

Learn-/Training Document

Siemens Automation Cooperates with Education (SCE) | As of Version V9 SP1

PA Module P02-03 SIMATIC PCS 7 – Archiving and trend reporting

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Archiving and trend reporting

1 Goal

After working through this module, the students will know the basic requirements and objectives of archiving. They are able to apply different types of archiving to process data and alarms. The students will know how suitable cycles can be determined for time-controlled archiving and the criteria according to which event-controlled data archiving is executed. They will know the options that PCS 7 provides.

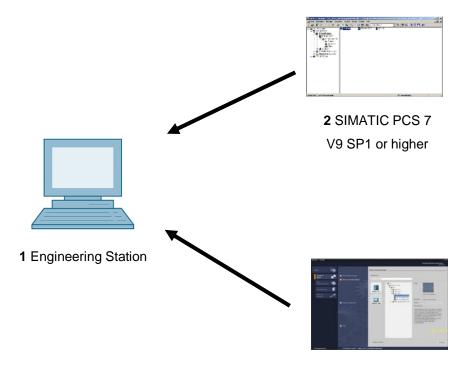
2 Prerequisite

This chapter builds on chapter 'Functional safety'. To implement this chapter, you can use an existing project from the previous chapter or the archived project 'p02-02-exercise-r1905-en.zip' provided by SCE. The download of the project(s) is stored on the SCE Internet for the respective module.

The (optional) simulation for the SIMIT program can be retrieved from the file 'p01-04-plantsimv10-r1905-en.simarc'. It can be run in demo mode.

3 Required hardware and software

- 1 Engineering station: Requirements include hardware and operating system (for further information, see Readme on the PCS 7 installation DVD)
- 2 SIMATIC PCS 7 software V9 SP1 or higher
 - Installed program packages (contained in SIMATIC PCS 7 Software Trainer Package):
 - Engineering \rightarrow PCS 7 Engineering
 - Engineering \rightarrow BATCH Engineering
 - Runtime \rightarrow Single Station \rightarrow OS Single Station
 - Runtime \rightarrow Single Station \rightarrow BATCH Single Station
 - Options \rightarrow SIMATIC Logon
 - Options \rightarrow S7-PLCSIM V5.4 SP8
- 3 Demo Version SIMIT Simulation Platform V10



3 SIMIT V10 or higher

4 Theory

4.1 Theory in brief

The archiving of process values is an important tool for correct and optimized process control.

The archived data allows an analysis of historical data for optimizing the process, tracking fault states and quality assurance.

Not only process values but also alarms and events are suitable for archiving. Particularly in the case of fault states, the operator has to handle a large number of alarms so that only the plant has returned to normal operation or is at a standstill is it possible to determine the exact cause. Both the alarms and events in the archive as well as the archived process values can be used for this.

Process values are usually archived cyclically, while archiving of alarms and events is usually event-driven. In the case of process values, the exact cycle depends on the dynamics of the underlying process. Selecting a cycle independent of the process has major disadvantages. A cycle that is too short requires a large amount of memory and may also record the noise of the signal. A cycle that is too long results in unusable values because the trend of the process value can no longer be reconstructed.

For signals that are subject to little or no fluctuations, the recording of almost identical values is not useful. For that reason, options exist for compressing the data, for example, by setting a dead zone. Only when the process value exceeds or drops below the specified limit is the value stored again in the archive.

Trend reporting provides the operator with an overview of process trends up to the current time. From the history of the process value, it is possible to recognize an impending fault state and how soon it might occur. Thus, countermeasures can be initiated before protection mechanisms have to be activated.

4.2 Introduction

The automating, safeguarding and monitoring of processes are basic requirements for a process control system. Archiving of data produced in the process offers the possibility of storing historical data and making it available for analysis.

There are many reasons why data needs to be analyzed. There are legal requirements on the one hand and process-related, safety-related and performance-related reasons on the other.

Legal requirements include the logging of incidents, such as the violation of limits or the occurrence of an event. Another legal reason for archiving is to provide proof for certificates and restrictions, such as emission limits. In connection with product liability and product safety, archiving of all process steps and raw materials is required for seamless tracking of the product. [1].

Product-related reasons for archiving of data are the statistical evaluation of production quantities and the statistical long-term analysis for process optimization, performance determination and reduction of production and material costs. The data is also very helpful for subsequent analysis of the impact and spread of incidents as well as for assessment and possibly revision of existing countermeasures. Thus, plant shutdowns can be avoided and the economics of the plant can be increased at the same time. Likewise, the data can be used to analyze normal operation and to identify optimization potential or quality improvement opportunities. The data is also of interest for optimizing maintenance of production facilities based on existing data.

Safety-related reasons relate primarily to the adaptation of operating parameters; i.e. limits and response times. When conducting tests for checking safety interlocks and Emergency Off functions, the recording can be used to verify the intended functions. If the data reveal safety deficiencies, the cause can be analyzed based on the data.

In addition, the storing of data in archives is intended to preserve the performance of the process database and act as a data backup. By storing data in an archive database, it is not necessary to keep paper copies of all process histories.

For the reasons mentioned, archiving turns out to be an important tool for correct and optimized process control. This gives rise to various requirements for archiving. One requirement is that the data be stored in full and in a uniform and structured manner. Likewise, structured access to data must be possible and allow criteria to be selected, e.g. through filtering.

It is also required that the data be archived for different time spans or at different intervals and at different locations.

In principle, two types of data can be distinguished: process data, which is produced cyclically, and alarms and events, which occur acyclically. This topic is discussed in greater detail below.

4.3 Process data

Process data refers to the analog and digital values that are determined by sensors and transmitted to the process control system. It is used to control and visualize the process.

Process data is transmitted cyclically to the process control system. Changes of analog process values within a certain interval vary widely. This is caused by the different process dynamics. The process data of a flow measurement is usually more dynamic than the process data of a temperature measurement. That is, the process data of the flow measurement changes within fractions of seconds, whereas the process data of the temperature measurement likely lies within a time period of more than 10 s.

The archiving of analog values should be *time-controlled*. Note that the rate of archiving of process data for a very dynamic process must be much higher than for a less dynamic process. One reason for this is to tailor the size of the archives to the appropriate amount. Moreover, for a less dynamic process, the display of process data in too short time periods is not useful and may contain a strong noise signal.

Binary process data can only toggle between two states, so that event-drive archiving should be carried out for this data.

4.4 Alarms and events

According to [3], **alarms** are reports of the occurrence of an event; i.e. of a transition from one discrete state to another. According to [3] an **event** is the spontaneous occurrence of a defined state. Important information for an unambiguous and complete alarm includes the state that occurred, the time and the location. Additional details regarding alarms and events are provided in chapter P02-02.

Alarms and events occur acyclically and can therefore not be archived at fixed intervals. Here it is necessary to select the relevant alarms and events to ensure efficient archiving. One possibility would be, for example, to archive only safety-critical alarms or alarms with a certain priority.

The archiving of alarms and events can only be *event-driven*.

4.5 Data compression

Because plants produce large volumes of data, usually, only a certain amount can be archived over a certain period. The amount of data depends largely on the cost of the storage medium and on the data transmission rate. On the other hand, the acceptable level of data loss has to be considered. The degree of compression results from weighing these two criteria.

When data is compressed, not only the quantity of the stored data changes but also its statistics, e.g. mean value and variance. For that reason, such values should be calculated from the original data and if needed, archived also. This should be done time-controlled, similarly to the archived process data.

Direct and transformation methods can be used for the data compression.

When the direct method is used, the data is archived in real time. There are rules that govern the archiving of individual measured values. The data is reconstructed by connecting the individual data points.

When transformation methods are used, the data is not archived in real time because the previous data history is included in the transformation. The original data is transformed in a different range. With this method, there is the possibility to design the compression adaptively, since the algorithms often have a parameter that is critical for the quality of the compression, depending on the process.

4.6 Trend reporting

The term *trend reporting* refers to the representation of process values in trends; i.e. as a function of time. The time period for the trend reporting includes the present and the recent past. It is important that the trend curves, in contrast to pure history curves, are updated [2].

By representing process values in trends, process values can be monitored, changes identified, actual values compared with desired values and faults analyzed. In contrast to the pure display of the value of the process tag, trend diagrams provide information about amplitude, slope, frequency and variation of a process tag.

4.7 Archiving in PCS 7

The PCS 7 process control system provides the option of archiving various data that is produced during process operation. This data includes process values that are stored cyclically in two different types of system archive. It also includes alarms that the user writes to the alarm log when triggered by an event. This data is archived on the **OS server** by default and is used for short term archiving as shown in Figure 1. If a **central archive server (CAS)** is additionally configured, OS logs and batch logs can also be archived in addition to the data mentioned above. The data archived on the CAS is used for long-term archiving and can be transferred periodically to external media. With **Storage Plus** it is also possible to generate views of the archived data, which can then be viewed via a web browser [4, 5, 6].

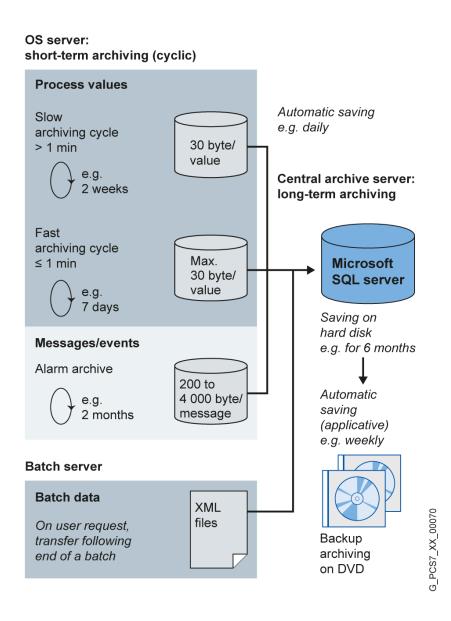


Figure 1: Overview of short-term and long-term archiving [Siemens]

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4.8 Archive system on the OS server

On the OS server, archives for process values and alarms/events can be created on the OS server.

As shown in Figure 2, these archives are organized as *circular archives*. They consist of individual *segments* that are defined either by a time period or by specifying a physical memory size. When one of these criteria is met, a segment is closed and a new one is started. If the memory of the server is exhausted, the segment that was created first is overwritten according to the FIFO principle (First In First Out). Figure 1, for example, specifies the time periods that the different archives can have for one circulation. The specified times also allow a view of the time relationships between the individual archives.

The process values are stored in the database compressed. They are compressed by setting a hysteresis. Depending on the signal change, a compression factor between 2 and 10 is reached. By selecting additional calculation functions, important statistical characteristic values can be retained despite compression.

To estimate the required memory for an archive, the average number of process values per second or the average number of alarms per second is needed. These averages are multiplied by the typical memory capacity for the data and by the desired archiving period. The period must be specified once for a segment and once for all segments together. Typical memory capacity is between 6 and 16 bytes for process values and 4000 bytes for alarms. For reasons of performance, the number of individual segments should not exceed 200 [4].

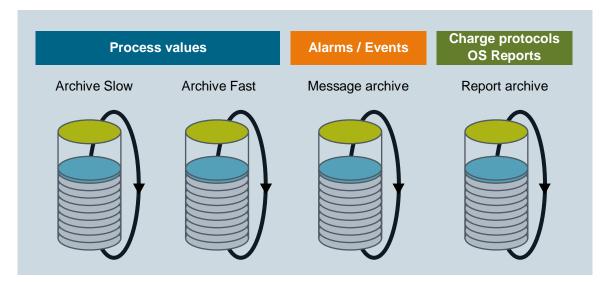


Figure 2: Circular archives for short-term archiving [4]

4.9 Storage Plus

Storage Plus can be used alternatively or as a supplement to the CAS. Storage Plus is always installed on a separate computer and is connected to the terminal bus (Figure 3). In contrast to the CAS, Storage Plus cannot be operated redundantly. However, it allows the display and analysis of data stored in the CAS, in the Storage Plus database or on external media, for example, the display of histories [2]. The archived data is displayed with views. These views filter out the necessary data from the total data. The data is represented in tables, diagrams or reports [7].

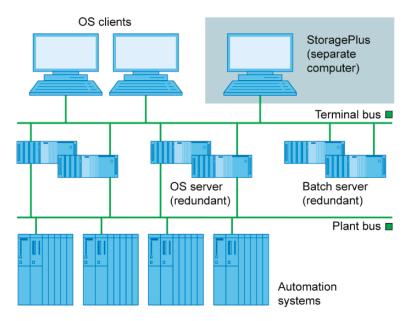


Figure 3: Role of Storage Plus in the control system structure [Siemens]

4.10 Trend reporting in PCS 7

Below, the two possibilities for representing archived process values in PCS 7 are described. The OS servers are accessed exclusively in that case. This makes it possible to quickly trace the trend of one or more process values and a negative trend can be detected or ruled out.

Trend groups

Trend groups can be called using a button on the PCS 7 operator interface. They are available by default and do not have to be additionally configured. However, there is the option to have certain trend groups pre-configured so that they only have to be displayed at runtime. If no trends are pre-configured or if the process values needed at the moment are missing in these groups, a new group can be created at any time.

Online- and Function Trend Control

Within process pictures, the following ActiveX Controls can be used to represent process value histories. Additional information for designing faceplates with ActiveX Controls is provided in chapter P03-03.

- Online Trend Control represents one or more process values over time.
- Function Trend Control represents a process value as a function of another process value.

Online Trend Control corresponds to the trend display (refer to section Trend reporting).

Function Trend Control can be used under certain constraints to display dependent process values in one trend. Otherwise, the process values to be represented have to be archived in the same cycle and the archive has to be located on the same OS server. To facilitate analysis, a target curve can be displayed in addition to the actual curve. The data for the target curve is configured and stored in a user archive [6].

4.11 Summary

To archive process data, alarms and events, an OS server must always be installed. The expanded archiving capabilities builds on this by reading the data for CAS and Storage Plus from the OS servers.

	Short-term	Long-term	Restrictions
OS Server	Yes	No	-
CAS	No	Yes	Display only via OpenPCS 7
Storage Plus	No	Yes	No redundancy

Table 1: Overview of short-term and long-term archiving according to servers

To display data of the short-term archiving that is located on the OS servers, the trend groups and the Online Trend Control can be used. For the Function Trend Control, only value pairs that are stored on the same OS server and with the same archiving cycle can be displayed.

Storage Plus has a web interface for displaying long-term archived data.

	Short-term	Long-term	Restrictions
Storage Plus	No	No	Additional computer, only from Storage Plus server
Online Trend Control or trend groups	Yes	Yes	Only from OS servers
Function Trend Control	Yes	Yes	Value pair only from an OS server and with the same archiving cycle

Table 2: Overview for display of short-term and long-term archiving

4.12 References

- [1] TU Dresden (2010-07): Vorlesung Prozessrechen- und -leittechnik.
- [2] VDI/VDE 3699, sheet 4 (Ed. 2014-01): Process control using display screens.
- [3] VDI/VDE 3699, sheet 5 (Ed. 2014-09): Process control using display screens Alarms/messages.
- [4] SIEMENS (2018-03): Compendium Part A Configuration Guidelines. A5E43228901-AA. (support.automation.siemens.com/WW/view/en/109756485)
- [5] SIEMENS (2017-12): SIMATIC Process Control System PCS 7 Engineering System (V9.0 SP1). A5E39221271-AC.
 (support.automation.siemens.com/WW/view/en/109754984)
- SIEMENS (2017-10): SIMATIC Process Control System PCS 7 Operator Station (V9.0 SP1). A5E39219186-AB. (<u>support.automation.siemens.com/WW/view/en/109754982</u>)
- SIEMENS (2008-11): MDM Storage Plus Information System. (support.automation.siemens.com/WW/view/en/37436169)

5 Task

This task deals with process value and alarm archives for the operator station (OS) and their variants and setting options.

As an example, you will create archiving of the level for Reactor A1T2R001 and display the archived values in *WinCC Runtime* as a trend using trend groups and as printout using the Report Designer for display.

6 Planning

In order to archive tags, it will be shown which settings are required using the CFC A1T2L001 as an example.

The logging of alarms (Alarm Logging) and process values (Tag Logging) will be examined.

The archived process values are to be displayed in WinCC.

As an alternative, a report can also be created for documentation purposes.

7 Learning objective

In this chapter, students learn the following:

- Activating the archiving of process tags in CFCs
- The settings for alarm properties and alarm archiving in CFCs
- The process object view as a tool for archive configuring
- The archive settings for alarms in Alarm Logging of WinCC
- The archive settings for process tags in Tag Logging of WinCC
- The trend groups for displaying archive tags in WinCC runtime
- The Report Designer for printing trends with archive tags

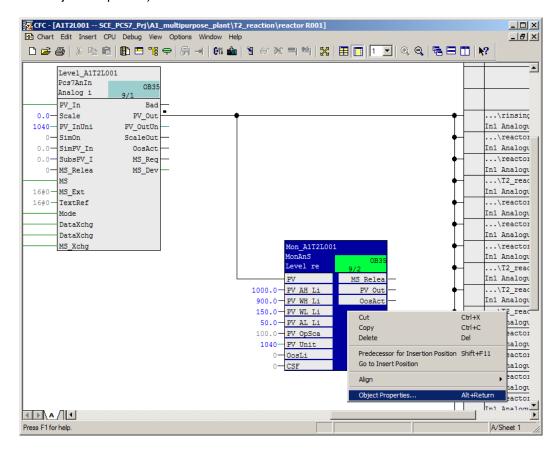
8 Structured step-by-step instructions

8.1 Configuration of the MonAnS block

 To program the archiving of the level process tag of Reactor A1T2R001 using the level monitoring, first open the existing CFC A1T2L001. (→ A1_multipurpose_plant → T2_reaction → reactor R001 → A1T2L001)

SIMATIC Manager - [SCE_PCS7_MP		Program Files (x86)	\SIEMENS\STEP7\S	7Proj\SCE_PCS7\SCEMI	
		🗄 🏢 🔁 < N	o Filter >	🖸 🏹 🔡 🌚 🔁	
SCE_PCS7_MP SCE_PCS7_Pri Shared Declarations Sh	A1T2H001 A1T2H008	A1T2H002 A1T2H011 A1T2S001	►A1T2H003 ►A1T2H013 ■A1T2S003 ■A1T2×003	Image: A1T2H007 Image: A1T2H015 Image: A1T2T001 Image: A1T2×007	

2. Open the object properties of motor block 'MonAnS' to adapt the properties. (MonAnS \rightarrow Object Properties)



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3. First, enter the comment 'Level-monitoring A1T2L001' for the MonAnS block. Click the 'Messages' button to make the settings for the message configuration. Keep these settings. Here, you see the composition of the text for an event with key word + text, for example: \$\$BlockComment\$\$ Upper alarm limit violation. After compilation of the OS, this becomes Level monitoring A1T2L001 Upper alarm limit violation. (→ Comment → "Level-monitoring A1T2L001" → Messages → Event → Save)

Properties - Block A1	T2L001\Mon_A1T2L001				×
General I/Os					
Type:	MonAnS	F	Block group:		
Name:	Mon_A1T2L001		lock group.	1	
Comment:	Level-monitoring A1T2L001				
Comment.	Levennonitoning ATT2L001				
	1				
Inputs:	45		OCM p	ossible ———	
Internal identifier:	FB1912			OCM	
Instance DB:	DB343				
Name (header):	MonAnS			reate block icon:	
Ivanie (rieduci).	Monana				
Family:	Monitor			1ES-relevant	
Author:	AdvLib90			IES-relevant	
To be inserted in OB/t	asks:		Special prop	perties	
✓ OB100 [Warm res	tart]				
				Messages	
				leadback enabled	
OK		Print		Cancel	Help
PCS7 Message Configur	ation - SCE_PCS7_Prj\AS1\	CPU 414-3 DI	P\S7 Program(1	l)\Cha\A1T2L001\	Mon_A1T2L001 X
Last changed 05/10/201	9 09:49:25 AM Type: FB1	912		Display lang	uage: German (Germany)
Message identi	fier Message o	lass	Priority		Event
MsgEvid1					
	Alarm - high		0		/ - Upper alarm limit viola
- SIG2	Warning - high		0		/ - Upper warning limit vi
- SIG3	Warning - low		0		/-Lower warning limit vi
- SIG4	Alarm - low	F . 1	0		/ - Lower alarm limit viola
- SIG5	PLC Process Control Me	-		\$\$BlockComment\$\$ Ex	
- SIG6	PLC Process Control Me	-		\$\$BlockComment\$\$ Ex	
- SIG7	PLC Process Control Me	ssage - Failure		\$\$BlockComment\$\$ Ex	ternal message 2
	< no message >		0		Þ
					More>>
Save				Cano	el Help

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 Click the 'OCM' button to display the tags of the MonAnS block Monitor_A1T2L001 that will be created when the OS is compiled. Only such tags of a CFC block can also be archived.
 (→ OCM → WinCC Attributes → OK)

	A1T2L001\Mon_A1T2L001	×
General I/Os		
Type: Name:	MonAnS Mon_A1T2L001	Block group:
Comment:	Level-monitoring A1T2L001	
Inputs:	45	OCM possible
Internal identifier:	FB1912	OCM
Instance DB:	DB343	
Name (header):	MonAnS	Create block icon:
Family:	Monitor	MES-relevant
Author:	AdvLib90	
To be inserted in Of	B/tasks:	Special properties
✓ OB100 [Warm r	estart]	Messages
ОК		Print Cancel Help

Parameter	PLC Data Type	OS Data Type	Adapt Format	Length	-
PV#Value	REAL	32-bit floating-point number IEEE 754	FloatToFloat	4	Ī
PV_Hyst	REAL	32-bit floating-point number IEEE 754	FloatToFloat	4	
PV_AH_Lim	REAL	32-bit floating-point number IEEE 754	FloatToFloat	4	
PV_WH_Lim	REAL	32-bit floating-point number IEEE 754	FloatToFloat	4	
PV_WL_Lim	REAL	32-bit floating-point number IEEE 754	FloatToFloat	4	
PV_AL_Lim	REAL	32-bit floating-point number IEEE 754	FloatToFloat	4	
PV_OpScale#High	REAL	32-bit floating-point number IEEE 754	FloatToFloat	4	
PV_OpScale#Low	REAL	32-bit floating-point number IEEE 754	FloatToFloat	4	
PV_Unit	INT	Signed 16-bit value	ShortToSignedWord	2	
DeadBand	REAL	32-bit floating-point number IEEE 754	FloatToFloat	4	
MS_RelOp	BOOL	Binary variable		1	
OnOp	BOOL	Binary variable		1	
OosOp	BOOL	Binary variable		1	
PV_AH_MsgEn	BOOL	Binary variable		1	
PV_WH_MsgEn	BOOL	Binary variable		1	
PV_WL_MsgEn	BOOL	Binary variable		1	-
PV_AL_MsgEn	BOOL	Binary variable		1	
SimOn	BOOL	Binary variable		1	
SimPV	REAL	32-bit floating-point number IEEE 754	FloatToFloat	4	
BatchID	DWORD	Unsigned 32-bit value	DwordToUnsignedDword	4	
BatchName	STRING	Text variable 8-bit character set		32	
StepNo	DWORD	Unsigned 32-bit value	DwordToUnsignedDword	4	
UserStatus	BYTE	Unsigned 8-bit value	ByteToUnsignedByte	1	Ŀ

 Now, specify the archiving of analog input values PV in the block properties. To do so, select input PV and select I/O 'Value' in its structure. The archiving is activated in the properties of 'Value'.

Chart Edit Insert CPU Debug View (ultipurpose_plant\72_reaction\reactor R001] Options Window Help 🖓 –I 6% 🏫 🕲 🛷 🎌 🛏 🎇 🔀 🔲 🔲 1 💌 4, 9, 14	× &×
Level_AlT2L001 Pcs7AnIn 0B35 Analog i 9/1 PV_In Bad 0.0-Scale PV_Out 1040-PV_InUni PV_OutUn 0-SimOn ScaleOut 0.0-SubsFV_I MS_Req 0-MS_Relea MS_Dev MS 16#0-MS_Ext 16#0-TextRef Mode DataXchg DataXchg MS_Xchg	Mon_A1T2L001 MonAnS Level-mo OB35 9/2 1000.0 PV_AH_Li 900.0 9/2 1000.0 PV_AH_Li 900.0 Delete Interconnection(s) Del 900.0 PV_WL_Li 150.0 Delete Interconnection(s) Del 901.0 PV_WL_Li Delete Interconnection(s) Alt+Return Object Properties 100.0 PV_AL_Li Delete Interconnection(s) Del 00.0 PV_AL_Li Object Properties 100.0 PV_OpSca Object Properties 0 Osili Ocili 0 CSF Object Properties	\T2_reac In1 Analogu \reactor In1 Analogu \reactor In1 Analogu \reactor In1 Analogu
Press F1 for help.		A/Sheet 1
	g Input)'	
Press F1 for help. Select Structure Element Structure: PV [STRUCT] 'Process Value (Analo Value [REAL] ' Value'		

 $(\rightarrow \mathsf{PV} \rightarrow \mathsf{Value} \rightarrow \mathsf{Archive:} \ \mathsf{Archiving} \rightarrow \mathsf{OK} \rightarrow \mathsf{Close})$

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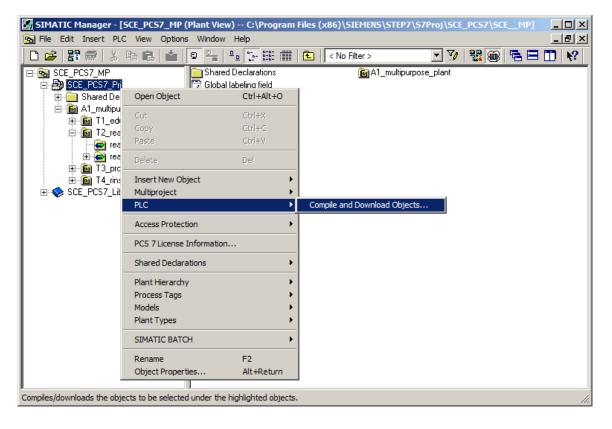
Learn-/Training Document | PA Module P02-03, Edition 02/2020 | Digital Industries, FA

Properties - 1	Input/Output					×
Block: I/O: Value:	MonAnS.Mor Value - IN(F			Inver Invisi Wato	ible	
Comment:	Γ	Value				
Operator aut	horization level:)	Archive: OS additiona	al text:	No archiving No archiving Archiving Long-term archiv	I III
Force Add for Forcin Force value	g active				ess object view — Parameter Signal S-relevant	
ОК]			Ca	ncel H	lelp

Note:

- Here, you could also select a tag for long-term archiving on the central archive server (CAS).

6. In order to see and also further edit these changes in the process object view, AS and OS must now be compiled. To do this and download the AS at the same time, select the project in the component view of *SIMATIC Manager*. Then, select 'Compile and Download' for the PLC. (→ SCE_PCS7_Prj → PLC → Compile and Download Objects)



7. Next, as shown here, select the objects for compiling and start the process as you learned in the previous chapters.

```
(\rightarrow \text{Start})
```

Compile and Download Objects						
election table:						
Objects	Status	Operating mode	Compile	Download		
E-By SCE_PCS7_Prj				V		
			×	Image: A start of the start		
Du Hardware	undefined		1			
□- CPU 414-3 DP			4	1		
Blocks						
Charts	undefined		✓	✓		
Connections	undefined		4	V		
<u></u> OS			V			
Du Configuration	undefined		✓			
— WinCC Appl.			\checkmark			
Connections	undefined		✓			
S(1)			✓			
Settings for compilation/download Update View log Select objects Edit Test Status Operating Mode Single Object All Upon opening Upon opening Upon opening Check project Check project						
Compile only Do not load if compilation error is detected Check project Compile only Devices connected to an enterprise network or directly to the internet must be appropriately protected against unauthorized access, e.g. by use of firewalls and network segmentation. For more information about industrial security, please visit: http://www.siemens.com/industrialsecurity						
Start Close				Help		

 For making multiple changes in one or more blocks, you have already become acquainted with the process object view. Archive entries can be edited here, too. (→ View → Process Object View)

🔄 SIMATIC Manager - [SCE_PCS7_MP (Plant View) C:\Program Files (x86)\SIEMENS\STEP7\S7Proj\SCE_PCS7\SCE_MP] 📃	×
🔁 File Edit Insert PLC View Options Window Help	×
▶ File Edit Insert PLC View Options Wiew Component View Plant View Plant View Process Object View Process Object View Process Object View Process Object View <	_
Changes to the Process Object View.	//.
· ·	

 In the process object view, select the CFC 'A1T2L001'. Select the 'Messages' tab and change the entries for 'Event' as shown here. (→ CFC 'A1T2L001' → Messages → Event)

🕼 SIMATIC Manager - [SCE_PCS7_MP (Process Object View) C:\Program Files (x86)\SIEMENS\STEP7\S7Proj\SCE_PCS7\SCE_MP]						
B File Edit Insert PLC View Options	Window Help		_ <u>-</u>			
🗅 🚅 🎛 🛲 👗 🗈 🙈 📩 🕬	- 옥_ 음_ 등- ::::: :::: ::::::::::::::::::::::::	y 🐮 🎯 🐂 🗖 📢				
SCE_PCS7_MP SCE_PCS7_Pri ScE_PCS7_Pri Shared Declarations Mathematic purpose_plant B M1_multipurpose_plant B M1_multipurpose_plant	General Charts Blocks Parameters Signals Messag Fiter by column: Display: < No fiter >		folder Equipment properties Shared declarations			
E E E E E E E E E E E E E E E E E E E	Chart GBlock Block comment	Subnumber Class	Event			
A1T2H001	1 A1T2L001 Mon_A1T2L001 Level-monitoring A1T2L0	01 II SIG_1 Alarm - above	\$\$BlockComment\$\$ PV - Alarm full			
A112H001	2 A1T2L001 Mon_A1T2L001 Level-monitoring A1T2L0	01 II SIG_2 Warning - above	S\$BlockComment\$\$ PV - Warning full			
A1T2H003	3 A1T2L001 Mon_A1T2L001 Level-monitoring A1T2L0		S\$BlockComment\$\$ PV -Warning empty			
A1T2H007	4 A1T2L001 Mon_A1T2L001 Level-monitoring A1T2L0		S\$BlockComment\$\$ PV - Alarm empty			
A1T2H008	5 A1T2L001 Mon_A1T2L001 Level-monitoring A1T2L0		S\$BlockComment\$\$ External error occurred			
- 🔂 A1T2H011	6 A1T2L001 Mon_A1T2L001 Level-monitoring A1T2L0	- /	#\$\$BlockComment\$\$ External message 1			
- 🔂 A1T2H013	7 A1T2L001 Mon_A1T2L001 Level-monitoring A1T2L0		\$\$BlockComment\$\$ External message 2			
A1T2H015	8 A1T2L001 Mon_A1T2L001 Level-monitoring A1T2L0	01 II SIG_8 < no message >				
- A1T2L001 - A1T2S001						
- A1125001 - A1125003						
A1125003						
A1T2X001		Event				
Press F1 to get Help.		\$\$BlockComment\$\$	PV - Alarm full			
		CODII-C	DV/ Wereine full			
		\$\$BlockComment\$\$	Pv - vvaming full			
		\$\$BlockComment\$\$	PV -Warning empty			

\$\$BlockComment\$\$ PV - Alarm empty

10. The settings for the archive tags can be made in the process object view also. In the 'Archive tags' tab, change the 'Archiving/display cycle' to 10 seconds. (\rightarrow Archive tags \rightarrow Archiving/display cycle \rightarrow 10 seconds)

SIMATIC Manager - [SCE_PCS7_MP (P File Edit Insert PLC View Options	vrocess Object View) C:\Program Files (x86)\SIEMENS\STEP7\S7Proj\SCE_PC57\SCE_MP] X Window Heip X
SCE_PCS7_MP SCE_PCS7_Pri Shared Declarations	General Charts Blocks Parameters Signals V Messages Picture objects V Archive tags Hierarchy folder Equipment properties Shared dec 🚺
⊡ 🛅 A1_multipurpose_plant ⊕ 📴 T1_educt_tanks	Filter by column: Display: Filter general: < No filter > Image: Confilter > Image: Confilter >
E E T2_reaction E E reactor R001 ■ T2_reactor R001	Chart MIII /O comment Archiving Acquisition cycle Factor for archiving cycle Archiving/display Save on fau Archive if Un 1 A1T2L001 III Value Class value 1 1 Last value ✓ Last value ✓
ATT2H001	1 second 2 seconds 5 seconds
- 🔂 A1T2H007 - 🔂 A1T2H008	10 seconds 20 seconds 1 min fe
- 🔂 A1T2H011 - 🔂 A1T2H013 - 🔂 A1T2H015	2 minutes 5 minutes 10 minutes
A112L001	20 minutes 1 hour
A1T25003	2 hours
A1T2X001	
Press F1 to get Help.	PLCSIM.TCPIP.1

11. Apply these changes by compiling the OS only. To do so, select the 'OS' in the component view of *SIMATIC Manager*. Then, select 'Compile and Download' for the PLC. (→ OS → PLC → Compile and Download Objects)

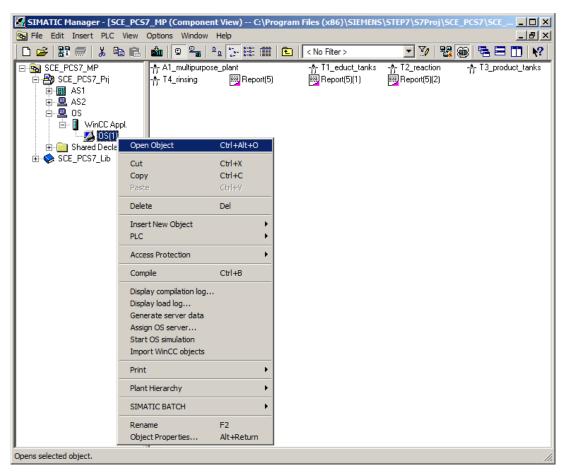
SIMATIC Mana	ger - [SCE_PCS7	_MP (Component	View) C:\Progran	n Files (x86)\SIEMENS\	STEP7\S7Proj\SCE_	PC57\5CE 💶 🗙
🔁 File Edit Inse	rt PLC View C	Options Window I	Help			_ 8 ×
🗋 🗅 🚔 🖁 🐖	X 🖻 🛢	📩 😨 🖳 º	D	< No Filter >	🔽 💯 👯 🛛	🗑 🔁 🗖 📢
⊡ • • • • • • • • • • • • • • • • • • •	S7_Prj	<mark>ըն</mark> ը Configuration	📳 WinCC Appl.	¦a tlE General		
	Open Object	Ctrl+Alt+O	_			
 	Cut Copy Paste	Ctrl+X Ctrl+C ⊂trl+∀				
	Delete	Del	-			
1 1	PLC	•	Download	Ctrl+L	1	
	Access Protectio	on 🕨	Configure Compile and Downl	Ctrl+K oad Objects		
	Print	•	Compare			
	SIMATIC BATCH	→	_			
	Rename Object Propertie	F2 es Alt+Return				
Compiles/downloads t	the objects to be se	elected under the hi	ahliahted objects.			4

 Next, as shown here, select the objects for compiling and start the process as you learned in the previous chapters. (→ Start)

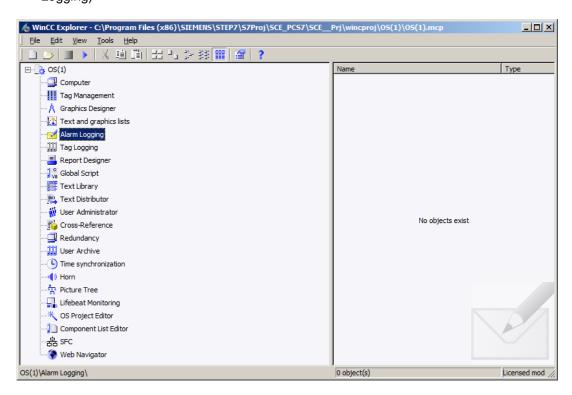
Compile and Download Objects				_ 🗆 🗙
Selection table:				
Objects	Status	Operating mode	Compile	Download
OS			×	
Du Configuration	undefined		✓	
E- WinCC Appl.			4	
Connections	undefined		v	
OS(1)			v	
Settings for compilation/download Update Edit Test Status Operating	- View		t objects	Deselect All
Upon opening Upon of				Deselect All
Compile only V Do not load if compilation error is detected	I			Check project
Devices connected to an enterprise network or directly to the against unauthorized access, e.g. by use of firewalls and netw For more information about industrial security, please visit: http://www.siemens.com/industrialsecurity	internet must be a work segmentation	appropriately protected L		
Start Close				Help

8.2 Configuring Alarm Logging

1. After successful compilation, open the OS. (\rightarrow OS(1) \rightarrow Open Object)



In WinCC Explorer, first open 'Alarm Logging' for configuring the alarm system. (→ Alarm Logging)



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 Select the AS messages. In the center window of Alarm Logging, you will find the individual messages and can edit their properties in the Properties area on the right edge. (→ AS Messages → Mon_A1T2L001 → PV – Warning full)

n logging 🛛 «	🖂 Messages [S7\$	Program(1)]			Find 🔎
Messages	Num Message class	Message Type	Mes Pri	o Source	Area Event
Message blocks	170 6794 PLC process co	Failure	A1_10	A1_multipurpose_plant/T2_reaction/A1T2X003/valve_A1T2X003	A1_(External error has occurred
Message groups	171 679 PLC process co	Failure	A1_10	A1_multipurpose_plant/T2_reaction/A1T2X002/valve_A1T2X002	A1_(External error has occurred
System messages	172 679 PLC process co	Failure	A1_(0	A1_multipurpose_plant/T2_reaction/A1T2X001/valve_A1T2X001	A1_(External error has occurred
Limit monitoring	173 6794 PLC process co	Failure	A1_10	A1_multipurpose_plant/T2_reaction/A1T2S004/pump_A1T2S004	A1_Motor protection triggered
AS Messages	174 6794 PLC process co	Failure	A1_10	A1_multipurpose_plant/T2_reaction/A1T2T002/control_A1T2T002	A1_(Continuous PID controller - Large - temperature External me
S7\$Program(1)	175 679 Warning	Warning High	A1_(0	A1_multipurpose_plant/T2_reaction/A1T2T002/control_A1T2T002	A1_(Continuous PID controller - Large - temperature PV - High w
a availadin(1)	176 6794 PLC process co	Failure	A1_(0	A1_multipurpose_plant/T2_reaction/A1T2S002/stirrer_A1T2S002	A1_(Motor protection triggered
	177 679 PLC process co	Failure	A1_(0	A1_multipurpose_plant/T2_reaction/A1T2X008/valve_A1T2X008	A1_(External error has occurred
	178 6794 PLC process co	Failure	A1_(0	A1_multipurpose_plant/T2_reaction/A1T2X006/valve_A1T2X006	A1_(External error has occurred
	179 6794 PLC process co	Failure	A1_(0	A1_multipurpose_plant/T2_reaction/A1T2X005/valve_A1T2X005	A1_(External error has occurred
	180 6794 PLC process co	Failure	A1_(0	A1_multipurpose_plant/T2_reaction/A1T2X004/valve_A1T2X004	A1_External error has occurred
	181 6794 PLC process co	Failure	A1_(0	A1_multipurpose_plant/T3_product_tanks/A1T3X001/valve_A1T3X001	A1_External error has occurred
	182 6794 PLC process co	Failure	A1_(0	A1_multipurpose_plant/T3_product_tanks/A1T3X002/valve_A1T3X002	A1_External error has occurred
	183 6794 Warning	Warning High	A1_(0	A1_multipurpose_plant/T2_reaction/A1T2L001/Mon_A1T2L001	A1_Level-monitoring A1T2L001 PV - Warning full
	184 6794 Warning	Warning High	A1_(0	A1_multipurpose_plant/T2_reaction/A1T2L002/Mon_A1T2L002	A1_(Level reactor R001 PV - High warning limit violated
	185 6878 PLC process co	Failure	0	S7\$Program(1)/@(1)/AS1_1	Time-of-day interrupt OB@3%d@ elapsed (time jump)
	186 6878 PLC process co	Failure	0	S7\$Program(1)/@(1)/AS1_1	Interface error
	187 6878 PLC process co	Error	0	S7\$Program(1)/@(1)/AS1_1	CPU loss of redundancy in rack @8%d@
	188 6878 Preventive mai	Maintenance	0	S7\$Program(1)/@(1)/AS1_1	Priorities of cyclical OBs not conforming to PCS 7
	189 6878 PLC process co	Failure	0	S7 Program(1)/@(1)/UR2ALU_1	Failure connection ID: 16#@3%X@
	190 6878 PLC process co	Failure	0	S7 Program(1)/@(1)/UR2ALU_1	Failure connection ID: 16#@3%X@
	191 6878 PLC process co	Failure	0	S7 Program(1)/@(1)/UR2ALU_1	Failure connection ID: 16#@3%X@
	192 6878 PLC process co	Failure	0	S7 Program(1)/@(1)/UR2ALU_1	Failure connection ID: 16#@3%X@
	193 6878 PLC process co	Failure	0	S7 Program(1)/@(1)/UR2ALU_1	Failure connection ID: 16#@3%X@
ag Management	194 687(PLC process co		0	S7 Program(1)/@(1)/UR2ALU_1	Failure connection ID: 16#@3%X@
	195 6878 PLC process co	Failure	0	S7 Program(1)/@(1)/UR2ALU_1	Failure connection ID: 16#@3%X@
larm logging	196 6878 PLC process co	Failure	0	S7 Program(1)/@(1)/UR2ALU_1	Failure connection ID: 16#@3%X@
	197 6878 PLC process co	Failure	0	S7 Program(1)/@(1)/UR2ALU_1	Failure connection ID: 16#@3%X@
ag Logging	198 6878 PLC process co	Failure	0	S7 Program(1)/@(1)/UR2ALU_1	Failure connection ID: 16#@3%X@
Ш 🐠 😓 🔛 -	199 6878 PLC process co		0	S7 Program(1)/@(1)/UR2ALU_1	Failure connection ID: 16#@3%X@
100 W 187 1	H 4 + H Messages	Text lists			•
NUM				English (United States)	Table: 632 Messages 100 % 😑 🗸 🗸

182 67	9 PLC process co	Failure	A1_I	0	A1_multipurpose_plant/T3_product_tanks/A1T3X002/valve_A1T3X002	A1_	External error has occurred
183 67	94 Warning	Warning High	A1_I	0	A1_multipurpose_plant/T2_reaction/A1T2L001/Mon_A1T2L001	A1_	Level-monitoring A1T2L001 PV - Warning full
184 67	94Warning	Warning High	A1_1	0	A1_multipurpose_plant/T2_reaction/A1T2L002/Mon_A1T2L002	A1_	Level reactor R001 PV - High warning limit violated
185 68	78 PLC process co	Failure		0	S7\$Program(1)/@(1)/AS1_1		Time-of-day interrupt OB@3%d@ elapsed (time jump)

 In the properties of the parameters, you can select, for example, whether the corresponding message is to be archived. (→ Archived → OK)

-	Selection		
	Object type	Message	
	Object name	Message 679477386	
-	General		
	Number	679477386	
	Message class	Warning	
	Message Type	Warning High	
	Message Group	A1_multipurpose_plant	
	Priority	0	
	Hide mask		
]	Tags		Ī
	Message tag	S7\$Program(1)#RawEvent	Ī
	Message bit	0	
	Status tag		
	Status bit	0	
	Acknowledgment tag	S7\$Program(1)#RawEvent	
	Acknowledgment bit	0	
]	Parameter		
	Single acknowledgment		
	Central signaling device		
	Archived		
	Falling edge		Ī
	Triggers action		
	Extended associated value data		
	Help		
]	Extended		
	Format DLL	NRMS7PMC.NLL	
	Loop In Alarm		
	Function name	LoopInAlarm	

In the properties of a message

p02-03-archiving-and-trend-reporting-v9-tud-0719-en.docx

 In the shortcut menu of the messages, under the item 'Archive Configuration', you can now select the 'Properties' of the 'Message archive' (→ Messages → Archive Configuration → Properties)

Alarm logging - WinCC Co		-					_	
<u>File Edit View Tools</u>	Help	Selection]	Find		. م	🖂 Propertie	s - Message	>>>
+ Messages	Num Message ta	ag	Message bit	Status tag		Selection		
	message class	-5	0			Object type	Message	
Hessage g	inessage class					Object name	Messages	
System me 🗈 Copy	_					Hide Manual	ly	
Limit monit 🖺 Paste	_					Days	0	
E AS Messag						Hours	0	
S7\$Pr	t					Minutes	30	
	Confirmation of	Reset						
	ve Configuration 🔹							
Select	tion 🕨	Link archive						
	10	Disconnect from arc	hive					
	11							
	12	Reload after power f	ailure					
	13	Properties						
	14							
	15							
	16							
Tag Management	17							
	18							
Alarm logging	19							
Tag Logging	20							
	21							
🏢 🏭 🐠 🕆 🔀 👻	22 II I I I Messag	je classes 🧹 Message t	ypes .					
Ready NUM		Engl	ish (United Stat	es)	Table: 1 Messag	ge 100 % 🕞 -		÷

 Under Archive Configuration, you now set the size of the entire archive and the division into segments. (→ Archive Configuration → Archive size → Time of the segment change)

AlarmLogging	×
Archive Configuration Backup Configuration	
Archive size Time period of all segments Max. size of all segments Time period covered by a single segment Time period covered by a single segment Max. size of a single segment 100 ÷ Max. size of a single segment 100 ÷ Max. size of a single segment 100 ÷ Megabyte(s) ▼	
Time of the segment change Month May Year 2019 ± Day of month 1 ± Weekday Wednesday Hour 11 ± Minute 26 ±	
OK Cancel Apply Help	 >

Under 'Backup Configuration', it is possible to activate a backup of the archive data to a 'Destination path' to ensure gapless process documentation. By default, the backup is started after the first time-dependent segment change. Accept the settings with 'OK' and exit Alarm Logging .
 (→ Backup Configuration → OK →)

AlarmLogging	×
Archive Configuration Backup Configuration	
Signing activated Activate backup Destination path Browse	
Alternative destination path Browse	
OK Cancel Apply Help	

8.3 Configuring Tag Logging

In WinCC Explorer, open 'Tag Logging' for configuring the process value archives. (→ Tag Logging)

& WinCC Explorer - C:\Program Files (x86)\SIEMENS\STEP7\S7Proj\SCE_PCS7\SCE_	Prj\wincproj\05(1)\05(1).mcp	
Eile Edit View Tools Help		
□≥ ■ > X 車面 出出を移[
⊡- 💽 OS(1)	Name	Туре
🕺 Graphics Designer		
Alarm Logging		
Tag Logging		
Report Designer		
Text Library		
📲 👬 User Administrator		
🚰 Cross-Reference	No objects exist	
User Archive		
····· b Time synchronization		
──		
💮 🏈 Web Navigator		
OS(1)\Tag Logging\	0 object(s)	Licensed mod //

Process values can be archived according to different time patterns. This is important in order not to generate data volumes that are too large in the case of large archives. The shortest time is 500 ms. (→ Timers → Cycle times → 500 ms)

Image Logging Immer name Time base Time factor At system shutdown Start time A I 1 day 1 day 1 Image control Image control Disc transme Disc transme <t< th=""><th>Tag Logging 🧼 «</th><th>Ti</th><th>mers [Cycle</th><th>e times]</th><th></th><th>Find</th><th></th><th>ب م</th><th>P</th><th>roperties - Time</th><th>cycle</th></t<>	Tag Logging 🧼 «	Ti	mers [Cycle	e times]		Find		ب م	P	roperties - Time	cycle
1 1	.] Tag Logging		Timer name	Time base	Time factor	At system startup	At system shutdown	Start time 🔺	Ξ	Selection	
2 1 hour 1 hour 1 <td< td=""><td>Timers</td><td>1</td><td>1 day</td><td>1 day</td><td>1</td><td></td><td></td><td></td><td></td><td>Object type</td><td>Time cycle</td></td<>	Timers	1	1 day	1 day	1					Object type	Time cycle
3 1 minute 1 minute 1		2	1 hour	1 hour	1					-	500 ms
i i secondi secondi secondi i secondi i secondi i secondi i secon	- 555	3	1 minute	1 minute	1				Ξ		
S 2 hours 1 hour 2		4	1 second	1 second	1					-	04.03.2019 12:26:
6 2 minutes 1 minute 2 1		5	2 hours	1 hour	2						
7 2 seconds 1 second 2 Image: Control of the contr		6	2 minutes	1 minute	2						500 ms
8 5 hours 1 hour 5 1 1 At system shutdown Start time Market time 9 5 minutes 1 minute 5 1 1 Start time Market		7	2 seconds	1 second	2						<u> </u>
9 5 minutes 1 minute 5 1		8	5 hours	1 hour	5						<u> </u>
10 5 seconds 1 second 5 Image: Control of the second of the secon		<u> </u>			5						
11 10 hours 1 hour 10 Image: Control of the second					5	Luna					
12 10 minutes 1 minute 10 Image: Control of the second in the sec					10	Lund					
13 10 seconds 1 second 10 Image: Condent and the second and the s											
14 20 minutes 1 minute 20 Image: Constraint of the second		<u> </u>									
15 20 seconds 1 second 20 Image: Constraint of the second of the		<u> </u>									
16 500 ms 500 ms 1 Image: Constraint of the second		<u> </u>								•	E00 mg
17 1 1 1 1 18 1 1 1 1 19 1 1 1 1 20 21 22 1 1 21 22 1 1 1 23 1 1 1 1				-							
18 18 19 20 20 21 21 22 22 23 23 24				1000 1113	-					Time factor	1
19 20 20 21 22 22 Alarm logging 23		<u> </u>	ZIN								
20 21 Z2 23 Alarm logging 24											
Tag Management 21 22 23 23 24											
Alarm logging 22		<u> </u>									
Alarm logging 23	Tag Management										
	Alarm logging	<u> </u>									
Tag Logging 25		<u> </u>									
	Tag Logging										

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3. A 'Process Value Archive' called 'SystemArchive' is already created automatically for the PCS 7 project. Additional archives can be created in the subitems 'Process Value Archives' and 'Compressed Archives'. You will create an additional archive for a 'Compressed Archive'. The differences between these two types of archive are described via the property dialogs on the following pages. (→ Archives → Compressed Archives)

Tag Logging «	Archives [Compres	sed Archives]	Find	ب م		Properties - Compressed a	rchive »
⊡…]] Tag Logging	Archive name	Comment	Archiving disabled	Manual input permitted	E	Selection	
	1 💥					Object type	Compres
Archives	2					Object name	(no sele
Process Value Archives	3				E	General	
SystemArchive	4					Comment	
Compressed Archives	5					Archiving disabled	
[]] Compressed Archives	6					Manual input permitted	
	7					Last change	
	8				E	General archive properties	
	9					Archive name	
						Action at archive start/enable	
	10				E	Compressed Tag Properties	
	11					Processing method	
	12					Compression time period	
	13					Recalculation with manual input	
	14				l e	Weighted quality code	
	15					Quality code bad	
	16				Π.	Quality code uncertain	
	17					Quality code good (Cascaded)	
	18				Π.	Quality code good (Non-Cascade	d)
	19						
	20						
Tag Management	21						
Tag management	22						
Alarm logging	23						
	24				니는		
Tag Logging	25						
	25						
🏢 🎁 🏭 🜒 🛧 🔛 🔹	Zb Id d ▶ H Compressed	Auchines					

- 4. Assign a name to the 'Compressed_Archive'.
 - $(\rightarrow \mathbb{K} \rightarrow \text{Archive Name} \rightarrow \text{Compressed}_\text{Archive})$

H Tag Logging - WinCC Configuration	Studio	0							_ 🗆 ×
<u>F</u> ile <u>E</u> dit <u>V</u> iew Too <u>l</u> s <u>H</u> elp									
Tag Logging «	Arc	hives [Compressed	Archives] Find		- م		Properties - Compressed are	ch »
E] Tag Logging	A	Archive name	Comment	Archiving disabled	Manual input	t permitted 🔄	•	∃ Selection	
	1 0	Compressed_Archive				1		Object type	Compre
Archives	2							Object name	Compre
Process Value Archives	3						1	General	
	4							Comment	
Compressed Archives	5							Archiving disabled	
E jui compressed Archives	6							Manual input permitted	
	7						Ш.	Last change	10.05.2
	8						1	General archive properties	-
	9							Archive name	Compre
	10							Action at archive start/enable	
	11						Ľ	Compressed Tag Properties	C. I I. t
	12							Processing method	Calculat
	13							Compression time period	1 day
	14							Recalculation with manual input Weighted guality code	
	15						Ľ	Quality code bad	_
	16							Quality code bau Quality code uncertain	-
	17							Quality code uncertain Quality code good (Cascaded)	
	18							Quality code good (Non-Cascaded)	1
	19							Qualicy code good (Non-Cascaded)	
• •	20								
Tag Management	21 22						L		
Alarm logging	22						L		
Alarm logging							┛╞		
Tag Logging	24 25							Name of selected object	
	26	Company of Auch					4		
Ready NUM	14 4	Compressed Arch		ish (United States)		Table: 1 Compre		d archive 100 % (=)	÷
Ready NOM			Engl	isin (officed states)		tuble, i compri	Lose		• .:

5. Now, look at the properties of such a 'Compressed Archive'. $(\rightarrow \text{Compressed Archive} \rightarrow \text{Properties})$

III Tag Logging - WinCC Configuration	n Studio			_ 🗆 🗙
<u>File E</u> dit <u>V</u> iew Too <u>l</u> s <u>H</u> elp				
Tag Logging «	Archives [Compressed	Find 🔎 🗸	Properties - Compressed arc	hive »
E Tag Logging	Archive name	Comment Archiving disabled Manual in	Selection	
Timers	1 Compressed_Archive		Object type	Compressed archive
Archives	2 💥		Object name	Compressed_Archive
Process Value Archives	3		🗆 General	
SystemArchive	4		Comment	
	5		Archiving disabled	
Compressed Archives	6		Manual input permitted	V
	7		Last change	10.05.2019 11:10:19
	8		General archive properties	
			Archive name	Compressed_Archive
	9		Action at archive start/enable	
	10		Compressed Tag Properties	
	11		Processing method	Calculate
	12		Compression time period	1 day
	13		Recalculation with manual input	
	14		Weighted quality code	
	15		Quality code bad	
	16		Quality code uncertain	
	17		Quality code good (Cascaded)	
	18		Quality code good (Non-Cascaded)	
	19			
	20			
Tag Management	21			
Tag Management	22			
Alarm logging	23			
	24			
Tag Logging	25		Name of selected object	
🏢 🎁 🋄 🐠 🐄 😒 👻	26 II I I I I Compressed Arch	ives I I		
Ready NUM	Compressed Aren		Table: 1 Compressed archive 100 % (=	
Ready NUM		English (United States)	Table: 1 Compressed archive 100 %	+ (

6. In the 'General' section, you can specify if this archive has already been enabled when WinCC is started and, thus, the archiving of data is to start (archiving not disabled) or if the archiving is to be enabled later via a C script. An action can also be linked to enabling/starting of the archive under 'General archive properties'. (→ General → Archiving disabled: No)

Ξ	General								
	Comment								
	Archiving disabled								
	Manual input permitted								
	Last change	10.05.2019 11:05:17							

 In the 'Compressed Tag Properties' section, the compression time period and the processing method are selected. (→ Processing method: Calculate → Compression time period: 1 day → OK)

Ξ	Compressed Tag Properties		
	Processing method	Calculate	
	Compression time period	1 day	•
	Recalculation with manual input		

8. Tags are assigned to the compressed archives from the tags previously created in the process value archives. ($\rightarrow \ddagger$ Compressed_Archive $\rightarrow \ddagger \rightarrow \ddagger$ SystemArchive \rightarrow A1_multipurpose_plant/... \rightarrow OK)

Tag Logging - WinCC Configuration	n Studio				_ _ _ ×
<u>F</u> ile <u>E</u> dit <u>V</u> iew Too <u>l</u> s <u>H</u> elp					
Tag Logging «	Archives [Compres	ssed Find	۶ -	Properties - Compressed ar	chive »
🖃 🖳 Tag Logging	Source tag	Source archive	Tag name	Selection	
	1 💥			Object type	Compressed archive
Archives	2			Object name	Compressed_Archive
Process Value Archives	3			🖂 General	
SystemArchive	4			Comment	
200	5			Archiving disabled	
Compressed Archives	6			Manual input permitted	
Compressed_Archive	7			Last change	10.05.2019 11:10:19
	-			General archive properties	
	8			Archive name	Compressed_Archive
	9			Action at archive start/enable	
	10			Compressed Tag Properties	
	11			Processing method	Calculate
	12			Compression time period	1 day
	13			Recalculation with manual input	
	14			Weighted quality code	
	15			Quality code bad	
	16			Quality code uncertain	
	17			Quality code good (Cascaded)	
	18			Quality code good (Non-Cascaded	1)
	19				
· · · · · · · · · · · · · · · · · · ·	20				
Tag Management	21				
111 Tay management	22				
Alarm logging	23				
	24				
Tag Logging	25			Name of selected object	
	26				
🧮 🖗 🏭 🕕 🕆 🔛 🔹	H I H Tags				
Ready NUM		English (United States)	100 % 🤆	

Tag selection	× X
Filter:	▶ 🗈 🗄 🎬
WinCC Server Compressed_Archive	Name Parameter A1_multipurpose_plant/T2_reaction/A1T2L001/Mon_A1T2L001.PV#Value Analog
· · · · · · · · · · · · · · · · · · ·	Apply OK Cancel

In the properties of the compressed tag logging, the focus will be on parameters for processing or calculating the compression. (→ III Compressed_Archive → Tag name → Properties → Parameters → Processing: Average value → Unit: ml → OK)

Tag Logging - WinCC Configuration	1 Studio					
<u>File E</u> dit <u>V</u> iew Too <u>l</u> s <u>H</u> elp						
Tag Logging «	Archives [Co Find		ہ م	F	Properties - Compressed Ta	ıg »
🖃 🖳 Tag Logging	Source tag	Source archive	Tag name 🔺		Selection	A 10 10 10 10 10 10 10 10 10 10 10 10 10
	1 A1_multipurpose_pla	stemArchive	A1_multipu		Object type	Compressed Tag
- Archives	2 💥				Object name	A1_multipurpose_plant/T2_reacti
Process Value Archives	3				General	
SystemArchive	4				Comment	
Compressed Archives	5				Archiving disabled	
	6				Relevant long term	
Compressed_Archive	7				Manual input permitted	
	8				Last change	10.05.2019 11:15:35
	9				General archive properties	
	10		I		Archive name	Compressed_Archive
					General tag properties	
	11				Tag name	A1_multipurpose_plant/T2_reacti
	12				Tag supply	System
	13				Compressed Tag Properties	
	14				Recalculation with manual input	
	15				Parameters	
	16				Processing	Average value
	17				Unit	ml
	18				Counter Limit High	0
I)	19				Counter Limit Low	0
·····	20				Properties of compressed tag	
Tag Management	21				Source tag	A1_multipurpose_plant/T2_reacti
Tag management	22				Source archive	SystemArchive
Alarm logging	23				Weighted quality code	•
	24					
Tag Logging						
	25					
🏢 🧌 🏭 🕕 🛧 🔛 🔸	26 H I I I Tags					
Ready NUM		English	(United States)		Table: 1 Compressed Tag	g 100 % 🗩 🗸 🕂

10. Then, take a look at the properties of the 'Process Value Archive'. ($\rightarrow \square$ Process Value Archive \rightarrow SystemArchive \rightarrow Properties)

ag Logging «	Ar	chives [Process Valu	Find		<mark>,</mark>	P	Properties - Process v	alue archive
Tag Logging		Archive name	Comment	Archiving disabled	Manual		Selection	
Timers	1	SystemArchive					Object type	Process value archive
Archives	2	No.					Object name	SystemArchive
Process Value Archives	3					Ξ	General	
SystemArchive	4						Comment	
	5						Archiving disabled	
Compressed Archives	6						Manual input permitted	
Compressed_Archive	7						Last change	10.05.2019 12:07:36
	8					Ξ	General archive propertie	25
	9						Archive name	SystemArchive
	-						Action at archive start/enab	ble
>	10					Ξ	Memory location	
	11						Memory location	Hard disk
Tag Management	12						Size in data records	1000
Alarm logging	13						Size in kB/tags	31
Alarm logging	14							
Tag Logging	15							
	16							

11. In the 'General' and 'General archive properties' sections, you can again specify whether this archive is to already be enabled when the OS is started (not disabled). You also specify whether an action is to be linked to the enabling/starting of the archive. (\rightarrow General \rightarrow Archiving disabled: No)

P	roperties - Process valu	ue archive	*				
Ξ	Selection						
	Object type	Process value archive					
	Object name	SystemArchive					
⊡	General						
	Comment						
	Archiving disabled						
	Manual input permitted						
	Last change	10.05.2019 12:07:36					
⊡	General archive properties						
	Archive name	SystemArchive					
	Action at archive start/enable						
Ξ	Memory location						
	Memory location	Hard disk					
	Size in data records	1000					
	Size in kB/tags	31					
s	pecifies whether archiving is tartup.	disabled at system					

12. In the 'Memory location' section, there is the option to select the storage location for the archive. If the main memory was selected, the memory size must be restricted.
 (→ Memory location → Hard disk)

value archive				
value archive				
rchive				
)19 11:35:09				
General archive properties				
rchive				
Action at archive start/enable				
C 🔽				
Here, you specify the memory in which the data are to				
be stored for archiving.				
k				

How to configure a process value archive
 How to configure compressed archives

13. Now, look at the 'Properties' of the process tag that you created previously in the CFC. (\rightarrow III SystemArchive \rightarrow Tag name \rightarrow Properties)

Tag Logging - WinCC Configuration Studio					
Eile Edit View Tools Help Tag Logging «	Archives [System	mArchi Find	۶ -	Properties - Tag	»
⊡…] Tag Logging	Process tag Tar	g type Tag name	Archive name	Selection	A
±	1 A1_multipurp Ana			Object type	Tag
Archives	2 💥			Object name	A1_multipurpose_plant/1
	3			General	
Process Value Archives	4			Comment	
SystemArchive	5			Archiving disabled	
Compressed Archives				Relevant long term	
Compressed_Archive	6			Manual input permitted	
	7			Last change	10.05.2019 12:07:36
	8			General archive properties	10:00:2010 12:07:00
	9			Archive name	SystemArchive
	10			General tag properties	Systematicity
	11			Process tag	A1_multipurpose_plant/1
	12			Tag type	Analog
	13			Tag name	A1_multipurpose_plant/1
	14				
	15			Tag supply	System
				Also in tag	
	16			Archiving	
	17			Acquisition type	Cyclical, continuous
	18			Acquisition cycle	1 second
	19			Factor for archiving cycle	1
	20			Archiving/display cycle	10 seconds
	21			Number of values leader	0
	22			Number of values trailer	0
	23			Start event	
	24			Stop event	
-1	25			Start tag	
·····	25			Stop tag	
Tag Management				Archive after segment change	
Tag wanagement	27			Hysteresis	0
Alarm logging	28			Hysteresis Type	absolute 👻
Alarin logging	29				
Tag Logging	30				
iiii ng cogging	31				
🏢 🧌 🛄 🐠 🛧 🔛 👻	27 H 4 ▶ H Tags	Process-controlled to			
Ready NUM		English (United Stat	es)	Table: 1 Tag 100 %	· • • • •

14. In the 'General' and 'General tag properties', there are basic settings for the archive tag, such as the tag supply through WinCC and not via 'Manual input', or the possible assignment to a central archive server (CAS) via 'Relevant long term'. (→ Tag supply: System → Archiving disabled: No)

P	Properties - Tag		>>
Ξ	Selection		
	Object type	Tag	
	Object name	A1_multipurpose_plant/T2_reaction/A1T2L001/Mon_A1T2L001.PV#Value	
Ξ	General		
	Comment		
	Archiving disabled		
	Relevant long term		
	Manual input permitted		
	Last change	10.05.2019 12:07:36	
Ξ	General archive properties		
	Archive name	SystemArchive	
Ξ	General tag properties		
	Process tag	A1_multipurpose_plant/T2_reaction/A1T2L001/Mon_A1T2L001.PV#Value	
	Tag type	Analog	
	Tag name	A1_multipurpose_plant/T2_reaction/A1T2L001/Mon_A1T2L001.PV#Value	
	Tag supply	System	-
	Also in tag		
Ð	Archiving		
Ð	Parameters		
Ŧ	Display		
Ŧ	Compression		

15. The archive tag is acquired according to a fixed acquisition cycle. It can be set whether archiving also follows a cyclical archiving cycle (>acquisition cycle) or whether this archiving is to take place acyclically when a change occurs (event-driven). In the 'Hysteresis' field, it is specified whether only a process value that is above or below the specified threshold in absolute (abs.) or relative (in %) terms will be archived. (→ Archiving → Acquisition type: Cyclical, continuous → Acquisition cycle: 1 second → Archiving/display cycle: 10 seconds)

F	roperties - Tag	*			
Ð	Selection				
Ð	General				
Ŧ	General archive properties				
Ð	General tag properties				
Ξ	Archiving				
	Acquisition type	Cyclical, continuous			
	Acquisition cycle	1 second			
	Factor for archiving cycle	1			
	Archiving/display cycle	10 seconds 🛛 💌			
	Number of values leader	0			
	Number of values trailer	0			
	Start event				
	Stop event				
	Start tag				
	Stop tag				
	Archive after segment change				
	Hysteresis 0				
	Hysteresis Type	absolute			
Ŧ	Parameters				
Ŧ	Display				
Ŧ	Compression				

16. In the remaining 'Parameters, functions can be specified that are also to be calculated during archiving. In addition, it is possible to define the unit of the respective value. (→ Parameter → Processing: Actual value → Unit: ml)

P	roperties - Tag	*			
+	Selection				
+	General				
+	General archive properties				
+	General tag properties				
+	Archiving				
Ξ	Parameters				
	Archiving on				
	Processing	Actual value			
	Unit	ml			
	Action for processing				
	Save on Error	Last value			
	Counter Limit High 0				
	Counter Limit Low 0				
+	Display				
+	Compression				

17. Now, turn to the 'Archive configuration'. There are two 'Archive types' in Tag Logging: 'TagLogging Fast' and 'TagLogging Slow'. The differences become evident in the parameters. First, the parameters for the TagLogging Fast. (→ III Archives → Archive Configuration → TagLogging Fast → Properties)

🛄 Tag Logging - WinCC Configuration Studio							
<u>F</u> ile <u>E</u> dit <u>V</u> iew Too <u>l</u> s <u>H</u> elp							
Tag Logging «	Archives [Process Valu	e Arc Fi	nd	Q	•	Properties - Process value	archive »
E] Tag Logging	Archive name	Comment	Archiving disabled	Manual input		Selection	
	1 SystemArchive					Object type Pro	ocess value archive
Archives	2 💥					Object name System	stemArchive
Proce						General	
Archive Conf	figuration	ast 🕨	Reset			Comment	
333	TagLogging S	low 🕨	Link archive			Archiving disabled	
Compressed Archive			Disconnect from are	hive		Manual input permitted	
	7			inve			.05.2019 11:35:09
	8		Properties			General archive properties	
	9					Archive name System	stemArchive
	10					Action at archive start/enable	
	10					Memory location	
▲						Memory location Ha	rd disk 💽
	12					Size in data records 10	
Tag Management	13					Size in kB/tags 31	
	14						
Alarm logging	15					Here, you specify the memory in	which the data
	16					are to be stored for archiving.	
Tag Logging	17						
📑 🎁 🏭 🕕 🛧 🔛 🕞	18					B How to configure a process valu	ie archive
E W W W Configure compressed archives							
Ready NUM English (United States) Table: 1 Process value archive 100 % 🕞							

 Under Archive Configuration, the size of the entire archive and the division into segments can be set. This item looks the same for the TagLogging slow archive type. (→ Archive Configuration → Archive size → Time of the segment change)

TagLogging Fast	×
Archive Configuration Backup Configuration Archive Contents	
Archive size Time period of all segments Max. size of all segments Time period covered by a single segment Time period covered by a single segment Max. size of a single segment 100 • Max. size of a single segment 100 • Max. size of a single segment 100 • Max. size of a single segment	
Time of the segment change Month May Year 2019 - Day of month 1 - Weekday Wednesday Hour 11 - Minute 26 -	
OK Cancel Apply Help	

 Under 'Backup Configuration', it is possible to activate a backup of the archive data to a 'Destination path' to ensure gapless process documentation. The backup is started by default after the first time-related segment change. (→ Backup Configuration)

TagLogging Fast			×
Archive Configuration Backup Configuration	Archive Contents		
Signing activated			
C Activate backup	Backup to both paths		
Destination path			
		Bro	WSE
Alternative destination path			
		Bro	Wse
	OK Cancel	Apply	Help

20. In the 'Archive Contents' tab, the difference compared to TagLogging Slow becomes evident. Here, the archiving criteria for TagLogging Fast are specified. The other tags with longer cycle time are located in TagLogging Slow. For the archive type TagLogging Slow, this tab does not exist. Accept the settings with 'OK' and exit Alarm Logging. (→ Archive Contents → OK → X)

TagLogging Fast
Archive Configuration Backup Configuration Archive Contents
Measured values with event-driven acquisition
Cyclic meas. values with cycle <= 1 x 1 minute
Compressed values with cycle <= 1 x 1 minute
Proccontrolled meas. values
Note All Tag Logging tags that do not fulfill the above-stated conditions will be
archived in Tag Logging Slow.
OK Cancel Apply Help

Note:

An additional individual variant of archives are the user archives. These are database tables where users can create their own data fields. User archives are used to store data and offer standardized access to this data according to SQL database description. However, this variant is not shown here, because its creation is very individual and complicated. (→ User Archive → Open → …)

http://www.steps.com/www.steps.com/steps.com/steps/ste	Prj\wincproj\05(1)\05(1).mcp	
<u> </u>		
]□≥ ■ > X 趙靖 出出於錄		
⊡ <mark>]}</mark> OS(1)	Name	Туре
Tag Management		
Text and graphics lists		
Tag Logging		
Report Designer		
Text Library		
\min 🎁 User Administrator		
	No objects exist	
Time synchro		
* OS Project Editor		
, D Component List Editor		
Web Navigator		
OS(1)\User Archive\	0 object(s)	Licensed mod //

8.4 Displaying archive data in WinCC Runtime

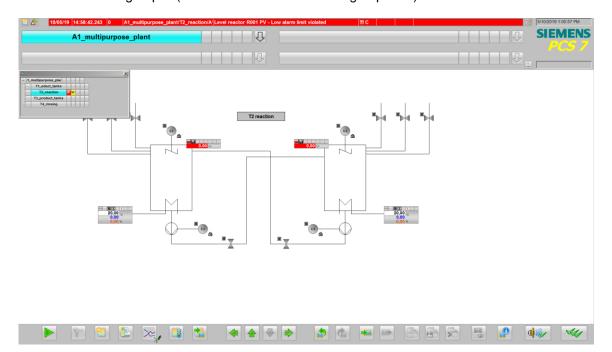
1. In order to display the archive data, first start OS Runtime. (\rightarrow Activate OS Runtime)

http://www.steps.com/www.steps.com/steps	57\SCEPrj\wincproj\05(1)\05(1).mcp	
<u> </u>		
□≫ ■▶ ※喧□ 出出シ謎(
🖃 🔂 OS(1)	Name	Туре
Computer	Computer	Computer
Tag Management	Tag Management	Tag Managemen
Graphics Designer	A Graphics Designer	Editor
	Text and graphics lists	Editor
Text and graphics lists	Alarm Logging	Editor
	Tag Logging	Editor
	📇 Report Designer	Editor
Report Designer	Global Script	Editor
Global Script	Text Library	Editor
Text Library	Text Distributor	Editor
	🚻 User Administrator	Editor
Text Distributor	Cross-Reference	Editor
😳 👬 User Administrator	Redundancy	Editor
	User Archive	Editor
	Time synchronization	Editor
User Archive	Horn	Editor
Time synchronization	T Picture Tree	Editor
	Lifebeat Monitoring	Editor
() Horn	S Project Editor	Editor
	Component List Editor	Editor
Lifebeat Monitoring	器sFC	Editor
	😯 Web Navigator	Editor
Component List Editor		
💮 Web Navigator	•	
Activates the project.	22 object(s)	Licensed mod //

2. Click the down arrow to the right of 'A1_multipurpose_plant' and then select 'T2_reaction'. (\rightarrow

\bigcirc \rightarrow T2_reaction)	
10/05/19 14:58:42.243 0	A1_multipurpose_plant/T2_reaction/A ¹ Level reactor R001 PV - Lov
A1_multipur	pose_plant
- 1_multipurpose_plar T1_educt_tanks T2_reaction A W T3_product_tanks T4_rinsing	X T2 reaction

The simplest way to display archive data in trend form is by clicking on [▶] 'Assemble / retrieve trend groups'. (→ Assemble / retrieve trend groups [▶])



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4. In the dialog below, assign a name to the 'New Trend Group' and select 'Archive' as the contents. That means that the displayed values come from an archive. As an alternative, all other online tags can be displayed directly. (→ New → Name:Trend_Group01 → Contents: Archive → Create)

Þ	Trends Online					×		
	Trend Groups	Owner	Changed	last	Display			
					New			
					Delete			
		New T	end Group		Bonomo	1		X
		Name Con		roup01			Create Cancel	

5. In the 'Trends' tab, select the folder icon next to the 'Tag name' field under 'Data Connection', and in the next dialog select the tag A1_multipurpose_plant/....
(→ Tag name → SystemArchive → A1_multipurpose_plant/... → OK)

WinCC OnlineTrendControl Properties	<u><</u>
Toolbar Status Bar Online Configuration Export	
Trends General Font Trend Window Time Axes Value Axes	
Trends: Object name:	
Trend 1	
Trend window:	
Trend window 1	
Time axis:	
Time axis 1	
Value axis:	
Value axis 1	
Label:	
New Remove Up Down Comment as trend name	
Data Connection Data source: Tag name:	
1 - Archive tags 🔽 🗖 Show Alarms 🔯 😭	
Effects	
Trend type: Trend color:	
Line style: Line weight:	
0 - Solid	
Dot type: Dot width:	
2 - Squares 3	
Dot color: Fill color:	
OK Cancel Apply	1
Tags - Project: \\PCS70SCLIENT3\WinCC_Project_05(1)_1\05(1).mcp	_
Filter: Data source:	
⊡-∰ WinCC Server Name	
PCS7OSCLIENT3	L001.PV#Value
🗄 🖟 📕 Archives	
SystemArchive Compressed_Archive	

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? ×

F

Help

Cancel

ОК

Comment

rameter

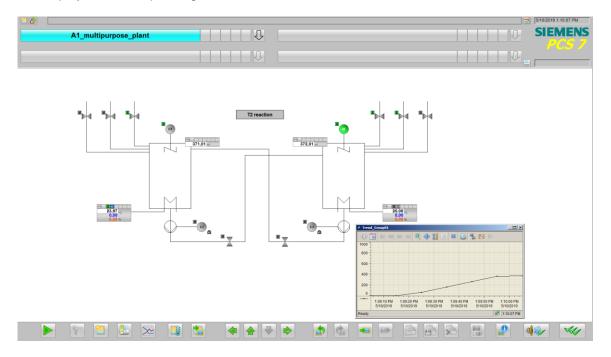
In the 'Value axes' tab, deselect 'Automatic' and set the value range to 0 ... 1000. (→ Value Axes → deselect 'Automatic'→ Value range: 0 ... 1000)

WinCC OnlineTrendControl Properties	×
Toolbar Status Bar Trends General Font Tre	Online Configuration Export Axes Value Axes
Value Axes: Value axis 1 New Remove Up Down	Object name: Value axis 1 Trend window: Trend window 1 Label: Alignment: 0 - Left Scaling: 0 - Linear ▼
Value range from: to: 0 1000	
Effects Decimal places: 2 Exponential notation	Color:
User scaling	Area names
	OK Cancel Apply

7. In the 'Time Axes' tab, select the time range 1 x 1 minute. (\rightarrow Time Axes \rightarrow Time range: 1 x 1 minute)

WinCC OnlineTrendControl Properties	×
Toolbar Status Bar Trends General Font Tre	Online Configuration Export and Window Time Axes Value Axes
Time axes: Time axis 1 New Remove Up Down Time range	Object name: Time axis 1 Trend window: Trend window 1 Label: Alignment: 0 - Bottom Refresh
Setting: 0 - Time range	Start time: 10.05.2019 13:01:52 End time: 10.05.2019 13:02:52
Number of measurement points:	Time range:
Effects Time format: Automatic Date format: Automatic	Color:
	OK Cancel Apply

8. You now have a trend display for the archive tag whose range and segment can be modified conveniently using the task bar in the Trendgroup01 window. For displaying the trend display, the corresponding SIMIT model as well as the simulation has to be started in PCS 7.

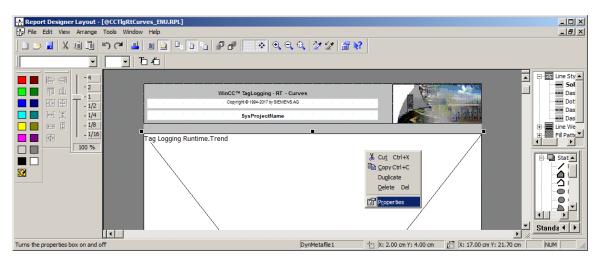


8.5 Creating reports

 Another variant for displaying trends from archives is to create a printout using the 'Report Designer'. Here it is important that WinCC remains started in Runtime. In the Report Designer, print jobs with contained layouts can be started. For this reason, first select a layout suitable for the archive data ('@CCTIgRTCurves_ENU.RPL') in order to adapt it. (→ Report Designer → Layouts → English → @CCTIgRtCurves_ENU.RPL)

WinCC Explorer - C:\Program Files (x86)\SIEMENS\STEP7\S7Proj\SCE_PCS7\SCE_Prj\wincproj\05(1)\05(1).mcp [Active]							
Eile Edit View Iools Help							
] □ ▷ ■ → X 輯 聞 出 ᄓ 莎 翔 圖 ?							
⊡ OS(1)	1[Name	Туре	Last Change	▲		
- Computer	11	CCAlgRtOnlineMessagesHiding_ENU.RPL	Layout	2/18/2017 1:13:30 AM			
Tag Management	Ш	@CCAlgRtOnlineMessagesLocked_ENU.RPL		2/18/2017 1:13:30 AM			
A Graphics Designer	Ш	@CCAlgRtOnlineMessagesNewWithTolerance_ENU.RPL					
Text and graphics lists	Ш	@CCAlgRtOnlineMessagesNew_ENU.RPL	· ·	2/18/2017 1:13:30 AM			
	Ш	@CCAlgRtOnlineMessagesOld_ENU.RPL		2/18/2017 1:13:30 AM			
	Ш	@CCAlgRtOnlineMessages_ENU.RPL	· · ·	2/18/2017 1:13:26 AM			
Tag Logging	Ш	@CCAlgRTSequenceArchiveJournal_ENU.RPL		2/18/2017 1:13:30 AM			
🖃 🗐 Report Designer	Ш	@CCAlgRTSequenceArchiveOperation_ENU.RPL		2/18/2017 1:13:30 AM			
Layouts	Ш	@CCAlgRTSequenceArchiveProcess_ENU.RPL		2/18/2017 1:13:30 AM			
Language neutral	Ш	@CCAlgRtSequenceArchive_ENU.RPL		2/18/2017 1:13:26 AM			
	Ш	@CCAlgRtShortTermArchive_ENU.RPL	· · ·	2/18/2017 1:13:26 AM			
German (Germany)	Ш	@CCCurveControlContents_ENU.RPL		2/18/2017 1:13:26 AM			
English (United States)	Ш	@CCFunctionTrendCtrl-CP_ENU.RPL		2/18/2017 1:13:26 AM			
🔚 Spanish (Spain, Traditional Sort)		@CCOnlineTableCtrl-CP_ENU.RPL		2/18/2017 1:13:26 AM			
French (France)	Ш	@CCOnlineTrendCtrl-Curves-CP_ENU.RPL		2/18/2017 1:13:26 AM			
Italian (Italy)	Ш	@CCTableControlContents_ENU.RPL		2/18/2017 1:13:26 AM			
■ Print jobs		@CCTIgRtCurves_ENU.RPL		2/18/2017 1:13:26 AM			
	Ш	@CCTlgRtTables_ENU.RPL		2/18/2017 1:13:26 AM			
Global Script	1	@Control Center CS (compact)_ENU.rpl		2/18/2017 1:13:26 AM			
Text Library		@Function Trend Control - Picture_ENU.RPL	· ·	2/18/2017 1:13:26 AM			
		@Global Script single Action (landscape)_ENU.rpl		2/18/2017 1:13:26 AM			
💮 👬 User Administrator		Global Script single Project Funtion (landscape)_EN		2/18/2017 1:13:26 AM			
Cross-Reference		@Global Script single Standard Function (landscape)		2/18/2017 1:13:26 AM			
Redundancy		gscract_ENU.rpl		2/18/2017 1:13:26 AM			
		ggscrpfc_ENU.rpl		2/18/2017 1:13:26 AM			
User Archive		gscrsfc_ENU.rpl	Layout	2/18/2017 1:13:26 AM	-		
OS(1)\Report Designer\Layouts\English (United States)\		1 object(s) selected		ju	icensed mod 🎵		

 In the 'Report Designer Layout', the layout can now be edited. Here it is shown how the parameters of the dynamic view of the tag trend must be assigned. (→ Tag Logging Runtime.Trend → Properties)



 In the following dialog, under 'Connect' select the 'Tag Selection' for editing. Likewise, the time range, time base and format can be specified here. (→ Connect → Tag Selection → Edit)

Object Properties			? ×
Image: Properties Connect	metafile	DynMetafil	e1 💌
⊡. Tag Logging Runtime	Name Time range Tag Selection Time base Format	Parameter	Edit Delete

4. No tag is selected yet. Therefore, click on 'Add'. (\rightarrow Add)

Tag Logging Runtime: Tag Selection for Reporting	<u>? ×</u>						
Current selection and sequence:	ок						
Variable	Cancel						
	Add						
	Move Up						
	Move Down						
	Delete						
	Properties						
This dialog box allows you to select tags for reporting from existing Tag Logging archives.							

5. From 'SystemArchive': select 'A1_multipurpose plant' as the tag. (\rightarrow SystemArchive \rightarrow A1_multipurpose_plant/... \rightarrow OK \rightarrow OK)

Archive Selection			? ×
🔁 📴 🖽 🎹			
Hierarchy: SystemArchive			
PCS7OSCLIENT3 Compressed_Archiv SystemArchive	Tag name * Y A1_multipurpose_plant/T2_reaction/A1T2L001/Mon_A1T2L001.PV#Value	Co Ta * 7 * 7 An	Ac La: * 7 * Cy 20
	4		Þ
	ОК	Cancel	Help

Tag Logging Runtime: Tag Selection for Reporting	<u>? ×</u>					
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Variable	Cancel					
SystemArchive\A1_multipurpose_plant/T2_reaction/A1T2L001/Mon_A1T2L00						
	Add					
	Move Up					
	Move Down					
	Delete					
▼ ▶	Properties					
This dialog box allows you to select tags for reporting from existing Tag Logging archives.						

6. Close the 'Properties' dialog and save the modified layout under the same name or a

different name. (\rightarrow Close \rightarrow Save \square)

Report Designer Layout - [@CCTlgRtCurves_ENU.RPL]	
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Saves the active document.	DynMetafile1 1: X: 2.00 cm Y: 4.00 cm 1: X: 17.00 cm Y: 21.70 cm NUM

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 Now, set the properties in the print job for online trends '@Report Tag Logging RT Curves New'. (→ Report Designer → Print jobs → @Report Tag Logging RT Curves New → Properties)

WinCC Explorer - C:\Program Files (x86)\SIEME <u>Fi</u> le <u>E</u> dit <u>V</u> iew <u>Tools H</u> elp	NS	\STEP7\S7Proj\SCE_PCS7\SCE_Prj`	wincproj\05(1)	\05(1)).mcp [Active]	<u>_ ×</u>
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- Computer	16	@Documentation Graphics Designer Or	verview	@pdlpi	cOvr.rpl (P)	3/4/2019
Tag Management	Ш	@Documentation Lifebeat Monitoring		@LBM(CS.rpl (P)	3/4/2019
	Ш	📕 @Report Alarm Logging RT Revolving a	archive	@ALRt	UmA.RPL (P)	3/4/2019
	Ш	📕 @SysDiagControl - Picture		@SysD	iag Control - Picture.RPL	5/7/2019
	Ш	📕 @AlarmControl - Picture		@Alarr	n Control - Picture.rpl (P)	3/4/2019
	Ш	📕 @Report Alarm Logging RT Sequence a	archive Journal	@CCA	lgRtSequenceArchiveJou	3/4/2019
Tag Logging		📃 @Documentation Global Script Standar	d function	@GSC	_RSFC.rpl (P)	3/4/2019
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		@Report OnlineTableControl-CP		@CCO	nlineTableCtrl-CP.rpl (P)	3/4/2019
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Print jobs	Ш	📕 @Report Alarm Logging RT OnlineMess	sages Hiding	@CCA	lgRtOnlineMessagesHidin	3/4/2019
Global Script	Ш	@Report Asset Faceplate		@Asse	tFaceplate.rpl (P)	3/4/2019
Text Library	Ш	@Report Tag Logging RT Curves New		@CCTI	gRtCurves.rpl (P)	3/4/2019
	Ш	📃 @internal Graphics Designer Actions a	New print job		prop.rpl (P)	3/4/2019
User Administrator	Ш	🔜 @RulerControl - Table	Delete print jo	Ь	Control - Table.rpl (P)	3/4/2019
	Ш	@Documentation OS Projecteditor	Preview print j	ob	cteditor.rpl (P)	3/4/2019
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User Archive	Ш	@Report PCS 7 Measuring Point Brows	Properties		TagBrowser.RPL (P)	5/7/2019
····· 🕒 Time synchronization	Ш	📃 @OnlineTableControl - Table		@Onlin	e Table Control - Table.r	3/4/2019
······••• Horn	Ш	📃 @Report Curve Control Contents		@CCC	urveControlContents.rpl	3/4/2019
Picture Tree		@UserAdminControl - Table		@User	Admin Control - Table.R	5/7/2019
Lifebeat Monitoring		@UserArchiveControl - Picture		@User	Archive Control - Picture	3/4/2019
		@Report Alarm Logging RT Sequence a		-	gRtSequenceArchivePro	3/4/2019
		@Documentation Picture Tree Manage	r	@PTM	CS.rpl (P)	3/4/2019
Component List Editor	1	۱				Þ
S(1)\Report Designer\Print jobs\		10	object(s) selected		Lic	ensed mod

 In the 'General' dialog, a suitable 'Layout file: @CCTIgRTCurves.RPL' is already preselected. If your own layouts were created, they can be selected here also. (→ Layout file: @CCTIgRTCurves.RPL)

Print Job Propertie	25	? ×
General Selection	Printer Setup	
Name: Project:	Report Tag Logging RT Curves New C:\Program Files (x86)\SIEMENS\STEP7\S7Pro	
Layout name:	@CCTlgRtCurves.rpl	
Layout file:	@CCTIgRtCurves.RPL	<u>i</u>
	Line layout for line printer	
	Selection for print job list	
Dialog:	No dialog	1
Last pr	intout on:	1
Next p	rintout on:	
Start I	Parameters	-
	art time: 2019 - 05 - 10 + 13 : 28 +	
	vole: Daily	
	OK Cancel He	lp

 Under 'Selection of the print job properties', the pages and the time range are specified. (→ Selection → Page Range → Data time range)

Print Job	Properties ?	×
General	Selection Printer Setup	
9	Page Range All Pages from 1 to 10 to	
	Data time range Image: Construction of the print start time) Number:	
	YYYY - MM - DD HH : MM From 2019 05 10 13: 28 To 2019-05- 10 13: 28	
	OK Cancel Help	

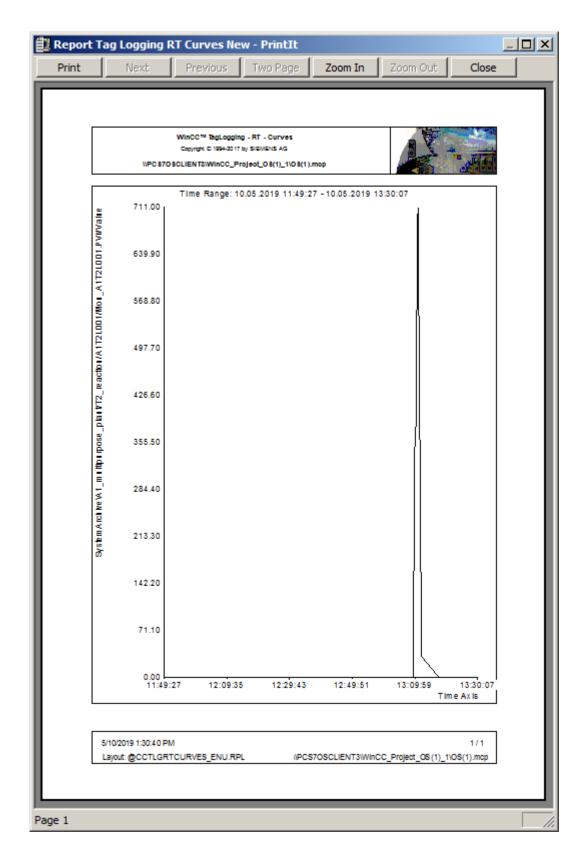
10. In 'Printer Setup', several printers can be specified sorted according to priority. (\rightarrow Printer Setup \rightarrow OK)

Print Job Properties	? ×
General Selection Printer Setup	
Print Output To ✓ Printer Printer Priorities 1.) <standard printer=""> 2.) <none> 3.) <none> Minimum space required on the hard disk in MB Generate warnings 150 Discard trigger for logging 100 File (*.emf) PDF Tray: PRT_OUT_YYYYMMDDhhmmssmmm PRT_OUT_YYYYMMDDhhmmssmmm.pdf Minimum space required on the hard disk in MB Generate warnings 150 Discard trigger for logging 100</none></none></standard>	
OK Cancel Help	

11. A printout can now be made. To save paper, you can also preview the print job. (\rightarrow @Report Tag Logging RT Curves New \rightarrow Preview print job)

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	/sDiagControl - Picture	@SysDiag Control - Picture.RPL	5/7/2019					
Text and graphics lists	armControl - Picture	@Alarm Control - Picture.rpl (P)	3/4/2019					
	eport Alarm Logging RT Sequence archive :	Journal @CCAlgRtSequenceArchiveJou	3/4/2019					
Tag Logging	ocumentation Global Script Standard functi	on @GSC_RSFC.rpl (P)	3/4/2019					
E-E Report Designer	REFPrintRef	@XREFPRINTREF.rpl (P)	3/4/2019					
	eport OnlineTableControl-CP	@CCOnlineTableCtrl-CP.rpl (P)	3/4/2019					
E Print jobs	eport Alarm Logging RT OnlineMessages Ne	ew @CCAlgRtOnlineMessagesNew	3/4/2019					
	eport Alarm Logging RT OnlineMessages Hi	ding @CCAlgRtOnlineMessagesHidin	3/4/2019					
Global Script	eport Asset Faceplate	@AssetFaceplate.rpl (P)	3/4/2019					
Text Library	eport Tag Logging RT Curves New	@CCTlgRtCurves.RPL (P)	5/10/20					
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Cross-Reference	ocumentation OS Projecteditor Prev	view print job cteditor.rpl (P)	3/4/2019					
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	ternal Global Script Actions	perties Ict.rpl (P)	3/4/2019					
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Time synchronization	nlineTableControl - Table	@Online Table Control - Table.r						
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Lifebeat Monitoring	serArchiveControl - Picture	@User Archive Control - Picture	3/4/2019					
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8.6 Checklist – step-by-step instruction

The following checklist helps students to independently check whether all steps of the step-bystep instruction have been carefully completed and enables them to successfully complete the module on their own.

No.	Description	Checked
1	Messages in the MonAnS block of level measurement A1T2L001 are configured and successfully compiled	
2	Alarm Logging configured	
3	Tag Logging configured	
4	Trend group successfully created	
5	Report successfully created	
6	Project successfully archived	

Table 3: Checklist for step-by-step instructions

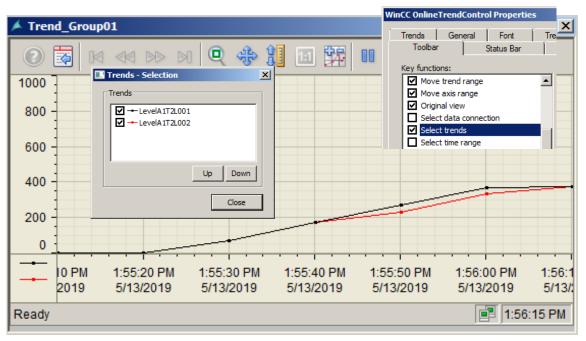
9 ExerScises

In the exercises, you apply what you learned in the theory section and in the step-by-step instructions. The existing multiproject from the step-by-step instructions (p02-03-project-r1905-en.zip) is to be used and expanded for this. The download of the project is stored as zip file "Projects" on the SCE Internet for the respective module.

The objective of this exercise is to configure two trend groups that represent various archive values for the reactors. To this end, combine the temperature- and controller-relevant data in the first trend group and the level-relevant data in the second trend group.

9.1 Tasks

- 1. Archive all values that are level-, temperature- and controller-relevant. Edit the corresponding blocks in a way that these values are archived.
- Define a trend group for Reactor R001 that displays the values of the PID controller. Add all relevant archive tags. Do the same for Reactor R002. Try different time axis and value axis settings.
- 3. The level-relevant data of the reactors is to be visualized together. Select them and display them.
- 4. Test different settings in the configuration dialog. Search for a function that can be used to select and deselect individual trends of the trend group.



Note:

 To make the trend selection visible, you must select the 'Select trends' check box in the 'Toolbar' tab in the configuration dialog The tasks below were not realized in the exercise project. However, they are typical for planning archive systems.

- 5. Which process values should be archived for an easy-to-follow and gapless display? Develop a concept and implement it.
- 6. Calculate the memory needed for the tag "Tag Logging Fast". As the number of process values, utilize the results from the first task. For the analog process values, once assume 6 bytes for each process value and once 16 bytes for each process value. One segment is to store the process values for 2 weeks and all segments at least half a year.
- 7. Also calculate the memory requirement for Alarm Logging by assuming 4 messages per minute. One message requires 4000 bytes memory.
- Based on the results, distribute the assumed 10 GB memory to the Tag Logging Fast, Alarm Logging and Tag Logging Slow archives. Then set the properties of the archives in your project.

9.2 Checklist – exercise

The following checklist helps students to independently check whether all steps of the exercise have been carefully completed and enables them to successfully complete the module on their own.

No.	Description	Checked
1	Archiving for 2x level, 2x temperature and (2x3)x controlling configured	
2	Trend groups created for Reactors R001 and R002 with 3 controller tags each	
3	Trend group created for levels of Reactors R001 and R002	
4	Trends successfully shown and hidden in trend groups	
5	Concept for gapless display of process valued created and implemented	
6	Segment sizes and memory requirements calculated for Tag Logging Fast	
7	Memory requirements calculated for Alarm Logging	
8	10 GB distributed among archives according to calculations and configured in the project	
9	Project successfully archived	

Table 4: Checklist for exercises

10 Additional information

More information for further practice and consolidation is available as orientation, for example: Getting Started, videos, tutorials, apps, manuals, programming guidelines and trial software/ firmware, under the following link:

siemens.com/sce/pcs7

Preview "Additional information"

Getting Started, Videos, Tutorials, Apps, Manuals, Trial-SW/Firmware

- SIMATIC PCS 7 Overview
- SIMATIC PCS 7 Videos
- > Getting Started
- > Application Examples
- > Download Software/Firmware
- SIMATIC PCS 7 Website
- SIMATIC S7-400 Website

Further Information

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SCE Trainer Packages siemens.com/sce/tp

SCE Contact Partners siemens.com/sce/contact

Digital Enterprise siemens.com/digital-enterprise

Industrie 4.0 siemens.com/future-of-manufacturing

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SIMATIC Controller siemens.com/controller

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Product catalogue and online ordering system Industry Mall **mall.industry.siemens.com**

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