Configuring chronological messaging

service & SUPPORT

How do you implement chronological messaging with S7-400 CPUs and WinCC?

SIEMENS

FAQ

Entry ID: 23730697

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http://support.automation.siemens.com/WW/view/de/23730697

Question

How do you implement chronological messaging with S7-400 CPUs and WinCC?

Answer

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

Entry ID: 23730697

1 Information

1.1 Instructions

This entry shows you how to implement chronological messaging with an S7-400 CPU and WinCC. Chronological messaging means that the messages are sent from the PLC to the WinCC station. When they are created in the PLC, the messages are given a time stamp and then sent to the WinCC station. The WinCC station does not poll the PLC, which significantly reduces the bus load. There are basically two types of message in STEP 7:

1. **Symbol-related messages**
   Symbol-related messages can only be generated by CPUs of the S7-400 series. The messages are triggered asynchronously to the program.
2. **Block-related messages**
   Block-related messages can be generated by CPUs of the S7-300 and S7-400 series.
   The block-related messages are created by the STEP 7 program using the system message blocks (e.g. ALARM_8P). The message is sent as soon as the STEP 7 program calls a system message block and the conditions for sending a message are fulfilled. The messages are triggered synchronously to the program.

1.2 Message classes

Messages are sorted into message classes according to their usage (e.g. Alarm, Warning). You can configure 16 message classes.

1.3 Message types

The message types divide the message classes once again (e.g. Alarm High for High Limit Exceeded, Alarm Low for Low Limit Exceeded). You can configure 16 message types per message class.

Note

The message types are numbered consecutively, i.e.:

- Message class 1 has message types 1-16
- Message class 2 has message types 17-32
- Message class 16 has message types 241-256

The texts of message classes and message types are not compiled to WinCC, only the message class and message type numbers are used to assign the messages in WinCC to a message class and message type respectively.

WARNING

The message class and message type numbers used in STEP 7 must also be configured in WinCC. If a message is triggered in STEP7 with a message class number or message type number, for which no message class or message type number is configured in WinCC, then this is marked purple in Alarm Logging and no message is displayed in the Runtime.

1.4 OS project editor

If you are using the OS project editor, the message classes and message types that are available to you for configuring messages are created automatically. It is not necessary to configure the messages in WinCC.

If you do **not** use the OS project editor, you must configure the message classes and message types in WinCC. For which STEP 7 message class is assigned to which message class and message type in WinCC, please refer to Entry ID: 31622970.

1.5 Block attribute alarm_ui

If this block attribute is set to "True", the PCS 7 message configuration dialog is available. In this dialog, the following texts are added automatically to the messages and do not have to be configured.

- Origin
- Area
- Charge Name
- Operation

If this block attribute is set to "False", the message text and 9 additional texts are available for each message when configuring messages. These texts are assigned to the corresponding user text blocks in WinCC. Instructions for configuring the additional texts and the assignment of the additional texts are available in Entry ID: 30550239.

1.6 Additional information

- **Reference manual "Programmable Logic Controller S7-400 CPU Data"**
  This gives you detailed information on the available message procedures of a CPU. This documentation is part of the documentation package 6ES7498-8AA03-8AA0. The manual is available for downloading in Entry ID: 19538001.
- **Manual "Operation List S7-400 CPU 412, 414, 416, 417"**
  This gives you detailed information on available system functions and system function blocks for creating CPU messages. This documentation is part of the documentation package 6ES7498-8AA04-8AN0. The manual is available for downloading in Entry ID: 1117645.
- **STEP 7 Online Help**
  You can find detailed information about alarm processes, alarm types and system alarm blocks in the STEP 7 Online Help.

2 Configuration

Requirements

- The WinCC component "AS-OS Engineering" is installed.
  You can select this component when doing a user-defined setup of WinCC.
  Please use the following installation sequence:

3. STEP 7
4. WinCC with the "AS-OS Engineering" component
   Entry ID: 22272911 includes a description of how to retro-install the "AS-OS Engineering" component.

- The WinCC project is integrated in the STEP 7 project.
  Entry ID: 11841504 contains information on how to integrate a WinCC project in STEP 7.
- The "Alarm Logging Runtime" is enabled in the startup list in the "Computer Properties" dialog of the WinCC project.

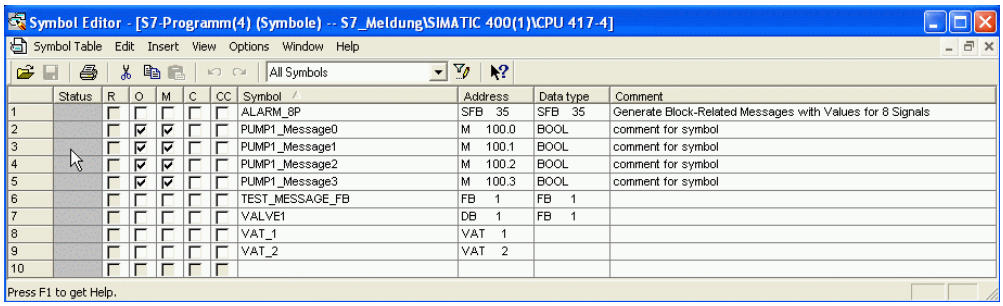
Below we show you how to configure symbol-related and block-related messages.

2.1 Configuring symbol-related messages

2.1.1 Configure extended attributes for messaging in the symbol table

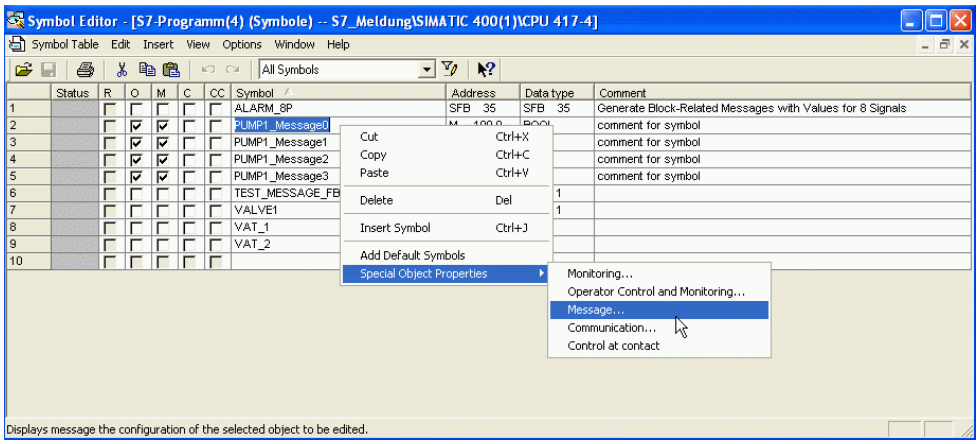
1. In SIMATIC Manager, open the symbol table.
2. Using the menu command "View > Columns R, O, M, C, CC Ctrl+K" you make additional properties to the symbols used visible.
3. Create a symbol (e.g. "PUMP1_Message0") that is to trigger a message. Assign an address, e.g. "M100.0" (BOOL data type).

Figure 2-1



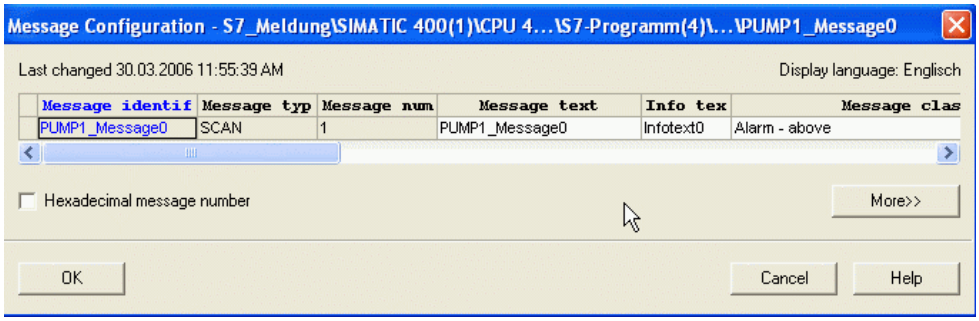
4. Assign the attribute "M" for messaging for the symbol that is to trigger a message. For this you open the "Message Configuration" dialog by clicking on the relevant option field in the "M" column. You can also open the "Message Configuration" dialog via the pop-up menu "Special Object Properties > Message...".

Figure 2-2



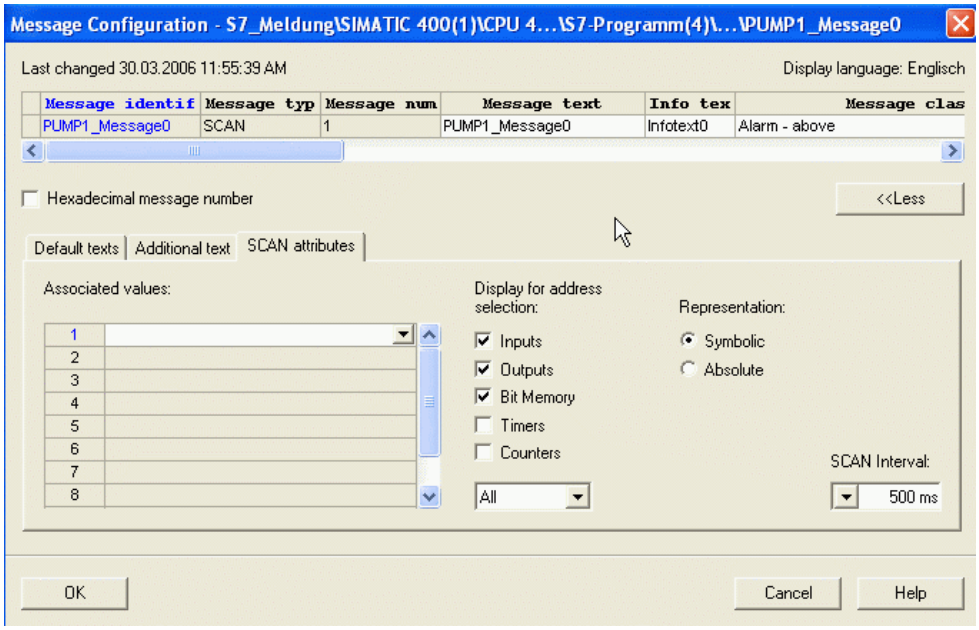
5. Make the settings in the "Message Configuration" dialog.

Figure 2-3



6. Here you can parameterize the message and information texts, the message class and other properties of the message. With the "More>>" button you can parameterize more parameters (e.g. Additional text, SCAN attributes etc.).

Figure 2-4



7. Click the "OK" button to acknowledge the message configuration.
8. Repeat the message configuration for all the symbols that are to generate messages.
9. Save the symbol table, for example, using the menu command "Symbol Table > Save". When you save the symbol table, a system data block ("SDB 305") is created.

Note

It is also possible to configure the message texts in multiple languages. The display language currently selected is shown in the "Message Configuration" dialog. You configure the message texts for all those languages that will be used later for WinCC Runtime. For this you change the standard language in the SIMATIC Manager with the menu command "Options > Language for Display Devices" and repeat message configuration for each language separately.

The attribute in the "O" column (operator control and monitoring) determines whether the symbol is created as a WinCC tag when compiling is performed.

2.1.2 Download program in PLC

Download the S7 program into the PLC.

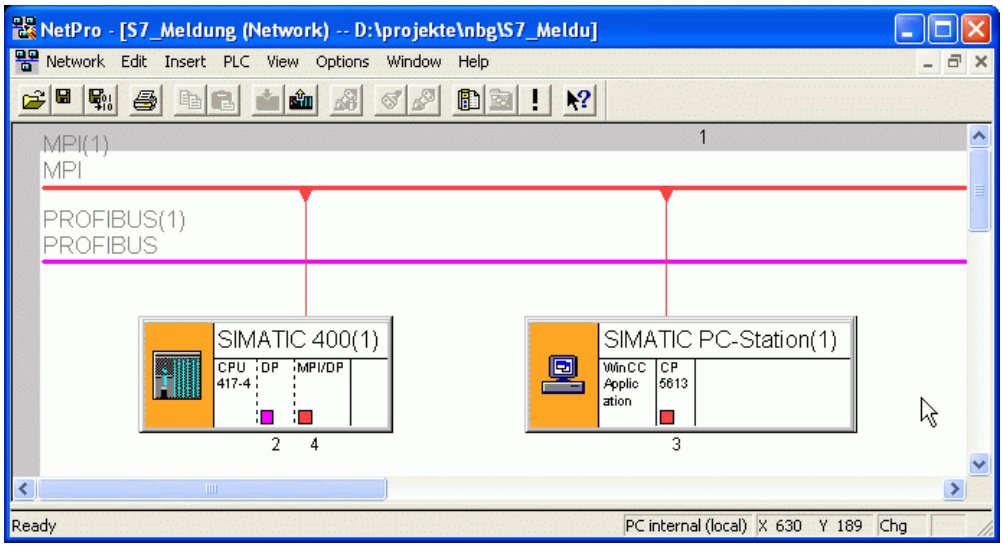
2.1.3 Compile the OS

"OS Compile" creates the messages in WinCC. In earlier versions the procedure was also done with "Mapping" or "Transfer PLC/OS Connection Data".

Requirements

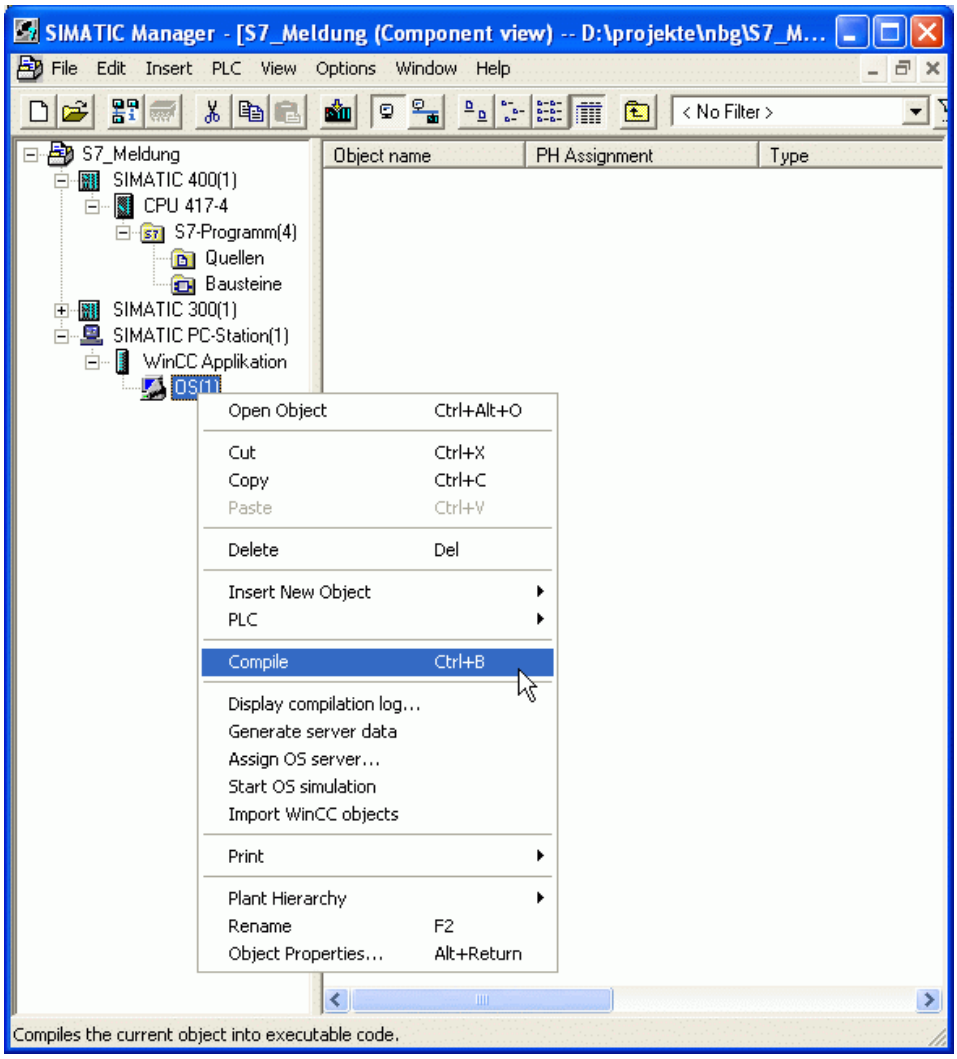
The PLC's CPU and the OS must be networked. There must be at least one common network connection in NetPro.

Figure 2-5



1. Start the OS compilation procedure. In the SIMATIC Manager you select the OS and then in the associated pop-up menu you select "Compile".

Figure 2-6



A wizard takes you through multiple dialogs. Here you can make various settings for compiling the OS. You must select which PLC program is assigned to which OS and which connection is to be used.

Note

Using the "Back" and "Next" buttons you can navigate in the wizard's settings mask. With the "Finish" button you get a summary of the compilation procedure displayed.

2. Start the compilation procedure with the "Compile" button.

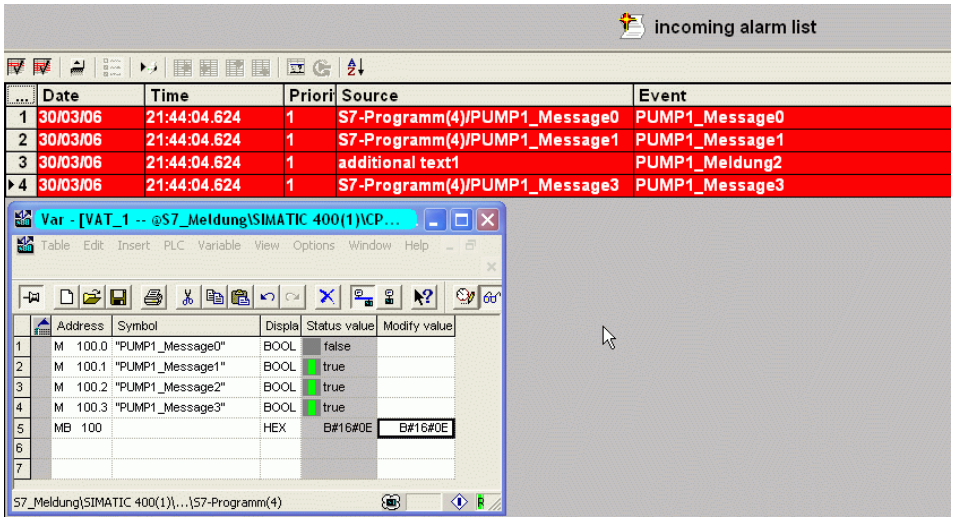
2.1.4 Download the OS

Download the program into the OS.

2.1.5 Test the messages at WinCC Runtime

Start WinCC flexible Runtime. Trigger the messages using the variable table. The messages are displayed in the alarm window of WinCC and can be acknowledged where necessary.

Figure 2-7



2.2 Configuring block-related messages

Here we present block-related messaging using the system message block SFB35 (ALARM_8P). The procedure using the other system message blocks is essentially identical.

2.2.1 Copy SFC35 (ALARM_8P) into current project

1. In the SIMATIC Manager you select "File > Open... > Libraries" and open the Standard Library.
2. Select the system message block SFB35 (ALARM_8P). It is located in the directory "Standard Library > System Function Blocks > Blocks".
3. Copy the system message block SFB35 into the project.

2.2.2 Create a message-compatible block

1. Insert a new function block, e.g. "FB1" into the STEP 7 project. The language used is STL.
2. Open the function block "FB1".
3. Create the following input variables:

Table 2-1

Name	Datentype
EV_ID	DWORD
SIG1 ... SIG8	BOOL
SD1 ... SD10	REAL

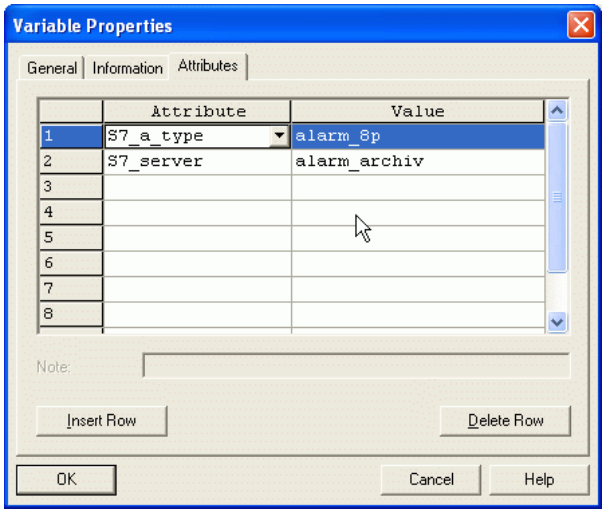
4. Create the following output variables:

Table 2-2

Name	Datentyp
DONE	BOOL
ERROR	BOOL
STATUS	WORD
ACK_STATE	WORD

5. Create the following instance FB variable in the static area:
   - ALARM (ALARM_8P or SFB35)
6. Open the "Object Properties" dialog of input "EV_ID". Assign the following attributes:
   - S7_a_type = alarm_8p
   - S7_server = alarm_archiv

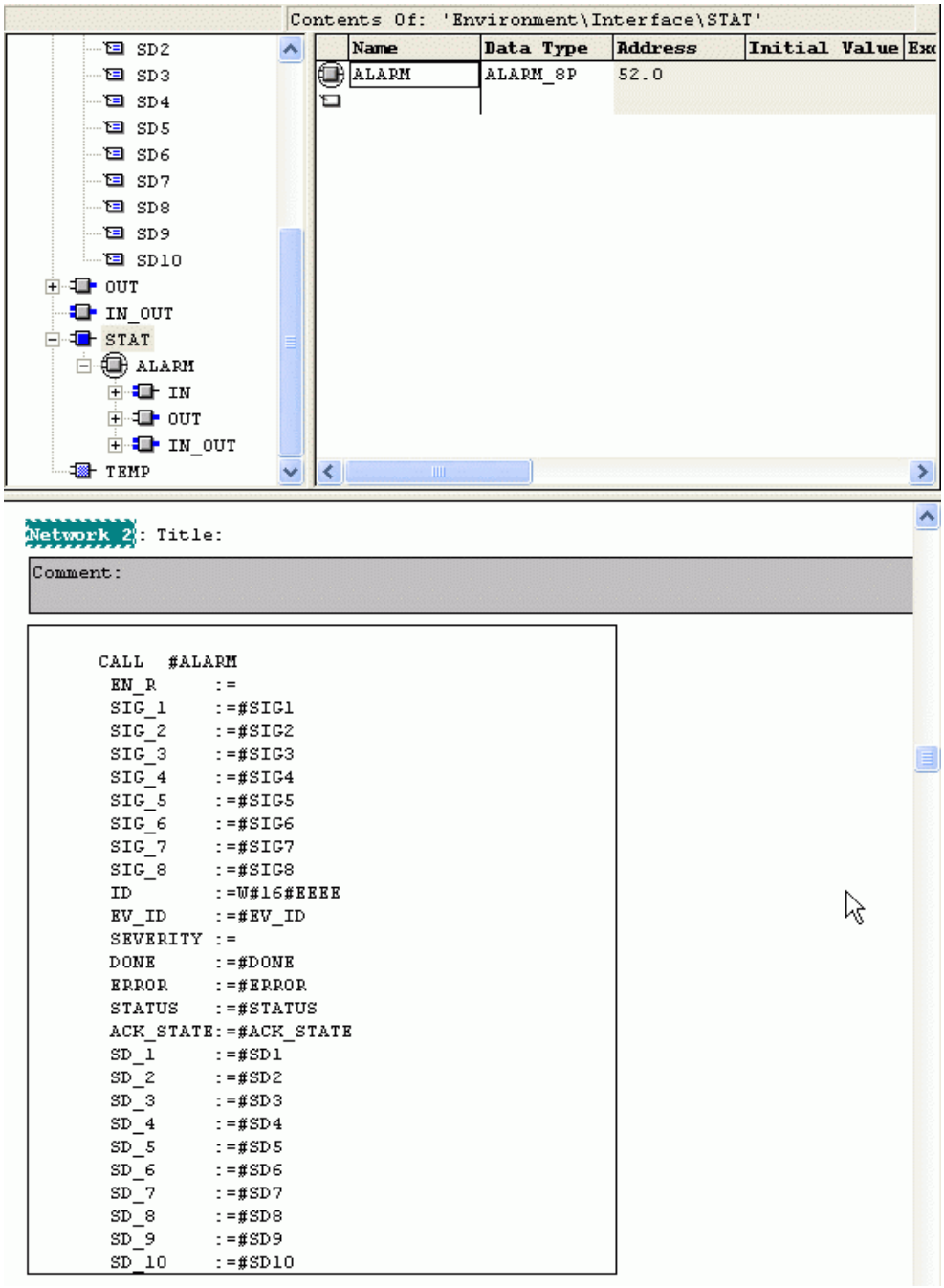
Figure 2-8



7. Select the system message block SFB35 (ALARM_8P) in the program part.

2.2.3 Connect the parameters of the system message block with the corresponding inputs/outputs of the function block

Figure 2-9



Note

The "ID" parameter is permanently set with the value "W#16#EEEE".

The parameters SIG1 to SIG8 trigger the messages.

The EV_ID parameter receives the message number generated by the system.

You can configure message-associated values with the parameters SD1 to SD8.

The parameters DONE, ERROR, STATUS and ACK_STATE provide information on operating, error and alarm statuses.

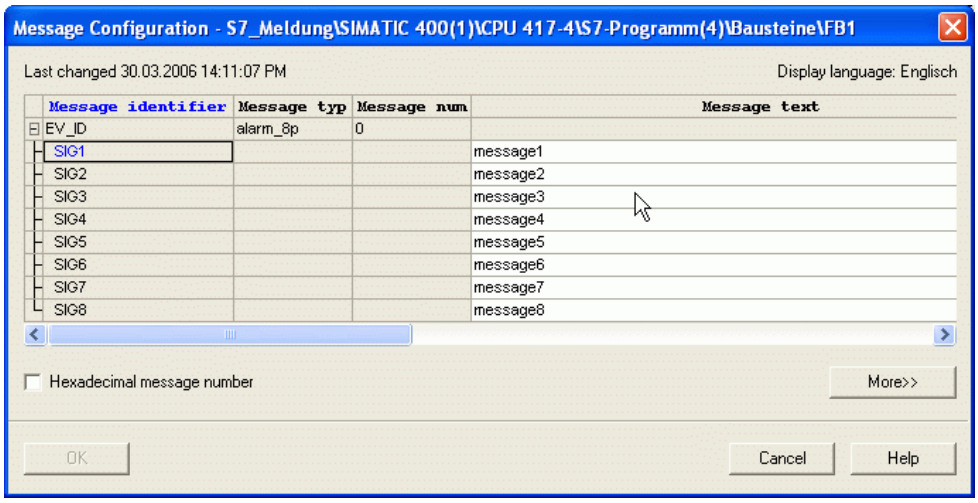
Repeat this procedure to create up to 7 more messages as required.

8. Save the function block FB1 and close the editor.

2.2.4 Configure standard messages

1. Select function block "FB1" in the SIMATIC Manager.
2. In the pop-up menu you call the command "Special Object Properties > Messages...". The Message Configuration dialog opens.

Figure 2-10



3. Specify the message texts for the messages. In this menu you can parameterize more message properties (message class, info and additional texts, acknowledge group, acknowledge behavior, ...).

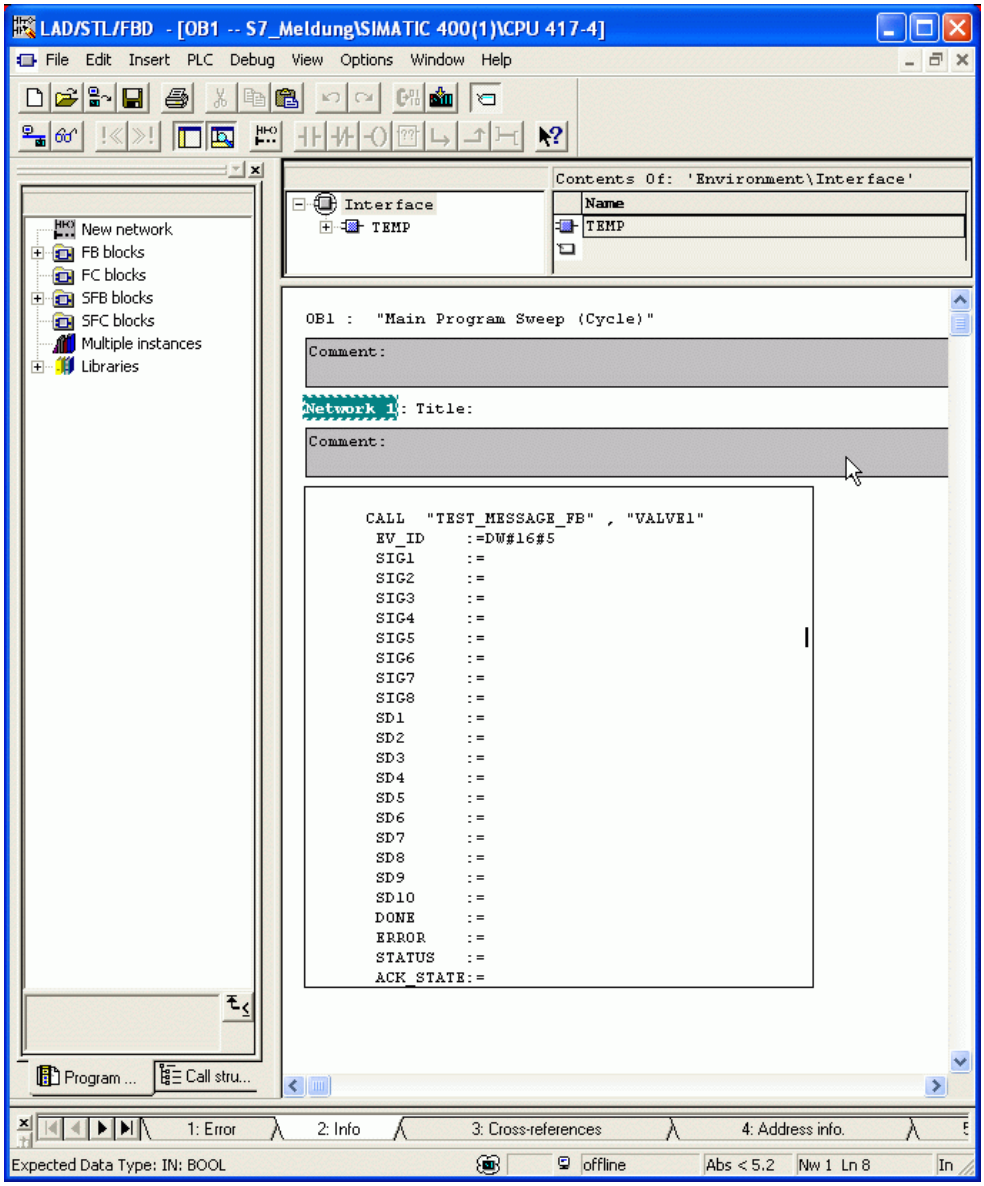
Note

It is also possible to configure the message texts in multiple languages. The display language currently selected is shown in the "Message Configuration" dialog. You must configure the message texts for all those languages that will be used later for WinCC Runtime. For this you change the standard language in the SIMATIC Manager with the menu command "Options > Language for Display Devices" and repeat message configuration for each language separately.

2.2.5 Call message-compatible block in the program

4. Call function block FB1 in your program.
5. For this you open the organization block OB1 and enter the following code:

Figure 2-11



WARNING **The IDs for the messages are generated automatically by STEP 7. You must not change these IDs!**

6. Save the organization block OB1 and close the editor.

2.2.6 Configure block-related messages

After incorporating the message-compatible block you can change the message texts, for example, to display the measuring point name in the message. There are various options for displaying the measuring point name in the message:

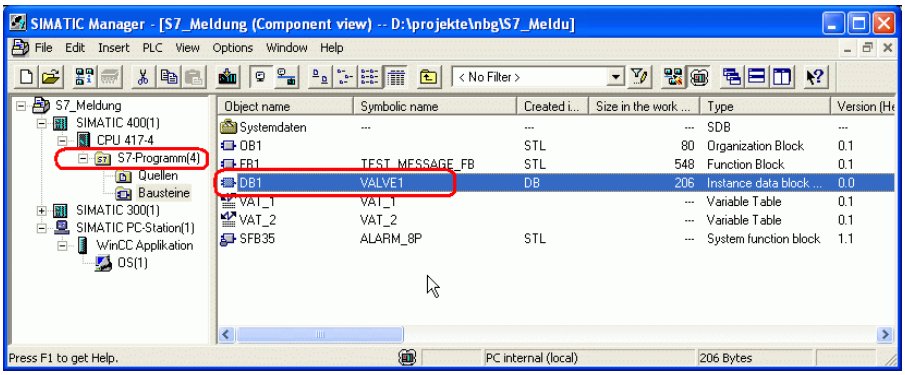
Using the symbolic name of the instance data block

1. Assign a practical name after the instance data block, e.g. the name of the measuring point.
2. Assign a practical name for the S7 program, e.g. the name of the system or subsystem. The "Additional text 1" is not used for message configuration.

After "Compile OS" the User text block1 of the message receives the name of the subsystem followed by the name of the measuring point.

If you have used the OS project editor to install the WinCC project, the User text block1 is displayed as "Origin" in the message window.

Figure 2-12

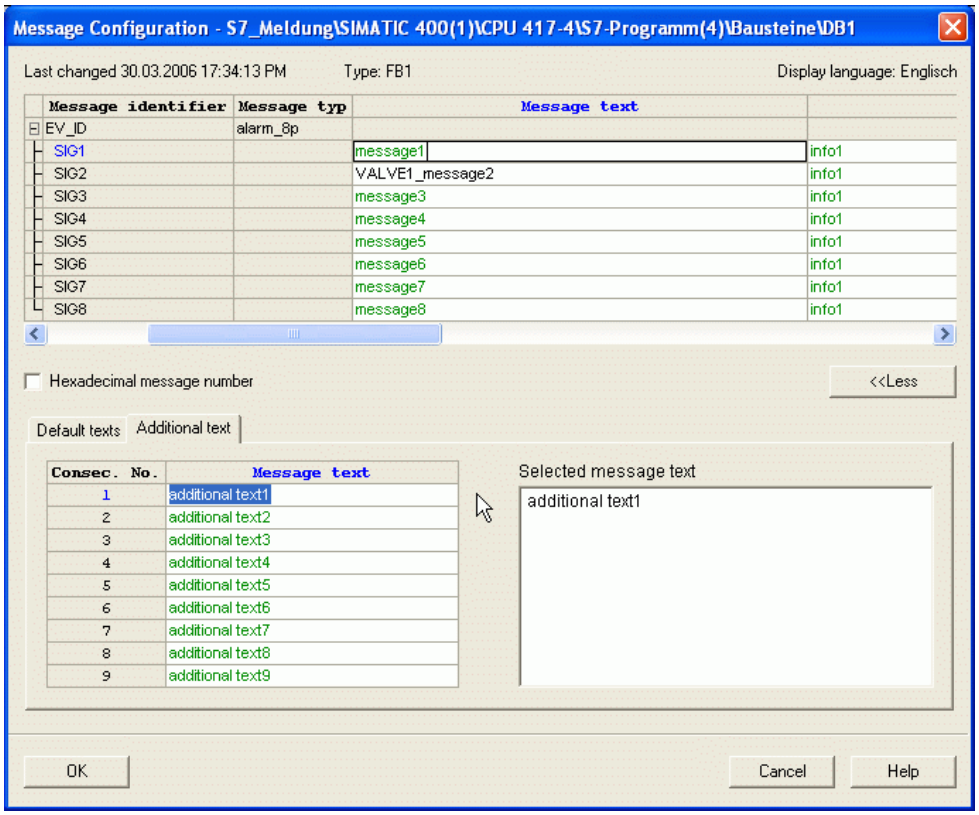


Using additional texts

3. For each instance data block you call the Message Configuration dialog via "Special Object Properties > Messages...".
4. For "Additional text1" you enter the required text for each message, e.g. subsystem and measuring point, for all the relevant languages.

After compiling the OS the User text block1 of the message then contains the Additional text1. This is displayed in the "Origin" column when you use the OS project editor.

Figure 2-13

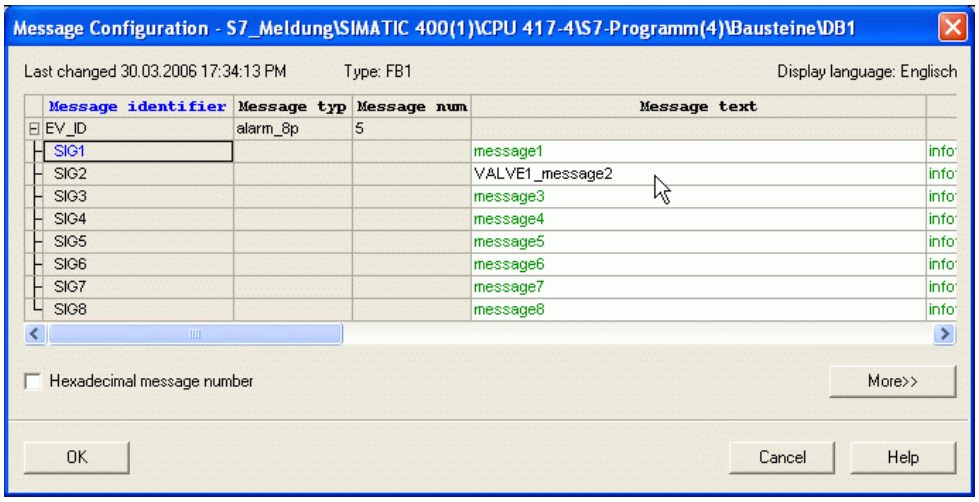


Extending the message text

You can also extend the actual message text by adding the subsystem and measuring point names.

1. For each instance data block you call the Message Configuration dialog via "Special Object Properties > Messages...". The Message Configuration dialog opens.
2. Change the message text accordingly for each relevant language.

Figure 2-14



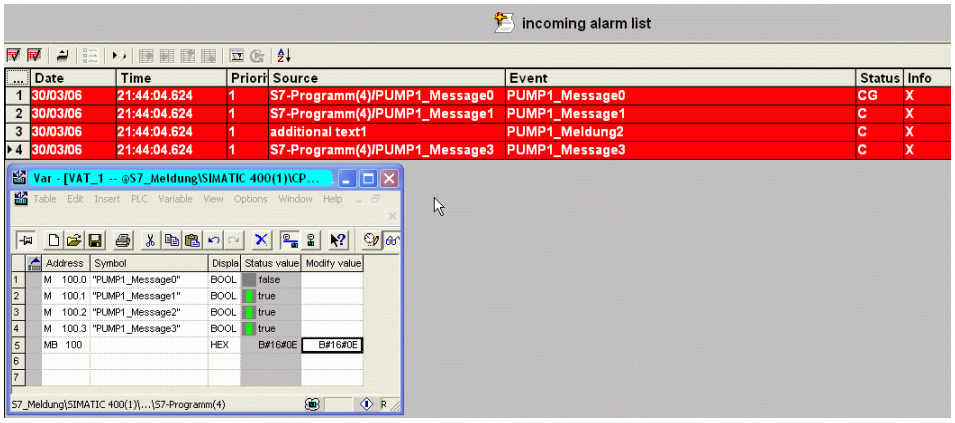
2.2.7 Download PLC, Compile OS and Download OS

Perform the steps (Download PLC, Compile OS and Download OS) from the instructions for symbol-related messaging.

2.2.8 Test the messages at WinCC Runtime

Start WinCC flexible Runtime. Trigger the messages using the variable table. The messages are displayed in the alarm window of WinCC and can be acknowledged where necessary.

Figure 2-15



This entry has been created with WinCC V6.0 SP4 and STEP 7 V5.3 SP2. The entry was also tested with WinCC V7.0 and STEP 7 V5.4 SP4.

3 History

Table 3-1 History

Version	Date	Amendments
V1.0	27.11.2008	First edition (html)
V1.1	27.11.2008	Supplemented and revised, converted to PDF file