# How can you output tags from an SQL database via a trend archive?

WinCC flexible 2008 SP2

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## Question

How can you output tags from an SQL database via a trend archive?

### Answer

Follow the instructions and notes listed in this document for a detailed answer to the above question.

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## **1** Configuration Notes

This entry includes the principal configuration steps for...

- Creating a Microsoft SQL database.
- For archiving tags in a Microsoft SQL database.
   The archive name is assigned "dynamically" in the example in this FAQ. (The name is created only at runtime).
- Reading out the archived tags via a trend display. Here you can preset the period of time in a selection window.
- Exporting the contents of the archived entries to a CSV file.

#### Name for the tag archive

The archive names in the SQL database are assigned "**dynamically**" in the example in this FAQ. This means that the name of each archive is created only at runtime.

At Runtime a database is created automatically every month with the relevant database name. The values acquired are archived every hour in this database.

The database name is composed of the elements below:

- Archive name + year + month

The archive names in this database are composed of the elements below:

- Archive name + year + month + day + time

The figure below shows an example of how the archived entries are displayed. Figure 1-1



#### SQL database and WinCC flexible

When WinCC flexible 2008 is installed, the "Microsoft SQL Server 2005 Express Edition" is also installed.

You can log your data in this Microsoft SQL database via WinCC flexible.

Alternatively, you can download the "Microsoft SQL Server 2005 Express Edition" from the Microsoft Support site and install it separately on another PC. This would be the case, for example, if you wanted to stored data on an external PC on which WinCC flexible is not installed.

In this case, check which database is released for WinCC flexible (Help system > Search > <u>Released databases</u>).

#### **Microsoft SQL Server Management Studio Express**

The "Microsoft SQL Server Management Studio Express" (SSMSE) provides a graphical management tool for the "MS SQL Server 2005 Express Edition".

The "Microsoft SQL Server Management Studio Express" is not included in the WinCC flexible delivery package.

If required, you can download the "Microsoft SQL Server Management Studio Express" from the Microsoft Support site.

#### When do you need the SQL Management Studio?

If you want to enter, edit and view data in the "Microsoft SQL Server 2005 Express Edition", you need the

"Microsoft SQL Server Management Studio Express".

**Note** When "MS SQL Server" is mentioned in the documentation, this always refers to the "Microsoft SQL Server 2005 Express Edition".

When "Microsoft SQL Management Studio" is mentioned in the documentation, this always refers to the "Microsoft SQL Server Management Studio Express".

## 2 SQL Database

Information on how to operate the SQL database is given below.

## 2.1 Open the "MS SQL Management Studio"

You need the "Microsoft SQL Management Studio" to view and change the data archived in the SQL database.

#### **Requirements:**

- Windows XP operating system
- Microsoft SQL Management Studio is installed.

#### Table 2-1

No.	Description	Picture
1.	Start the "SQL Management Studio" Start the "Microsoft SQL Management Studio" on your PC. "Start > Programs > Microsoft SQL Server 2005 > SQL Server Management Studio".	SitNATIC   Set Program Access and Defaults   Windows Catalog   Windows Lipidate   Image: Programs   Documents   Documents   Documents   Programs   Programs <
	"Microsoft SQL Server Management Studio Express" starts.	Microsoft Microsoft Management Studio Express Microsoft

No.	Description	Picture
2.	Set up connection to the local server	Connect to Server
	Specify the server name The server name consists of the following elements: "Computer name\Instance name".	Microsoft SQL Server 2005 Server type: Server name: TESTPC02tWINCCFLEXEXPRESS
	The instance name in this example is "WINCCFLEXEXPRESS".	Authentication:
	<ul> <li>You can specify the server name and instance name "manually" or via the drop-down list (1).</li> <li>From the drop-down list you select</li> </ul>	Connect Cancel Help Options >>
	<ul> <li>the item "<browse for="" more="">". Another dialog field opens (2).</browse></li> <li>Select the "Local Servers" menu command. Select your local server and confirm the input with "OK".</li> </ul>	Connect to Server     Microsoft     SQL Server.2005     Server type:     Database Engine     Server name:     TESTP20020WINDERLEXED/PEESS     Server name:     TESTP20020WINDERLEXED/PEESS     Server name:     Server name:     Password:     Server type:     Server type:
	Authentication Select the authentication here. In this case "Windows Authentication".	Connect Cancel
	After specifying the server name and authentication, click on the " <b>Connect</b> " button. The connection to the server is set up.	DK Cancel Help
3.	Overview of the "Microsoft SQL Server Management Studio Express".	Summary         Cbject Explorer

No.	Description	Picture
4.	<ul> <li>Start the SQL server</li> <li>If the server has not already been started, indicated by the "red" icon (1), then start the server manually.</li> <li>In the "Object Explorer", you right-click on the instance name of the connection and in the pop-menu that opens you select the "Start" item (2).</li> <li>You are then asked if you really want to restart the SQL server. Acknowledge the message with "Yes".</li> <li>The SQL server starts.</li> </ul>	Microsoft SQL Server Management Studio Express         File       Edit       View       Tools       Window       Community       Help         New Query       Image: Community       Image: Community       Help       Image: Community       Help         Object Explorer       Image: Commet       Summary       Image: Commet       Summary         Image: Community       Image: Commet       Disconnect       Register       Image: Community       Help         Image: Commet       System       Databases       Commet       Disconnect       TESTPCO2\WINCCFLEXEXPRESS         Image: Community       Image: Commet       Name       Databases       Security         Image: Community       Image: Community       Name       Databases       Security         Image: Community       Image: Community       Name       Databases       Security         Image: Community       Image: Community       Reside       Restruct       Replication         Image: Community       Image: Community       Properties       Replication       Management
5.	You do not need to change any other settin	gs.

#### 2.2 Remote access to the SQL database

In section 2.1 the SQL server and the WinCC flexible Runtime are installed on the same PC.

In this section, the SQL server and WinCC flexible Runtime are each installed on a different computer.

The PC with the SQL server serves as the "central PC" on which the data management is conducted. All the WinCC flexible Runtime stations store their data there centrally.

Figure 2-1



The default setting of the "Microsoft SQL Server 2005 Express Edition" does not permit "Remote Access".

Below are the settings to be made to enable "Remote Access".

#### 2.2.1 Enable remote access

The settings are to be made on the PC on which the SQL server is installed.

Table 2-2

No.	Description	Picture
1.	First, execute the steps described in section 2.1.  Note: In this case, the instance name is now not "WINCCFLEXEXPRESS", but "SQLEXPRESS". (With the SQL Server 2005, the name for the default instance is "SQLEXPRESS".)	
2.	Edit server properties In the "Object Explorer", you right-click on the instance name of the connection and via the pop-menu that opens you open the " <b>Properties</b> " of the server connection. The "Properties" dialog box opens.	Image: Server Management Studio Express         File Edit View Tools Window Community Help         New Query         Image: Server Chipets         Image: Server Chipets
3.	<ul> <li>"Properties" dialog box</li> <li>In the "Select a page" list you select the "Security" item.</li> <li>Then, under "Server authentication", you select the "SQL Server and Windows Authentication mode" option.</li> <li>Confirm the entries with "OK".</li> <li>You then get a message informing you that the changes only become effective after restarting the SQL server. Acknowledge the message with "OK".</li> <li>This closes the dialog box.</li> </ul>	Server Properties - COMPUTERAMELSQLEXPRISS         Calcal a page         Server Annual         Server advertication         Memory         Processor         Server advertication         Windows Adhenication made         Database Setting         Server advertication         Vindows Adhenication made         Database Setting         Server and Windows Authenication made         Login authoritication         Server and Windows Authenication made         Login authoritication         Server page and Windows Authenication made         Login authoritication         Server page accurat         Prometores         Server page accurat         Promy accurat         Promy accurat         Promy accurat         Prometores         Options         Convections         Prometores         Options         Convections         Prometores

No.	Description	Picture
4.	<ul> <li>Restarting the SQL server</li> <li>In the "Object Explorer", you right- click on the instance name of the connection and in the pop-menu that opens you select the "Restart" item.</li> <li>You are then asked if you really want to restart the SQL server. Acknowledge the message with "Yes".</li> <li>The SQL server shuts down and then restarts.</li> <li>If you do not want to make any more entries, you can close the "Microsoft SQL Management Studio"</li> </ul>	Image: Server Management Studio Express         File Edit Wew Tools Window Community Help         New Query         Image: Server Objects         Image: Server Objects

#### 2.2.2 SQL server surface area configuration

Via this service you can edit the SQL server surface area configuration. The settings required for "Remote Access" are described below. The settings are to be made on the PC on which the SQL server is installed.

Table 2-3



No.	Description	Picture
4.	<ul> <li>The "Surface Area Configuration for Services and Connections" dialog box.</li> <li>In the list, you select the component "SQL Server Browser &gt; Service" (1).</li> <li>Then, on the right-hand side, open the "Startup type" drop-down list and select the "Automatic" option (2).</li> <li>If the "Service status" is set to "Running", confirm once with the "Stop" button and then with the "Start" button. If the "Service status" is set to "Stopped", then click on the "Start" button.</li> <li>Confirm the entry via the "OK" button (4).</li> </ul>	Surface Area Configuration for Services and Connections - localhost     SQL Server 2005 Surface Area Configuration     Help Protect Your 30L Server     The services and connections uses in a connections before     protect your solutions for default (efficience)     Select a component and then configure its services and connections:     WINDERESPRESS     Service area is connectional for values services.     Service name: SQLDiovree     Service
	This closes the dialog box.	
5.	The "SQL Server 2005 Surface Area Configuration" dialog box is displayed again. Close this dialog box again. This completes the settings for "Remote Access". Now you can access the SQL database from the "WinCC flexible RT stations".	Style. Server 2005 Surface Area Configuration     Windows Server System     Windows Server System     Sul. Serve 2005 Surface Area     Sul Serve     Sul Serve 2005 Surface Area     Sul Serve     Surface Area Configuration for Services and Connections     Surface Area Configuration for Features

## 2.3 Configure the ODBC data source

Via an ODBC application you create an ODBC data source via which you set up a connection to a Microsoft SQL server.

The ODBC settings must be made on the PC on which the WinCC flexible Runtime is installed.

Table 2-4

No.	Description	Picture
1.	Calling the "ODBC Data Source Administrator" Open the "ODBC Data Source Administrator" on your PC. "Start > Settings > Control Panel > Administration > Databases (ODBC)". The dialog box shown on the right opens. <u>Note:</u> There might already be entries from user data sources. You do not need to pay attention to these.	ODBC Data Source Administrator     Iser DSN System DSN File DSN Drivers Tracing Connection Pooling About User Data Sources:     Add     Remove     Configure     Add      Remove     Configure     An ODBC User data source stores information about how to connect to     the indicated data provider. A User data source is only visible to you,     and can only be used on the current machine.     OK Cancel Apply Help
2.	Adding a data source Select the "User DSN" tab and then click on the "Add" button. The "Create New Data Source" dialog box opens.	An ODBC User data source stores information about how to connect to the indicated data provider. A User data source is only visible to you, and can only be used on the current machine.
3.	Selecting an SQL server In the drop-down list you select the "SQL Server" item and then click on the "Finish" button. The "Create a New Data Source to SQL Server" dialog box opens.	Select a driver for which you want to set up a data source.           Name         V           Microsoft DBEC for Oracle         2           Microsoft Paradox Driver (".db.)         4           Microsoft Paradox Treiber (".db.)         4           Microsoft Visual FoxPro Driver         1           Microsoft Visual FoxPro Driver         1           St. Hattv Effent         2           St. Server         2           Microsoft Paradox Effect         2

No.	Description	Picture
No. 4.	DescriptionDefine the reference name and serverSpecify a data source name in the"Name" dialog box (1).You use the name to reference the database and storage location.The name you use here must match the name that you use to identify the "DSN" (Data Source Name) in WinCC flexible 	Picture
	<b><u>TIP:</u></b> You can select already available servers from the drop-down list. If you server is not displayed, open the "SQL Management Studio" (see section 2.1). Copy the name of the " <b>Instance</b> " (3) and add this name to the " <b>Server</b> " input field.	
5	Then click on the "Next>" button.	Canada a Navy Data Sauras to SOL Sauras
	Select a login option for the SQL data source. If you are in a domain, you can then use your domain account. In this example, we have taken the options selected in the picture. Then click on the " <b>Next&gt;</b> " button.	Kenter and Wether Source For Source Source Source For Source Source Source Source Source Source For Source Source For Sou
	When you click on the " <b>Next</b> " button, the system attempts to set up a connection to the SQL server. If this does not succeed, you get an error message (see next point).	< Back Next > Cancel Help

No.	Description	Picture
6.	Possible error message	Microsoft SQL Server Login
	<ul> <li>If connection setup to the SQL server has failed, check the "Server name" specified.</li> <li>Via the "<back" button="" can="" li="" previous="" return="" screen.<="" the="" to="" you=""> <li>Remote access</li> <li>If you do not want to access the "local server" but the "remote server" (central PC), then check the points below.</li> <li>Is the PC to be reached via a "PING" or via the "computer name"?</li> <li>Is the login data correct? The user of the client operating system must also be created on the SQL server operating system (identical name and password for all computers)!</li> <li>Check the cable connection between the PCs.</li> </back"></li></ul>	Connection failed: SQLState: (1000' SQL Server Error: 33 [Microsoft][ODBC SQL Server Driver][DBNETLIB]ConnectionOpen (Connect()). Connection failed: SQL Server Error: 17 [Microsoft][ODBC SQL Server Driver][DBNETLIB]SQL Server does not exist or access denied. OK
	• See section 2.2.	
7.	Select the database You do not have to select any special database in the example in this FAQ. Then click on the "Next>" button.	Microsoft SQL Server DSN Configuration         Image:         Image:
8.	Complete the user data source	Create a New Data Source to SQL Server
	On this page you can make a few more settings. It is useful to change the language of the SQL server system messages to the relevant "local language" (1). Complete the user data source by clicking on the " <b>Finish</b> " button. When you click on the " <b>Finish</b> " button, the "ODBC Microsoft SQL Server Setup"	Change the language of SQL Server system messages to: German Use strong encryption for data Perform translation for character data Use regional settings when outputting currency, numbers, dates and times. Save long running queries to the log file: CNOOCUME "INUSERING CALS" INTemp/STATS. Browse CNOOCUME "INUSERING CALS" INTemp/STATS. Browse CBack Finish Cancel Help
	window opens. All the settings you have made are displayed once again in this window.	

No.	Description	Picture
9.	ODBC Microsoft SQL server setup All the settings you have made are displayed once again in this window. Furthermore, you can test the connection via the	ODBC Microsoft SQL Server Setup       Image: Configuration in the following configuration:         Microsoft SQL Server ODBC Driver Version 03.85.1117       Image: Configuration in the following configura
	"Test Data Source" button. Close the dialog by clicking on the "OK". When you click on the "OK" button, the "ODBC Data Source Administrator" window opens.	Server: TESTPC02/WINCCFLEXEXPRESS Database: (Default) Language: German Translate Character Data: Yes Log Long Running Queries: No Log Driver Statistics: No Use Integrated Security: Yes Use Regional Settings: No Prepared Statements Option: Drop temporary procedures on disconnect Use Failover Server: No Use ANSI Quoted Identifiers: Yes Use ANSI Quoted Identifiers: Yes Data Encryption: No Test Data Source OK Cancel
10.	View the newly created user data source	ODBC Data Source Administrator     OUSer DSN   System DSN   File DSN   Drivers   Tracing   Connection Pooling   About
	The "ODBC Data Source Administrator" dialog box displays your defined user data source (1). Via buttons (2) you can	User Data Sources: Name Driver Add WinCCFlexible SQL Server (1) (2)
	<ul> <li>Delete a user data source.</li> </ul>	
	Edit a user data source.	
	Mark the associated user data source. If you do not want to make any more entries, close the window with the " <b>OK</b> " button.	An ODBC User data source stores information about how to connect to the indicated data provider. A User data source is only visible to you, and can only be used on the current machine.           DK         Cancel         Apply         Help

## 3 WinCC flexible ES

This chapter describes how to configure and make various settings for logging data in an SQL database. Details are given in the attached project.

**Note** All the settings already described have been made in the attached configuration.

## 3.1 Create a tag log

The settings below are to be made generally regardless of whether it is a message or tag log.

Table 3-1

No.	Description	Picture
1.	Create a tag log First create two new logs. In this example: Data_Logs Data_Logs_Trend_View Settings: General Open the properties of the tag log "Data Logs > General". Storage location (1) From the drop-down list, select "Database" as storage location. Storage location (2) Select the option "User-defined data source name" and enter the name of the data source. In this case "WinCCFlexible" (the name must match the name you used in the ODBC parameterization see link).	01_Trend_View       AData Logs       Pata source name       Path         Data_Logs       100000       Database       WnCCflexible       DiffES         Data_Logs_Value_Trend_View       100000       Database       WnCCflexible       DiffES         Data_Logs (Data_log)       Image: Control of the source name       Image: Control of the source name       Image: Control of the source name         Pata_Logs (Data_log)       Image: Control of the source name       Image: Control of the source name       Image: Control of the source name         Properties       Image: Control of the source name       Image: Control of the source name       Image: Control of the source name         No. of data records per log       Image: Control of the source name       Image: Control of the source name         No. of data records per log       Image: Control of the source name       Image: Control of the source name         No. of data records per log       Image: Control of the source name       Image: Control of the source name         No. of data records per log       Image: Control of the source name       Image: Control of the source name         No. of data records per log       Image: Control of the source name       Image: Control of the source name         No. of data records per log       Image: Control of the source name       Image: Control of the source name         No. of data records per log
2.	Define properties Properties Open the properties of the tag log "Properties > Properties". You can make the settings individually. Detailed information on the separate points is available in the Online Help of WinCC flexible.	Ol_Trend_View       Data Logs         No. of data records per log Storage location       Data source name         Data_Logs       100000       Database       WinCCRexble         Data_Logs_Value_Trend_View       100000       Database       WinCCRexble         Data_Logs (Data_Log)       Ceneral       Ceneral       Ceneral         Corrents <ul> <li>General</li> <li>Logging Activation</li> <li>Comment</li> <li>Events</li> <li>Events</li> <li>General data to existing log</li> <li>Append data to existing log</li> </ul>

No.	Description	Picture	
3.	SQL database view If you start WinCC flexible Runtime and a connection to the SQL server is established, the logs configured previously are stored in the SQL database as follows. Open the folder "Databases > System Databases > master > Tables". The prefix "dbo" and the number "0" are	Image: Second	Summary  Sum
	added automatically by the system.	Image: Security         Image: Security	

## 3.2 Tag Logging

#### Define logging properties

Table 3-2

No.	Description	Picture
1.	Define logging properties	01_Trend_View <= Tags
	<ul> <li>Mark the tags to be logged. (Tags of the "STRING" type cannot be logged).</li> <li>Logging Open the properties of the tags "Properties &gt; Properties &gt; Logging".</li> </ul>	Name     Data log     Data type       HMI_Archive_Data.Tag_01     Data_Logs     Int       HMI_Archive_Data.Tag_02     Data_Logs     Int       HMI_Archive_Data.Tag_03     Data_Logs     Int       Selection_Month <undefined>     UInt</undefined>
	<ul> <li>Tag log (1) Select the relevant tag log from the drop-down list. In this case "Data_Logs".</li> <li>Trigger (2) Here you enter the acquisition mode.</li> </ul>	
	In this case "Cyclic continuous". You do not need to make any other settings for logging.	Logging (2)     Logging cycle 1 s      Logging Limits     Events

## 3.3 Scripts

#### 3.3.1 Script editing for logging

In the sample project attached the scripts are used to achieve a clear view of the values logged in the database. In addition, the scripts are used to read out the logged data of the SQL database via a WinCC flexible Runtime.

All the logged data is logged by default in the "Data\_Log" log. There is **no** script required for this.

The figure below shows an excerpt of entries logged in "Data\_Log". Figure 3-1



In this example three values are logged every second. After just a short time the table becomes very "long" and it is difficult to pick out a specific value for a specific time.

Using the scripts you can split the existing table into several "small" tables. In this example a database is created for each month. A separate log is created for every hour in this database.

The name of the archive is created automatically.

Furthermore, you can use the scripts and a text list to predefine a specific period of time and select a specific log. The values from the log chosen can then be displayed via a trend archive.

#### 3.3.2 Scripts used

This chapter provides you with information on the scripts configured.

**Note** A certain amount of experience and basic knowledge of the SQL instruction set is required for creating these scripts. Refer here to Entry ID: <u>26283062</u>.

Essentially, the scripts have the same format. Lines 9 to 14 are for setting up the connection to the SQL database. Figure 3-2



#### Line 5: Declaration of tags

- Line 9: The "ADO" command is for accessing the database of an SQL server and the tables and data records contained in it. "ADODB.Connection" -> Database connection
- Line 10: The "ADO" command is for accessing the database of an SQL server and the tables and data records contained in it. "ADODB.Recordset" -> Collection data records
- Line 14: The DSN name "**WinCCflexible**" references the database and the storage location. This name is used in all scripts. The name must match the name you used when configuring the ODBC data source (<u>see link</u>).

The description of the scripts below limits itself to the function that scripts execute. Please refer to the configuration for details.

#### S1\_Create\_Database\_Table

The script is executed once when WinCC flexible Runtime starts.

The script creates a new database for the current month in an SQL database. If a database already exists for the current month, a system message is issued.

The database name is composed of the elements below:

- Archive name + year + month

#### S2\_Archive\_Data\_Hourly

The script is call once at the beginning of each hour via the scheduler.

The script copies all the values of the "previous" hour from the "Data\_Logs" archive and inserts the data into a newly created archive.

The name of the new archive is composed of the elements below:

Archive name + year + month + day + hour

#### Functional sequence:

- 1. When the WinCC flexible Runtime starts, the "Data\_Logs" archive (<u>Link</u>) is created in the system database of the SQL server. The configured values are stored continuously in this archive.
- 2. At the beginning of each hour the script "S2\_Archive\_Data\_Hourly" is called via the "Scheduler".

The script creates a new archive for the past hour.

Then all the values of the past hour between the minute "xx:00:00" and the minute "xx:59:59" are copied from the "Data\_Logs" archive and pasted into the newly created archive.

3. After copying, the "old" values are deleted in the "Data\_Logs" archive.

#### 4. Example:

Archiving is started at 14:35:42. At 15:00 the scheduler executes the script. All the values between 14:35:42 and 14:59:59 are stored in the archive named "Data\_Logs\_2010\_7\_28\_14".

(Archive name + year + month + day + hour)

Continuous archiving of the subsequent data in the "Data\_Logs" archive is not interrupted during the copying procedure.

#### S3\_Load\_Database\_Table

The script is called via the "Download archive data" button.

The script copies the data logged in the given time and pastes it into the "Data\_Logs\_Trend\_View" archive.

These values from the "Data\_Logs\_Trend\_View" are displayed via a trend display.

If the archive selected is not available, a system message is issued.

#### **Functional sequence:**

- When the WinCC flexible Runtime starts, the "Data\_Logs\_Trend\_View" archive (Link) is created in the system database of the SQL server. The archive acts as a "temporary" buffer for values.
- 2. The "S2\_Archive\_Data\_Hourly" script creates a new archive with the corresponding values every hour.
- 3. You select a file archived in the SQL database by entering a specific point in time (date and time) via text lists.
- After specifying the time period you press the "Download archive data" button to execute the script.
   Based on time period specified the script searches the archived file in the SQL

database and copies the contents into the "Data\_Logs\_Trend\_View" archive.

The values from the "Data\_Logs\_Trend\_View" archive can then be displayed via a trend archive.

#### S4\_Export\_Archiv\_As\_CSV\_File

You call the script via the "Export selected archive as CSV file" button.

The script copies the data archived in the SQL database from the specified period of time and creates a \*.CSV file on the C:\ drive.

The name of the new file is composed of the elements below:

Archive name + year + month + day + hour

If the archive selected is not available, a system message is issued.

#### **Functional sequence:**

- 1. The "S2\_Archive\_Data\_Hourly" script creates a new archive with the corresponding values every hour.
- 2. You select a file archived in the SQL database by entering a specific point in time (date and time) via text lists.
- After specifying the time period you press the "Export selected archive as CSV file" button to execute the script. Based on time period specified the script searches the archived file in the SQL database and creates a CSV file out of the data available.

#### Example:

File in the SQL database:Data\_Logs\_2010\_7\_29\_14File on drive "C:\":Data\_Logs\_2010\_7\_29\_14.csv

## 4 Operate the Sample Application

This chapter describes how to operate the application.

## 4.1 Call the data in the SQL database

#### Requirements

- The settings as described in chapter 2 "SQL Database" have been made.
- Data has been logged in the SQL database via WinCC flexible Runtime.

#### Open the SQL table

Table 4-1

No.	Description	Picture			
1.	Open the SQL table         You only have to open the SQL table to see the data in the SQL database.         Open the "SQL Management Studio".         (See section 2.1).         "Standard" Archive (1)         In the folder "Databases > System         Databases > master > Tables" you see         the archive files that WinCC flexible         creates automatically when Runtime         starts (Link).         In this example:         -       Data_Logs_Trend_View0         -       Data_Logs0         Created Archive (2)         In the "Data_Logs_xx_xx > Tables"         database you see the data archived using         the scripts.         Right-click on the relevant "table" and         select the "Open Table" item in the pop-         up menu. The table with the stored data	Ficure         Microsoft SQL Server Management Studio Express         File       Edit       View       Tools       Window       Community       Help         New Query       Image: Colorer       Image: Co			
2.	Table View	Table - dbo.D2010_7_29_17 Summary			
	The figure below shows you an opened table In this case it is the data from the table " <b>Data_Logs_2010_7_29_17</b> ". You can add new values to the table and change existing values. If you make changes to the table, you must then save the data.	VarName         TimeString         VarValue         Validity           HMI_Archive_Data.Tag_01         29.07.2010 17:49:34         546         1           HMI_Archive_Data.Tag_02         29.07.2010 17:49:35         704         1           HMI_Archive_Data.Tag_03         29.07.2010 17:49:35         480         1           HMI_Archive_Data.Tag_03         29.07.2010 17:49:35         548         1           HMI_Archive_Data.Tag_02         29.07.2010 17:49:36         712         1           HMI_Archive_Data.Tag_03         29.07.2010 17:49:36         712         1           HMI_Archive_Data.Tag_03         29.07.2010 17:49:36         550         1           HMI_Archive_Data.Tag_03         29.07.2010 17:49:37         720         1           HMI_Archive_Data.Tag_03         29.07.2010 17:49:37         552         1			

No.	Description	Picture	
3.	Update values in a table		
	Tags continue to be logged even in an opened table. To update the values in the table you close and then reopen the table.		
4.	Update the database table		
	Click on the " <b>Tables</b> " folder and press the ' Alternatively you select the menu item "Vie	F5" key on the PC keyboard. w > Refresh".	

## 4.2 Operate the WinCC flexible Runtime screens

#### Requirements

You must start the SQL server before starting WinCC flexible Runtime (see link).

The WinCC flexible Runtime consists of three screens.

#### Table 4-2

No.	Description	Picture
1.	Screen 01: "Trend View" The trend display is for the graphical	Trend View         7/00/000 02:30:013144           900         900
	representation of tag values from the current process. The values of the tags below are displayed. - HMI_Archive_Data.Tag_01 - HMI_Archive_Data.Tag_02 - HMI_Archive_Data.Tag_03	700 600 500 400 200 100 0
	The values are also archived in an SQL database.	12:29:13144         12:29:23 8744         12:29:23 8
2.	Screen 02: "Archive Trend View"	Statt Viet C noble betwee     Archive Trend View     7/10/000 12-51 -0 Fer
	Via this screen you can call the archived values from the SQL database. Furthermore, you can export the data from the selected archive into a CSV file.	000         000
3.	Screen 03: "System Site" Via this screen you can change the language (Deutsch/English) and end Runtime. Alarm events are output via the alarm display.	Plant If wird2, heads having         System Site         ////////////////////////////////////
		Trand View Andrive View Surfame Sea



How to operate the separate screens is described in detail below.



W SIMATI	C WinCC fle	xible Runtime				
					System Site	7/30/2010 1:4
	No.	Time	Date	Status	Text	GR
\$	140000	11:53:38 AM	7/30/2010	K	Connection established: Connection_ Slot 2.	1, Station 172.168.34.210, Rack 0, 0
\$	60000	11:53:35 AM	7/30/2010	К	Datenbank Tabelle bereits vorhander	n U
\$	80026	11:53:34 AM	7/30/2010	к	Log initialization ended. All logs UK.	U
\$	110001	11:53:34 AM	7/30/2010	К	Change to operating mode 'online'.	U
\$	70018	11:53:34 AM	7/30/2010	к	Password list imported successfully.	U
\$	/0022	11:53:34 AM	//30/2010	К	Password list import started.	U
						Deutsch RT
						Trend View Archive View Syste



#### 4.2.1 Open exported CSV file with Excel

You should follow the instructions below to open the exported CSV.

Table 4-4

No.	Description	Picture
1.	Open the CSV file with Excel	Data_Logs_2010_7_29_15.csv
	If you open the exported CSV file directly with a double-click, then the values might not be displayed correctly in the columns. In the adjacent figure, for example, in the " <b>TimeString</b> " column does not show the "seconds" (only date + hour + minute) even though seconds are given in the "original" CSV file. (To check you can open the CSV file with a text editor).	A         B         C           1         VarName         TimeString         VarValue           2         HMI_Archive_Data.Tag_03         29.07.2010 15:00         405           3         HMI_Archive_Data.Tag_03         29.07.2010 15:02         535           4         HMI_Archive_Data.Tag_02         29.07.2010 15:04         680           5         HMI_Archive_Data.Tag_02         29.07.2010 15:06         544           6         HMI_Archive_Data.Tag_02         29.07.2010 15:06         280           7         HMI_Archive_Data.Tag_03         29.07.2010 15:06         280           8         HMI_Archive_Data.Tag_04         29.07.2010 15:06         280           9         HMI_Archive_Data.Tag_04         29.07.2010 15:06         288           10         HMI_Archive_Data.Tag_03         29.07.2010 15:06         275           11         HMI_Archive_Data.Tag_04         29.07.2010 15:06         548           12         HMI_Archive_Data.Tag_02         29.07.2010 15:06         548           13         HMI_Archive_Data.Tag_03         29.07.2010 15:06         296
2.	<b>Open CSV file with Excel</b> There are different ways of open a CSV to open a CSV file with Excel 2003.	ile with Excel. Below we take an example to show how
3.	Create empty workbook Create a new workbook in Excel.	Microsoft Excel - Book1           Image: Second se
4.	Import data Select the menu command "Data > Import External data > Import Data". A window opens in which you can navigate to the desired CSV file. Select the desired CSV file and click on the "Open" button. The "Text Import Wizard" opens.	Elifectoroff Exect - Book1           Elifectoroff Exect - Book1           Elife Edit View (note: Figmat Loois)           All         C           All         C           Subration         Adapte PDF           All         C           Figm.         H         I           Subration         H         I           All         C         Subration           All         C         Figm.           Subration         H         I           Image Existence         H         I           Subration         Costo Costo         Existence           B         C         Subration         Figm.           Subration         Figm.         H         I           Subration         Figm.         H         I           G         Costo Costo         Figm.         Figure Existence           B         Costo         Costo Costo         Figure Existence           B         Costo         Figure Existence         Figure Existence           B         Costo Costo         Figure Existence         Figure Existence           B         Costo Costo         Figure Existence         Figure Existence           <

No.	Description	Picture
5.	Text Import Wizard	Text Import Wizard - Step 1 of 3
	Step 1 of 3. Select the options shown. In this example: Original data type: Delimited Start import at row 1 File origin Windows (ANSI) Then click on the "Next >" button.	The Text Witzerd has determined that your data is Delimited. If this is correct, choose Next, or choose the data type that best describes your data. Original data type Choose the file type that best describes your data: © Delimited • Characters such as commas or tabs separate each field. © Fixed width • Fields are aligned in columns with spaces between each field. Start import at row: 1 Start import at row: 1 File grigin: Windows (ANSI) • Preview of file D:\Helmut\Excel\Data_Logs_2010_7_30_15.csv. 1 WarName"; "TimeString"; "VarValue"; "Validity"; "Time_ms" 2 HHTI_Archive_Data.Tag_01"; "30.07.2010 15:02:12"; 318;1;403896284 3 HHTI_Archive_Data.Tag_01"; "30.07.2010 15:02:2"; 16:21;403896284 4 HHTI_Archive_Data.Tag_01"; "30.07.2010 15:02:2"; 16:21;403896284 5 HHTI_Archive_Data.Tag_01"; "30.07.2010 15:02:2"; 16:21;403896283 • MITI_Archive_Data.Tag_01"; "30.07.2010 15:02:2"; 16:21;403896283 • MITI_Archive_Data.Tag_01"; "30.07.2010 15:02:2"; 16:21;403896284 • MITI_Archive_Data.Tag_01"; "30.07.2010 15:02:2"; 16:21; 16:21;403896284 • MITI_Archive_Data.Tag_01"; "30.07.2010 15:02:2"; 16:21;
6.	Text Import Wizard	Text Import Wizard - Step 2 of 3
	Step 2 of 3. Select the options shown. In this example: Delimiters Tab Semicolon Text qualifier Then click on the "Next >" button. Note: Delimiters are "country-specific" and can also be a "comma", for example. If you open the CSV file with a text editor, you can see which "Delimiters" are used.	This screen lets you set the delimiters your data contains. You can see how your text is affected in the preview below. Delimiters Space Qther: Treat consecutive delimiters as one Text gualifier: Teat gualifier: Text gualifier: Taxt gual
7.	Text Import Wizard Step 3 of 3. Now you can adapt the data format by selecting the individual columns. For this application it suffices to select the "General" option for all columns. Then click on the "Finish >" button.	Text Import Wizard - Step 3 of 3       ? X         This screen lets you select each column and set the Data Format.       • General       • General         'General' converts numeric values to numbers, date values to dates, and all remaining values to text.       • General       • General         Advanced       • Data greview       • Do not import column (skip)         Data greview       • Data TimeString       • VarValue       • General         Iff_Archive_Pata.Tag/01       00.70.2010       15:02:12       18       1       403         Iff_Archive_Data.Tag/01       30.07.2010       15:06:23       16       1       403         Iff_Archive_Data.Tag/01       30.07.2010       15:07:46       1       403       ¥

No.	Description	Picture		
8.	Import data	Import Data     X       Where do you want to put the data?     OK		
	be imported is to be added to an existing worksheet or a new worksheet.	Cancel		
	In this example: "Existing worksheet"	New worksheet     Create a PivotTable report		
	Then click the " <b>OK</b> " button.	Properties Parameters Edit Query		
9.	Format "TimeString" column	<mark>ﷺ Microsoft Excel - Book1</mark> ﷺ File Edit View Insert Format Icols Data Window <u>H</u> elp DataMonitor Ado <u>b</u> e PDF		
	Once the data has been imported, you must change the format of the " <b>TimeString</b> " column.	Image: Second system       Image: Second system <t< td=""></t<>		
	<ul> <li>Mark the "B" column.</li> <li>Right-click on the marked column.</li> <li>A pop-up manu opens</li> </ul>	4         HMI_Archive_Data.Tag_01         30.07.2010         15.         4039823935           5         HMI_Archive_Data.Tag_01         30.07.2010         15.         Paste Special         40389630396           6         HMI_Archive_Data.Tag_01         30.07.2010         15.         Jaste Special         40389630396           7         HMI_Archive_Data.Tag_01         30.07.2010         15.         peset         40389632340           7         HMI_Archive_Data.Tag_01         30.07.2010         15.         peset         40389632340		
	<ul> <li>Select the pop-menu command "Format Cells". The "Format Cells" dialog box opens.</li> </ul>	B         HMI_Archive_Lata.1ag_01         30.07.2010         15.         Clear Coglents         40399634273           9         HMI_Archive_Data.Tag_01         30.07.2010         15.         Clear Coglents         40399634273           10         HMI_Archive_Data.Tag_01         30.07.2010         15.         Example         40389635234           11         HMI_Archive_Data.Tag_01         30.07.2010         15.         Column Width         40389636206           12         HMI_Archive_Data.Tag_01         30.07.2010         15.         Hide         40389638160           13         HMI_Archive_Data.Tag_02         30.07.2010         15.         Unhide         40389638780           14         HMI_Archive_Data.Tag_02         30.07.2010         15.         Unhide         40389638780           15         HMI_Archive_Data.Tag_03         30.07.2010         15.         Unhide         40389638780		
10.	Format cells	Microsoft Excel - Book1     Image: Second Sec		
	In the dialog box you select the " <b>Number &gt; Custom</b> " menu.	B1     A     A     TimeString       A     Format Cells     ? X		
	Enter the format below in the input field (1).	1         VarName         Number         Alignment         Font         Border         Patterns         Protection           2         HMI_Archive_Dt         Gategory:         Sample           3         HMI_Archive_Dt         General         TimeString		
	"DD.MM.YYYY hh:mm:ss" (pay attention to character cases!)	4         HMI_Archive_D;         Number           5         HMI_Archive_D;         Currency           6         HMI_Archive_D;         Accounting           7         TT.MM.JJJJ hh:mm:ss		
	Alternatively you can use the scroll bar to select the required format. (The complete format you require might not be available, in which case you must complete it as necessary manually).	7       HMI_Archive_D;         8       HMI_Archive_D;         9       HMI_Archive_D;         9       HMI_Archive_D;         10       HMI_Archive_D;         11       HMI_Archive_D;         12       HMI_Archive_D;         13       HMI_Archive_D;         14       HMI_Archive_D;         15       HMI_Archive_D;         16       HMI_Archive_D;         17       HMI_Archive_D;         18       HMI_Archive_D;         19       HMI_Archive_D;         10       HMI_Archive_D;         13       HMI_Archive_D;         14       HMI_Archive_D;         15       HMI_Archive_D;         16       HMI_Archive_D;         17       HMI_Archive_D;         17       HMI_Archive_D;		
11.	Finished Excel file	18     HM_Archive_D;     Cancel       19     Ltmt     Cancel		
	In the figure on the right you see the "finished" Excel file. The " <b>seconds</b> " are now displayed as well in the " <b>B</b> " column.	Image: Second		

#### 4.2.2 Troubleshooting

If no data is logged in the SQL database, run through the points listed below.

#### **Check IP address**

If the SQL server and WinCC flexible Runtime are installed on different computers (<u>Remote Access</u>), then check the IP addresses used on the PCs. The IP addresses must be in the same IP band and subnetwork. If necessary, get in touch with your system administrator.

#### SQL server address

Check the SQL server address used (link).

#### Data source name

Check the data source name used. The name is used for parameterizing the logs and in the scripts (<u>link</u>).

#### Start the SQL server

Make sure that the SQL server has been started (link).

#### WinCC flexible Runtime

Make sure that the SQL server is started before starting the WinCC flexible Runtime and that the connection to the SQL server is not interrupted during operation.

#### Sample error messages

Figure 4-2

No.	Time	Date	Status	Text	GR	^
\$ 80052	5:15:13 PM	7/30/2010	К	Error in case of read access to log file Data_Logs_Trend_View.	0	
\$ 80052	5:15:02 PM	7/30/2010	К	Error in case of read access to log file Data_Logs_Trend_View.	0	
\$ 20010	5:14:54 PM	7/30/2010	К	Error [Microsoft][ODBC SQL Server Driver][DBMSLPCN]SQL Server doe	. 0	
\$ 80029	5:14:45 PM	7/30/2010	К	Log initialization ended. 2 log reports error.	0	
\$ 80015	5:14:45 PM	7/30/2010	К	Data_Logs0 - is corrupted	0	
\$ 80006	5:14:45 PM	7/30/2010	К	ODBC(ADO) error: Cannot log to Data_Logs_Trend_View.	0	
\$ 80015	5:14:45 PM	7/30/2010	К	Data_Logs_Trend_View0 - is corrupted	0	
\$ 140000	5:14:32 PM	7/30/2010	К	Connection established: Connection_1, Station 172.168.34.210, Rack 0	. 0	
\$ 110001	5:14:28 PM	7/30/2010	К	Change to operating mode 'online'.	0	
\$ 70018	5:14:28 PM	7/30/2010	К	Password list imported successfully.	0	
\$ 70022	5:14:27 PM	7/30/2010	К	Password list import started.	0	~