Printing of recorded Operator Actions

SIMATIC WinCC flexible/Audit

Application Description • August 2009

Applikationen & Tools

Answers for industry.

SIEMENS

Warranty, Liability and Support

Note

The Application Examples are not binding and do not claim to be complete regarding the circuits shown, equipping and any eventuality. The Application Examples do not represent customer-specific solutions. They are only intended to provide support for typical applications. You are responsible for ensuring that the described products are used correctly. These application examples do not relieve you of the responsibility to use sound practices in application, installation, operation and maintenance. When using these Application Examples, you recognize that we cannot be made liable for any damage/claims beyond the liability clause described. We reserve the right to make changes to these Application Examples at any time without prior notice. If there are any deviations between the recommendations provided in these application examples and other Siemens publications – e.g. Catalogs – the contents of the other documents have priority.

We do not accept any liability for the information contained in this document.

Any claims against us – based on whatever legal reason – resulting from the use of the examples, information, programs, engineering and performance data etc., described in this Application Example shall be excluded. Such an exclusion shall not apply in the case of mandatory liability, e.g. under the German Product Liability Act ("Produkthaftungsgesetz"), in case of intent, gross negligence, or injury of life, body or health, guarantee for the quality of a product, fraudulent concealment of a deficiency or breach of a condition which goes to the root of the contract ("wesentliche Vertragspflichten"). The damages for a breach of a substantial contractual obligation are, however, limited to the foreseeable damage, typical for the type of contract, except in the event of intent or gross negligence or injury to life, body or health. The above provisions do not imply a change of the burden of proof to your detriment.

Any form of duplication or distribution of these Application Examples or excerpts hereof is prohibited without the expressed consent of Siemens Industry Sector.

If you have any questions concerning this document please e-mail us to the following address:

online-support.automation@siemens.com

Industry Automation and Drives Technologies Service & Support Portal

This article is taken from the Service Portal of Siemens AG, Industry Automation and Drives Technologies. The following link takes you directly to the download page of this document.

http://support.automation.siemens.com/WW/view/en/36969886

Table of Contents

1 Automation Task

1.1 Overview

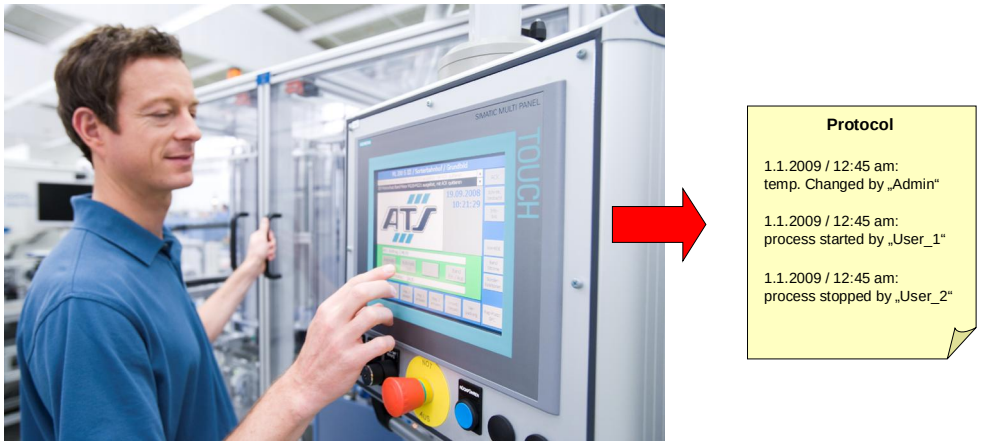
Introduction

In many sectors the traceability of the actions performed in Runtime becomes more and more important. Storing the production data in electronic format has many advantages over paper documentation. For this reason, the function range of the option WinCC flexible/Audit was expanded as of version WinCC flexible 2008.

Overview of the automation problem

The picture below provides an overview of the automation task.

Figure 1-1



Description of the automation problem

An operating device shall be used for controlling a “bread baking plant”. Using this example plant it should be possible to trace all operator actions at a later point in time as well. Setting the temperature at the oven shall only be allowed for certain users. A protocol shall be printed out via a printer.

2 Automation Solution

2.1 Overview of the overall solution

Display

The following figure displays the most important components of the solution:

Figure 2-1

2.2 Description of the core functionality

The core functionality of the example is to print an Audit Trail and to include the respective securities.

For each performed operator and user action the traceability is guaranteed by means of the WinCC flexible option “Audit”. These recordings are archived by printing the “Audit Trail”. If an “Audit Trail” is to be printed, the current recording is interrupted and the printing process is started. Prior to the printing process it is ensured that a process operation is no longer possible, since these operations are not recorded in the stopped “Audit Trail”.

A unique assignment of the responsibility for changing the oven temperature will be possible using the “electronic signature” function. While the “Audit Trail” is stopped it shall no longer be possible to perform operator actions. A query whether the print has been successful will appear as a check after printout.

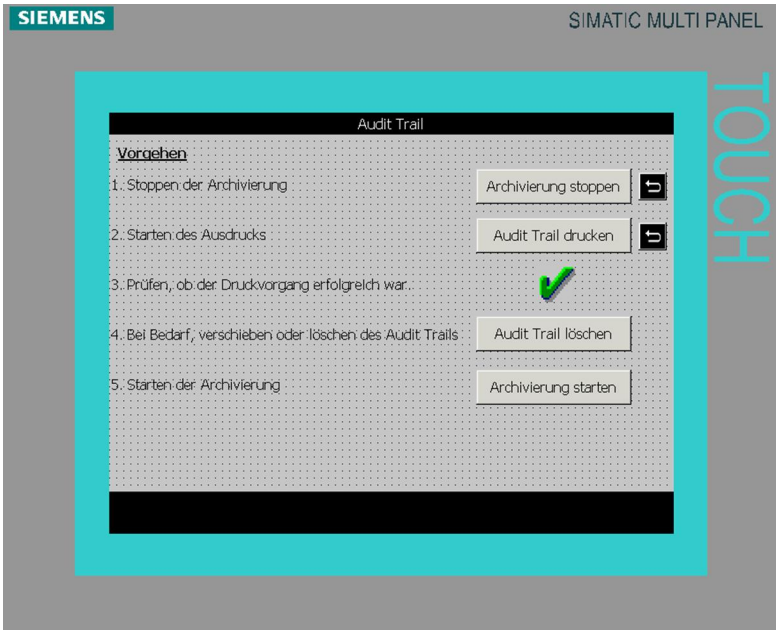
The configuration example provides a solution to safely print the protocol in Runtime using the “Audit” option.

Process sequence of main functionality

To get to the secured picture “03_Audit” the user must be registered and have the required user rights (logon as administrator). The “Audit” button can only be pressed if no plant process is active. For simulation purposes in the example project this is solved via a script (“all_process_stopped”). In a real plant this must be ensured by the control program and be signaled at the panel.

Picture “03_Audit” can only be accessed if these 2 conditions are fulfilled. In this picture it must be ensured that the template is not used to provide no operating elements after stopping the archiving process.

Figure 2-2



The following steps are required for securing an audit protocol.

Table 2-1

	Action	Note
1.	Stopping the archiving process using the system function "StoppeArchivierung".	No further user actions are recorded now. Therefore you generate a picture in which the user cannot press anything but “Print Audit” to ensure security.
2.	Stopping the printout using the system function "DruckeProtokoll".	
3.	Checking whether the print job has been completed successfully.	Add a query to your acknowledgement
4.	If necessary shift or delete the Audit Trails using the system function "ArchiviereProtokolldatei" or "LoescheArchiv".	
5.	Starting the archiving process of Audit using the system function "StarteArchivierung".	After renewed starting of the audit protocol the access rights to the plant can be again assigned to the user

Advantages of this solution

The “Audit” option replaces the paper documentation at plants:

- Simple acquisition of the data at the entire plant
- Simple archiving of the data at the entire plant
- Recorded data are fake-proof and can be read any time
- Supports sector-specific and sector-wide standards for electronic documentation of production data
- Continuous traceability of operator actions of users
- Electronic signature

Typical fields of application

The “WinCC flexible Audit” is specially used in sectors where traceability and documentation of production data becomes increasingly important. Some respective examples are:

- Pharmaceutical industry
- Food and beverages industry
- Chemical industry
- Engineering industry

2.3 Hardware and software components used

The application was generated with the following components:

Hardware components

Table 2-2

Component	Qty	MLFB / order number	Note
MP 277	1	6AV6643-0C..	
License “Audit for Panels”	1	6AV6618-7HB01-3AB0	Can be used for all panels
Load power supply 120/230V AC:24VDC/5A	1	6ES7 307-1EA00-0AA0	Power supply for the panel

Further information on the handling of licenses is available in entry 27005215.

Standard software components

Table 2-3

Component	Qty.	MLFB / order number	Note
WinCC flexible 2008 SP1	1	6AV6613-0AA51-3CA5	

Example files and projects

The following list contains all files and projects used in this example.

Table 2-4

Component	Note
WinCC_flexible_Audit.zip	<This zip file contains the WinCC flexible project.>

3 Basics

3.1 Editing the output parameters for an Audit Trail

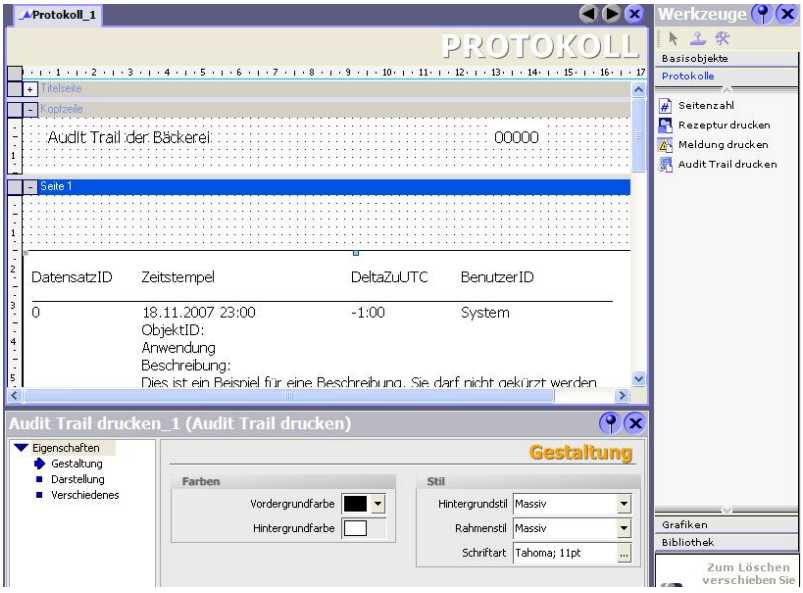
Edit the output parameters for an Audit Trail protocol in the Properties window. To display the properties, the "Print Audit Trail" object must have been added in a protocol. The Properties window must be open.

In Properties the following parameters can be edited:

- Colors and style
- Position and visible elements

Furthermore, the protocol can be provided with a header and footer. A title page can be added optionally. Here you open the generated protocol. Use drag & drop to insert the page number as well as other basic objects from the tools window.

Figure 3-1



3.2 Printer configuration at the MP 277

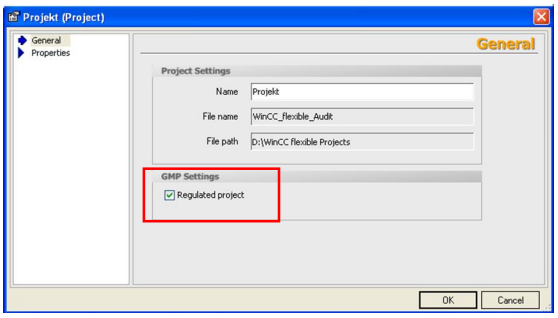
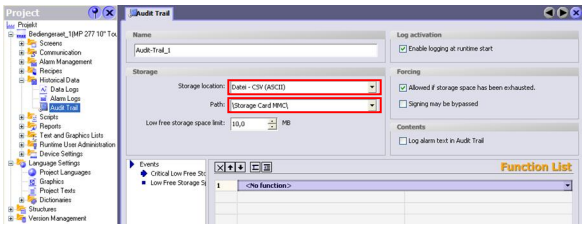
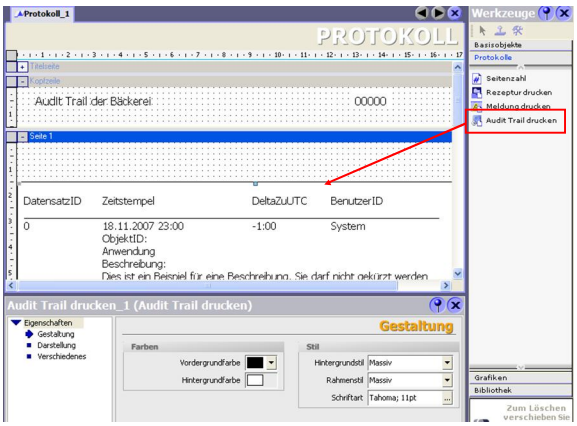
A detailed overview of the enabled printer for SIMATIC Panels and Multi Panels are available at entry ID 14668901. This FAQ also describes the commissioning process of the printer.

4 Configuration Instruction

4.1 Commissioning the WinCC flexible option/ Audit

Follow the steps from Table 4-1 to configure the Audit option.

Table 4-1

No	Action	Comment
1.	In the project window you open the entry “Properties” in the context menu of the project. In GMP settings you activate the selection “Regulated project”. The project is now expanded by configuration options.	
2.	In “Archive” an “Audit Trail” archive was enabled through the activation of the regulated project. Here you define the storage location, path and other desired properties. It is important here that the protocol is executed Runtime start.	
3.	In “Protocols” you create a new protocol and draw the “Print Audit Trail” object into the protocol via drag & drop. How to edit the output parameters of the protocol is available in the Basics of this description. The Audit Trail has now been configured and will be recorded at Runtime start.	

Note

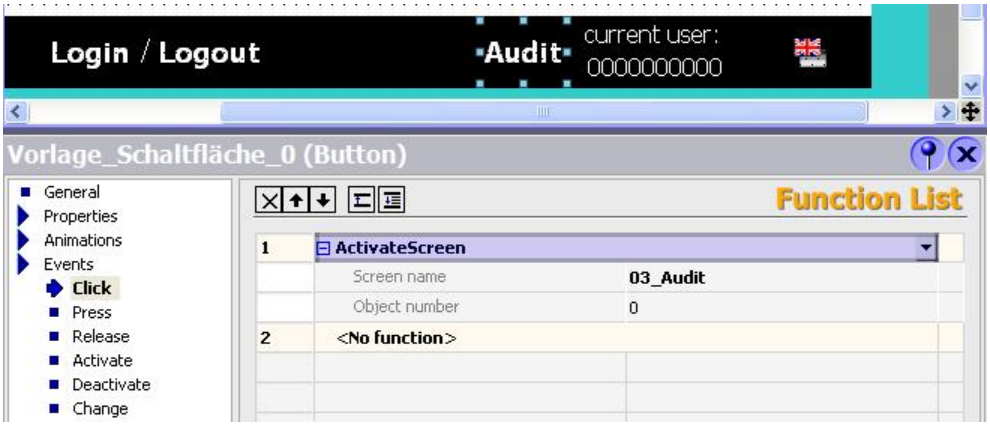
After activating the regulated project, the following configurations are possible:

- Project window, group "Archive": Entry "AuditTrail"
- Properties window of the variables, group Properties: Entry "GMP Settings"
- Properties window of the recipes, group Properties: Entry "GMP Settings"
- System function "Notify User Action"

4.2 Configuring the secured picture “03_Audit”

Create a new picture (03_Audit). To get to this picture configure an invisible button in the template and place it above the text field “Audit”. In the “Visibility” animation you ensure that the invisible button is only visible if all processes of the plant have been terminated. In this example application this is realized by the “all_process_stopped” script. If no running processes exist, the variable “running_prozess” is set to 1 and the button becomes visible. Configure a switching to picture “03_Audit”

Figure 4-1



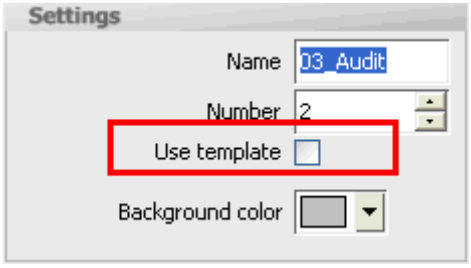
Only the administrator of the plant should have access to the “03_Audit” picture. Therefore, you activate the security at the invisible button.

Figure 4-2

4.2 Configuring the secured picture “03_Audit”

Picture “03_Audit” must not be configured with the template, since the user could stop the recording of the audit protocol and get back to the plant control. In this situation secure recording would no longer be guaranteed.

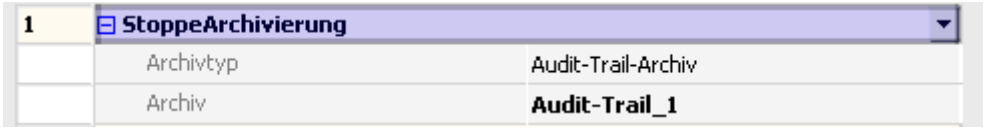
Figure 4-3



In picture “03_Audit” you configure the following buttons:

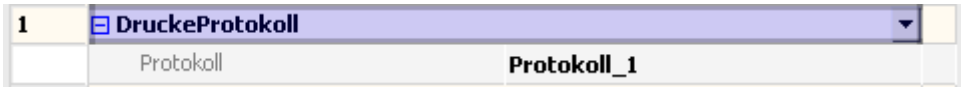
- Stop archiving (the recording into the „Audit-Trail_1” archive is stopped using the “StoppeArchivierung” function.)

Figure 4-4



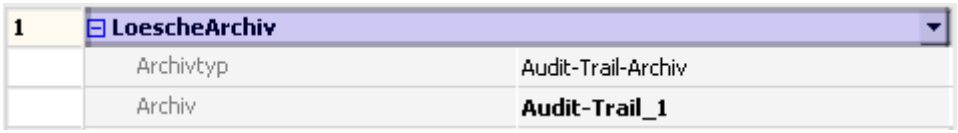
- Print Audit Trail (the printout is initiated using the “DruckeProtokoll” function.)

Figure 4-5



- Delete Audit Trail (the content of the archive file is reset using the “LoescheArchiv” function.)

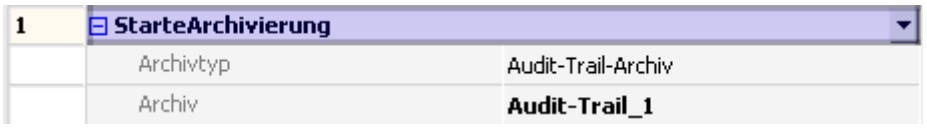
Figure 4-6



Note Optionally, you can secure the archive file to a PC connected at the network. How to save to a PC via a local network is described in entry 13336639.

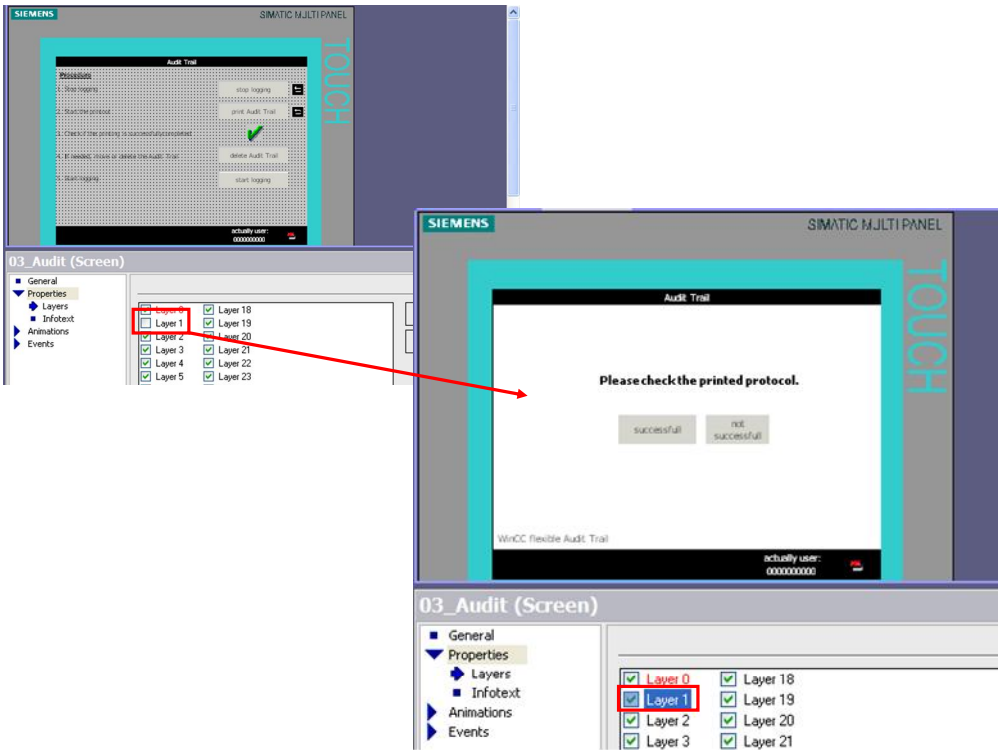
- Start archiving (the recording is restarted using the “StarteArchivierung” function.)

Figure 4-7



Add a further picture or object which is to be shown as a query on the printing process. This query is meant as additional security for the successful printout. If printing has been successful the Audit Trail can be archived or be deleted. If printing has not been successful the user should be able to initiate the printing process again.

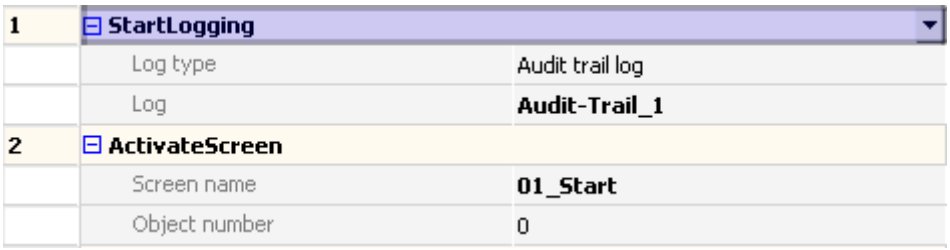
Figure 4-8



At the “Start Logging” button the start screen reappear to be able to operate the plant again after starting the recording.

4.2 Configuring the secured picture “03_Audit”

Figure 4-9



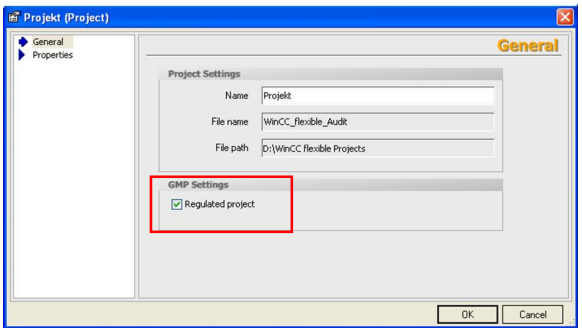
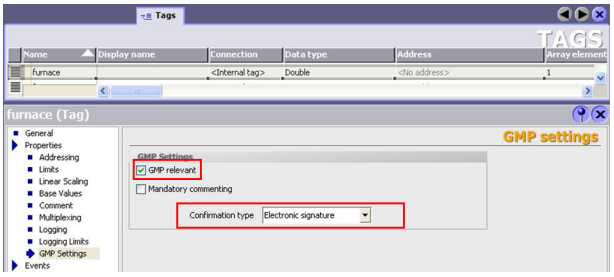
Note In Animations you activate the “Visibility” checkbox so that only the button whose function follows in the next step becomes visible. This procedure ensures the correct archiving process.

4.3 Electronic signature

The Audit Trail function and the “Electronic signature” are provided with the Audit option.

Through the electronic signature the user is supported in fulfilling increased quality requirements of his project, i.e. for plants requiring validation according to 21 CFR Part 11.

Table 4-2

No	Action	Comment
1.	• In the project window you open the entry “Properties” in the context menu of the project. • In GMP settings you activate the selection “Regulated project”. The project has now been expanded by the configuration options.	
2.	• Create a variable for oven temperature. In the Properties of the variables you now find the “GMP-Settings”. • Activate the checkbox “GMP relevant” and change the type of acknowledgement to “Electronic signature”. • Then link these variables with an I/O field.	

5 Operation of the Application

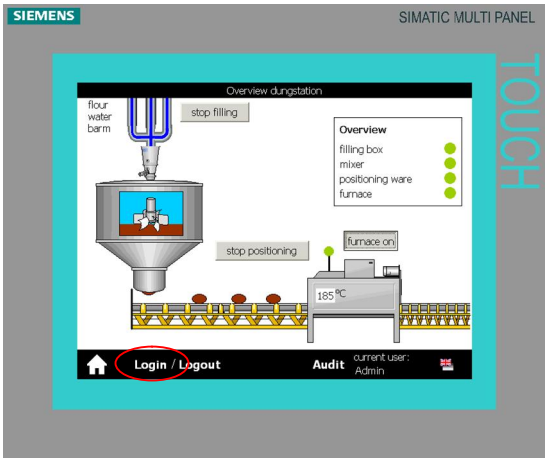
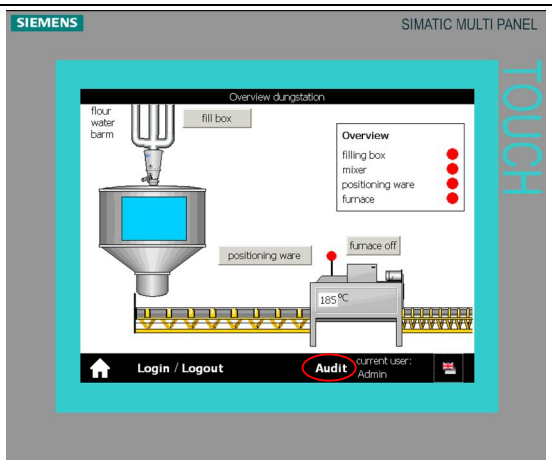
5.1 Print the “Audit Trail”

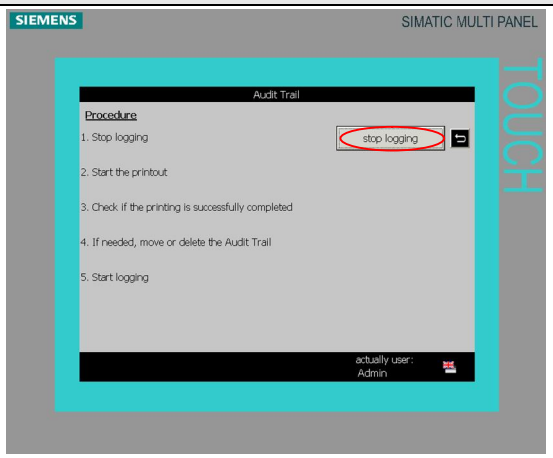
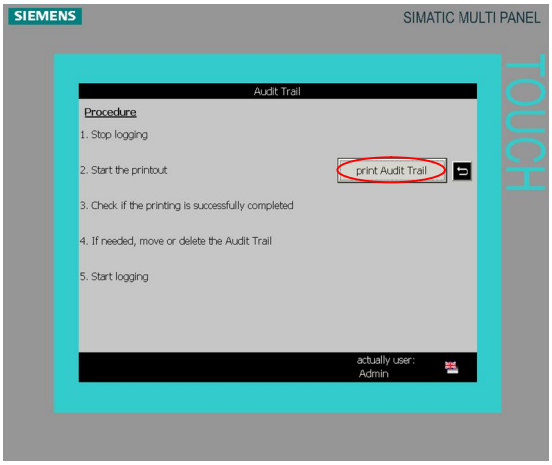
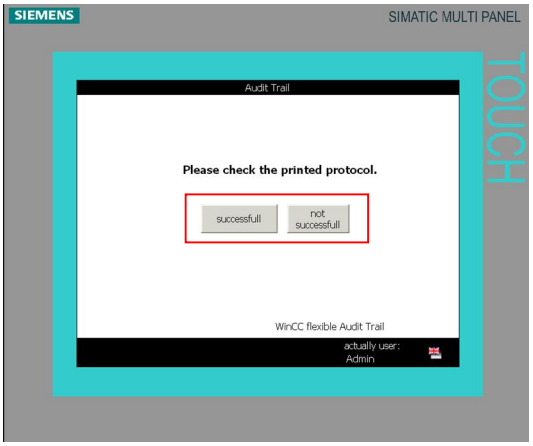
Introduction

To print an “Audit Trail” proceed as described in Table 5-1. The baking process has already been started.

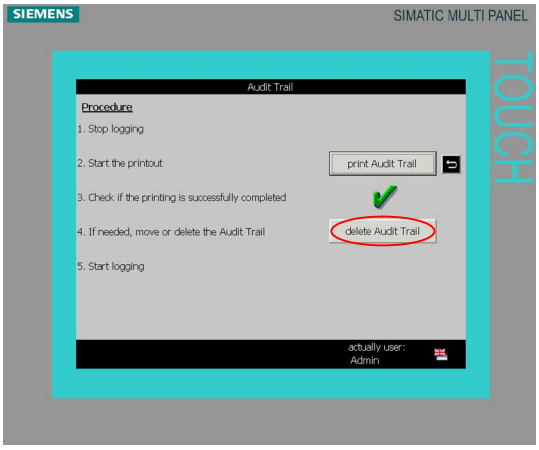
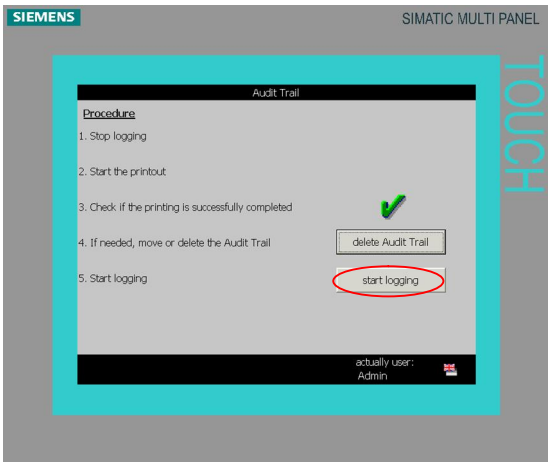
In picture “03_Audit” operation of the plant is not possible then. This is a secured picture since the recording is stopped and otherwise security problems might arise. The user only has the option to change the language. For optimal representation of the sequence of the printing process only those control elements are shown through the “Visibility” property which are also required in the active step.

Table 5-1

No	Action	Comment
1.	Click on the “Login” button and log on as “Admin”. (The created users and their passwords are displayed to you by means of an auxiliary text.) After registration the current user is displayed to you in the bottom right picture corner.	
2.	Terminate all running processes at the plant. (In the overview it is apparent which process is still active.) Through the standstill of the plant the “Audit” button can now be operated. Acknowledge it to go to the picture “03_Audit” To be able to guarantee secure recording, the “Audit” button can only be operated if all processes have been stopped.	

No	Action	Comment
3.	Stop recording the “Audit” by clicking on the “stop logging” button. Now the recording is interrupted. On picture “03_Audit” it is therefore important to give the user the option to return to the plant control.	
4.	Click the “Print Audit Trail” button to start the printing process.	
5.	In this query the user shall acknowledge the successful printout. If the printout was not successful, the user is taken to step 4 to be able to restart the printing process. If the printout was successful, click on the “successfull” button.	

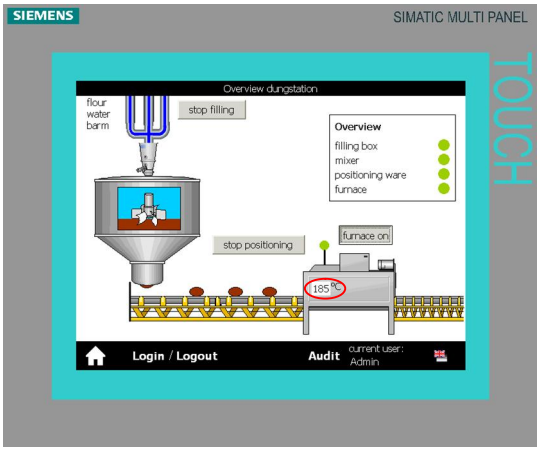
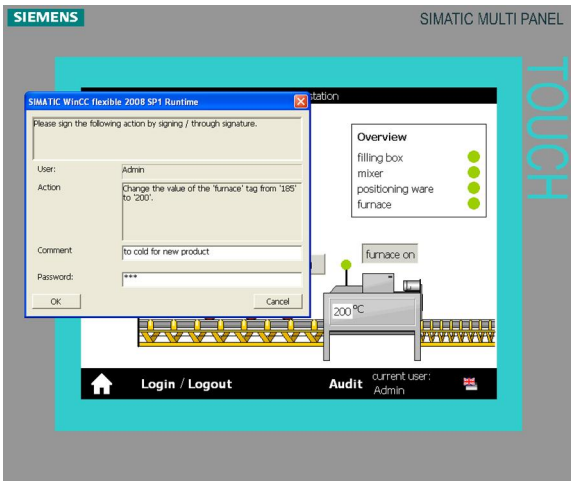
5.1 Print the “Audit Trail”

No	Action	Comment
6.	If the Audit Trail has been printed, you may delete the existing recording. Click the “delete Audit Trail” button to delete the content. (In this step you could also configure the archiving of the Audit Trail, for example, in order to secure the Audit Trail as long-term archiving)	
7.	To terminate the printing process it is important to start a new recording. Click the “start logging” button. The recording of the Audit is restarted. You are now taken back to the start screen to restart the plant	

5.2 Electronic signature

A further feature is using the “Electronic signature” function. If was configured in the example project when changing the oven temperature.

Table 5-2

No	Action	Comment
1.	Log on as one of the configured users. The normal temperature of the oven is 185 °C. Click the temperature display to set the oven temperature.	
2.	The oven temperature can be reset. However, before this setting can be adopted, the user must enter a comment (e.g. the reason) and his/her password.	

6 Bibliography

6.1 Internet Links

This list is by no means complete and only provides a selection of appropriate sources.

	Topic	Title
\1\	Link to the manual of WinCC flexible	http://support.automation.siemens.com/WW/view/en/18796010
\2\	Siemens I IA/DT Customer Support	http://support.automation.siemens.com

Further help on the topic of WinCC flexible/Audit is available in the WinCC flexible help system.

7 History

Table 7-1 History

Version	Date	Modification
V1.0	06.08.2009	First issue