab" is automatically unchecked.

WinCC User Archive consumer

In Connection mapping tab, the WinCC User Archive consumer section is displayed at bottom left hand side of Connection mapping tab. This section area exists below the Dynamic database provider section area. The WinCC User Archive consumer includes the following 3 tabs:

- WinCC User Archive consumer
- Where-statement
- Delete settings

The WinCC User Archive consumer section provides you with required options to choose schema, table name and column names to be mapped with the column(s) existing within Dynamic database provider. A specific connection can be created between the Dynamic database provider column and the column (belonging to WinCC User Archive consumer) selected in the Where statement tab. You can create a new connection or else modify an existing connection to apply Where statement on the selected column.

Where-statement

The Where statement is required to be configured in order to select the column within the WinCC User Archive Consumer. The "Where-statement" tab mainly includes the "Where statement" configuration section and exception handling section.

Follow the steps given below to perform a connection mapping:

1. In the "Dynamic database provider" section, at the (top left), select the column for which the where statement (WinCC User Archive consumer) needs to be applied.
2. Upon selection, the column name is displayed in "Column for data value" field. The data type is selected automatically based on selection of column name.

3. In the "Where-column" field, select the column that is to be used for the Where Statement. If a value needs to be written to the database, this column is compared with the connected provider column(s). Only lines in which both values match are updated.
4. The behavior is defined in the "Exceptional handling" section if the selection of the consumer row is not unique:
 - Error Message: No consumer rows lines are overwritten and an error message is given as an output in the trace view of IDB Runtime.
 - Change all rows: All selected consumer rows are overwritten.
 - Using the "Enable Insert" check box, you define the behavior if a line with the key (primary key) does not exist. If the option is selected, a new line with the respective key is created.

Note

Simultaneous Utilization as Key and Consumer Column

In order to have more setting ability with the configuration, you can use a column as a key column and as a target column simultaneously. Take note that this causes the data in the database to be inconsistent and/or future access to the WinCC User Archive consumer may result in errors.

5. Check the name of the connection in the "Connection mapping settings" area (right). Enter a unique name for the connection in the "Connection name" field or use the options within "Default name options". Click "Connect" button to confirm your entries.

Delete settings

With "WinCC User Archive consumer", you are able to delete data records from the User Archive. This requires connecting a provider column with a consumer column. If the delete condition has been met, the data record of the consumer column is deleted from the user archive. Delete has priority over "Insert" and "Update" actions.

Follow the steps given below to perform a connection mapping:

1. In the "Dynamic database provider" section, at the (top left), select the column for which the values should be compared.
2. Upon selection, the column name is displayed in "Column for data value" field. The data type is selected automatically based on selection of column name.
3. In "Delete settings" tab, enable the "Delete possible" check box and enter a value for the delete column in the "Value for delete variable" field.

If the connecting provider column takes on this value, the respective data record that contains this value is deleted from the User Archive based on the Where statement.

4. Check the name of the connection in the connection area (right). Enter a unique name for the connection in the Connection field or use the Default name convention. Click "Connect" button to confirm your entries.

Connection mapping

1. In Dynamic database provider, the selected archive is shown in the "Table" field. Select the Schema if applicable by selecting from the drop down list in "Schema" text box.
2. The Column names are displayed within "Columns" area. Select a Column name from the list. The selected column is displayed in "Column for data value" field. The data type is shown automatically.
3. The "Filter" field provides you the option to filter the Column names based on single character or first few characters of column name.

For example, if you wish to view the column names starting with "S", type this character in "Filter" text box. All column names starting with "S" are displayed.
4. Next, configure the consumer tag in the "WinCC User Archive consumer" section by following these steps:
 - The selected table is shown in the "Table" field. Select the Schema if applicable by selecting from the drop down list in "Schema" text box.
 - The column names are displayed within "Columns" area. If the table has columns with respective data types, the time stamp can also be written to the table. In this case, select the respective "Active" check box and select the column within "Column for timestamp" field.
5. Select the Column name that you wish to connect with "Dynamic database" column.

The selected column is displayed in "Column for data value" field.
6. Check the name of the connection in the "Connection mapping settings" area to the right. Enter a unique name for the connection in the "Connection name" field or use the options within "Default name options". Click "Connect" button to confirm your entries.

Note

Data type conversion

If the provider column does not match with consumer column, IDB CS converts the data type to match with data type of provider. A status window is displayed to indicate this change.

7. Repeat steps 1 to 6 for all elements of the "Dynamic database provider" that you wish to transfer.

5.3.3 WinCC User Archive - Dynamic Database

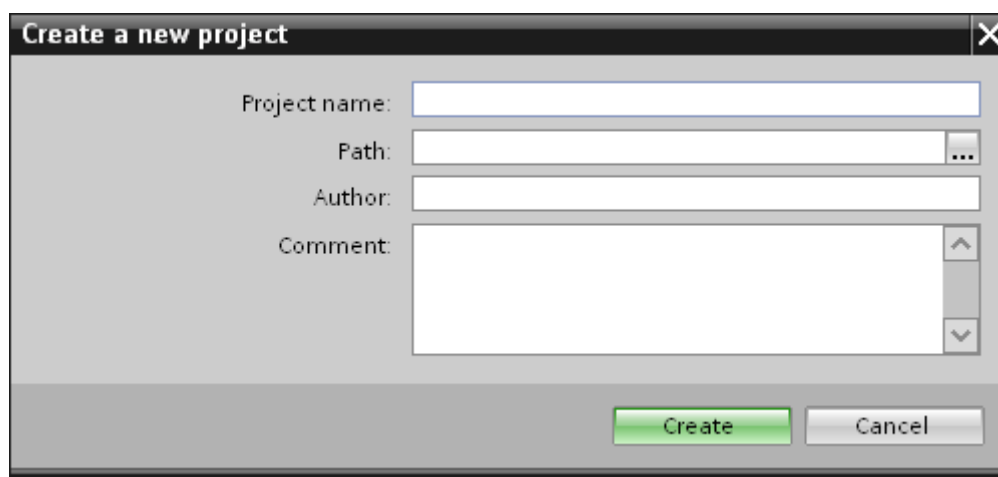
5.3.3.1 Step 1: Create Project and Link

Introduction

This chapter provides you with the complete steps for creating a project and link in IDB Configuration System application. The objective here is to create a project with corresponding link having WinCC User Archive as provider and Dynamic Database as consumer.

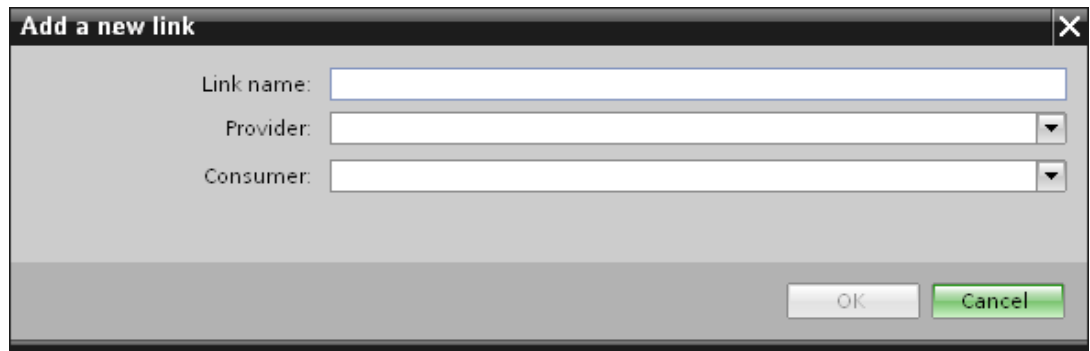
Procedure

1. Open IDB Configuration and create a project by following the steps mentioned below:



- In IDB Configuration menu, select "Project" > "Create" to create a new project.
 - In the "Create new project" dialog box, specify a project name, click [...] button and select the folder location wherever the project needs to be saved.
 - After entering the required information, select "Create" button. This creates a new project.
2. The project name will be listed within the "Project tree".

3. The next step is to create a link. Follow the steps mentioned below to create a link between provider and consumer:



- Right click on project name node in the tree structure and select "Add new link" option.
After creating a project, by default a new node "Add new link" is displayed in project tree below project name node.
Alternatively, you can create a new link by double clicking the "Add new link" node in project tree.
 - In the "Add new link" dialog that is displayed, enter a unique link name.
 - Select the provider type as WinCC User Archive, consumer type as Dynamic Database and click OK button.
 - The created link will be displayed below the project name in project tree.
4. The corresponding entries - *Provider*, *Consumer*, *Settings* and *Connections* are created as nodes that exist below the new link in the tree structure.

Result

You have created a project that consists of a link having WinCC User Archive as provider and Dynamic Database as consumer.

5.3.3.2 Step 2: Configuring an Interface

Introduction

In this chapter, you will configure the respective provider/consumer configuration along with transfer behavior settings for provider.

Procedure

1. In project tree, open the Provider configuration window by double clicking the Provider node.

WinCC User Archive provider configuration

Connection string

Provider=SQLOLEDB.1;Data Source=\\WinCC;Initial Catalog=CC_idb_gett_13_02_05_13_00_39R;Persist Security Info=False;Integrated Security=SSPI;

Server: \\WinCC

☒ Use automatic Windows authentication

Enter information to log on to the database

User name:

Password:

☐ Blank password

☒ Allow saving password

Database: CC_idb_gett_13_02_05_13_00_39R

Test...

2. In Provider configuration window, perform the following settings:
 - Enter the server name and/or complete path of WinCC User Archive database.
 - Select the database name from the list that is displayed in the "Database" field. Click on the drop down list box to view this list.
 - If you wish to enable windows authentication automatically, select the check box "Use automatic windows authentication".
 - Within the section area that provides options to logon to the database, enter the user name and password.

This information is required to logon to the WinCC User Archive database.
 - Click Test button to test the connection. Next, double click the Consumer node in project tree.

Note

User Archive

Ensure that you enter the complete path of the computer wherever WinCC has been installed. If the path name is not valid, then the "Database" field will not display any tables. Also, it is important to verify that the user archive table contains one or more rows of data.

3. In Consumer configuration window, perform the following settings:

Dynamic database consumer configuration

Connection string

Provider=Microsoft.Jet.OLEDB.4.0;Data Source=C:\Documents and Settings\All Users\Documents\Siemens\IndustrialDataBridge\idb_getting_started\IndustrialDataBridge

OLE DB consumer(s)

☒ Microsoft Access
☐ Microsoft SQL server
☐ Oracle database
☐ MySQL

Microsoft Access

Server:

☐ Use automatic Windows authentication

Enter information to log on to the database

User name:

Password:

☐ Blank password
☒ Allow saving password

Database: C:\Documents and Settings\All Users\Documents\Siemens\IndustrialDataBridge\idb_getting_started\IndustrialData...

- Select the type of database by choosing the appropriate radio button.
- If the database exists on a server location, enter the server name in "Server" field.
If you wish to enable windows authentication automatically, select the check box "Use automatic Windows authentication".
- In "Database" field, click on [...] button and select the database from the list or from the folder structure.

Note

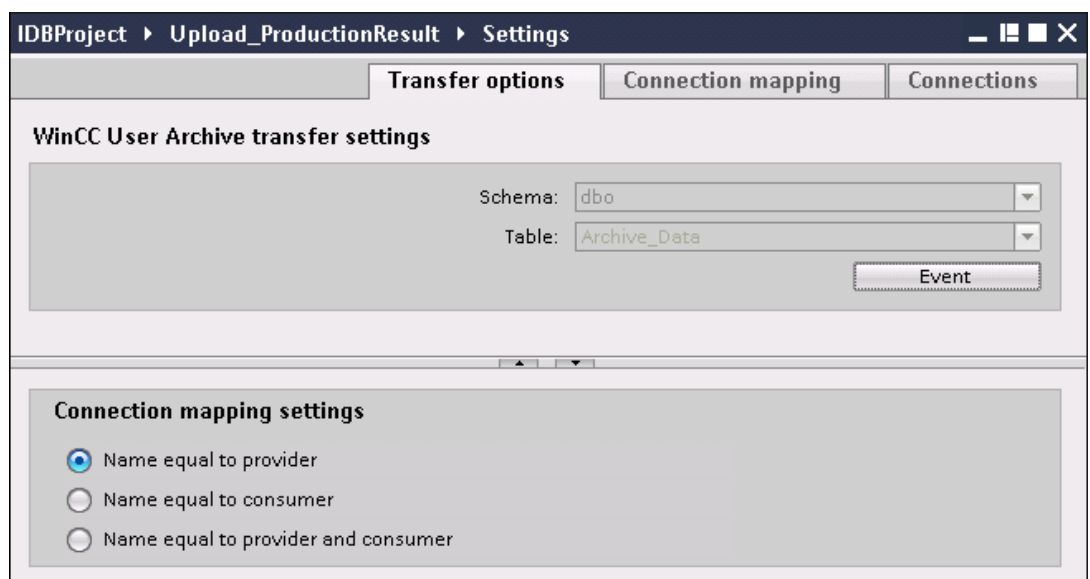
Server name

The "Server" field for entering the Server name, "Use automatic Windows authentication" check box and fields for entering the logon information are enabled only if you have selected a database other than Microsoft Access.

- If a user name and password has been set for the database, enter the user name and password in the "User name" and "Password" fields respectively.
If you wish to set a blank password, enable the check box "Allow saving password".
- Click Test button to test the connection. The application tests the database connection string and verifies the selected database.

Performing link settings

1. In project tree, double click the Settings node to open Settings window in the work area. The Settings window consists of 3 tabs - *Transfer options*, *Connection Mapping & Connections*.



2. Within the Transfer options tab, you can configure the transfer behavior settings for provider.
 - Select the Table name by selecting from the drop down list.

Note

Schema

- In WinCC User Archive, a default schema is selected automatically in the Transfer options tab.
-

3. Click "Event" button to configure the trigger provider settings. The "Trigger provider" dialog will be opened.

The description of the "Config Trigger dialog" is provided in chapter "Configuring a Trigger (Page 135)"

4. The transfer behavior settings for provider will be saved automatically.

Note

Saving changes

A save operation is not required every time whenever changes are performed within the editor window in the work area. The changes made to these settings are automatically saved. However, once the project is created, at any point of time, you can save the project by selecting the "Project" > "Save" menu option.

Result

You have configured the WinCC User Archive interface and Dynamic Database consumer including the provider transfer options. These elements are displayed in the tree structure of the IDB configuration interface.

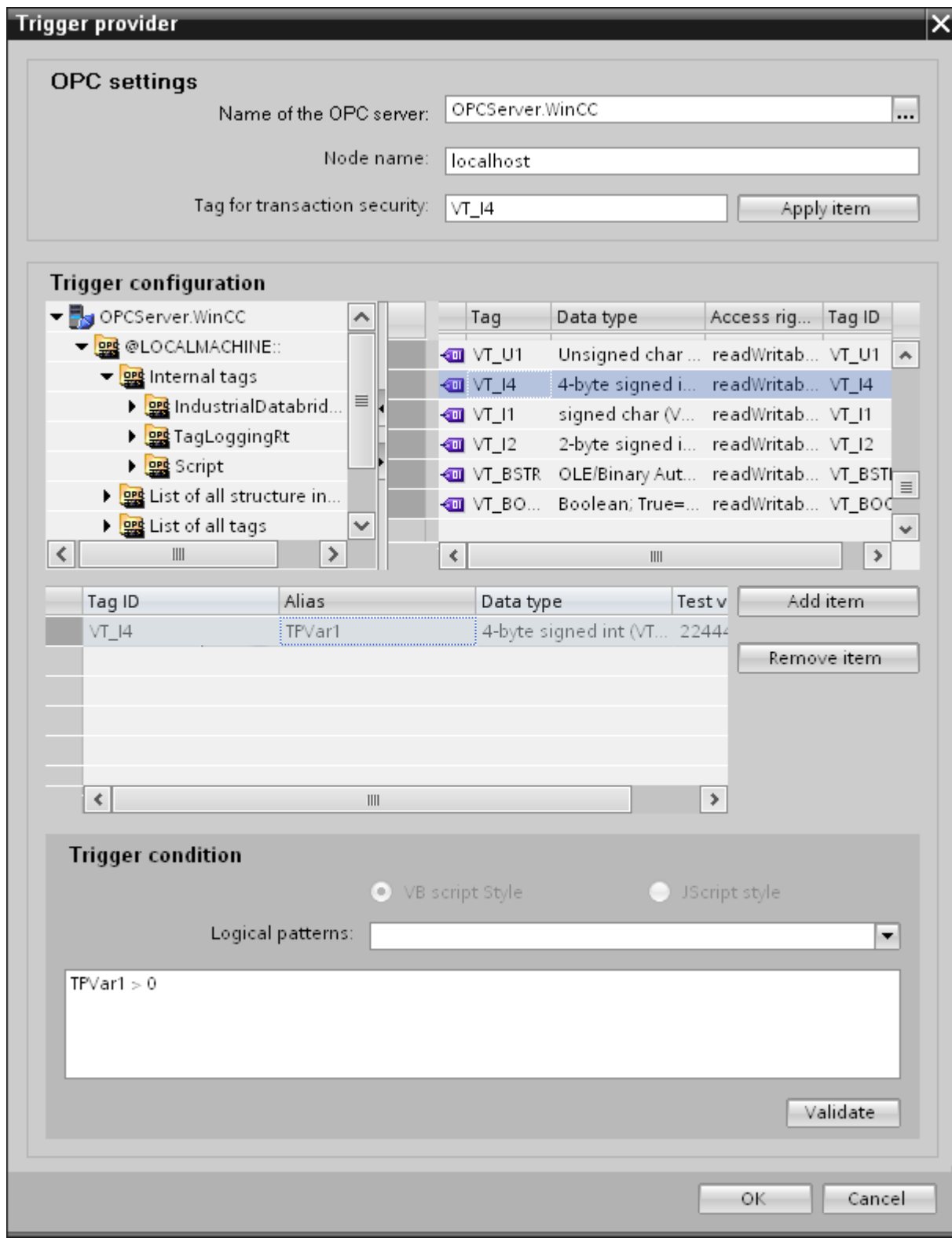
5.3.3.3 Step 3: Configuring a Trigger

Introduction

The "Trigger Provider" dialog window provides the OPC settings, Trigger configuration options and required fields that help you to configure the condition that triggers a data transfer. This dialog window is opened after clicking the "Trigger" button in *Transfer options* window.

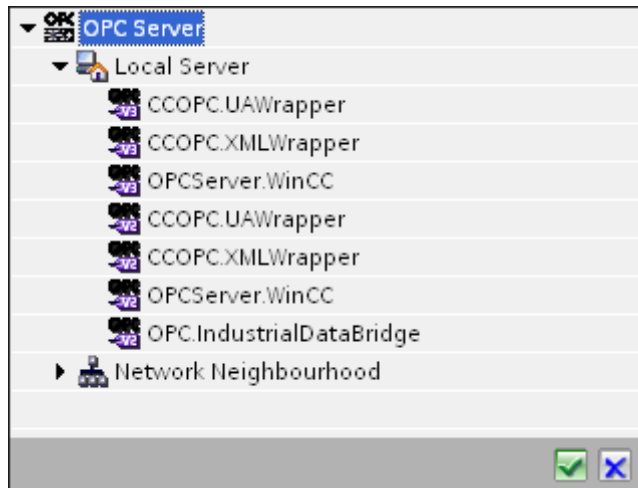
Note**OPC tag browser**

The OPC tags within "Trigger configuration" section will only be displayed if you have already selected the name of the OPC Server.



Procedure

1. In "OPC settings" area, select the OPC server by clicking on the [...] button. The selection of the server is supported by an OPC tag browser. Next, click the button representing "tick mark" to accept the changes.



2. If this server is located on another computer, enter the computer name as well. The tree structure of OPC server is displayed within "Trigger Configuration" area.

Note

Node name

For local OPC Server, the node name will display as "local host". In case of remote OPC Server, the remote computer name will be displayed after selection of OPC Server on the remote computer. This "Node name" is required for searching the OPC Server from the remote computer.

The OPC tag browser does not display any content if node name is invalid.

Note

The "OPC Server" and "Node name" fields are provided as editable fields.

If the information about OPC Server name and node name is known, you can directly enter the information in the "OPC Server" and "Node name" fields. If the node name / OPC Server name is invalid, there will be no content displayed within the OPC tag browser.

3. You can define an OPC tag on the trigger source, in which the success-/failure-status of the data transfer will be stored in the "Tag for transaction security" field. This value should have 1 byte signed char (e.g. VT_I1). -1 indicates the success state and 0 indicates failure.

Select the tag of the OPC server, in which this information is to be saved in the tag browser and click on the "Apply item" button.

4. In "Trigger Configuration" area, select the desired tags individually and accept them by clicking on "Add item" each time.

The selected tags are shown in the Tag list below.

5. Use the "Remove item" button to remove the marked item. If no item is marked for deletion, the last item from the list is deleted if you click the "Remove item" button. Details about the columns in the Tag list are located in section "Tag declaration".

Note

OPC Server

After selection of the tags and adding them to tag list, if you switch to another OPC Server in OPC Settings area, a dialog window is displayed that prompts the message whether you wish to discard previous settings.

6. In "Trigger condition" area, you can select the type of syntax with selection button "VB Style" or JScript Style". If a trigger condition is already created, this setting can no longer be changed. If the language is to be changed, the text in the "Configure Trigger Condition" field must be deleted.

Details on the programming languages are located in section "Programming Languages".

7. Create the trigger condition in the selected language. Use the Alias designations in the tag list for these tags. Within the text box displayed, enter the operator symbols using the keyboard or select them from the "Logical patterns" list box.
8. Test the created condition by clicking on "Validate". The trigger condition is calculated with the values that are entered in the "Test value" column. The result "TRUE" or "FALSE" is shown in a message box.
9. If the trigger condition provides the correct result and after confirming the changes, close the dialog by clicking on "OK" button.

Additional Information

Tag declaration

The columns for the tag declaration contain the following:

- Data type: Data type of the tag. If the data type defined here does not match that on the server, an attempt to convert the data type is made.
- TagID: The TagID of the tag on the OPC server
- Alias: The alias is used for creating the trigger condition. This name must be unique and it must correspond with the naming conventions of the allocated programming languages. For more detailed information about the naming conventions, see paragraph "Valid alias names".

- **Confirmation value:** The confirmation value is the value that the variable takes on after fulfilling the trigger condition and the values have been delivered to the consumer. The default value is "<Empty>", i.e., no confirmation value is written.
- **Test value:** This value is only for testing the trigger condition and has no influence on the later data exchange. The test values are to be selected and changed so that they test whether the trigger condition delivers the expected result in all operating conditions.

Note**Confirmation value**

The confirmation value does not give any information on whether a transaction has been completed successfully.

Note**Necessity of Alias names**

The OPC ItemID is not used because it may possibly not correspond with the tag validity criteria, for instance, a "Point" in the tag name is not allowed.

Valid Alias names

A valid alias must correspond with the following rules:

- Letters (no umlaut characters or ß), numbers and underscore character (_) are allowed.
- The first character must be a letter or underscore.
- An alias can be as long as you require.
- Key words from VB script or J script are not allowed. Note the respective language description for this.
- Case sensitive (upper and lower case letters).
("tag" is not the same as "Tag").

Programming languages

You can use VBScript or JScript for the trigger condition.

The following table shows the operator type and their symbols in both languages:

Type	VBScript	JScript
Logical NOT	NOT	!
Logical AND	AND	&&
Logical OR	OR	
multiplication	*	*
division	/	/

Type	VBScript	JScript
addition	+	+
subtraction	-	-
Not equal to	<>	!=
Less than	<	<
Greater than	>	>
Comparison	=	==
Assignment	<not possible>	=
True	true or True	true
Incorrect	false or False	false
string	<Quotation Marks>	<Quotation Marks>

It is recommended to use these operators only. Other operators can be found in the language descriptions for the respective language

Note**Loss of Trigger Events**

The triggering depends on the update speed of the OPC server. In this case, note that data changes that occur within an update cycle are not considered by the trigger. That means that a faster change of a tag from 1 - 0 - 1 is not necessarily indicated to the trigger provider by the OPC server, since the 1 exists at the end again and no value change exists at the check time. This means that a potentially true condition is not recognized as being true and therefore will not lead to a data transfer.

Configurations, with which the confirmation value is to set a "true" trigger condition to "false" again, are not secure because of the statement above. When data changes occur too quickly, the "true value" may stay the same or values can be left out.

5.3.3.4 Step 4: Connecting Tags

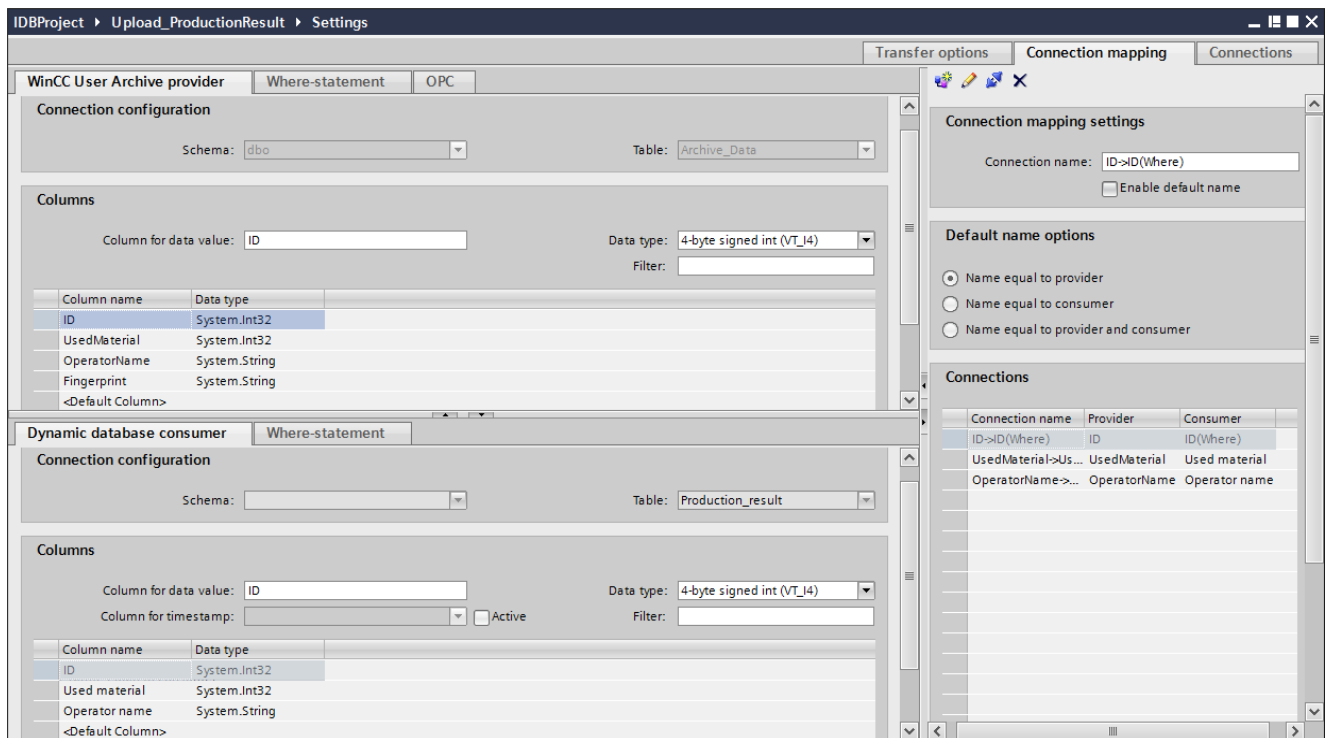
Introduction

This chapter provides the steps for performing connection mapping between provider and consumer.

Connecting Tags

In "Settings" window, the "Connection mapping" tab includes the required fields to connect tags that have been sent from the WinCC User Archives interface with the selected consumer. The Connection mapping tab divides the window into 3 sections

- WinCC User Archive provider
- Dynamic Database consumer
- Connection mapping settings



WinCC User Archive provider

The "WinCC User Archive Provider" section is displayed at top left portion of "Connection mapping" tab. This section provides you with required options to choose schema, table name and column names to be mapped. The "Dynamic Database consumer" section exists below the provider section and lists the column values that can be mapped with the columns existing within WinCC User Archive database.

The separator between the provider and consumer section provides a resize handle that helps you to resize the height of the section in order to view the fields within the section clearly.

The "Connection mapping settings" section is displayed at right side of "Connection mapping" tab. This section helps you to provide a name for connection along with options for choosing default name for connection. The "Connect", "Modify connection", "Delete connection" and "Delete all connections" icons are provided at the top portion of this section.

The "WinCC User Archive provider" section consists of 3 tabs:

- WinCC User Archive
- Where-Statement
- OPC

Where-statement

Note

Select OPC server

In order to configure the settings on the "Where Statement" tab, you must have selected an OPC server in the dialog "Trigger Provider (Page 135)". This dialog window is accessed by clicking on the "Event" button in "Transfer options" tab.

Note

Columns

The column names shown in screenshot might vary and is dependent on the table selected.

The SQL String that describes the access location for reading the data is shown on this tab. The "Where-statement" tab mainly includes the "WHERE" section and text area for displaying the "Resulting SQL-String".

Where statement - Add columns

Column selection

Fieldname: Data type:

Fieldname	DB-Datatype
ID	System.Int32
Number	System.Int32
Name	System.String
Ingredient	System.Int32
Amount	System.Int32

WHERE

Select the OPC-variable

Tag: Data type:

	Tag	Data type	Access rights	Tag ID
OPCServer.WinCC				
@LOCALMACHINE::				
Internal tags				
List of all structure instances				
List of all tags				
OPC				
	TimeZone	2-byte signed int ...	readWritable	TimeZone
	TriggerWinCCO...	Boolean; True=-1,...	readWritable	TriggerWinCCO...
	TriggerEnd	OLE/Binary Auto...	readWritable	TriggerEnd
	TriggerStart	OLE/Binary Auto...	readWritable	TriggerStart
	TriggerWinCCO...	Boolean; True=-1,...	readWritable	TriggerWinCCO...
	A_VT_I4	4-byte signed int ...	readWritable	A_VT_I4
	A_VT_R8	8-byte real (VT_R8)	readWritable	A_VT_R8
	A_VT_R4	4-byte real (VT_R4)	readWritable	A_VT_R4

OK Cancel

Follow the steps given below to configure the Where statement:

1. Click "Add" button to open the dialog that provides you with options to select the column in order to compare the content.
2. Select the Fieldname you wish to check for a certain value. The selected field name is displayed in "Fieldname" field. The data type for this field name is automatically selected in the "Datatype" field.
3. This "Fieldname" is shown in the "WHERE" text box. Choose the operator symbol from the drop down list that is used for comparison.
4. In "OPC-variable" section, select the OPC tag, the value of which is compared with the previously selected column entry. Then, click OK button.
5. The condition is shown in the table within "Where" section and is entered in the "Resulting SQL String" field.

6. To remove an already existing "Resulting SQL String", click "Remove" button.
7. To define multiple conditions, repeat steps 1 to 5.

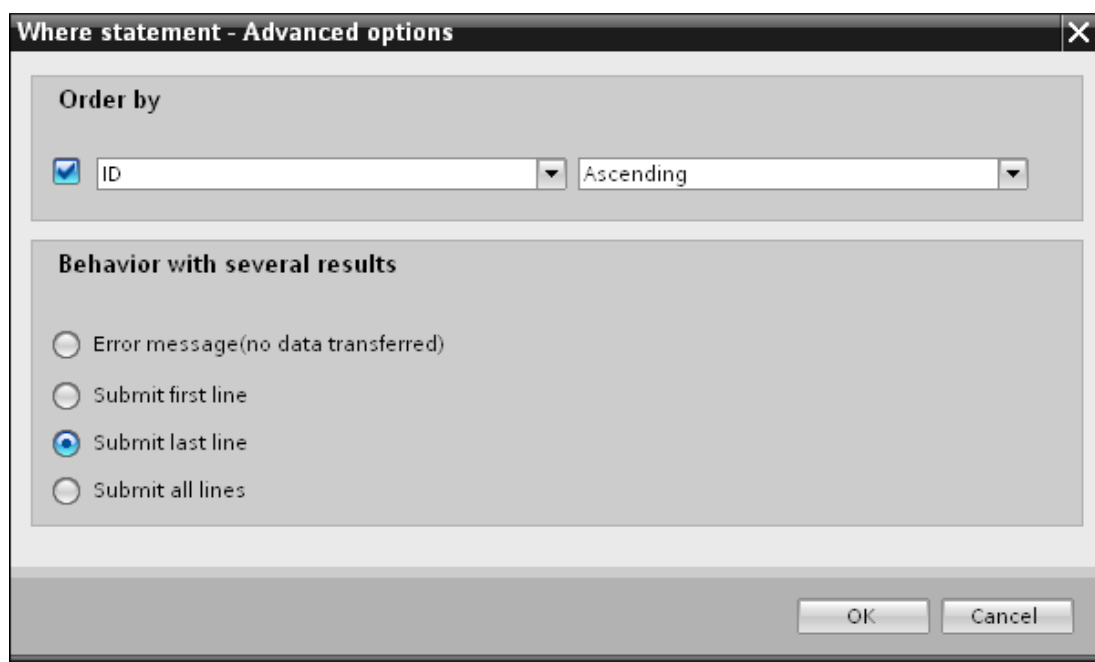
Note

SQL String

- If multiple conditions are configured, they are connected with a logical "AND".
 - Only data records (lines) are requested from the IDB and transferred in which all conditions have been met.
 - An optional connection is not possible with a logical "OR".
-

Advanced:

Using button "Advanced", you can define the sort sequence and the behavior when multiple data records exist.



- **Order By**
Select the selection field. You can then define the column name and the sort direction.
- **Behavior with several results:**
Select one of the following option fields and click OK button. Based on selected radio button, you can decide the action to be performed:
 - Error message (no data transferred)
 - Submit first line
 - Submit last line
 - Submit all lines

Standard settings for these options are:

- No sorting
- Error message (no data transferred)

OPC tab

Note

OPC server

In order to configure the settings on the "OPC" tab, you must have selected an OPC server in dialog "Trigger Provider". This dialog window is accessed by clicking on the "Event" button in "Transfer options" tab.

1. In the "WinCC User Archive Provider" area, within the OPC tab, the OPC tag browser is displayed. In tag browser, select the tag for which the values should be transferred. The selected tag is shown in the "Tag ID" field. The data type is chosen according to the selection.
2. If the selected tag has Array data type, then the "Array" check box is automatically enabled. This check box is provided below the "Datatype" field.
3. Next, configure the consumer column in the "Dynamic Database consumer" section by following these steps:
 - The selected table is shown in the "Table" field. Select the Schema if applicable by selecting from the drop down list in "Schema" text box.
 - The column names are displayed within "Columns" area. If the table has columns with respective data types, the time stamp can also be written to the table. In this case, select the respective "Active" check box and select the column within "Column for timestamp" field.

4. Select the Column name that you wish to connect with the OPC tag. The selected column is displayed in "Column for data value" field.
5. Check the name of the connection in the "Connection mapping settings" area to the right. Enter a unique name for the connection in the "Connection name" field or use the options within "Default name options". Click "Connect" button to confirm your entries.
6. Repeat steps 1 to 5 for all elements of the "WinCC User Archive Provider" that you wish to transfer.

Note

Array

If the provider tag has a data type of array data type and if the database consumer column has data type other than array data type, after clicking on the Connect button, the "Array" check box in the "OPC tab" is automatically unchecked.

Dynamic Database consumer

The "Dynamic database consumer" section is displayed to bottom left portion of "Connection mapping" tab. This section exists below the WinCC User Archive provider section area. The Dynamic Database consumer section provides you with required options to choose schema, table name and column names to be mapped with WinCC User Archive provider.

A specific connection can be created between the WinCC User Archive provider column and the column (belonging to Dynamic database consumer) selected in the Where statement tab. You can create a new connection or else modify an existing connection to apply Where statement on the selected column.

Note

Selecting Schema

- If you are using a database other than Microsoft Access, selection of Schema is mandatory before choosing the Table name.
 - While using Microsoft Access as database, the "Schema" field is displayed in disable state and does not allow any selection of Schema.
-

The Dynamic Database consumer consists of 2 tabs:

- Dynamic Database
- Where-statement

Where-statement

The Where statement is required to be configured in order to select the consumer column within the "Dynamic database consumer" area. The "Where-statement" tab mainly includes the "Where statement" configuration section and exception handling section.

Follow the steps given below to perform a connection mapping:

1. In the "WinCC User Archive provider" section, at the (top left), select the column for which the where statement (Dynamic database consumer) needs to be applied.
2. Upon selection, the column name is displayed in "Column for data value" field. The data type is selected automatically based on selection of column name.
3. In the "Where-column" field, select the column that is to be used for the Where Statement. If a value has to be written to the database, this column is compared with the connected provider column(s). Only lines in which both values match are updated.
4. The behavior is defined in the "Exception handling" field if the selection of the consumer row is not unique:
 - Error Message: No target lines are overwritten and an error message is given as an output in the trace view of IDB Runtime.
 - Change all rows: All selected consumer rows are overwritten.
 - Using the "Enable Insert" check box, you define the behavior if a line with the key (primary key) does not exist. If the option is selected, a new line with the respective key is created.

Note

Simultaneous Utilization as Key and Consumer Column

In order to have more setting ability with the configuration, a column can be used as a key column and as a consumer column simultaneously. Take note that this causes the data in the database to be inconsistent and/or future access to the dynamic database consumer may result in errors.

5. Check the name of the connection in the "Connection mapping settings" area (right). Enter a unique name for the connection in the "Connection name" field or use the options within "Default name options". Click "Connect" button to confirm your entries.

Connection mapping

1. In "WinCC User Archive provider", the selected archive is shown in the "Table" field. Select the Schema for database if applicable by selecting from the drop down list in "Schema" field.
2. The Column names are displayed within "Columns" area. Select a Column name from the list. The selected column is displayed in "Column for data value" field. The data type is shown automatically.

3. The "Filter" field provides you the option to filter the Column names based on single character or first few characters of column name.

For example, if you wish to view the column names starting with "S", type this character in "Filter" text box. All column names starting with "S" are displayed.

4. Next, configure the consumer column in the "Dynamic database consumer" section by following these steps:
 - The selected table is shown in the "Table" field. Select the Schema for database if applicable by selecting from the drop down list in "Schema" field.
 - The column names are displayed within "Columns" area. If the table has columns with respective data types, the time stamp can also be written to the table. In this case, select the respective "Active" check box and select the column within "Column for timestamp" field.
5. Select the Column name in "Database consumer" that you wish to connect with "WinCC User Archive Provider" column name. The data type of selected column will be automatically displayed in the "Datatype" field.

The selected column is displayed in "Column for data value" field.

6. Check the name of the connection in the "Connection mapping settings" area to the right. Enter a unique name for the connection in the "Connection name" field or use the options within "Default name options". Click "Connect" button to confirm your entries.

Note

Data type conversion

If the provider column does not match with consumer column, IDB CS converts the data type to match with data type of provider. A status window is displayed to indicate this change.

7. Repeat steps 1 to 5 for all elements of the "WinCC User Archive Provider" that you wish to transfer.

Result

The connections that you have created are shown in the "Connections" tab of IDB CS "Settings" window as well as within the project tree node.

5.3.4 Viewing Example 2 in WinCC Runtime

Overview

This chapter provides information about the steps to be followed in order to view Getting Started Example 2 in WinCC Runtime environment. The Getting Started project provided along with the installation includes all the required resources for running the example project.

Prerequisites

- WinCC V7.3 is installed
- IDB Getting Started project "idb_getting_started.MCP" is loaded in WinCC and project is activated
- IDB CS application is open
- Getting Started project "IDBProject" is loaded in IDB CS application

Importing the configuration (XML file)

Follow the steps given below to import the configuration file provided along with IDB Getting Started and to configure the respective provider/consumer type:

1. In IDB CS, select Project > Import Runtime Configuration to import the configuration file.
2. In the "Open" dialog window displayed, browse for the IDB Getting Started folder (idb_getting_started) and select the configuration XML file "idb_getting_started_configfile.xml". Next, click "Open" button.
3. The IDB Getting Started project configuration will be imported in IDB CS with the project name displayed as "IDBProject".
4. The project tree on left hand side displays a tree structure that displays the project, links and their sub-nodes.
5. In IDB CS, perform the following settings in the respective provider/consumer modules that is part of Example2 project:
 - In WinCC User Archive provider /consumer configuration, enter the complete computer path wherever WinCC has been installed and choose the appropriate database.
 - Configure the Where statement and advanced options for WinCC User Archive & Dynamic database provider / consumer in connection mapping tab and create connections.
6. After performing these steps, save the project and export the configuration XML file to the IDB Getting Started folder (idb_getting_started).

This XML file will be used in IDB Runtime application.

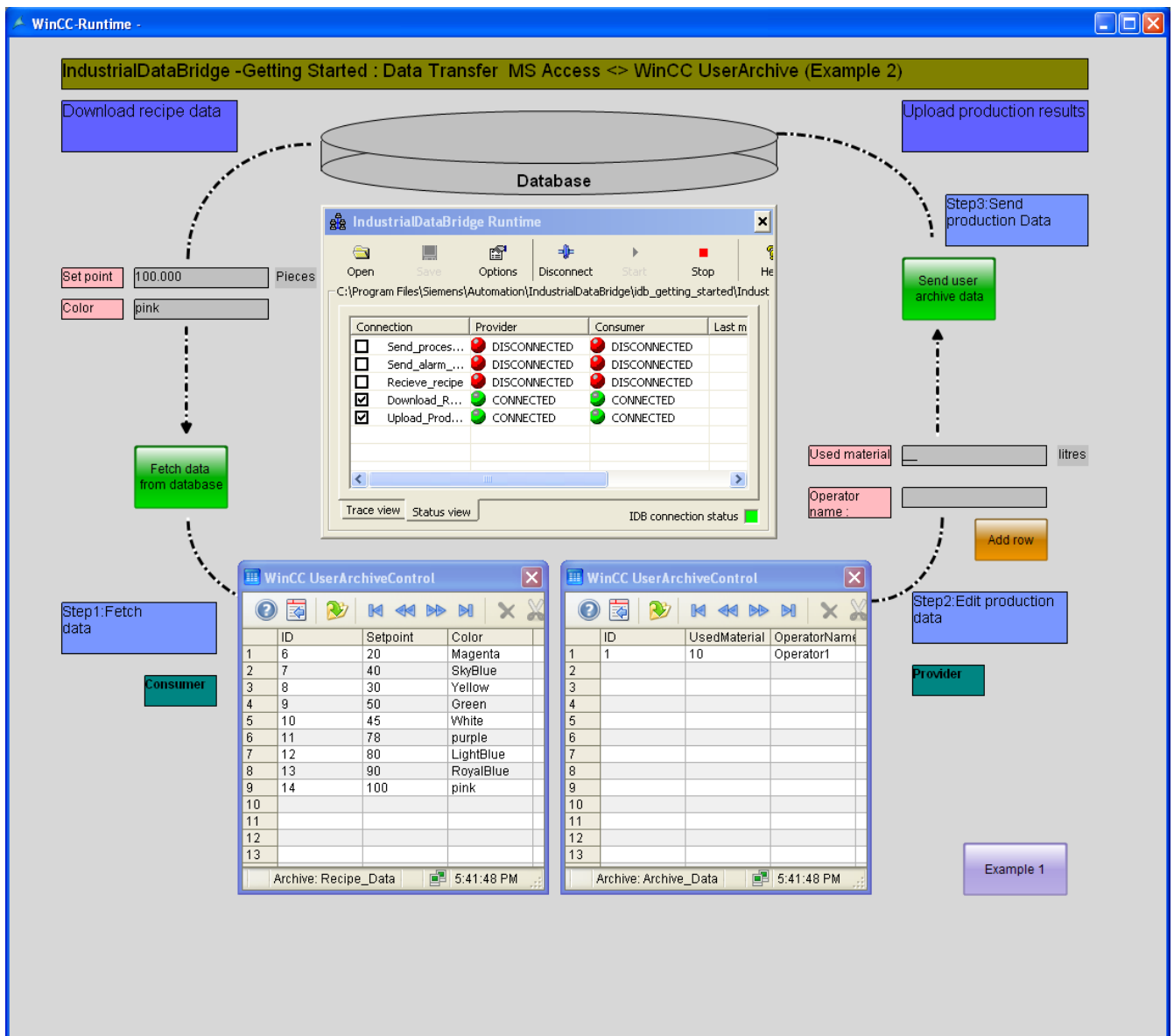
Note

Opening IDB configuration

The IDB configuration required for Getting Started project can also be opened in IDB CS using "IDBProject.ip73" file. In IDB CS, click Project > Open project and click on Browse button to browse the folder structure. Select the .ip73 file existing within "IDBProject" folder by browsing the folder contents.

Viewing Example 2 in WinCC Runtime

The Example 2 displayed in WinCC Runtime includes several user controls and buttons that enables the data transfer. The text controls are provided to enter the required value in these fields. The example includes the process of downloading recipe data from Database to WinCC User Archive and further uploading production results to the Database. The IDB Runtime control is provided in the middle of the example screen that includes options to connect the links and initiate data transfer.



Follow the steps given below to connect the configuration and start data transfer:

1. In IDB Runtime control, select "Options" button to open the "Runtime configuration" window.
2. In "NT Service" tab, click "Start service" button to start IDB service and click OK.

3. Next, load the configuration file by clicking on the Open button. In the "Open" dialog window, browse the folder contents, select the configuration file "idb_getting_started_configfile.xml" and click "Open" button.

Note

Connections displayed in IDB Runtime

The IDB Runtime window displays the connections (links) that belongs to both Example 1 and Example 2. While working with each example, it is suggested to select the connections (links) that are used within the specific example.

4. The list of connections will be displayed along with provider and consumer status. The status is shown next to each provider/consumer as a small circle.
5. Click "Connect" button to connect the provider and consumer types. The status of provider and consumer will now be changed to green colour.
6. Next, click "Start" button to start the data transfer.

Download recipe data

7. Within "Download recipe data" section displayed on left hand portion of example screen, click "Fetch data from database" button. The data retrieved from database is displayed in the WinCC User Archive control. A tick mark icon is shown in the example screen to indicate successful data transfer.
8. The last updated record existing within the table is shown in "Set point" and "Color" fields. These fields serve as an input for the production process in the plant.

Upload production results

9. In "Upload production results" section, enter the data in "Used material" and "Operator name" fields and click "Add row" button. Press the "Enter" key each time when you enter any data in these fields.

You can observe that the data that is entered is displayed in the WinCC User Archive control.

10. Click "Send user archive data" button to send these production results to the database. A tick mark icon is shown in the example screen to indicate successful data transfer.

Note

Switching between Example 1 and Example 2

To switch from one example to other, click the button provided at bottom right hand portion of the example screen.

It is important to note that after switching to another example, before proceeding further, you need to stop the data transfer, disconnect the connection(s). Once you are ready, then you can start connecting the provider/consumer types and start the data transfer.

Result

You have performed the data transfer successfully and have understood the steps for connecting the configuration links and starting data transfer using IDB with the help of this example.

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