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Application Example• 04/2016

WinCC Data Transfer with OPC DA Interface

WinCC/IndustrialDataBridge, WinCC

https://support.industry.siemens.com/cs/ww/en/view/109483465

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1 Task

1.1 Overview

Introduction

WinCC/IndustrialDataBridge V7.3 (IDB) is a WinCC option that, through an easy and quick configuration, allows data transfer between different automation systems via various standard interfaces, for example:

- OPC XML,
- WinCC OLE DB or
- Send/Receive.

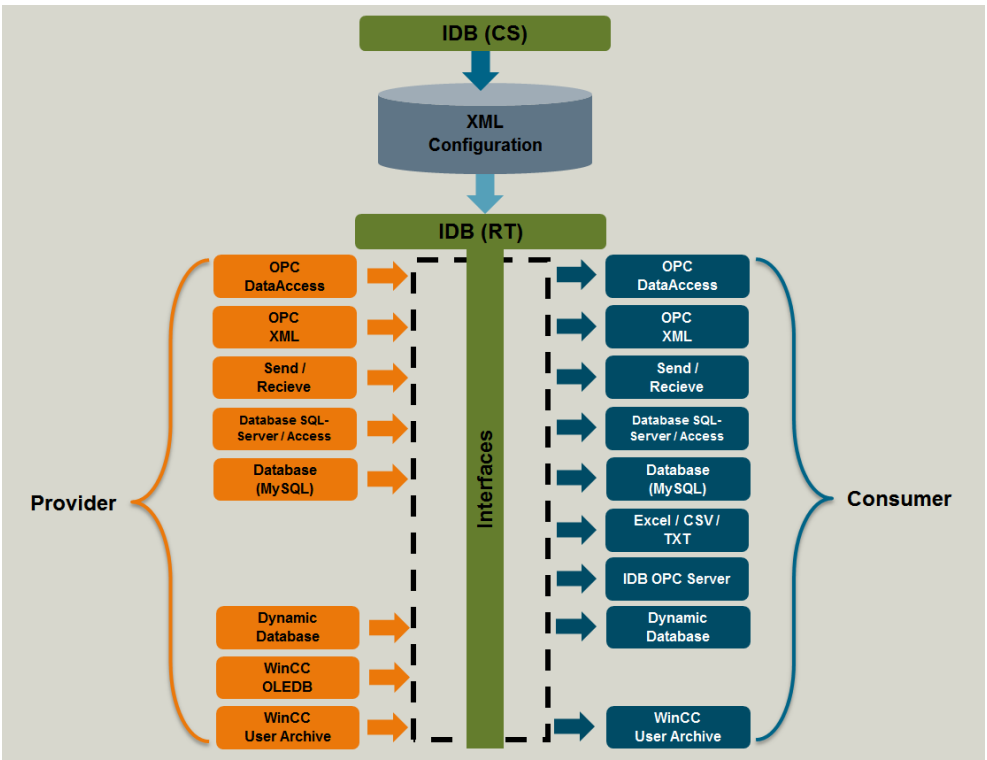
To analyze and to save process values in Office formats, WinCC/IndustrialDataBridge V7.3 also allows data transfer with other applications, such as:

- CSV/TXT,
- Microsoft Excel or
- Microsoft Access.

To archive larger amounts of data, data bases (e.g. SQL Server, Oracle) can also be integrated.

The following figure shows a schematic overview over the various applications and formats, which are supported by WinCC/IndustrialDataBridge V7.3.

Figure 1-1



The data interfaces shown in Figure 1-1 are integrated via software modules. These modules are divided as follows:

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Provider module

The provider module establishes the connection to the data provider that provides the data.

Consumer module

The consumer module connects to the data consumer into which the data is written.

Note

You can connect various providers and consumers with each other. The following must be observed in this regard:

- Not all providers are available as consumers and vice versa.
- Provider(s) and consumer(s) are fixed components of a connection.

1.2 Requirements for the automation task

The application describes the required software and configuration to realize the following requirement for the automation task:

- Accessing online tag values from the WinCC data manager (reading and writing) via the provider module “OPC Data Access“ and saving them WinCC-externally.

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2 Solution

2.1 Overview

This documentation guides you through the configuration of WinCC/IndustrialDataBridge V7.3 by using a practical example:

With the help of the supplied WinCC sample project, the environment required to establish the connections between provider and consumer modules in WinCC/IndustrialDataBridge V7.3 is made available.

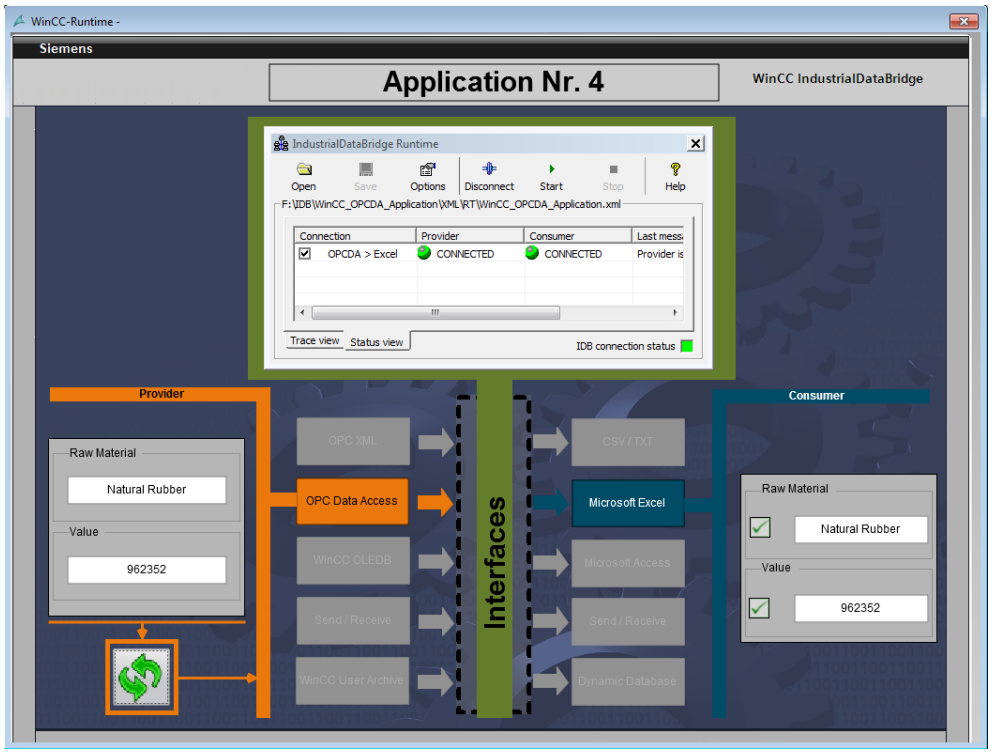
Sample project

The included WinCC project “WinCC_IDB_Application_4“ allows reading online tag values (raw materials, quantity) from the WinCC data manager of SIMATIC WinCC V7.3.

This example provides WinCC/IndustrialDataBridge V7.3 with the environment for the data transfer of online tag values, which can then be transmitted to MS Excel via the “OPC Data Access“ module.

The following Figure 2-1 schematically shows the sample project in WinCC runtime:

Figure 2-1



Topics not covered in this application

This documentation does not describe the creation of the supplied sample projects.

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Required knowledge

- **SIMATIC WinCC V7.3**

  To execute the WinCC sample projects included in this application, no further basic knowledge is required.

2.2 Description of the core functionality

The application example serves to familiarize yourself with the configuration screen of IndustrialDataBridge V7.3. It illustrates how to create and configure each IDB project of the supplied WinCC projects within WinCC/IndustrialDataBridge V7.3. The application example covers the following subjects:

- Creating a new project and the required connection(s)
- Defining the provider and consumer types
- Configuring the provider properties
- Configuring the consumer properties
- Configuring the connection settings
- Establishing the connections of the corresponding provider and consumer tags
- Generating the runtime configuration

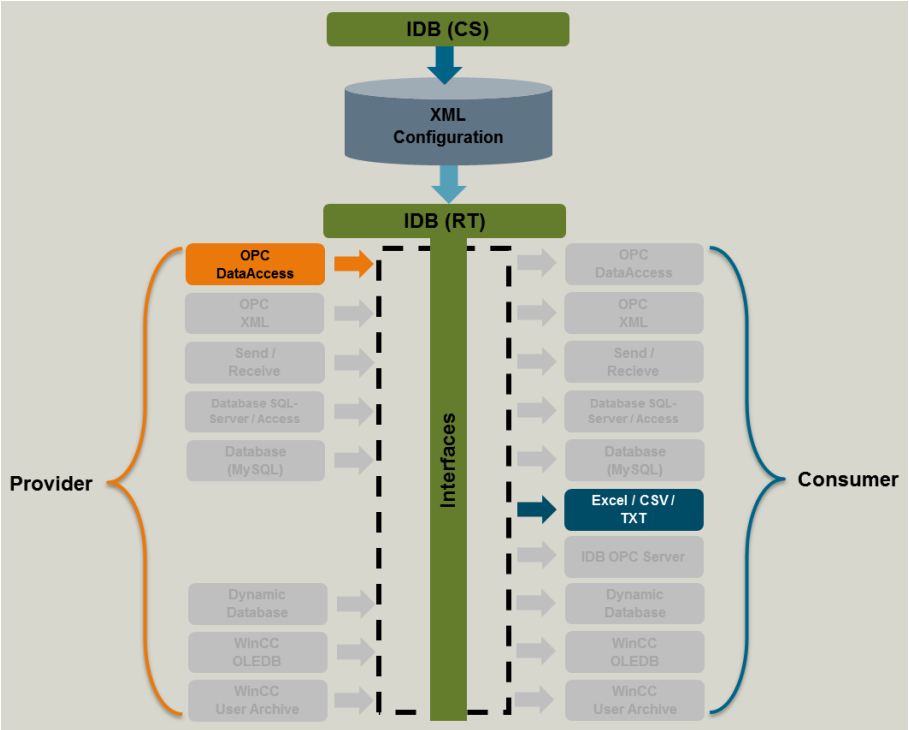
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2.3 Sequence of the core functionality

With the help of the supplied WinCC sample project “WinCC_IDB_Application_4”, Chapter 3 shows the necessary configuration steps in WinCC/IndustrialDataBridge V7.3 to establish a connection between “OPC data access” as data source and “MX Excel” as data target.

Figure 2-2 schematically shows the process sequence and the interfaces used in WinCC/IndustrialDataBridge V7.3.

Figure 2-2



2.4 Hardware and software components

The following components were used to create the application:

Software components

Table 2-1

Component	Qty	Article number
SIMATIC WinCC V7.3	1	6AV63.1-....7-3...
WinCC/IndustrialDataBridge V7.3	1	6AV6371-1DX07-3...
Windows 7 SP1 64-Bit	1	
Microsoft Excel 2013	1	

Sample file and project

The following chart contains the sample project used in this documentation:

Table 2-2

Component	Note
WinCC_IDB_Application_4.zip	This zipped file contains the required WinCC project for the application example_No. 4

Downloading and unpacking

Download the as download available sample project and unzip the contained zip archive.

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3 Application example: Provider module OPC Data Access

In this chapter, you will learn how, with the help of

- WinCC/IndustrialDataBridge V7.3 and
- SIMATIC WinCC V7.3,

online tag values from the WinCC data manager can be transferred to a MS Excel file.

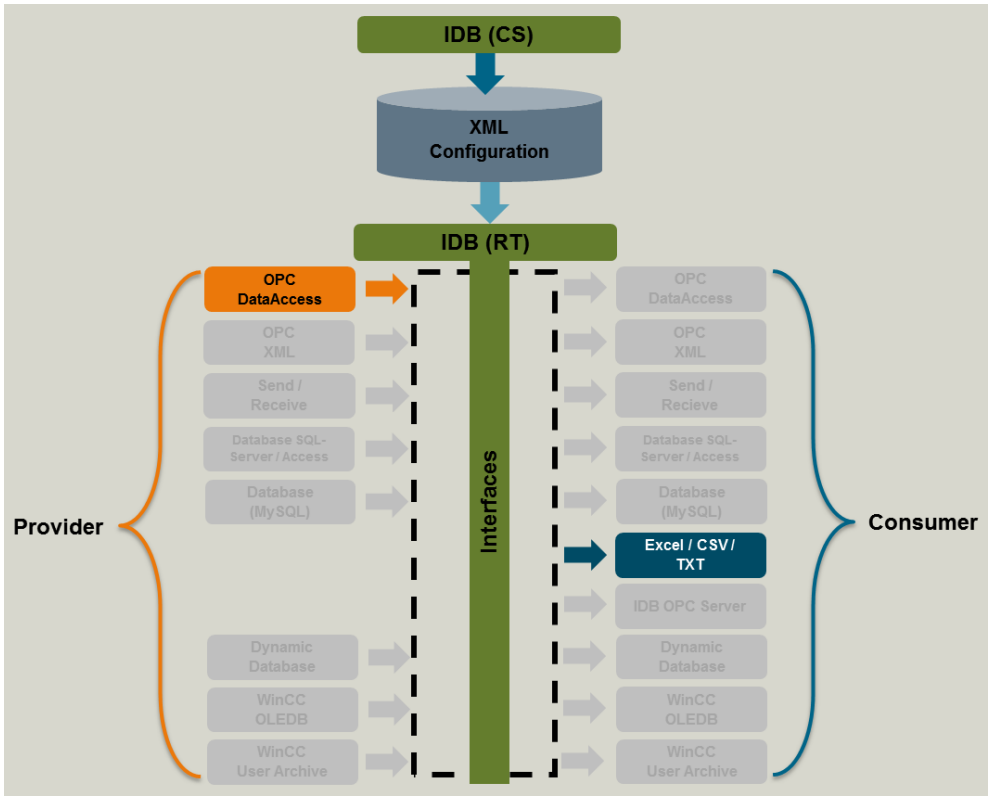
3.1 Overview

The application example shows how to execute the following steps in WinCC/IndustrialDataBridge V7.3 with the supplied WinCC project “WinCC_IDB_Application_4“:

- Creating a new IDB project
- Creating the corresponding links
- Configuring the corresponding provider/consumer connection configuration
- Setting the transfer mode.

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Figure 3-1



3.2 SIMATIC WinCC V7.3

Objective of this application

The supplied WinCC project “WinCC_IDB_Application_4“ provides online tag values via a simple application from the WinCC data manager. With the help of WinCC/IndustrialDataBridge V7.3, these online tag values can later be transferred to MC Excel to save them WinCC-externally and to evaluate them further.

Scope of functions/Topics not covered in this application

This chapter focuses on the function description, not on how to create the WinCC application.

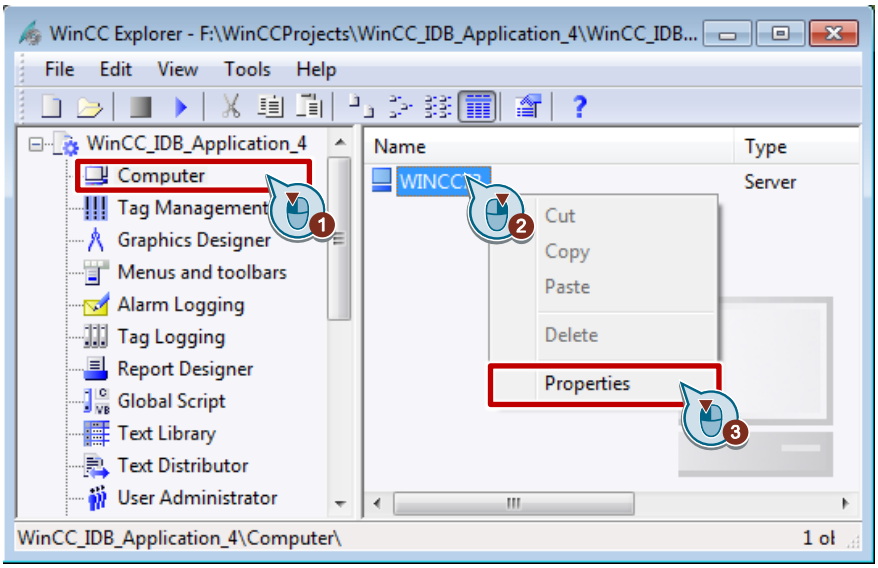
Required knowledge

No prior knowledge is needed to understand the function description of the WinCC application.

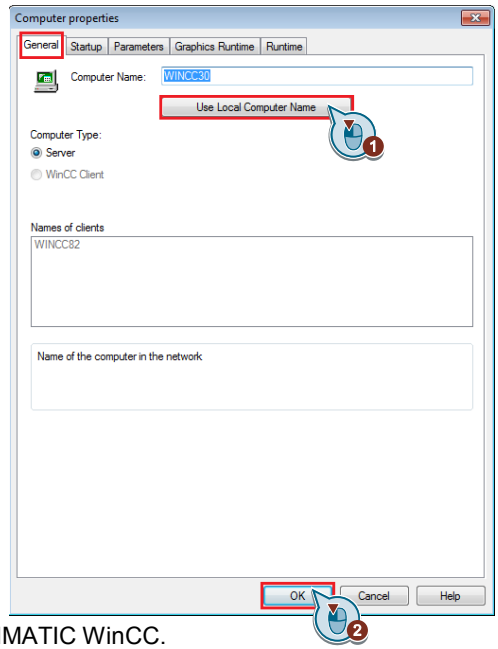
3.2.1 Preparing the project environment in SIMATIC WinCC V7.3.

This chapter describes the necessary steps for the supplied WinCC project “WinCC_IDB_Application_4.MCP“ to adjust the project environment in SIMATIC WinCC V7.3, in order to avoid error messages while activating WinCC runtime.

Table 3-1

No.	Approach
1.	Start the SIMATIC WinCC Explorer.
2.	Open the WinCC project “WinCC_IDB_Application_4.MCP“ by clicking on “File>Open” and then selecting the WinCC project.
3.	**In the WinCC Explorer window:** • In WinCC Explorer, click on the icon “Computer”. (1) • In the workspace, right-click on the computer name with the type “server computer”.(2) • Then click on “Properties.”(3) 

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No.	Approach
4.	**In the "computer properties" window** • In the window "Computer properties>General", click on "Accept local computer name". (1) • Confirm your selection with "OK". (2)  • Restart SIMATIC WinCC.

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3.2.2 Function description of the WinCC application

Figure 3-2 shows the WinCC application right after WinCC runtime has been activated.

Note The entire user interface is in English.

Figure 3-2

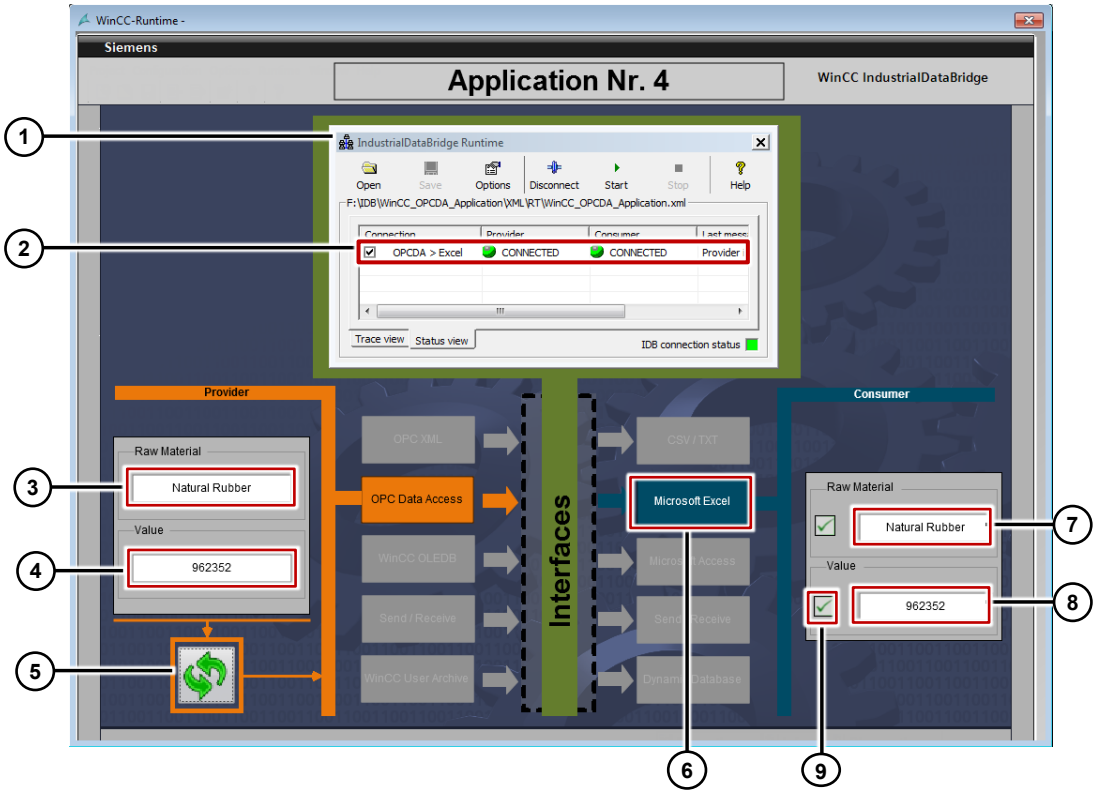


Table 3-2

No.	Description
1.	WinCC/IndustrialDataBridge Runtime
2.	Existing IDB connection
3.	Entry box of raw material name
4.	Entry box of quantity
5.	Update IDB trigger
6.	Open MC Excel file (data target)
7.	Display field of raw material to be transferred
8.	Display field of quantity to be transferred
9.	Confirmation of IDB trigger update

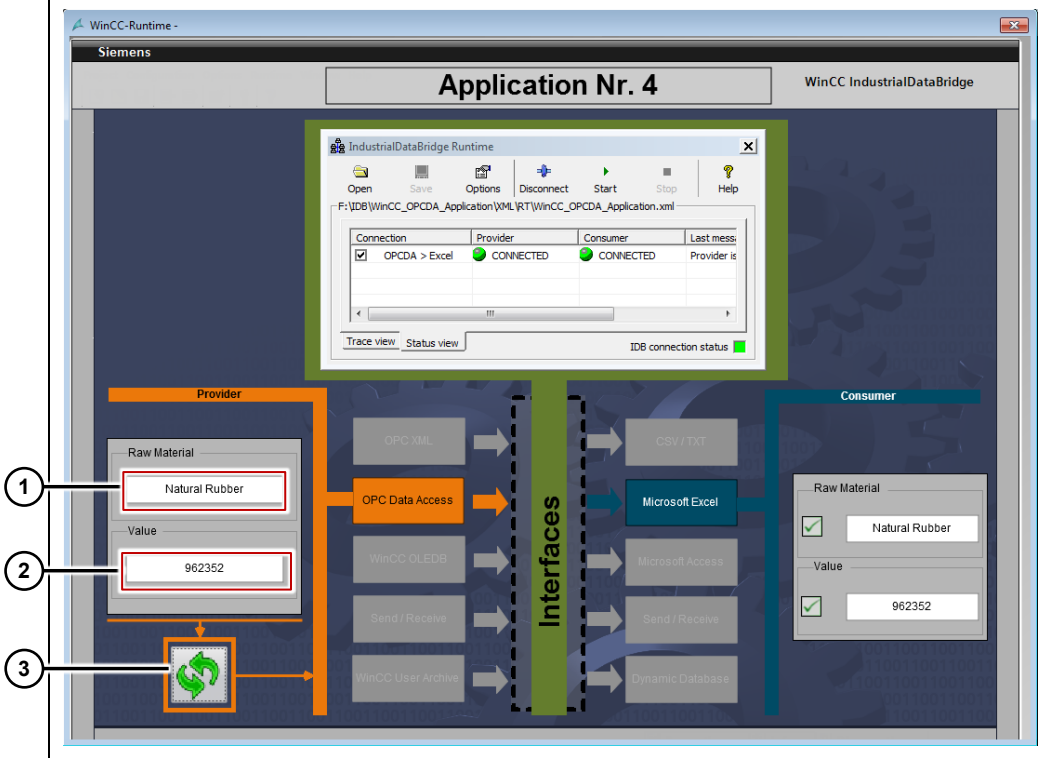
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3.2.3 Operating the WinCC application

This section describes how to access online tag values in WinCC runtime in the WinCC User Archive in write mode.

Table 3-3

No.	Approach
1.	Enter the desired name into the entry box “Raw Material”. (1)
2.	Confirm your entry by clicking on “Enter”.
3.	Enter the desired quantity in the entry box “Value”.(2)
4.	Confirm your entry by clicking on “Enter”.
5.	By clicking on the “Update” button (3), the IDB trigger stored in WinCC/IndustrialDataBridge is activated or set to “One” to transfer the tags via IDB (RT) into MS Excel or to update them.

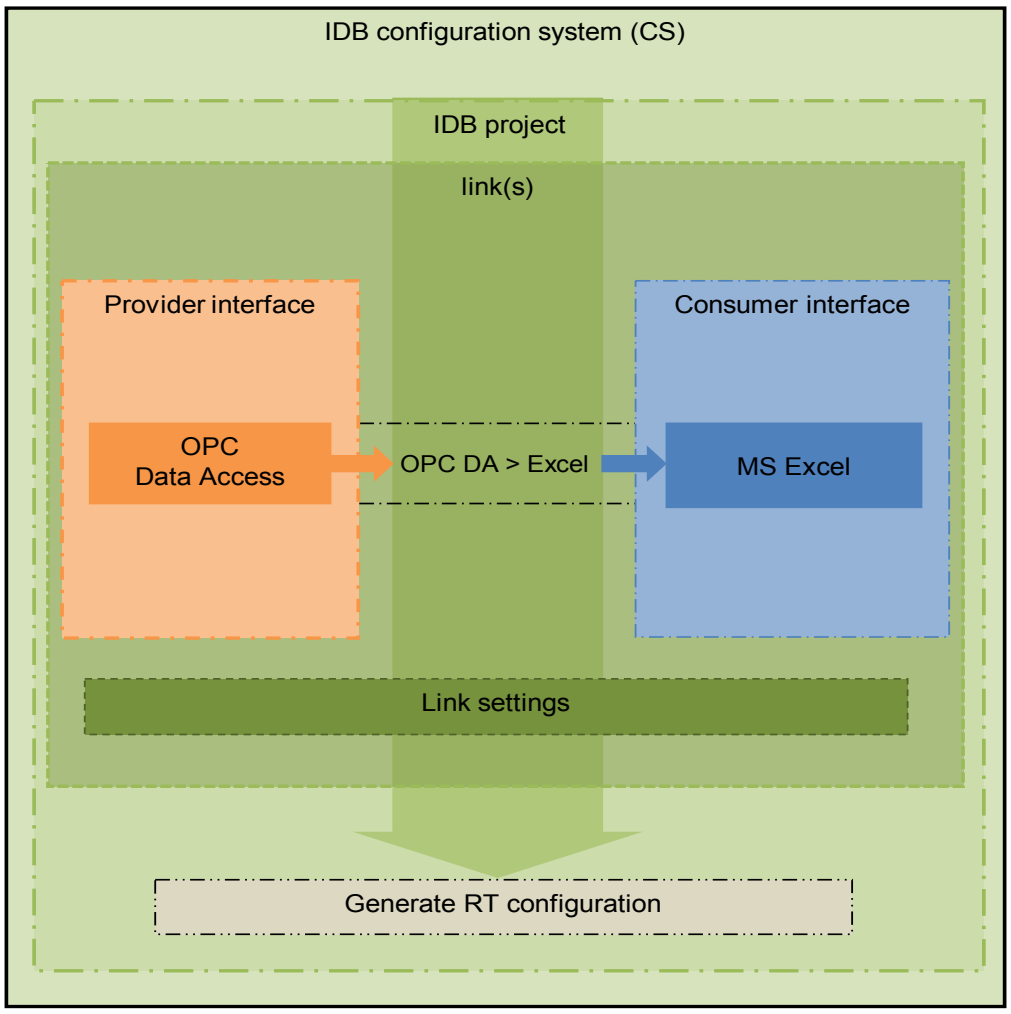


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3.3 IDB configuration system (CS)

This chapter shows all necessary steps in the IDB configuration system (CS) to create and configure an IDB project in order to successfully establish a connection between data source and data target.

Figure 3-3



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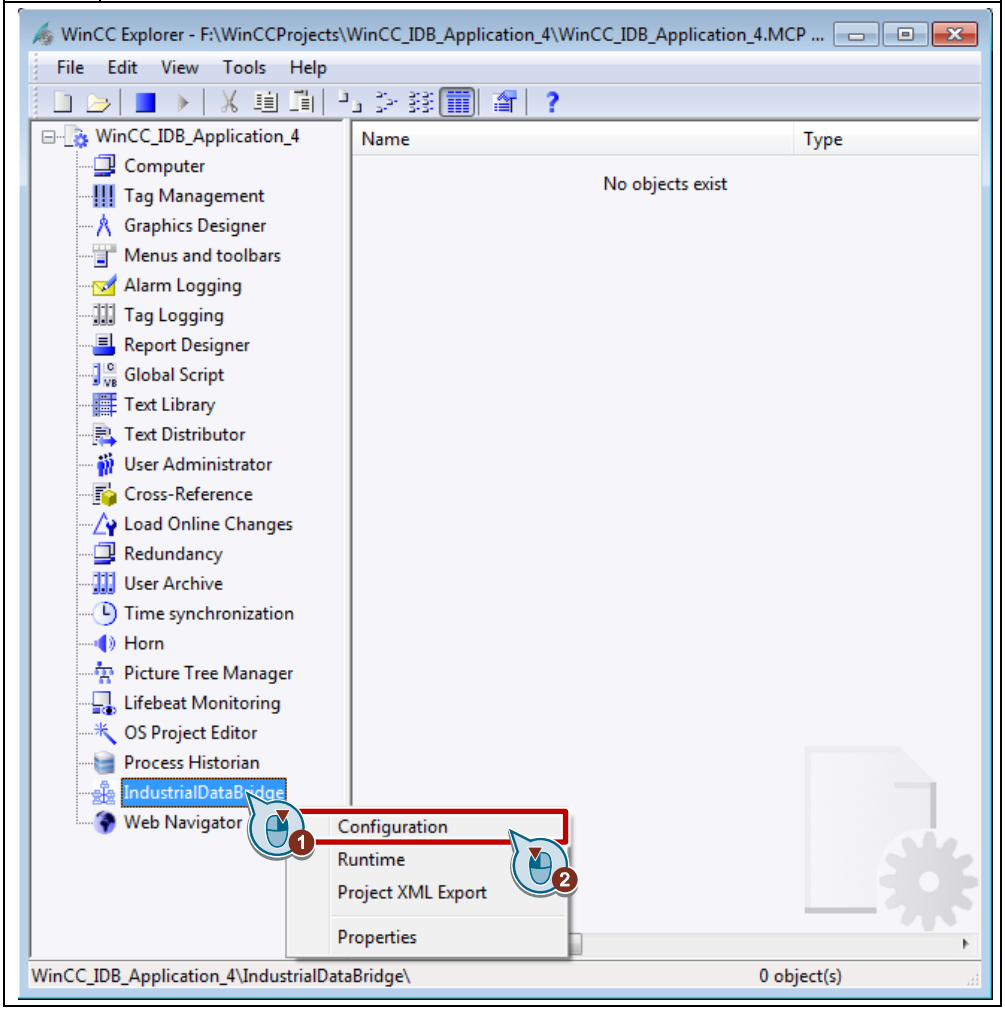
3.3.1 Creating and configuring an IDB project

Opening the IDB configuration system (CS)

Open the IDB configuration system (CS) as described in the following chart:

Table 3-4

No.	Approach
1.	In the navigation area of the WinCC Explorer, right-click on “IndustrialDataBridge”. (1)
2.	Select the command “Configuration” (2) to open the IDB configuration system.



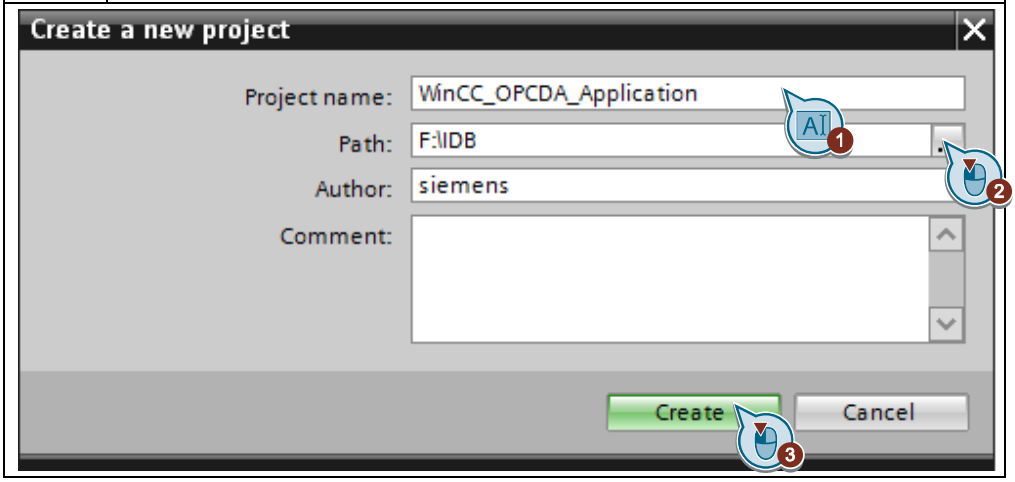
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Creating a new project

Create a new project as described in the following chart:

Table 3-5

No.	Approach
1.	In the menu bar, click on “Project > New project”
2.	In the window “Create new project”, enter a project name, e.g. “WinCC_OPCDA_Application“ (1) and a storage path for the new IDB project.(2)
3.	Click the “Create” button (3).



The created project appears on the list in the navigation area. Next, you have to create a link.

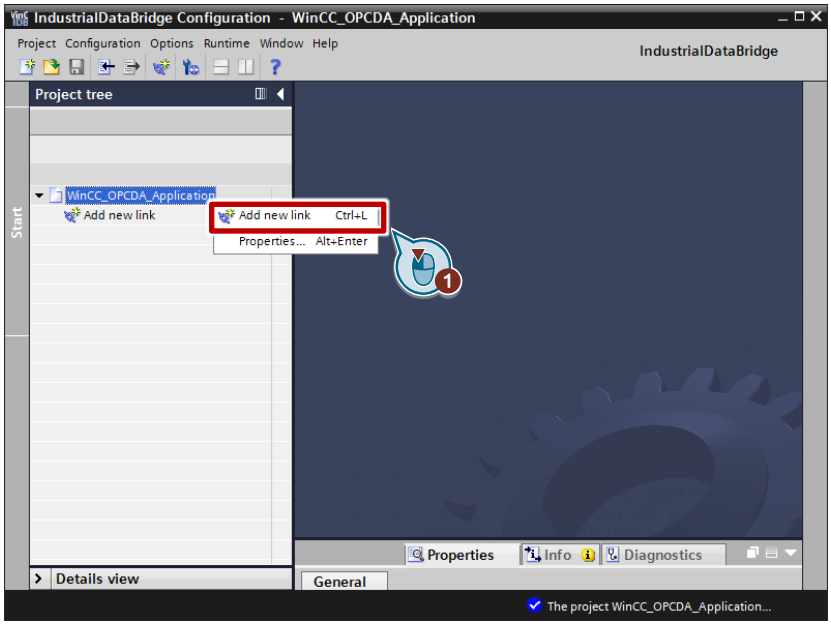
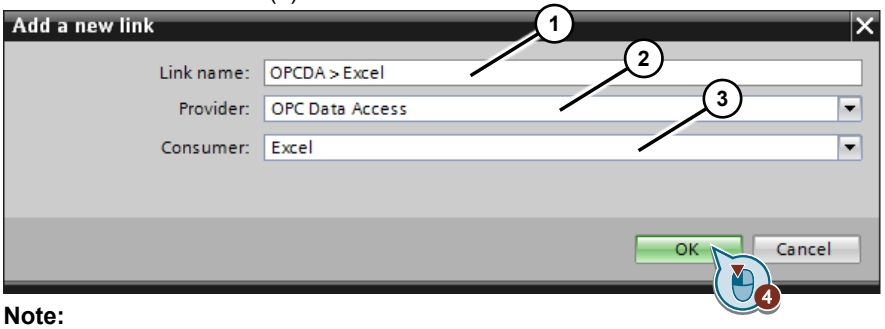
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3.3.2 Creating links

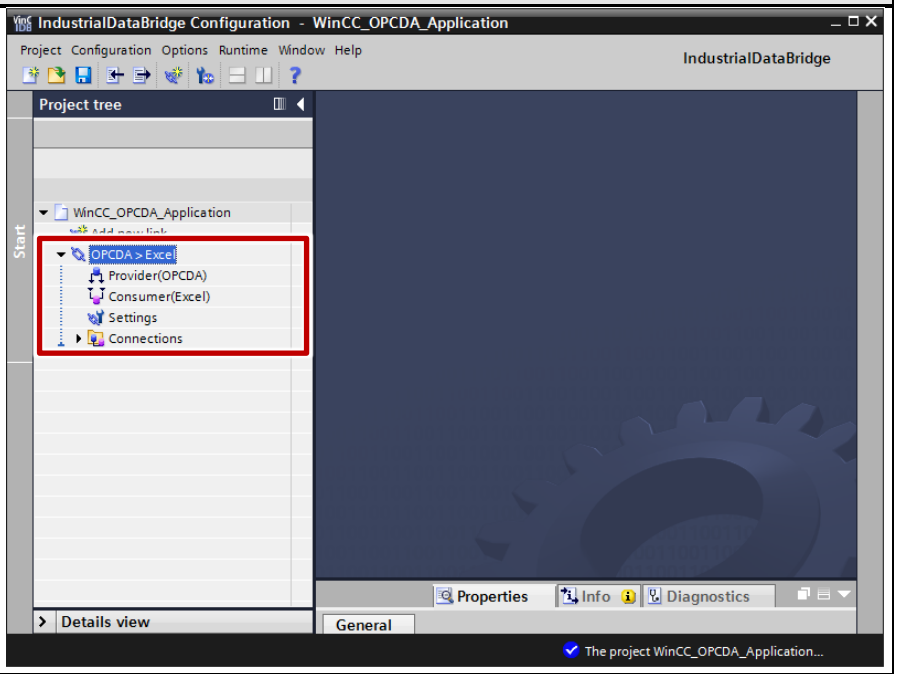
To create a link between provider and consumer, perform the following steps:

Note A link is created with “OPC Data Access” as provider and the “Excel” interface as consumer.

Table 3-6

No.	Approach
1.	Right-click on the project name node “WinCC_OPCDA_Application“ in the tree structure and select “Add new link”. (1) 
2.	**Creating a “OPC DA > Excel“ link** • In the displayed dialog box “Add new link”, enter a clear name for the link to be created, e.g.: “OPC DA > Excel“. (1) • In the provider box, select “OPC Data Access” as provider. (2) • In the consumer box, select “Excel” as data target. (3) • Then click on OK.(4)  **Note:** When assigning the name, it is useful for a better display to designate the link with the name of the desired provider and its corresponding consumer. “Provider > Consumer“
3.	The created link appears in the project tree below the project name.

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No.	Approach
	

Next, you need to configure the provider interface (OPC Data Access).

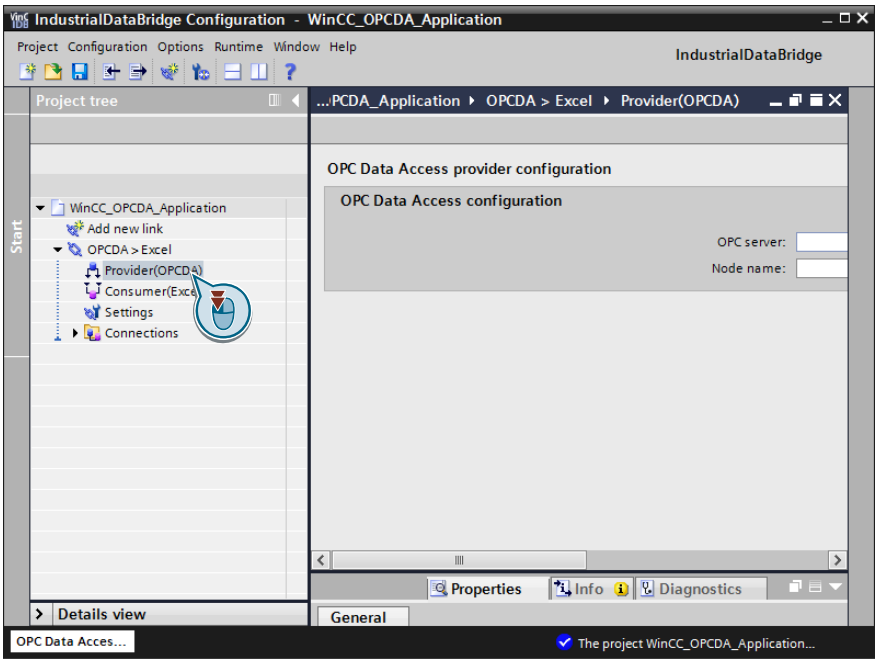
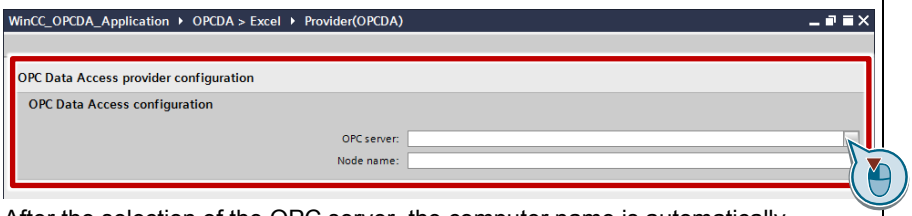
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3.3.3 Configuring the OPC Data Access interface as provider

To set up the OPC Data Access interface, perform the following steps:

Note Make sure that WinCC runtime is activated.

Table 3-7

No.	Approach
1.	In the project tree, double-click on the provider node “Provider(OPCDA)“ within the created link. 
2.	In the project area in the “OPC Data Access Provider Configuration” window, click on the [...] button and select “OPCServer.WinCC“. Then click on the check icon “√“.  After the selection of the OPC server, the computer name is automatically displayed in the text box “Computer name”.

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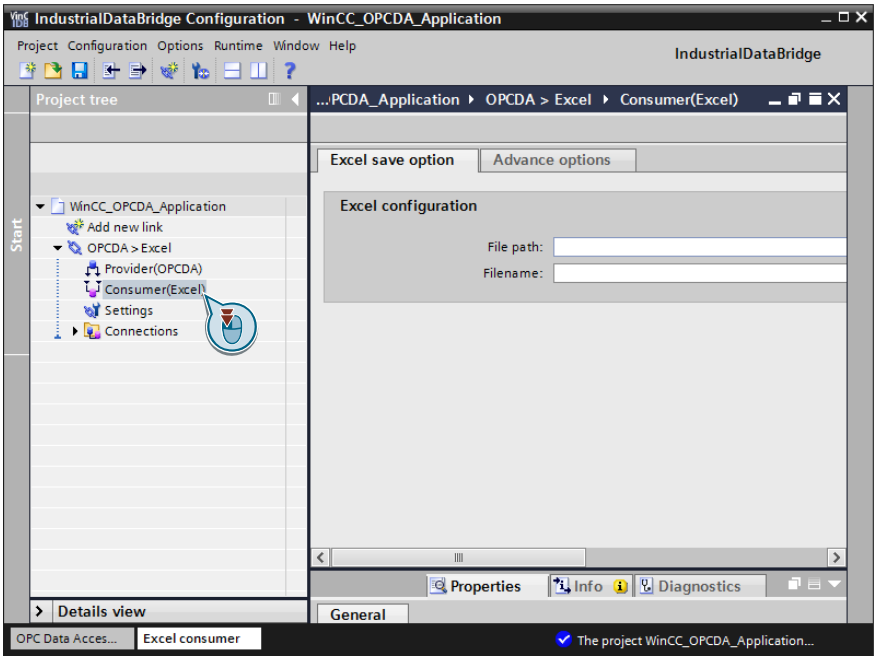
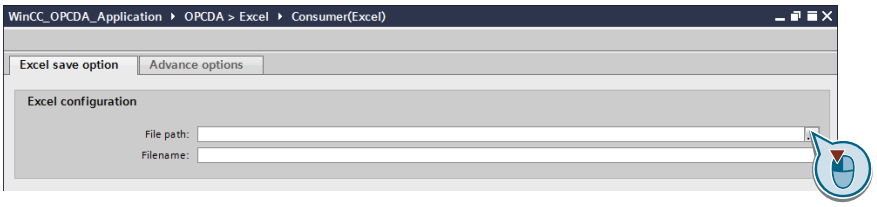
3.3.4 MS Excel files as consumer

Storage location structure

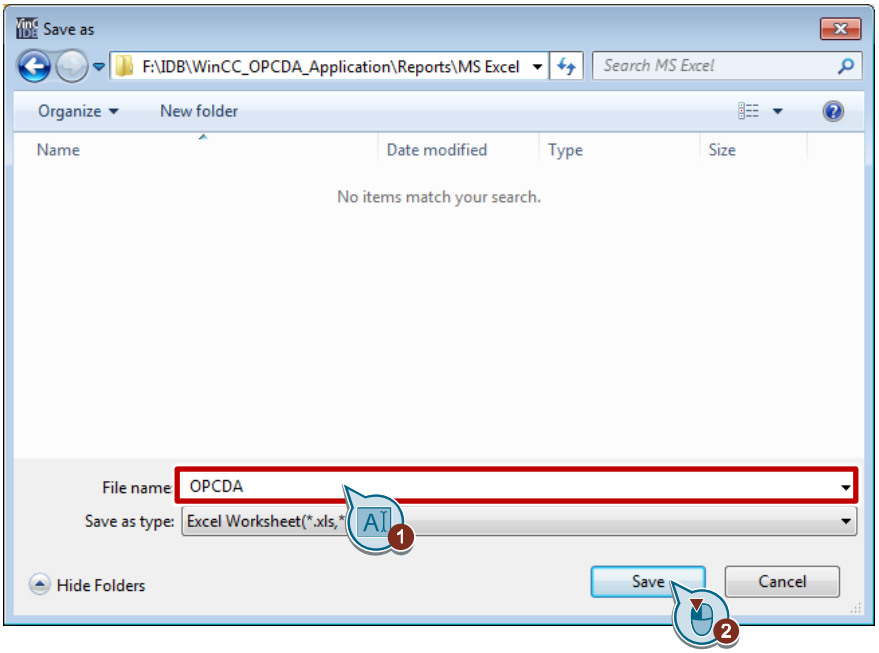
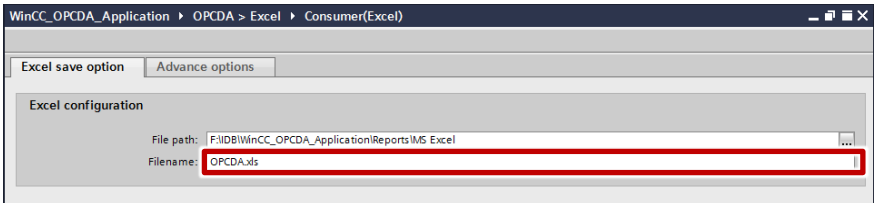
For an easier assignment, it is recommended to create a structured storage location. This has the advantage that with several links, the reports to be created can be held apart in terms of the consumer type.

To set up the MS Excel interface, perform the following steps:

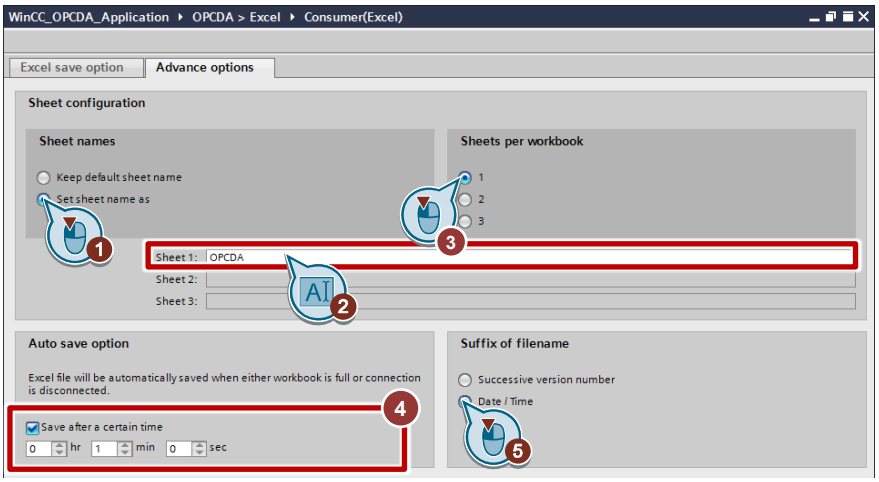
Table 3-8

No.	Approach
1.	In the project tree, double-click on the consumer node “Consumer(Excel)” 
2.	In the configuration area in the tab “Excel save options” in the area “Excel configuration”, click on the [...] button and select the corresponding folder for the Excel reports to be created. 

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No.	Approach
	In the browser window “Save as” in the text box “file name”, enter the name of the “OPCDA” Excel file to be created (1). Then click on the “Save” button.(2) 
3.	The text box “file name” in the “Excel configuration” area is filled automatically. 

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No.	Approach
4.	**In the “Advance Options” tab** • In the “sheet names” area, select the option box “Set sheet name as” (1) and enter the name “OPCDA” into the “Sheet 1” entry box.(2) • In the “Sheets per workbook” area, select option box “1” for one workbook. (3) • In the area “Auto save option”, activate the option box “Save after a certain time” and enter the desired save period, e.g. “1 minute”. (4) • In the area “Suffix of filename”, select the option box “Date/Time”. (5) 

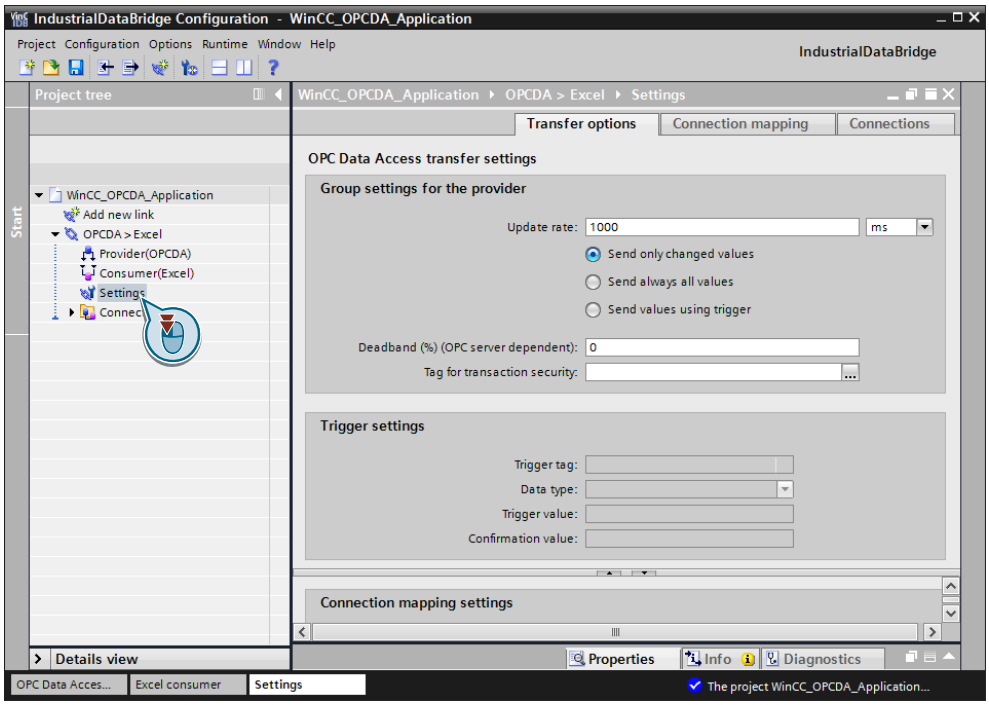
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3.3.5 Making link settings

In the project tree, double-click on the node “Settings” to open the “Settings” window in the workspace. The “Settings” window contains three tabs:

- “Transfer options”,
- “Connection mapping” and
- “Connections”.

Figure 3-4



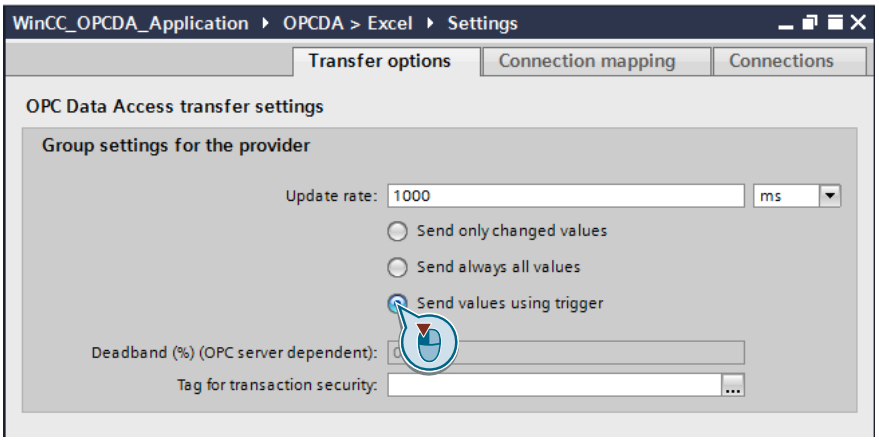
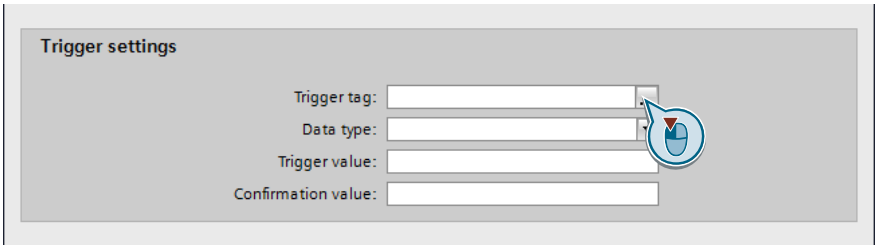
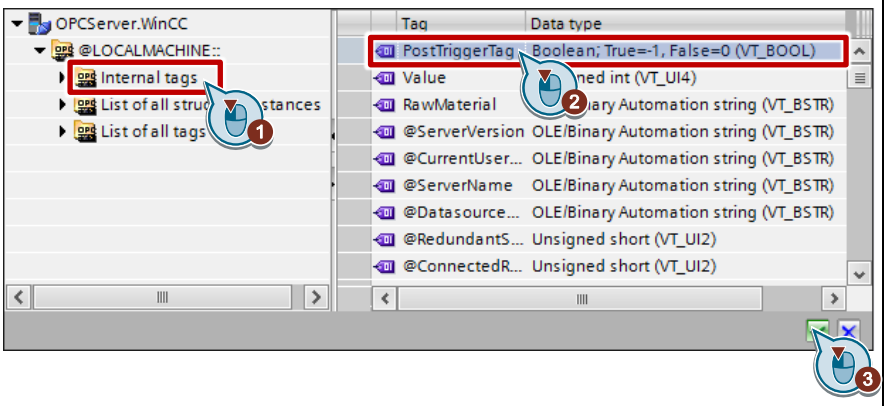
OPC Data Access transfer settings

In the “Transfer options” tab, proceed as follows for the OPC DA provider transfer settings:

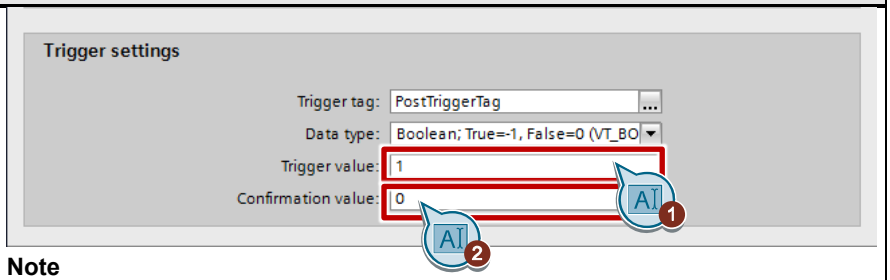
Note Make sure that WinCC runtime is activated.

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Table 3-9

No.	Approach
1.	**In the "OPC Data Access transfer settings" window** • In the area "Group settings for the provider", select the option box "Send values using trigger". 
2.	In the area "Trigger settings", click on the [...] button to select the trigger. 
3.	In the left area, open the project tree: "OPCServer.WinCC/@LOCALMACHINE::/ Internal tags/.(1) In the right area, select the tag "PostTriggerTag"(2). Confirm your selection by clicking on the check icon "(√)".(3) 
4.	**In the "Trigger settings" area** Enter the number "1" into the entry box "Trigger value".(2) (1) Enter the number "0" into the entry box "Confirmation value". (2)

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No.	Approach
	 **Note** With these entries, the IDB will transfer the desired tag values only when the "trigger value" is set to "One". After a successful transfer into the Excel sheet, IDB resets the "trigger value" back to "Zero" for confirmation.

Connecting tags (MS Excel file)

In the "Settings" window, click on the tab "Connection mapping" and proceed as follows:

Note

The "Connection mapping" tab contains the following areas:

- OPC Data Access Provider
- Excel Consumer
- Connection mapping settings
- Default name options
- Connections

In this application example, for the preparation and creation of a MS Excel file, the following column names from the "OPC Data Access Provider" area are considered:

- RawMaterial: contains the tag value.
- Value: contains the tag value.

Preparing the Excel file:

To transfer tags from the "OPC Data Access Provider" into an "Excel file", the desired column names from the "OPC Data Access Provider" area have to be displayed in the "Excel Consumer" area as follows:

Note

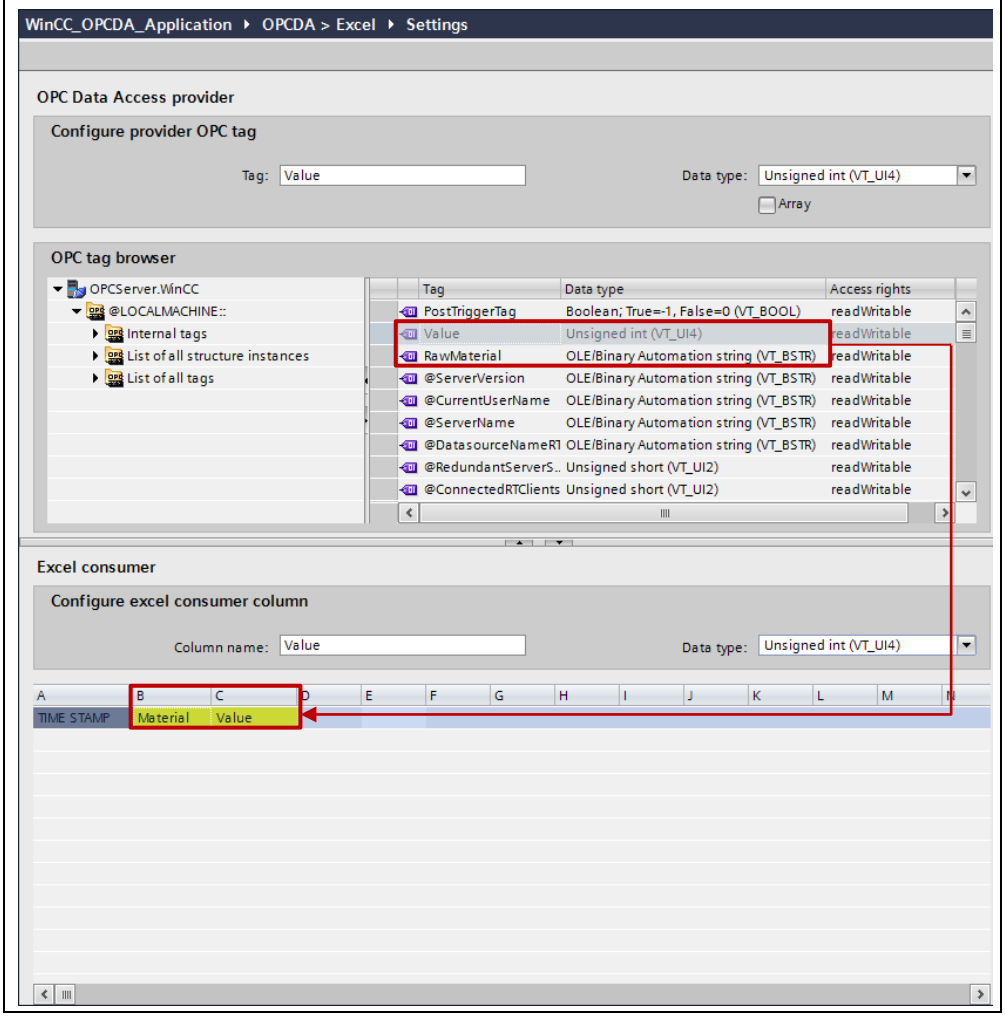
Make sure that WinCC runtime is activated.

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Table 3-10

Tag name (OPC Data Access Provider)	Column name (Excel consumer)
RawMaterial	Material
Value	Value

The image shows how the finished Excel file looks after the preparation:

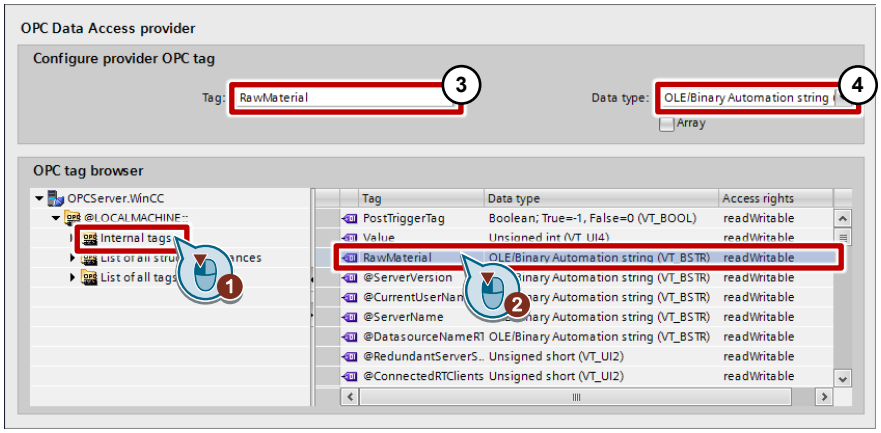
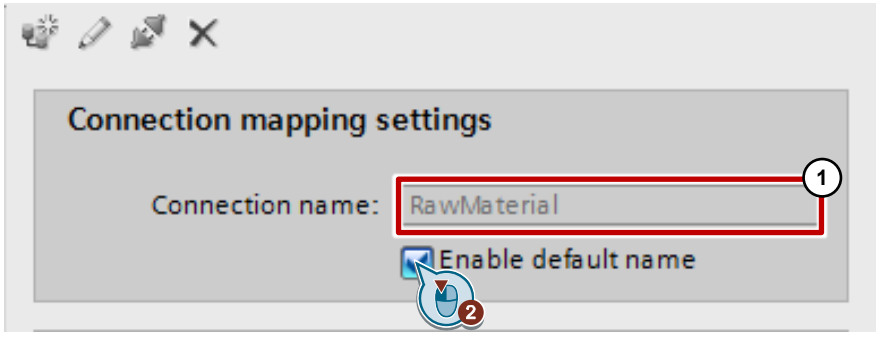


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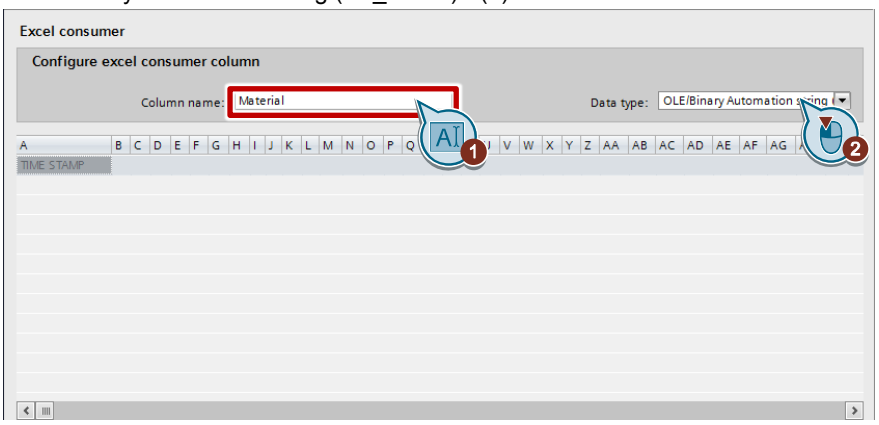
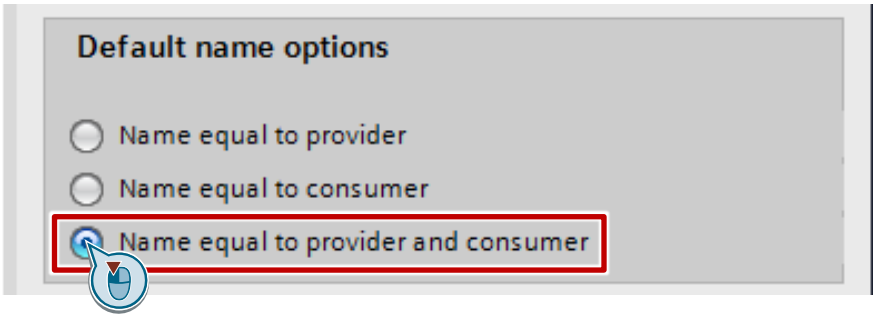
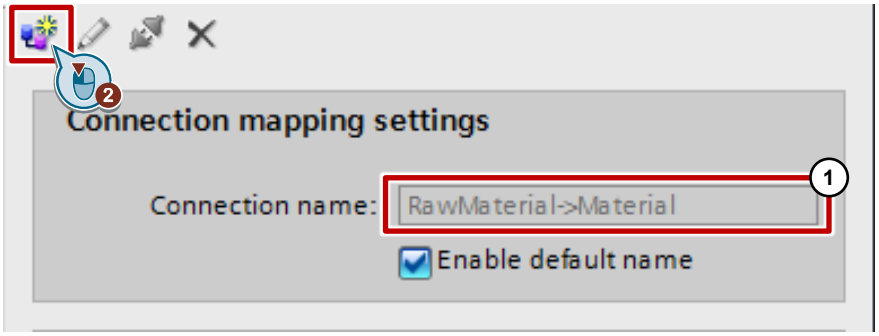
This happens as follows:

Assigning the column name:

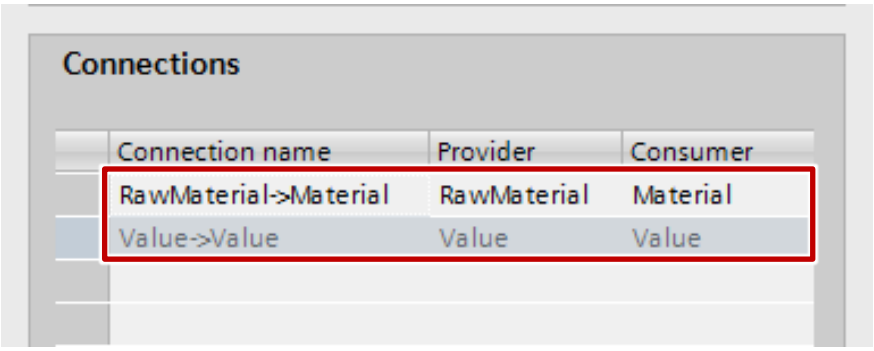
Table 3-11

No.	Approach
1.	**In the "OPC Data Access Provider" area** • In the left area of "OPC tag browser", select the subfolder "Internal tags"(1) • In the right area, select the tag name "RawMaterial"(2). • After the selection, the tag name is displayed in the display box "tag".(3) • The data type "OLE/Binary Automation string (VT_BSTR)" is automatically calculated after the selection of the tag name.(4) 
2.	**In the "Connection mapping settings" area** In the "Connection name" field, the selected tag name "RawMaterial" from the "OPC Data Access Provider" area is displayed.(1) **Note:** If the selected tag name cannot be displayed in the field "Connection name", deactivate and activate the option box "Enable default name".(2) 

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No.	Approach
3.	**In the "Excel consumer" area** In the text box "Column name", enter the column name "Material" to be assigned.(1) Then, in the option box "data type", select the corresponding data type "OLE/Binary Automation string (VT_BSTR)". (2) 
4.	**In the "Default name options" area** If the column names in the corresponding provider or consumer areas are named differently, it is recommended to select the option "Name equal to provider and consumer". 
5.	Now, the connection name in the "Connection mapping settings" area has changed to "RawMaterial->Material".(1) Click on the symbol " " to establish the connection between the two selected column names of both areas (provider & consumer).(2) 
6.	Repeat steps 1 - 5 for the remaining column: • Value -> Value

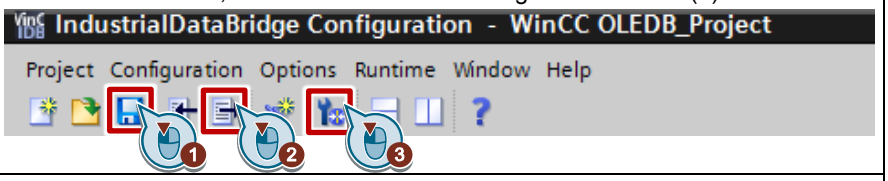
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No.	Approach
7.	**In the “Connections” area** In this area, all created connections are displayed. 

3.4 Generating the IDB runtime configuration

To generate the runtime configuration file, proceed as follows:

Table 3-12

No.	Approach
1.	In the IDB menu bar, click on the “Save” button.(1)
2.	Then click on “Generate runtime configuration”.(2)
3.	Save the “WinCC OLEDB_Projekt.xml“ IDB configuration file in the corresponding folder.
4.	In the IDB menu bar, click on the “Runtime configuration” button.(3) 
5.	**In the “runtime configuration” window:** • Activate the option box “Connect automatically and activate connection(s)” • In the “start option” area: • In the text box “Open existing configuration file”, click on the [...] button • Activate the option box “Activate track automatically” • In the box “Waiting time before connection (seconds)” select 5 seconds as delay time. This serves to activate/deactivate the corresponding links. • Then click on "OK".

Generating the IDB runtime configuration is now complete.

Result

When you start WinCC runtime again, the already generated IDB configuration file “WinCC_OPCDA_Application.xml” will automatically be loaded into the IndustrialDataBridge(RT).

Start the IndustrialDataBridge(RT) and proceed as follows:

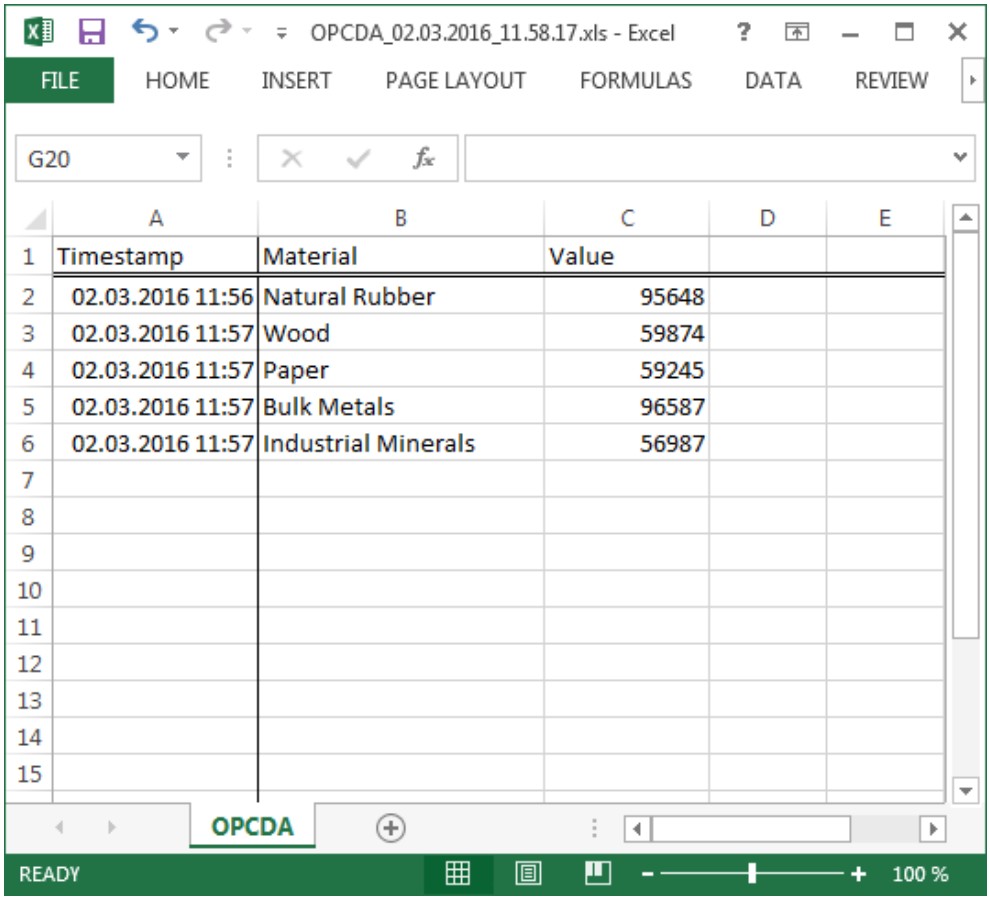
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- Enter some data, as described in chapter 3.2.3 “Operating the WinCC application“.
- Then, in the function tab of the IndustrialDataBridge (RT), click on “Stop” and after that on “Disconnect”.
- In the target folder, you can find the transmitted values in the corresponding consumer file.

MS Excel

The following figure is a result example of the data transfer into the MS access file:

Figure 3-5



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4 Error detection

In this chapter, frequently occurring errors in the respective application examples are listed:

Table 4-1

No.	Behavior	Possible cause(s)
1.	Error message during activation of SIMATIC WinCC runtime.	It is possible, that your computer has not been configured as server computer.
2.	The OPC tag browser does not display any OPC DA server. However, OPC servers are installed on the computer.	To display OPC DA servers, the service opcenum.exe must be running on the server computer. Select “Start” > “Execute” to check, whether this service is running. Enter “services.msc” and press enter. If “opecnum” has not been started, switch to automatic mode and start the service. If the OPC servers cannot be displayed on the remote computer, make sure that the step mentioned above is performed on the remote computer.
3.	The items on an OPC DA server cannot be displayed.	Check, whether the OPC server is running. If it is not running, start the OPC server.
4.	Although, the connectivity pack has been installed, you cannot call up data.	It is possible that the service “Microsoft Message Queue (MSQM) Server Core“ is not activated. Please refer to the WinCC/Connectivity Pack V7.3 manual under “Installing Microsoft Message Queuing“ on how to activate this service.
5.	IDB runtime reports an error during start-up.	It is possible that administration rights are missing. To fix this, please proceed as follows: Right-click on the start menu entry “Programs”>”Siemens Automation”>”IndustrialDataBridge”>”Execute as administrator”. In the appearing context menu, click on the entry “IndustrialDataBridge RT“.
		It is possible that the IDB runtime service has not been started yet. To fix this, please proceed as follows: Right-click on start menu entry “Computer”. Then click on “Manage”. In the “Computer management” window, double-click on

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No.	Behavior	Possible cause(s)
		“Services and applications”>”Services”. Right-click on “IndustrialDataBridge Runtime“>“Properties“. In the “Startup type” area, select the option “Automatic” from the dropdown list, then click on the “start” button.
6.	The value output of MS Excel is lower compared to a CSV/TXT file	In comparison to the “Excel file” data type, the consumer type CSV/TXT file features a significantly higher access speed.

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5 Related Literature

Table 5-1

	Topic	Title
\1\	Siemens Industry Online Support	http://support.industry.siemens.com
\2\	Download page of the entry	https://support.industry.siemens.com/cs/ww/en/view/109483465
\3\	System Manual WinCC/Connectivity Pack V7.3	https://support.industry.siemens.com/cs/ww/de/view/102768149/68357937035
\4\	System manual WinCC/IndustrialDataBridge V7.2	https://support.industry.siemens.com/cs/ww/de/view/73968374/54432553995
\5\	SIMATIC HMI WinCC V7.2 WinCC/IndustrialDataBridge Getting Started	https://support.industry.siemens.com/cs/ww/de/view/73968329/48054187787
\6\	Data transfer from WinCC Runtime Professional with the help of IndustrialDataBridge	https://support.industry.siemens.com/cs/ww/de/view/109476988
\7\	Communication between SIMATIC WinCC IndustrialDataBridge and SIMATIC S7	https://support.industry.siemens.com/cs/ww/de/view/104117374
\8\	Information about SIMATIC/IndustrialDataBridge V7.3	https://support.industry.siemens.com/cs/de/de/view/95157030

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6 History

Table 6-1

Version	Date	Modifications
V1.0	04/2016	First version