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Logging Process Values and Alarms

WinCC (TIA Portal) / V14 / HMI Operator Panels

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1 Task

Introduction

Before you start configuring logs, you should develop a concept regarding the requirements and objectives of logging.

Examples

- Debugging
 - A machine fails sporadically. You try to narrow down the cause of the fault by logging different parameters.
- Process
 - You want to track and document the cooling process of a product.

Each of the tasks listed here requires a custom logging concept. This is where the application example provides support and helps you find the logging concept that best suits your requirements.

Which tags can be logged?

By default, all tag types can be logged, except for tags of the "String" type. A tag of the "String" type can be saved to a CSV file in conjunction with a "discrete alarm" or with the aid of a script.

Chapter [3.3 "Logging STRING tags"](#) provides a detailed description of the specific solutions.

Overview of the automation task

The automation task is to find the right logging concept and, resulting from this concept,

- determine the hardware.
- achieve optimum performance.
- provide the greatest possible security in terms of "access protection".
- ensure output / evaluation.

If you are familiar with the different logging options and their properties, have a look at the following two summary tables.

Alternatively, read the individual chapters.

1.1 Selection aid

The following table provides a summary in terms of the

- hardware used.
- logging method.
- log properties.

Examples:

- You have an HMI operator panel.
The properties assigned in "Hardware" allow you to see, at a glance, which logging method and property are supported.
- You need an operator panel (hardware) that is capable of long-term logging of large data volumes.
The properties assigned in "Log properties" (from "--" for low/poor to "++" very high/very good) allow you to see, at a glance, which logging method and hardware best support the task.

For more information about "logging methods", click the appropriate link in the table.

Table 1-1

Logging method		Circular log (link)	Segmented circular log (link)	Automatic generation of sequence logs (link)	GMP data collection (link)	SQL database (link)	Compressed log (link)	Storage (link)	Process Historian (link)	Logging with the aid of scripts (link)	DataLog and Trace function (link)	Shared Memory Extension (SMX) (link)
Hardware	Basic Panel 2nd	✓	✓	—	—	—	—	—	—	—	—	—
	KTP Mobile, Mobile Panels	✓	✓	✓	✓	—	—	—	—	✓	—	—
	Comfort Panel	✓	✓	✓	✓	—	—	—	—	✓	—	—
	PC Runtime Advanced	✓	✓	✓	✓	✓	—	—	—	✓	—	—

1 Task

1.1 Selection aid

Logging method		Circular log (link)	Segmented circular log (link)	Automatic generation of sequence logs (link)	GMP data collection (link)	SQL database (link)	Compressed log (link)	Storage (link)	Process Historian (link)	Logging with the aid of scripts (link)	DataLog and Trace function (link)	Shared Memory Extension (SMX) (link)
	PC Runtime Professional	✓	✓	✓	—	✓	✓	✓	✓	✓	—	—
	SIMATIC LOGO	—	—	—	—	—	—	—	—	—	✓ ¹	—
	SIMATIC S7-1200 / S7-1500	—	—	—	—	—	—	—	—	—	✓	✓ ²
	SIMATIC S7-1500 Software Controller	—	—	—	—	—	—	—	—	—	✓	✓
Log properties	Data volumes	--	--	++	/	++	+-	+-	++		--	--
	Long-term logging	--	--	++	++	++	+-	--	++		++	++
	External access and evaluation	--	--	++	++	+	--	--	--		--	--
	Protects data against tampering	*)	*)	*)	++	+	*)	*)	*)	*)	*)	*)

*) A general statement cannot be made. Among other factors, this depends on where the data is logged (e.g., via a secure network and on a PC with appropriate user management).

¹ Trace function is not supported

² In conjunction with a WinAC RTX

1.2 Storage and access options

The following table summarizes the storage and access options in terms of the hardware used.

Table 1-2

Hardware	Storage Card SD\...	\Storage Card USB\...	\USB_X60.1\...	\\ComputerName\ShareName\...	Shared memory	DataLog function	Web server access
SIMATIC S7-1200 / S7-1500	—	—	—	—	✓	✓	✓
SIMATIC LOGO	—	—	—	—	—	✓	—
Basic Panel 2nd	—	—	✓	—	—	—	—
Comfort Panel	✓	✓	✓	✓	—	—	✓
KTP Mobile, Mobile Panels	✓	✓	✓	✓	—	—	✓
PC Runtime Systems	✓	✓	✓	✓	—	—	✓

Scope

This application example does not include a description of how to log a tag. The SIMATIC software and operator panels used are not discussed in detail. For details, please refer to the manuals summarized in a table in Chapter [4.2](#), "Links & Literature".

1.3 Components used

This application example was created with the following hardware and software components:

Table 1-3

Component	No.	Article no.	Note
SIMATIC WinCC Advanced V14 SP1	1	6AV2102-0AA04-0AA5	If there is no PC application, then WinCC Comfort V14 SP1
SIMATIC HMI TP1200 COMFORT		6AV2124-0MC01-0AX0	Alternative: script-capable HMI operator panels
Excel (2010)	1	Microsoft	

This application example consists of the following components:

Table 1-4

Component	File name	Note
Sample configuration <ul style="list-style-type: none"> • Comfort Panel • PC Runtime Excel template	109746939_CODE_v10.zip	This .zip file contains the "Excel" template for evaluating a data log.
Documentation	109746939_DOKU_v10_e.pdf	This document.

2 Solution

2.1 Logging concept

Not every tag needs to be continuously logged or stored on a server for several months for quality control.

For this reason, first define a logging concept. This concept defines the next steps.

The following list provides an overview of the requirements that can be placed on a logging concept. There are different solutions to each requirement.

- Quality assurance (traceability).
 - Daily documentation of the number of parts produced, divided into "good", "scrap", etc.
 - Proof of operations if an employee has made changes to the parameters of a machine.
- Service, maintenance and debugging (optimize plant configuration)
 - You want to optimize the control loop based on recorded machine data.
 - Based on the machine utilization, you want to determine when the next maintenance is due.
 - You are trying to locate a fault that occurs sporadically in the plant and causes a machine to fail.
- Business report (MS Office evaluation)
 - Determine production / manufacturing figures.
 - External access to individual items of production data.
- Process
 - You want to check the process to control, for example, the cooling process of a product.

2.2 Logging methods

Depending on the options listed in Chapter [2.1](#), "Logging concept", one or more of the following logging options can be considered. A distinction is made between whether the HMI operator panel or the SIMATIC controller is to be used for logging. The required software and hardware is described later in the document.

Data storage in the HMI device

- Circular log (for short-term logging of data).
- Segmented circular log (for short-term logging of data).
- Automatic generation of sequence logs (long-term logging).
- GMP data collection (logging of user actions).
- SQL database (long-term logging and large data volumes).
- Compressed log (long-term logging and large data volumes).
- Storage (WinCC Professional, for short-term logging of data).
- Process Historian (long-term logging and large data volumes).
- Storage of any HMI data with scripts (custom options).

Data storage in the CPU

- SIMATIC S7-1200 / S7-1500 controller (fast data acquisition).
 - DataLog.
 - Trace and logic analyzer function.
 - Shared Memory Extension (SMX).

2.3 Taking a look at each logging option

General properties of logs

Aside from the general properties of logs (parameters), the following must be considered when selecting the logging type.

Creating several small logs with a small number of "data records per log" is better than creating one large log. This applies in particular if you are using "alarm logs".

Log: Large number of data records => lower performance
 Small number of data records => higher performance

Circular log

Relevant to: WinCC Advanced WinCC Professional

A circular log is mainly suitable for data that must be available for a short period of time. When the configured size is reached, the oldest entries will be deleted.

The shortest logging cycle for WinCC Advanced is 1 second; for WinCC Professional, this cycle value is 500ms.

Using a Comfort Panel, the following sample calculation shows how much time is expected to pass until the log is full.

The duration depends on the

- logging cycle.
- number of data records
- number of logging tags.

Specified values:

Number of logging tags: 5
Number of data records: 10,000
Logging cycle: 2 sec.

Calculation:

$$\left(\frac{\text{no. of data records}}{\text{no. of logging tags}}\right) \times \text{logging cycle} = \text{time in seconds}$$

$$\left(\frac{10000}{5}\right) \times 2 = 66\text{min.} \approx 1\text{h}$$

A circular log would overwrite the "oldest" values after approx. 1 hour.

Function chart.

Figure 2-1



For detailed information about circular logs, please refer to the system manual (see Links & Literature, [\3](#) or [\4](#)).

Segmented circular log

Relevant to: WinCC Advanced WinCC Professional

Like a circular log, a segmented circular log is mainly suitable for data that must be available for a short period of time. When the configured size is reached, the oldest entries will be deleted.

A segmented circular log generates sequence logs (segments) until the configured number is reached. When all the logs are full, the contents of the oldest log will be deleted and the new data will be written to it.

The time expected to pass until the contents of the "oldest" log are deleted corresponds to the calculation of the circular log.

NOTICE

Make sure not to exceed the device-related system limits when configuring a "segmented circular log".

The total number of configured log entries is calculated as follows:

Total = "data records per log" x "number of segments"

Example – TP1200:

System limit for logs: Max. no. of entries: 20,000, max. no. of segments: 400.

Case 1: 2000 x 10 = 20,000 → System limit not exceeded.

Case 2: 2000 x 20 = 40,000 → System limit exceeded.

Case 3: 50 x 400 = 20,000 → System limit not exceeded.

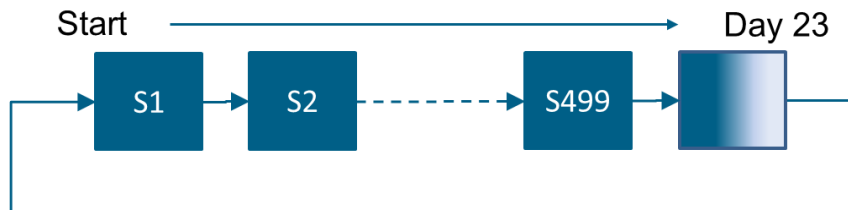
Advantages of "segmented circular logs":

- Except for the segment that is being written to, all other segments are closed. (In order to externally edit a log, stop the logging process first and then restart it. If this takes too long, data may be lost.)
- If a power failure occurs during logging, the logs are initialized more quickly when restarting the panel.
- Alarm logs are read out more quickly when the data records are smaller.

The shortest logging cycle for WinCC Advanced is 1 second; for WinCC Professional, this cycle value is 500ms.

Function chart:

Figure 2-2



For detailed information about circular logs, please refer to the system manual (see Links & Literature, [\3](#) or [\4](#)).

Automatic generation of sequence logs (long-term logging)

Relevant to: WinCC Advanced WinCC Professional

You have the option to create a copy of the currently written log. You can use this copy, for example, as a backup / sequence log. In conjunction with a script, any name can be assigned to the "sequence log".

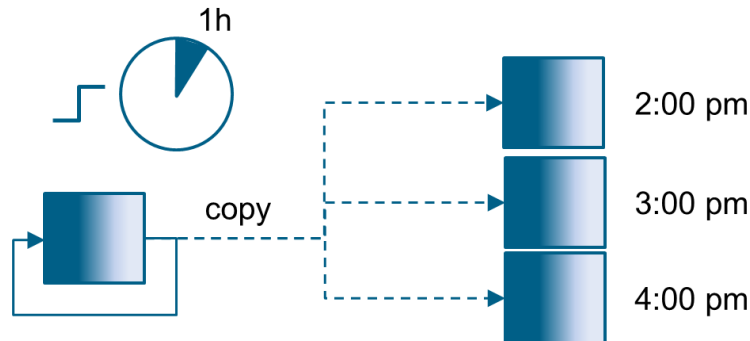
This method is mainly suitable for data that must be available for a long period of time. When using this approach, the maximum number of logs essentially only depends on the storage space.

This method is not suitable for data relevant to "GMP". GMP logs must not be copied.

The shortest logging cycle for WinCC Advanced is 1 second; for WinCC Professional, this cycle value is 500ms.

Function chart:

Figure 2-3



For detailed information, please refer to the following application example (see Links & Literature, [8](#)).

GMP data collection (logging of user actions)

Relevant to: WinCC Advanced WinCC Professional

When the "GMP" option is activated in the Runtime settings, the "Audit Trail" log is included as a "log type".

The "Audit Trail" log is used to log user actions; regarding the file size, it is only limited by the size of the storage medium. The created log is protected against tampering. To check the log data integrity, you can use the "HmiCheckLogIntegrity" program.

Process tags cannot be logged with the "Audit Trail" log.

There is no logging cycle. Logging takes place when the user action is performed.

When the "GMP" option is activated, the "Enable checksum" option is available for "standard logs". Logs where this option is activated allow the user to check whether log data was subsequently modified.

For detailed information, please refer to the system manual (see Links & Literature, [9](#)).

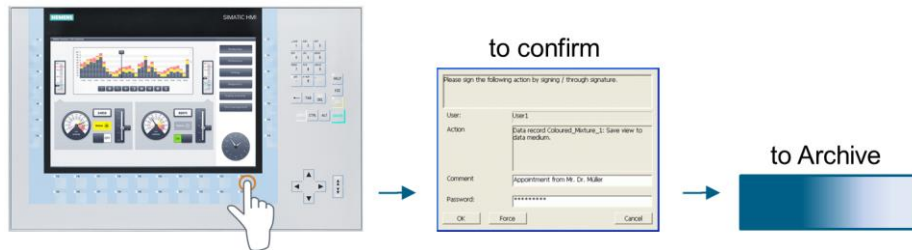
In WinCC Professional, you can log operations using the "SIMATIC WinCC WebNavigator" option in conjunction with "SIMATIC Logon".

For detailed information, please refer to the following application example (see Links & Literature, \10\).

Function chart:

Figure 2-4

Operation on the control unit



SQL database (long-term logging and large data volumes)

Relevant to: WinCC Advanced WinCC Professional

This method is mainly suitable for large data volumes and data that must be available for a long period of time.

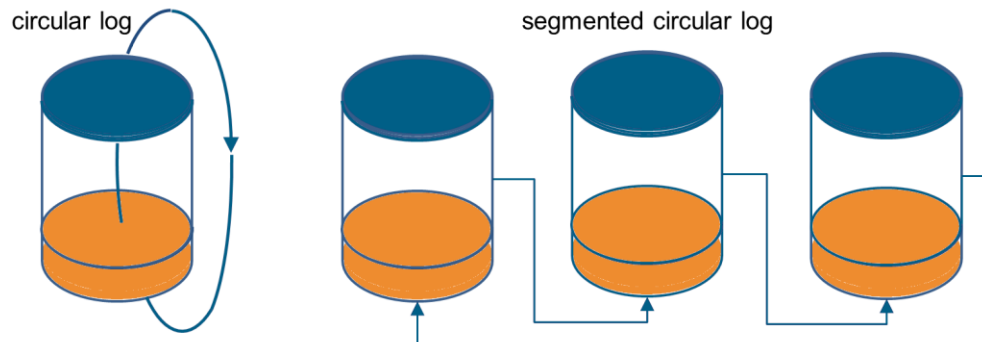
The data cannot be directly evaluated using MS Excel. It is necessary to first import the data from the SQL database into Excel. Alternatively, WinCC Professional provides the option to use the "SIMATIC Information Server" to access and evaluate the SQL database data.

Only a PC Runtime system can be used as an operator panel.

The shortest logging cycle for WinCC Advanced is 1 second; for WinCC Professional, this cycle value is 500ms.

Function chart.

Figure 2-5



For detailed information about SQL databases, please refer to the system manual (see Links & Literature, \3\ or \4\).

Compressed log (long-term logging and large data volumes)

Relevant to: WinCC Advanced WinCC Professional

This method is mainly suitable for large data volumes and data that must be available for a long period of time. An SQL database or "storage" (main memory, WinCC Professional) is used as a storage location.

The logging tags of a specific period are compressed to reduce the amount of data in the log database.

This compression is achieved by using mathematical functions. To this end, one of the following functions is used:

- Maximum value: Saves the highest process value in the compressed logging tag.
- Minimum value: Saves the lowest process value in the compressed logging tag.
- Total: Saves the sum of all process values in the compressed logging tag.
- Average value: Saves the average process value in the compressed logging tag.
- Weighted average value: Saves the weighted average value of the process values in the compressed logging tag.

What happens to the old logged process values after compression depends on the compression method that is used:

The data cannot be directly evaluated using MS Excel. It is necessary to first import the data from the SQL database into Excel. Alternatively, the user has the option to use the "SIMATIC Information Server" to access and evaluate the SQL database data.

The shortest compression period is 500ms.

For detailed information about compressed logs, please refer to the system manual (see Links & Literature, [4](#)).

"Storage" (fast data acquisition)

Relevant to: WinCC Advanced WinCC Professional

In contrast to saving to the log database, the process values logged in the main memory are only available while Runtime is active. However, saving to the main memory has the advantage that the values can be read and written very quickly.

The process values saved to the main memory cannot be swapped.

For WinCC Professional, the shortest logging cycle is 500ms.

For detailed information about "storage", please refer to the system manual (see Links & Literature, [4](#)).

Process Historian (large-scale production plants)

Relevant to: WinCC Advanced WinCC Professional

This method is mainly suitable for large data volumes and data that must be available for a long period of time.

SIMATIC Process Historian is the central, high-performance archiving tool for all SIMATIC SCADA and process control systems. It allows you to archive all process data and alarms of WinCC Professional (TIA Portal) and batch reports of SIMATIC Batch on a central server in real-time. This requires a server for long-term archiving that is connected to the Runtime PC. In addition, "Process Historian" must be installed on the server.

The data is evaluated using the "SIMATIC Information Server".

Only PC Runtime systems can be used as an operator panel.

For detailed information, please refer to the following application example (see Links & Literature, [\7\](#)) or the system manual (see Links & Literature, [\6\](#)).

SIMATIC S7-1200 / S7-1500 controller (fast data acquisition)**"DataLog" and "Trace" function**

Relevant to: WinCC Advanced WinCC Professional

The "DataLog" and "Trace" function is mainly suitable for data if an acquisition cycle of less than one second is required.

- **DataLog**

The "Data Log" instruction consists of 5 system function blocks (SFBs):

In the user program, the Data Log instructions are used to store process values in log files.

These log files can be stored on the memory card (MC) or in the internal load memory of the CPU.

The log files are stored in CSV format.

When using a memory card, the CSV file can be loaded using a card reader, or when accessed via a Web server, with the aid of a Web browser.

The logging cycle depends on the execution duration of the user program (sequencer processing of the "DataLog" instructions).

For detailed information, please refer to the following application example (see Links & Literature, [\11\](#)) or the system manual (see Links & Literature, [\5\](#)).

- **Trace and logic analyzer function.**

You use the trace and logic analyzer function to record tags of a device and analyze recordings. Tags are, for example, drive parameters or system and user tags of a CPU. The number of traces in the device depends on the hardware.

The recordings are saved on the device and, when required, can be read out with the engineering station (ES) and permanently saved.

The trace and logic analyzer function is suitable for monitoring highly dynamic processes. The recorded values are overwritten when the recording is reactivated.

The shortest logging cycle is "one program cycle".
The maximum recording duration is 58250 samples.

The data is saved on an SD memory card. For large data volumes, make sure that the card's maximum number of reads and writes is not exceeded.

For detailed information, please refer to the system manual (see Links & Literature, [5](#)).

- **Shared Memory Extension (SMX)**

Logging process values via the Shared Memory Extension (SMX)

Via the "shared memory", the data is read from the WinAC RTX by a C# program and stored in CSV files. The application example listed in the "Links & Literature" chapter illustrates process value logging via the Shared Memory Extension (SMX) interface of WinAC ODK. The data of several field PLCs (SIMATIC S7-1200 and S7-1500) is collected by a WinAC RTX head PLC by means of standard communication.

For detailed information, please refer to the following application example (see Links & Literature, [13](#)).

2.4 Log properties

This chapter describes general properties of logs and logging tags and their specific effects.

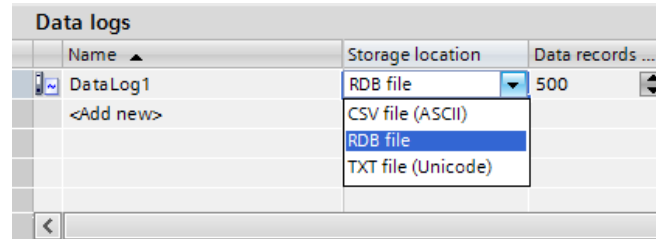
Storage location (logging format)

The selection of the storage location influences the log properties in many ways

- Performance:
The read/write speed of a log differs depending on the selected storage location.
- Later evaluation:
Depending on the selected storage location, the later evaluation of logged entries is possible with standard applications such as MS Excel or only with additional hardware and software.
- Security:
Depending on the selected storage location, data may be lost in the event of a power failure.

View in the configuration for selecting the storage location for a Comfort Panel.

Figure 2-6



- **Storage location: "CSV file"**

Relevant to: WinCC Advanced WinCC Professional

Pros:

Data can easily be edited. Data can be read out and graphically evaluated using a standard application such as MS Excel.

Cons:

Lower performance. Background: The system needs more time to write the data. For an alarm log, for example, the system always reads out the entire log contents before it outputs the data via an alarm view. As a result, an alarm log with only a few entries is read out more quickly than a log with a large number of entries.

In addition, this format is more prone to data loss if a power failure occurs while writing.

- **Storage location: "TXT file"**

Relevant to: WinCC Advanced WinCC Professional

Pros:

Compared to a "CSV file", a "Txt file" provides better performance. Data can easily be edited. Data can be read out and graphically evaluated using a standard application such as MS Excel.

Cons:

Generally low performance. Background: The system needs more time to write the data. For an alarm log, for example, the system always reads out the entire log contents before it outputs the data via an alarm view. As a result, an alarm log with only a few entries is read out more quickly than a log with a large number of entries.

In addition, this format is more prone to data loss if a power failure occurs while writing.

- **RDB file:**

Relevant to: WinCC Advanced WinCC Professional

Pros:

Higher performance compared to "CSV file" / "TXT file". The system does not read out the entire contents of the specified log before it outputs the data, for example, via an alarm view.

Alternatively, the RDB file can be read out using a database. For information about how to do this, please refer to Chapter [3.4 "Reading/opening the RDB file"](#).

This format is less prone to data loss if a power failure occurs while writing.

Cons:

The data can only be output using an operator panel, for example, as a trend view. External editing, for example, with MS Excel is not possible. Alternatively, the data can be copied to a "CSV file" (see Chapter [3.4 "Reading/opening the RDB file"](#)).

- **Database**

Relevant to: WinCC Advanced WinCC Professional

Pros:

Higher performance compared to "CSV file" / "TXT file". Not necessary to read out the entire contents when reading out the log.

Cons:

Data can only be used for PC Runtime systems. To evaluate the data using an external application such as MS Excel, the area to be read out must be exported.

- **Storage**

Relevant to: WinCC Advanced WinCC Professional

Pros:

Compared to the previous storage locations, this is the fastest option to write to / read from a log.

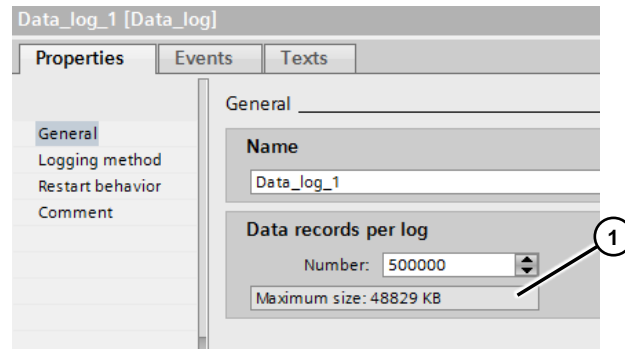
Cons:

The data is only available as "temporary" data. In the event of "Stop Runtime" or a power failure, the data no longer exists.

Data records per log (log entries)

Specifies the log entries and the expected file size (1) for a WinCC Runtime Advanced configuration.

Figure 2-7



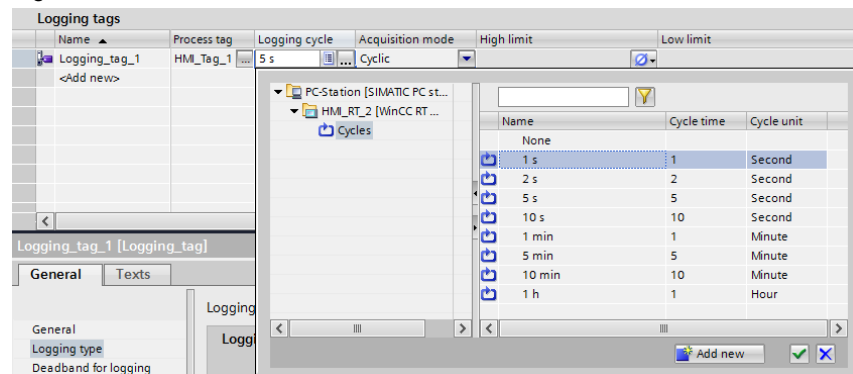
Data records per log influences

- the log's file size and therefore the required space. Based on the selected number of data records, the system automatically calculates the file size to be expected.
- performance when reading out the data.
 - Large no. of data records => low performance
 - Small no. of data records => higher performance

Logging cycle

View that allows you to set the logging cycle.

Figure 2-8



Values between 500ms and 1 hour can be specified as defaults (depending on the operator panel used). The setting influences the

- durability/lifetime of the storage medium used (read/write frequency).
- hardware used.
 - required logging cycle \geq 500ms / 1 second.
(\geq 1 second is supported by all HMI operator panels).
 - required logging cycle $<$ 500ms.
Can only be implemented directly using a SIMATIC S7-1200 and S7-1500.

Logging duration

This setting depends on the importance of the data and the resulting logging method.

- If the data has to be available only for a short period of time, a circular log may be sufficient.
- If the data must be available for a long period of time / permanently, a circular log / segmented circular log is not suitable.

Time of logging

The time of logging can be defined in several ways. This influences the handling of the individual tags to be logged.

- When defined actions or states occur (e.g., setpoint exceeded).
- When the value of a tag changes. Preferably use tags with a PLC connection.
- When selecting, for example, a button.
- On a time-controlled basis using the scheduler.

Restart/stop behavior

Depending on the selected restart behavior,

- logging starts when Runtime is started.
- logging continues / the log contents are reset.

Stop logging.

The data is written to the internal alarm buffer. After starting, the alarms are written from the buffer to the log. If the change between the two functions takes too long, the alarm buffer may be full and data loss may occur. To complete the operation, the "CloseAllLogs" system function must be executed.

2.5 Read/write access options

The data of a log can be accessed in different ways.

Write to log

Possible paths (depending on the operator panel used)

- \Storage Card SD\....
- \Storage Card USB\...
- \USB_X60.1\...
- \\ComputerName\ShareName\...(network access)
- Shared memory (SIMATIC controller)
- DataLog function (SIMATIC controller)

Access log

- \Storage Card SD\....
- \Storage Card USB\...
- \USB_X60.1\...
- \\ComputerName\ShareName\...(network access)
- Shared memory (SIMATIC controller)
- DataLog function (SIMATIC controller)
- Web server of the operator panel / controller

Chapter [1.2 "Storage and access options"](#) lists a summary of the storage and access options regarding the hardware used.

2.6 Data security

Reads/writes

A data medium has a certain service life during which smooth operation can be expected.

Hard drives with rotating magnetic disks can write large amounts of data, but are sensitive to mechanical shocks and vibrations. Compared to hard drives, flash-based storage devices are more resilient; however, they only have a limited number of read/write cycles.

Frequent reads and writes therefore quickly result in defective flash-based storage devices. It is essential to keep this in mind when defining the logging cycle.

Regularly check the storage medium you are using for functionality. For this check, you will find appropriate tools on the Internet.

2.7 Remote / Web access to log data

To increase data security, it may be useful, depending on the use case, to not store the log locally on the SD card of an HMI operator panel but centrally on a PC.

Depending on administration (PC support by a skilled person), the logged data can be retrieved at any time and in the event of irregularities, countermeasures can be initiated quickly. Entry ID [92346478](#), "Integrating HMI Operator Panels in TCP/IP Networks and access to a NAS or to a shared Windows folder", describes how to integrate an operator panel into a network.

As an alternative to the previous solution, for example, Comfort Panels provide the option to access the HMI operator panel's file system directly using a Web browser. The only requirements are that the HMI operator panel has been integrated into an Ethernet network and that the "HML pages" option has been transferred to the operator panel. For more information, see Chapter [3.1 "Data log access via Miniweb"](#).

2.8 Log display and evaluation

When displaying the values from the logs, a distinction has to be made whether the values are output as a "trend view" or as an "MS Excel" spreadsheet. In addition, it must be checked whether, aside from this output, additional information such as a "mean value evaluation" is required over a specified period.

- **Trend view**
Output supported by all HMI operator panels.
Make sure to appropriately configure the trend view to output meaningful trends. The following factors influence performance / updating of the trend view.
 - A long time interval (displayed time range).
 - A large number of trends.
 - "Segmented circular log": When the data is read from many different segments (can be avoided if you assign only one tag to a log).

An "approximate value" regarding settings that allow you to achieve a good result cannot be given at this point. Aside from the above factors, the hardware used also plays a role (Basic Panel ↔ WinCC Professional Runtime).
 - **Spreadsheet evaluation with MS Excel**
A direct evaluation is only possible with PC Runtime systems with MS Excel installed. It may be necessary to edit the TXT/CSV file externally and transfer it back to the HMI operator panel as an "xls" file. This file can then be read out using the integrated "Excel Viewer" of Comfort Panels.
For example, access via Miniweb is suitable for this file exchange to the operator panel (see Chapter [3.1](#)).
 - **Additional evaluation**
If, aside from 'log data', an additional requirement is to evaluate the data, for example, as a "mean value evaluation", this functionality is supported, for example, by a SIMATIC S7-1200 / S7-1500. This requires that the logs be stored on the memory card of the controller.
In addition, the functionality is supported by WinCC Professional in conjunction with the "compressed log" log type. For more information, please refer to Chapter [2.3](#). (Direct [link](#)).
- The application example comes with an Excel spreadsheet. This Excel spreadsheet allows you to read out and graphically evaluate the data of a data log that is available as an "Excel.csv file" (see Chapter [3.1](#)).
- **Batch evaluation**
If different production processes are started and stopped using the HMI operator panel, it is difficult to subsequently assign individual actions and alarms to a specific process or batch.
An evaluation in the form of a "batch report" is possible, but requires that an appropriate program be written.
For example, the Mannheim WinCC Competence Center provides support and application examples (see Links & Literature [\12](#)).

3 Program Examples and Applications

3.1 Data log access via Miniweb

Using the example of a Comfort Panel, this chapter describes how to access the external memory card with the stored data logs. This allows you to evaluate the data "externally" on a PC and additionally transfer the evaluated data back to the memory card as an "XLS file". The integrated "Excel Viewer" allows you to display the "XLS file" directly using the Comfort Panel.

Loading the data log (CSV file) from the panel

Table 3-1

No.	Description
1.	<p>Settings in the configuration</p> <ol style="list-style-type: none"> 1. In the project tree, open the "Runtime settings". 2. Select the "Services" menu item. 3. In "Diagnostics", enable the "HTML pages" option. 4. Transfer the configuration to the panel.
2.	<p>Settings on the panel</p> <ol style="list-style-type: none"> 5. Open the Comfort Panel's "Settings". 6. Use the icon to open the "WinCC Internet Settings". 7. Open the "Web Server" tab. <ul style="list-style-type: none"> - Check "Start automatically after booting" and "Close with Runtime". - Click the "User Administration" button. - Enter a password for the administrator or create a new user. In this example: "Administrator" and "100". - Confirm your entries. 8. Start Runtime.
3.	<p>Settings on the PC</p> <ol style="list-style-type: none"> 1. Open the Web browser. 2. In the address bar, enter the IP address of the panel (e.g., http://172.16.34.210). The SIMATIC HMI Miniweb user interface is displayed. 3. Log in with the login details you have assigned above. In this example: "Administrator" and "100". 4. Open the "File Browser" menu item. 5. Select the storage location. In this case: "Storage Card SD". 6. Navigate to the "CSV file" and click it. A context menu opens that allows you to save the file. 7. The "Browse" and "Upload File" buttons allow you to load a file back to the memory card. <p>Note Close all logs before you upload a CSV file with the log entries back to the panel using the "Upload File" function.</p>

No.	Description
4.	<p>Opening the Excel file ("XLS file") using the Comfort Panel</p> <p>1. Insert a button into the screen. 2. In "Events > Press", add the "StartProgram" function. Parameters: "Program name: \StorageLocation\FileName.xls</p> <p>In this example: \Storage Card SD\Logs\Evaluation_Process_Data.xls"</p> <p>Clicking the button opens the XLS file.</p>

1.

3.2 Evaluating a data log

3.2.1 Evaluating a CSV file / TxT file

This chapter describes how to evaluate a data log in the form of a "CSV file" / "TxT file".

The application example comes with an "Excel file template"
 => see "Evaluation_ProcessData_V2.xls"

Note The "Excel file template" contains a script. Depending on the Excel settings, enable/disable the macro function.

Range of functions

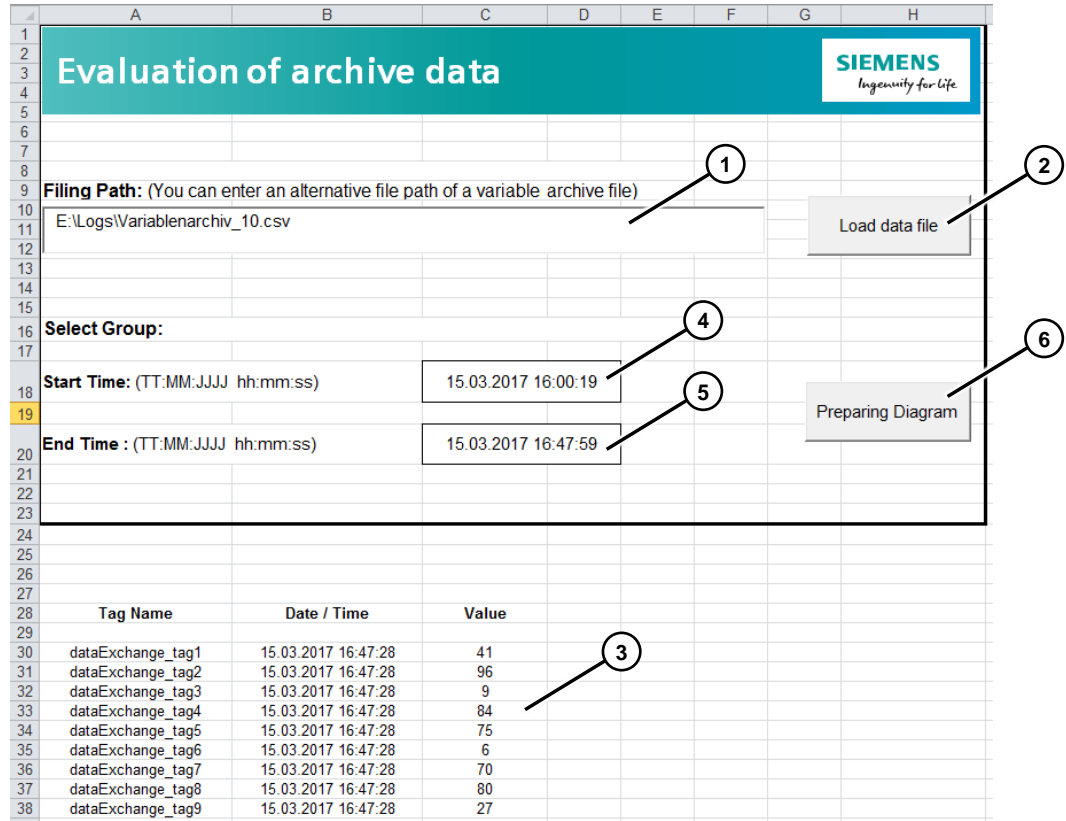
Import data log data from "CSV file" / "TxT file"

- Evaluate log file with up to **9** logging tags
- List different logging tags in separate spreadsheet
- Calculate and output "average value" of all logging tags
- Evaluate logging tags using "trend chart". The time range can be specified separately.

Spreadsheet 1 (ProcessData) – view

The figure shows the open Excel file template, "Evaluation_ProcessData_V2.xls", that comes with this application example.

Figure 3-1



- (1) Specifies the path and file name where the data log file is stored.
- (2) Button that allows you to load/import the selected data log file.
- (3) When you click the "Load data file" button, the data log file entries are listed here.
- (4) (5) Specifies the time range ("start value" and "end value") to be output via the graphical trend view.
- (6) The "Preparing Diagram" button is used to create the graphical trend view and output it in the "Diagram" spreadsheet. In addition, all values from the specified time range are listed in the "DiagramValue" spreadsheet and the mean value is calculated.

Note The time range to be output can be specified to the second.

Spreadsheet 2 (DiagramValue) – view

Evaluation of the different logging tags

Figure 3-2

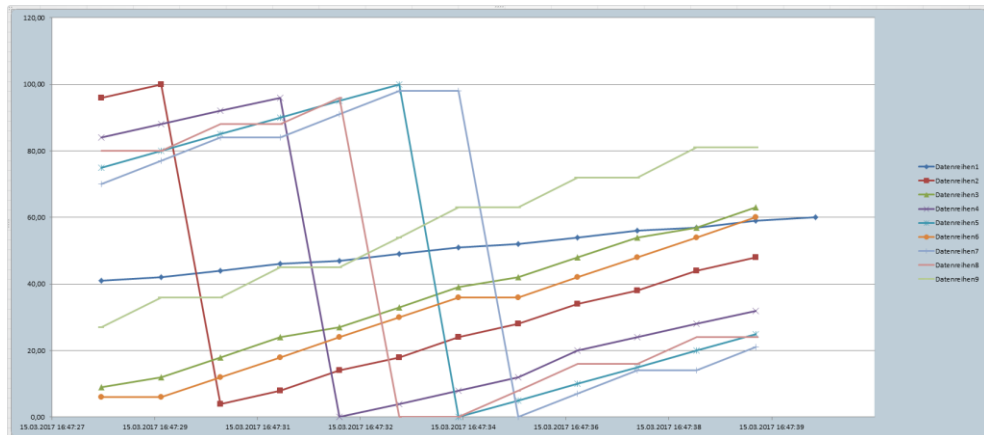
	A	B	D	E	F	G	H
1							
2							
3							
4							
5	dataExchange_tag1	Value	dataExchange_tag2	Value		dataExchange_tag3	Value
6	15.03.2017 16:47:28	41,00	15.03.2017 16:47:28	96,00		15.03.2017 16:47:28	9,00
7	15.03.2017 16:47:29	42,00	15.03.2017 16:47:29	100,00		15.03.2017 16:47:29	12,00
8	15.03.2017 16:47:30	44,00	15.03.2017 16:47:30	4,00		15.03.2017 16:47:30	18,00
9	15.03.2017 16:47:31	46,00	15.03.2017 16:47:31	8,00		15.03.2017 16:47:31	24,00
10	15.03.2017 16:47:32	47,00	15.03.2017 16:47:32	14,00		15.03.2017 16:47:32	27,00
11	15.03.2017 16:47:33	49,00	15.03.2017 16:47:33	18,00		15.03.2017 16:47:33	33,00
12	15.03.2017 16:47:34	51,00	15.03.2017 16:47:34	24,00		15.03.2017 16:47:34	39,00
13	15.03.2017 16:47:35	52,00	15.03.2017 16:47:35	28,00		15.03.2017 16:47:35	42,00
14	15.03.2017 16:47:36	54,00	15.03.2017 16:47:36	34,00		15.03.2017 16:47:36	48,00
15	15.03.2017 16:47:37	56,00	15.03.2017 16:47:37	38,00		15.03.2017 16:47:37	54,00
16	15.03.2017 16:47:38	57,00	15.03.2017 16:47:38	44,00		15.03.2017 16:47:38	57,00
17	15.03.2017 16:47:39	59,00	15.03.2017 16:47:39	48,00		15.03.2017 16:47:39	63,00
18	15.03.2017 16:47:40	60,00					
19			Average value	38,00		Average value	35,50
20	Average value	50,62					

- (1) Logging tag names
- (2) Logging tag values
- (3) Date of logging
- (4) Output of average value

Spreadsheet 3 (Diagram) – view

Output of the selected logging tags in a diagram

Figure 3-3



CSV file structure

Note The structure of the "TxT file" is identical to that of a "CSV file".

If you do not want to evaluate the data log with the aid of the supplied "Excel template", you have to convert the values in the "E" (Time_ms) column for an evaluation to the second.

Background

The "TimeString" column specifies the time in "year/hour/minute" format. In this case, this would not be sufficient for a graphical evaluation to the second. For this reason, the "Time_ms" column is used and evaluated.

The following figure uses an example to show the view of an open data log ("CSV file") with the appropriate entries.

Figure 3-4

	A	B	C	D	E
1	VarName	TimeString	VarValue	Validity	Time_ms
2	dataExchange_tag1	15.03.2017 12:12	33		1 42809508701
3	dataExchange_tag10	15.03.2017 12:12	10		1 42809508701
4	dataExchange_tag2	15.03.2017 12:12	56		1 42809508701
5	dataExchange_tag3	15.03.2017 12:12	33		1 42809508701
6	dataExchange_tag4	15.03.2017 12:12	96		1 42809508701
7	dataExchange_tag5	15.03.2017 12:12	65		1 42809508701
8	dataExchange_tag6	15.03.2017 12:12	66		1 42809508701
9	dataExchange_tag7	15.03.2017 12:12	77		1 42809508701
10	dataExchange_tag8	15.03.2017 12:12	96		1 42809508701
11	dataExchange_tag9	15.03.2017 12:12	90		1 42809508701
12	dataExchange_tag1	15.03.2017 12:12	34		1 42809508713
13	dataExchange_tag10	15.03.2017 12:12	10		1 42809508713
14	dataExchange_tag2	15.03.2017 12:12	60		1 42809508713
15	dataExchange_tag3	15.03.2017 12:12	33		1 42809508713
16	dataExchange_tag4	15.03.2017 12:12	0		1 42809508713
17	dataExchange_tag5	15.03.2017 12:12	70		1 42809508713

Example: Conversion of the "Time_ms" parameter

The value from [Figure 3-4](#), row 14, is used as an example.

"Time_ms" parameter: 42809508713

42809508713: 1,000,000 = 42809.508713

Integer part: = 42809

In the Excel spreadsheet, select a new column and select the "Date" format. Now insert the integer value into the formatted cell (in this example: "42809"). From this value, Excel automatically calculates the date (15.03.2017).

Note The calculated date is identical to the date in the "TimeString" column.

Calculating the time:

Above, the date was calculated using the "integer part". The time is calculated from the decimal places part.

(42809508712: 1,000,000 = 42809.**508713**)

Time in hours $0.508713 \times 24 = 12.\underline{209112}$ = 12h

Time in minutes $\underline{0.209112} \times 60 = 12.\underline{54672}$ = 12min

Time in seconds $0.\underline{54672} \times 60 = 32.8032$ = 32s

Overall result: 12h 12min :32s

Note

It is recommended to write a conversion script that performs the conversion.

3.2.2 Evaluating an RDB file

For details, see Chapter [3.4 "Reading/opening the RDB file"](#).

3.3 Logging STRING tags

3.3.1 General

Operating systems – different syntax

Please note: The syntax of operator panels with the Windows CE operating system and a PC Runtime system in conjunction with scripts differs.

File access differs for the two systems. For this reason, for example, the application for the Comfort Panel cannot be tested in the Runtime simulation. Keep the script names in mind.

PC Runtime: "pcCreatearchiveData_0x"

CE operating system: "panelCreatearchiveData_0x"

Required knowledge

The scripts use only internal tags that are supplied with the required values via "input parameters". This allows you to integrate the scripts into your configuration with little effort. The scripts can be changed, if necessary.

3.3.2 Example 1: Spreadsheet logging "as a list"

Example 1 outputs the logged values "as a list" (the values are arranged one below the other). To this end, the "panelCreateArchiveData_01" / "pcCreateArchiveData_01" script is used.

The following figure shows the output of the logged texts "as a list".

Figure 3-5

	A	B	C	D
1	C:\Logs\productionLine1_13.4.2017.csv			
2	VarName	TimeString	VarValue/Text	
3	Info about Tag_01	13.04.2017 13:26	Machine 001 fault...	
4	Info about Tag_02	13.04.2017 13:26	Machine 002 fault...	
5	Info about Tag_03	13.04.2017 13:26	Machine 003 fault...	
6	Info about Tag_01	13.04.2017 13:27	Machine 001 ok...	
7	Info about Tag_02	13.04.2017 13:27	Machine 002 ok...	
8	Info about Tag_03	13.04.2017 13:27	Machine 003 ok...	
9				
10				

Note

The structure of the two scripts, "panelCreateArchiveData_01" and "pcCreateArchiveData_01", is identical. They only differ in the file access syntax. The row numbers in brackets () refer to the script for PC Runtime.

"panelCreateArchiveData_01" script

The script is used to output the logged values "as a list". The script has 4 parameters that provide it with values for further processing.

The following program description helps you customize the script to your configuration, if necessary. You can also use the script without modifying it.

Row 20 (20) – specifies the logging location and log name

The logging location and log name (Excel.csv file) are passed to the script via "input parameters" and put together. The name is composed of the following elements:

- Parameter "StoragePath" (storage location)
- Parameter "NameArchive" (file name)
- Internal tag "currentDay" (current date)

Example: "\\Storage Card SD\Log\productionLine1_13.4.2017.csv"

If necessary, you can also permanently assign the name to the "FName" tag.

Row 25 (25) – specifies the "column header"

In the CSV file, a header is assigned to the "columns". You can specify any names and add more columns, if necessary.

Row 55 (96) – specifies the "date and time"

Aside from the logged tag, the CSV file displays the logging date and time in "dd.mm.yyyy hh:mm:ss" format.

You can customize the format as required.

Row 60 (101) – tag arrangement

The CSV file outputs the logging tags in the following format: "TagName; TimeStamp; TagValue".

You can change this arrangement, if necessary.

Note:

For the CSV file to display the time, including "seconds", in the "Date and time" column, format the column.

Select the "Custom" format and choose "dd.mm.yyyy hh:mm:ss".

Configuration

Example 1 uses "Tag_01" to "Tag_03".
Using the "panelCreatearchiveData_01" script, the tags are logged to a "...*.CSV file".

Table 3-2

No.	Description
1.	<p>Creating tags in the HMI configuration</p> <ol style="list-style-type: none"> 1. Open the tag editor. 2. Create a tag of the "String" type. 3. Open the "Properties > Events > Change Value" menu item of the STRING tag and insert the "panelCreatearchiveData_01" script. <p>Script parameters:</p> <ul style="list-style-type: none"> - StoragePath: Specify the storage path of the log, for example, "Storage Card SD". - NameArchive: File name of the log. - ProcessTag: Tag to be logged. In this case: The tag to which this function was linked. - TagName: Symbolic name of the tag, for example "Machine 1". <p>If you want to log more tags of the "String" type, repeat steps 2 through 4.</p>
4.	<p>Creating a screen, "Topic_001.0"</p> <p>The supplied sample project uses "Tag_01" to "Tag_01" in the "Topic_001.0" screen. The screen is located in the "Archive" subfolder.</p> <ol style="list-style-type: none"> 1. Open a screen or create a new screen. 2. Insert the tags of the "String" type you have created above into the screen.
5.	<p>Transferring the configuration</p> <p>Transfer the configuration to the operator panel. Before starting Runtime, make sure that a memory card is inserted.</p>

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3.3.3 Example 2: Spreadsheet logging "as a table"

Example 2 outputs the logged values "as a table" (in the "...*.CSV file", each tag is assigned to a column).

Accordingly, the associated tag values are assigned "as a table". To this end, the "panelCreateArchiveData_02" / "pcCreateArchiveData_02" script is used.

The following figure shows the output of the values "as a table".

Figure 3-6

	A	B	C	D
1	C:\Logs\productionLine2_13.4.2017.csv			
2	StorageTime	Tag1	Tag2	Tag3
3	13.04.2017 13:52	Motor 001 fault...		
4	13.04.2017 13:52	Motor 001 fault...	Motor 002 fault...	
5	13.04.2017 13:52	Motor 001 fault...	Motor 002 fault...	Motor 003 fault...
6	13.04.2017 13:53	Motor 001 OK...	Motor 002 fault...	Motor 003 fault...
7	13.04.2017 13:53	Motor 001 OK...	Motor 002 OK...	Motor 003 fault...
8	13.04.2017 13:53	Motor 001 OK...	Motor 002 OK...	Motor 003 OK...
9				
10				

Note The structure of the two scripts, "panelCreateArchiveData_02" and "pcCreateArchiveData_02", is identical. They only differ in the file access syntax. The row numbers in brackets () refer to the script for PC Runtime.

"panelCreateArchiveData_02" script

Output of up to three logged values as a table. The script has 5 parameters that provide it with the values for further processing.

The following program description helps you customize the script to your configuration, if necessary. You can also use the script without modifying it.

Row 20 (20) – specifies the logging location and log name

The logging location and log name (.CSV file) are passed to the script via "input parameters" and put together by the script.

The name is composed of the following elements:

- Parameter "StoragePath" (storage location).
- Parameter "NameArchive" (file name).
- Internal tag "currentday" (current date).

Example: "\\Storage Card SD\Logs\productionLine1_13.4.2017.csv".

If necessary, you can also permanently assign the name to the "FName" tag.

Row 25 (25) – specifies the "column header"

In the spreadsheet, a header is assigned to the "columns". You can specify any names and add more, if necessary.

Row 55 (96) – specifies the "date and time"

Aside from the logged tag, the spreadsheet displays the logging date and time in "dd.mm.yyyy hh:mm:ss" format.

You can customize the format as required.

Row 60 (101) – read and arrange tag values

The values are read using the "Tag1" to "Tag3" parameters. At this point, you can add more parameters or delete existing ones.

An internal tag, "currentTime", is used to prefix the parameters with the logging time stamp.

Note:

For the CSV file to display the time, including "seconds", in the "Date and time" column, format the column.

Select the "Custom" format and choose "dd.mm.yyyy hh:mm:ss".

Configuration

Example 2 uses "Tag_10" to "Tag_12". Using the "panelCreatearchiveData_02" script, up to 3 tags of the "String" type can be logged in a CSV file.

Table 3-3

No.	Description
1.	<p>Creating tags in the HMI configuration</p> <ol style="list-style-type: none"> 1. Open the tag editor. 2. Create a tag of the "String" type for each tag to be logged. 3. Open the "Properties > Events > Change Value" menu item of the STRING tag and insert the "panelCreatearchiveData_02" script. <p>Script parameters:</p> <ul style="list-style-type: none"> - StoragePath: Specify the storage path of the log, for example, "Storage Card SD". - NameArchive: File name of the log. - Tag1: 1st string tag to be logged. - Tag2: 2nd string tag to be logged. - Tag3: 3rd string tag to be logged. <p>If you want to log more tags of the "String" type, repeat steps 2 through 4.</p>
2.	<p>Creating a screen, "Topic_001.0"</p> <p>The supplied sample project uses "Tag_10" to "Tag_12" in the "Topic_001.0" screen. The screen is located in the "Archive" subfolder.</p> <ol style="list-style-type: none"> 1. Open a screen or create a new screen. 2. Insert the tags of the "String" type you have created above into the screen.

No.	Description
3.	<p>Transferring the configuration</p> <p>Transfer the configuration to the operator panel. Before starting Runtime, make sure that a memory card is inserted.</p>

3.3.4 Example 3: Spreadsheet logging using discrete alarms

Example 3 describes how you can save a String tag in conjunction with a discrete alarm to a "...*.CSV file".

The String tag is logged by creating a "discrete alarm" that is assigned to a separate alarm class. The alarm class, in turn, contains an "alarm log". When the "discrete alarm" is triggered, the stored text is saved to the "alarm log".

The following figure shows the output of the logged discrete alarms.

Figure 3-7

	A	B	C	D	E	F	G	N
1	Time_ms	MsgProc	StateAfter	MsgClass	MsgNumber	Var1	Var2	TimeString
2	4,2839E+10	2	1	64	1	Motor 001 fault...		13.04.2017 13:29
3	4,2839E+10	2	1	64	2	Motor 002 fault...		13.04.2017 13:30
4	4,2839E+10	2	1	64	3	Motor 003 fault...		13.04.2017 13:30
5	4,2839E+10	2	0	64	1	Motor 001 OK...		13.04.2017 13:30
6	4,2839E+10	2	0	64	2	Motor 002 OK...		13.04.2017 13:30
7	4,2839E+10	2	0	64	3	Motor 003 OK...		13.04.2017 13:30
8	4,2839E+10	2	1	64	1	Motor 001 emergency stop...		13.04.2017 13:34
9	4,2839E+10	2	1	64	2	Motor 002 emergency stop...		13.04.2017 13:35
10	4,2839E+10	2	1	64	3	Motor 003 emergency stop...		13.04.2017 13:35
11	\$RT_COUNT\$	20						
12								

Configuration

Using an alarm log, the supplied sample project logs "Tag_20" to "Tag_22" to a "...*.CSV file".

A "trigger tag" triggers the "discrete alarm".

Table 3-4

No.	Description
1.	<p>Creating tags in the HMI configuration</p> <ol style="list-style-type: none"> 1. Open the tag editor. 2. Create a tag of the "Integer" type. This tag triggers the "alarm". In this case: "triggerTagLogFile" 3. Create a tag of the "String" type. 4. Open the "Properties > Events > Change Value" menu item of the STRING tag and add the "InvertBitInTag" system function. <p>Parameter ("InvertBitInTag"): Tag: "triggerTagLogFile" (tag that triggers the alarm). Bit: "1" (ID value of the "discrete alarm" to be set).</p> <p>If you want to log more tags of the "String" type, repeat steps 2 through 4.</p>
2.	<p>Creating a message class</p> <ol style="list-style-type: none"> 1. In the project tree, open the "HMI alarms" folder. 2. Select the "Alarm classes" tab. 3. Create a new alarm class. In this example: "stringLogFileClass" <p>Settings: State machine: Alarm without acknowledgment. Log: Select the alarm log you have created above In this example: "stringArchivLog".</p>
3.	<p>Creating a discrete alarm</p> <ol style="list-style-type: none"> 1. In the project tree, open the "HMI alarms" folder. 2. Select the "Discrete alarms" tab. 3. Create a new discrete alarm. <ol style="list-style-type: none"> a. "Alarm text" column <ul style="list-style-type: none"> - Left-click the "Alarm text" field. - Click the right mouse button. - From the context menu, select the "Insert tag field..." function. A window opens. - In "Format", select the "Text" display type and enter the maximum length. Then go to "Process" to select the "String tag". Confirm your selections. b. "Alarm class" column <ul style="list-style-type: none"> - Select the alarm class you have created above. In this example: "stringLogFileClass" c. "Trigger tag" column <ul style="list-style-type: none"> - Select the trigger tag you have created above. In this example: "triggerTagLogFile"
4.	<p>"Topic_002.0" screen</p> <p>The supplied sample project uses "Tag_20" to "Tag_22" in the "Topic_002.0" screen. The screen is located in the "Archive" subfolder.</p> <ol style="list-style-type: none"> 1. Open a screen or create a new screen. 2. Insert the tags of the "String" type you have created above into the screen.

No.	Description
	<p>Inserting the alarm view: To check the function, an alarm view was stored in the "Topic_002.0" screen. In "Properties > General > Display", choose the "Alarm buffer" option and select the "stringLogFileClass" alarm class. As a result, only the "discrete alarms" from the newly created alarm class are displayed.</p>
5.	<p>Transferring the configuration Transfer the configuration to the operator panel. Before starting the Comfort Panel runtime, make sure that a memory card is inserted.</p>

3.3.5 How to use the sample projects

Comfort Panel

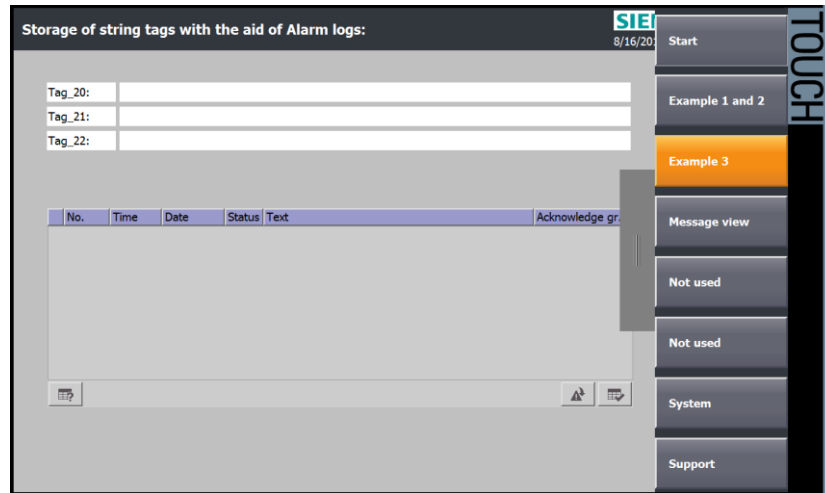
2. Start the Comfort Panel runtime.
3. Open the "slide-in screen" on the right-hand side.
4. The "Example 1 and 2" button opens the application to log String tags in conjunction with a script.
5. In one of the six text fields, enter a text value and use "Enter" to apply it. The entered text is logged in the event of a value change.

Figure 3-8



- The "Example 3" button opens the application to log String tags in conjunction with a discrete alarm.

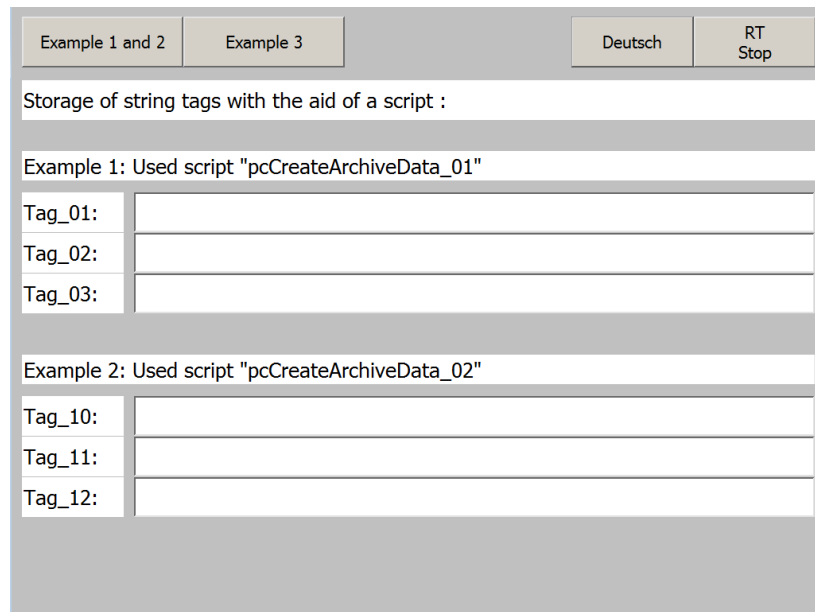
Figure 3-9



PC Runtime

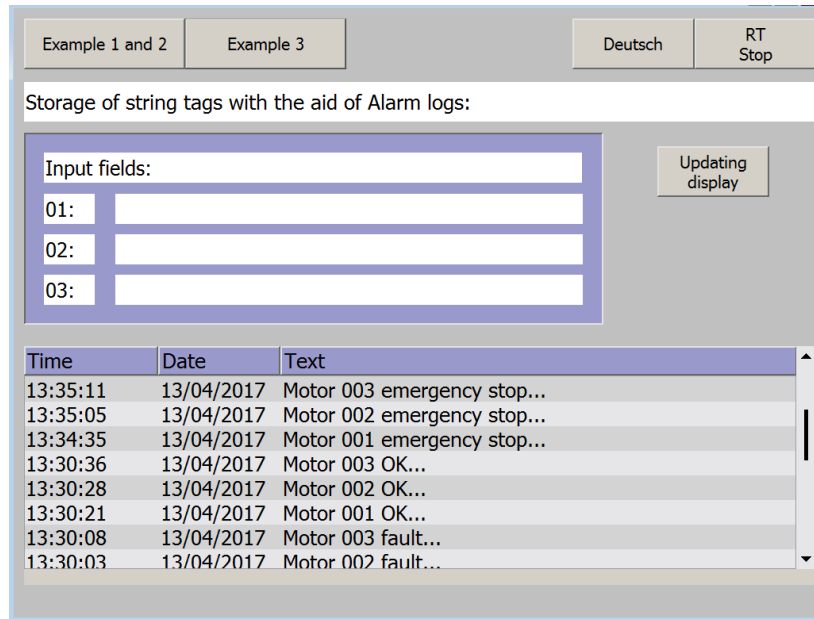
- Start Runtime.
- The "Example 1 and 2" button opens the application to log String tags in conjunction with a script.
- In one of the six text fields, enter a text value and use "Enter" to apply it. The entered text is logged in the event of a value change.

Figure 3-10



4. The "Example 3" button opens the application to log String tags in conjunction with a discrete alarm.

Figure 3-11



3.4 Reading/opening the RDB file

Aside from the many advantages the "RDB" logging format offers, the file cannot be directly opened to view the contents, for example, using an MS Excel application.

3.4.1 Copying to a CSV file

Copying the RDB file

The "CopyLog" system function allows you to copy an "RDB file" to a "CSV" or "TXT" file. This allows you to subsequently view the RDB file contents.

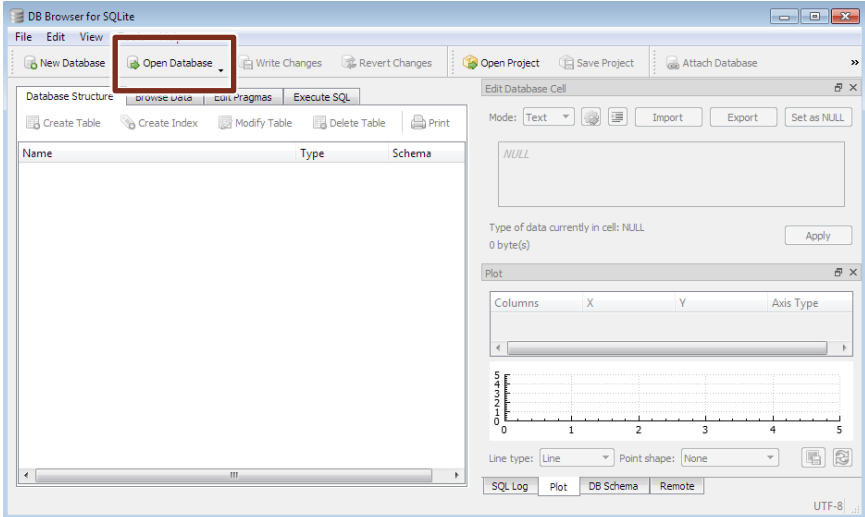
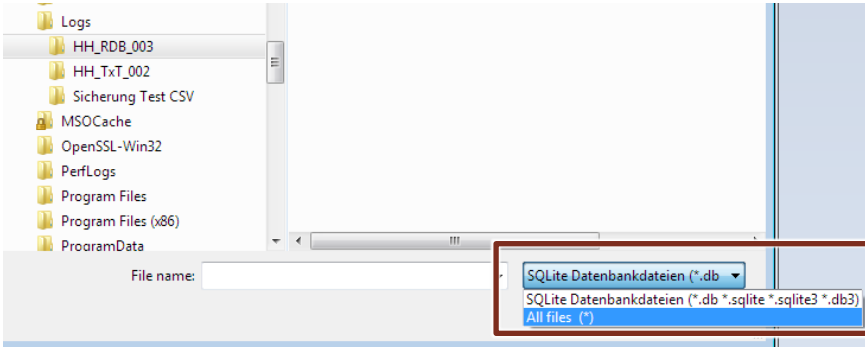
Table 3-5

No.	Description
1.	<p>Creating an empty log</p> <ul style="list-style-type: none"> • Create a new log whose <ul style="list-style-type: none"> - number of "data records per log" - "logging method" is the same as in the "RDB file" to be copied. • In "Storage location", select "CSV file" or "TXT file". • In "Path", select a storage path. • In the "Logging tags" overview navigation, do not enter any tags (empty log). <p>No other settings are required.</p>
2.	<p>"CopyLog" system function</p> <ul style="list-style-type: none"> • Insert a button into the screen. • In "Properties > Events > Press", add the "CopyLog" function. The parameters are self-explanatory. <p>Note While "copying", the destination log must not be closed (e.g., by the "CloseAllLogs" system function). If necessary, use the "OpenAllLogs" system function to open the log.</p> <p>No other settings are required.</p>

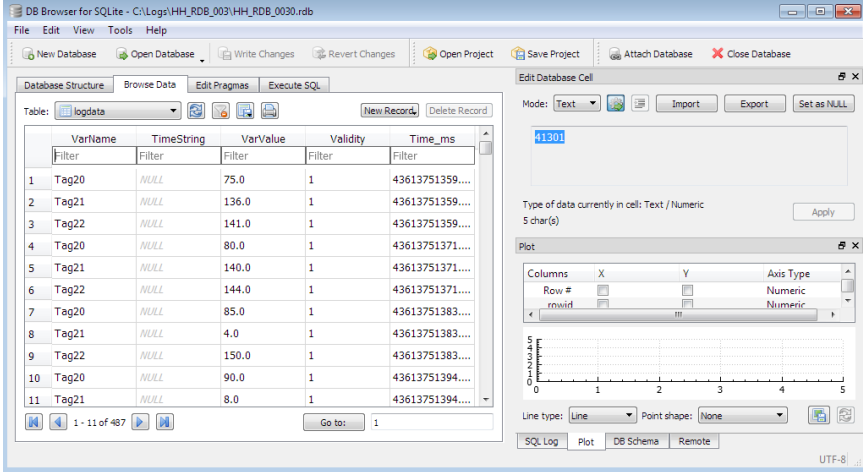
3.4.2 Opening using SQLite

SQLite is a public domain program library that contains a relational database system. It supports most of the defined SQL language commands.

Table 3-6

No.	Description
1.	Download the "SQLite" software from the Internet.
2.	Double-click the "DB Browser for SQLite.exe" file to start the program.
3.	<p>In the "start screen", click the "Open Database" button.</p> 
4.	<ul style="list-style-type: none"> • Navigate to the directory where the RDB file is stored and select the file. • Click the "Open" button. <p>Note: To enable the program to activate the file, set "SQLite database files" to "All files".</p> 

3 Program Examples and Applications

No.	Description																																																													
5.	<p>Click the "Browse Data" button. The data of the read "RDB file" is output as a table.</p>  <p>The screenshot shows the 'DB Browser for SQLite' interface. The main window displays a table with the following data:</p> <table border="1"> <thead> <tr> <th>Filter</th> <th>VarName</th> <th>TimeString</th> <th>VarValue</th> <th>Validity</th> <th>Time_ms</th> </tr> </thead> <tbody> <tr><td>1</td><td>Tag20</td><td>75.0</td><td>1</td><td>43613751359...</td></tr> <tr><td>2</td><td>Tag21</td><td>136.0</td><td>1</td><td>43613751359...</td></tr> <tr><td>3</td><td>Tag22</td><td>141.0</td><td>1</td><td>43613751359...</td></tr> <tr><td>4</td><td>Tag20</td><td>80.0</td><td>1</td><td>43613751371...</td></tr> <tr><td>5</td><td>Tag21</td><td>140.0</td><td>1</td><td>43613751371...</td></tr> <tr><td>6</td><td>Tag22</td><td>144.0</td><td>1</td><td>43613751371...</td></tr> <tr><td>7</td><td>Tag20</td><td>85.0</td><td>1</td><td>43613751383...</td></tr> <tr><td>8</td><td>Tag21</td><td>4.0</td><td>1</td><td>43613751383...</td></tr> <tr><td>9</td><td>Tag22</td><td>150.0</td><td>1</td><td>43613751383...</td></tr> <tr><td>10</td><td>Tag20</td><td>90.0</td><td>1</td><td>43613751394...</td></tr> <tr><td>11</td><td>Tag21</td><td>8.0</td><td>1</td><td>43613751394...</td></tr> </tbody> </table> <p>The interface also shows a 'Plot' window on the right, which is currently empty, and a 'Database Structure' window at the top left.</p>	Filter	VarName	TimeString	VarValue	Validity	Time_ms	1	Tag20	75.0	1	43613751359...	2	Tag21	136.0	1	43613751359...	3	Tag22	141.0	1	43613751359...	4	Tag20	80.0	1	43613751371...	5	Tag21	140.0	1	43613751371...	6	Tag22	144.0	1	43613751371...	7	Tag20	85.0	1	43613751383...	8	Tag21	4.0	1	43613751383...	9	Tag22	150.0	1	43613751383...	10	Tag20	90.0	1	43613751394...	11	Tag21	8.0	1	43613751394...
Filter	VarName	TimeString	VarValue	Validity	Time_ms																																																									
1	Tag20	75.0	1	43613751359...																																																										
2	Tag21	136.0	1	43613751359...																																																										
3	Tag22	141.0	1	43613751359...																																																										
4	Tag20	80.0	1	43613751371...																																																										
5	Tag21	140.0	1	43613751371...																																																										
6	Tag22	144.0	1	43613751371...																																																										
7	Tag20	85.0	1	43613751383...																																																										
8	Tag21	4.0	1	43613751383...																																																										
9	Tag22	150.0	1	43613751383...																																																										
10	Tag20	90.0	1	43613751394...																																																										
11	Tag21	8.0	1	43613751394...																																																										

4 Appendix

4.1 Service and Support

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks at:

<https://support.industry.siemens.com>

Technical Support

The Technical Support of Siemens Industry provides you with fast and competent support regarding all technical queries with numerous tailor-made offers – ranging from basic support to individual support contracts.

You send queries to Technical Support via Web form:

www.siemens.de/industry/supportrequest

SITRAIN – Training for Industry

With our globally available training courses for our products and solutions, we help you achieve with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to:

www.siemens.com/sitrain

Service offer

Our range of services includes the following:

- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog:

<https://support.industry.siemens.com/cs/sc>

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for Apple iOS, Android and Windows Phone:

<https://support.industry.siemens.com/cs/ww/en/sc/2067>

4.2 Links & Literature

Table 4-1

	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Download page of the entry https://support.industry.siemens.com/cs/ww/en/view/109746939
\3\	SIMATIC WinCC WinCC Advanced V14 https://support.industry.siemens.com/cs/ww/en/view/109742297
\4\	SIMATIC WinCC WinCC Professional V14 https://support.industry.siemens.com/cs/ww/en/view/109742302
\5\	SIMATIC STEP 7 Professional V14.0 https://support.industry.siemens.com/cs/ww/en/view/109742272
\6\	SIMATIC Process Historian 2014 SP2 SIMATIC Process Historian https://support.industry.siemens.com/cs/ww/en/view/109738440
\7\	Plant Configurations, Installation and Commissioning for SIMATIC Process Historian and SIMATIC Information Server for WinCC and WinCC Runtime Professional https://support.industry.siemens.com/cs/ww/en/view/106264271
\8\	Long-Term Data Archiving with WinCC Runtime PC and SIMATIC HMI Operator Panels with WinCC (TIA Portal) https://support.industry.siemens.com/cs/ww/en/view/109477071
\9\	GMP validation for quality from the start https://www.industry.siemens.com/verticals/global/en/pharma-industries/products-and-services/services-pharmaceutical-industry/Pages/good-manufacturing-practice.aspx
\10\	Record operator actions in WinCC Professional with the WinCC WebNavigator https://support.industry.siemens.com/cs/ww/en/view/109479441
\11\	Process Data Acquisition and Monitoring with the SIMATIC S7-1200 (Data Logging) https://support.industry.siemens.com/cs/ww/en/view/64396156
\12\	WinCC Competence Center Mannheim Email: winccaddon.automation@siemens.com Website: www.siemens.com/process-management
\13\	Archive data in CSV-files from several field devices (S7-1200, S7-1500) in a central station (WinAC RTX) https://support.industry.siemens.com/cs/ww/en/view/88964239
\14\	How do you store data with a script in a file with WinCC (TIA Portal) PC Runtime? https://support.industry.siemens.com/cs/ww/en/view/106501825
\15\	With SIMATIC WinCC (TIA Portal) on a panel, how do you access process data in a file via a script? https://support.industry.siemens.com/cs/ww/en/view/59604194
\16\	How do you export and reimport WinCC Runtime data? https://support.industry.siemens.com/cs/ww/en/view/850338

4.3 Change documentation

Table 4-2

Version	Date	Modifications
V1.0	12/2017	First version
V1.0	03/2018	WinCC (TIA Portal) Prof.: GMP information corrected.
V2.0	06/2019	TxT file evaluation added to Excel file. RDB file evaluation using SQLite.