SIEMENS

SIMATIC HMI

WinCC flexible 2008 ProAgent

System Manual

Printout of the Online Help

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indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

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Process diagnostics - an introduction

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1.1 Process diagnostics - an introduction

Note

You can only call ProAgent if this option was selected during installation of WinCC flexible, and if a project which contains a device type supported in ProAgent is available.

You can only ProAgent if you have selected "Custom installation."

In this section, you will learn about the advantages of a process diagnostics and you will see how a fault on the operating unit can be found and eliminated. An overview will demonstrate which steps are necessary for the configuration and where the interfaces are located between STEP 7, WinCC flexible and ProAgent.

Furthermore, this chapter will familiarize you with some important terms that will appear over and over again in connection with process diagnostics.

1.2 What process diagnostics can achieve

System environment

You can configure a highly efficient process diagnostics system when using PLCs of the SIMATIC S7 family. This functionality supports you in quickly identifying and eliminating potential problems. You benefit in terms of increased system availability, shorter downtimes and reduction of costs.
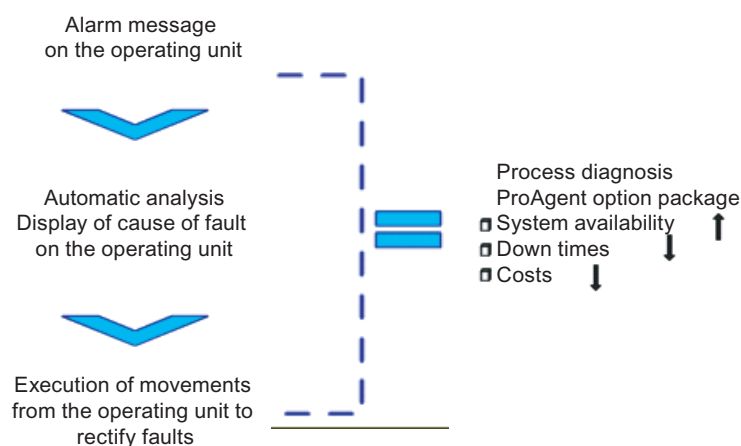
Figure 1-1   Procedures and advantages of process diagnostics

Opening a ProTool project

If you open a ProTool project with ProAgent configuration in WinCC flexible the selected units will be lost. Repeat selection of units. The alarms configured for the units selected in STEP 7 are assigned to the "S7 Alarm" class. If the alarms are to be displayed, activate this alarm class for each alarm display.

Supported HMI devices

The HMI devices listed below can be used for process diagnostics with WinCC flexible ProAgent:

- OP270, TP270, OP277, TP277
- MP270B, MP270B Touch, MP277, MP277 Touch
- MP370, MP370 Touch, MP377, MP377 Touch
- All Panel PCs (except FI25), Standard PC

Avoiding errors

You can take precautions against many errors

The flexibility of process diagnostics allows you to detect errors in the process sequence at an early stage. Tool wear is usually signaled by increased forces, for example. Process diagnostics can be used to monitor these forces and initiate acquisition and replacement of the tool in due time.

Identifying errors

The alarm system draws your attention to errors

The SIMATIC HMI devices let you clearly visualize and comfortably control the plants. A high-performance alarm system draws your attention to faults in the process.

An alarm message appears on the HMI device as an indication.

Troubleshooting

Situation-relevant information assists you in locating the fault

If any problems occur in process runtime, use the HMI device to comfortably track down the units which caused the fault. You analyze the corresponding results of logic operations in the statement list or in ladder diagram directly on the HMI device. It is not necessary to connect a programming device. The fault is found just as quickly.

You can quickly remedy the problem

You can initiate directed movements on the HMI device in order to eliminate the fault.

The HMI device indicates the faulty state of any plant component so that you can initiate corresponding repairs at the same time.

You can therefore recover full operability of your plant within a minimum time.
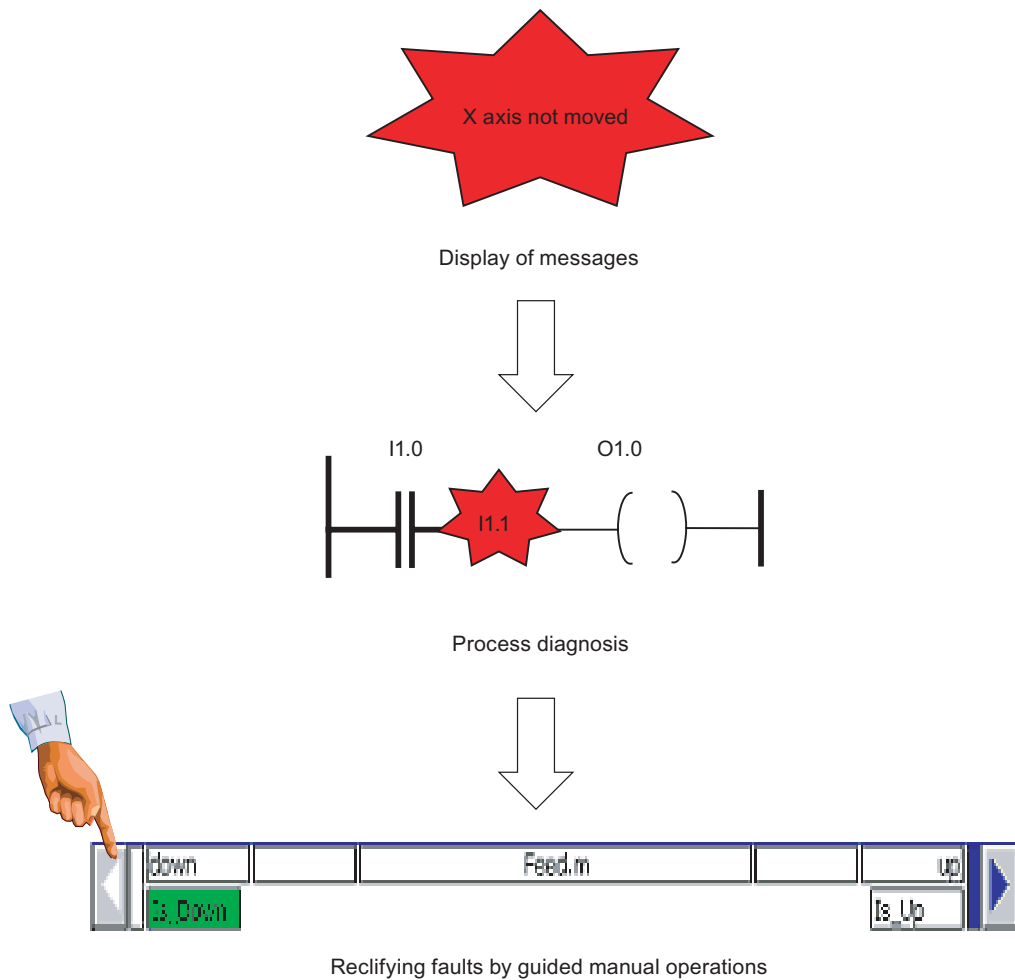
Figure 1-2   Alarm, diagnostics and support of troubleshooting

Reducing costs

Early identification and elimination of faults:

- increases plant availability
- reduces down times
- and last but not least reduces costs

See also

1.3   Important Terms

Unit

A unit in S7-PDIAG is a module, in S7-GRAPH step sequence, in S7-HiGraph a status diagram.

Units are object of the process diagnostis, which are monitored by means of error definitions. There can be several error definitions for one unit. Units can be physical objects in the process (e.g. press, stamp), which can also include movements (e.g. forward/back, up/down).

Units are logical order criteria and structure the process view. You can save data here that is shared by all objects in the subordinate hierarchy. Objects in the subordinate hierarchy can be units or movements.

There can be several actions for one unit.

Action

Actions are part of a unit. They are used in the process to trigger a single actuator.

An action in the sense of the program is:

- in a KOP/FUP/AWL program - a network

- in a S7-GRAPH program - a step

- in a S7-HiGraph program - a status

Transition

A transition describes a step-enabling condition from one step to the next within a step sequence.

Transitions only exist with S7-GRAPH and S7-HiGraph.

Motion

Movements in S7-PDIAG and S7-HiGraph are defined by the UDT "Movement" being used in a module.

Each movement can be executed in two directions, e.g. in/out, open/close, up/down, forward/backwards. With ProAgent, up to 16 target positions of a movement can be displayed.

See also

How a process diagnostic is configured (Page 13)

1.4 How a process diagnostic is executed

Diagnostics screens

Configured diagnostic screens are included (in a standard project) for the process diagnosis. Those screens are linked to one another by keys. You can either use Copy&Paste to insert the included diagnostic screens into your project or you can use the included ActiveX controls and configure your own diagnostic screens.

For the operator on the operating unit, process diagnostics is simple in view of these diagnostic screens:

When a fault occurs, an alarm message appears on the Message Screen or in the message window on the operating unit.

By identifying this alarm message by an asterisk (*), the operator sees that the malfunction is capable of being diagnosed - in other words, it indicates that he can trace the cause of the fault on the operating unit.

At the press of a button, the operator can switch either to an Overview Screen, a Motion View or a Detail View.

- On the "Overview Screen", all the units of the system are displayed together with their subunits. This shows the operator at a glance the current operating mode and condition of each individual unit.

- The "Motion View" provides quick assistance with rectifying faults. You can see at a glance which movements are blocked and those which can still be executed. It can be used to initiate movements by individual units by means of keys.

- The "Detail View" shows the results of the fault analysis automatically instigated from the operating unit. To do this, a simple signal list, a detailed statement list (STL) or a ladder diagram (LAD) is shown in the display with the corresponding section of the STEP 7 program code. At the same time, the status bits of the operands and all the logic operation results can be displayed. Signals that have caused a fault are highlighted. You can quickly trace the cause of an error in this manner.

- The "Step View" can be used to set or reset individual steps in the selected S7-GRAPH sequence of steps.

Message Screen Selection Acknowledgment	Overview Screen Units Status of units Operating modes
Movement Screen Possible movements Execution of movements using keys	Detail Screen Result of fault analysis Status and result of logical operations
Step Sequence Screen Operation of S7 GRAPH step chains	
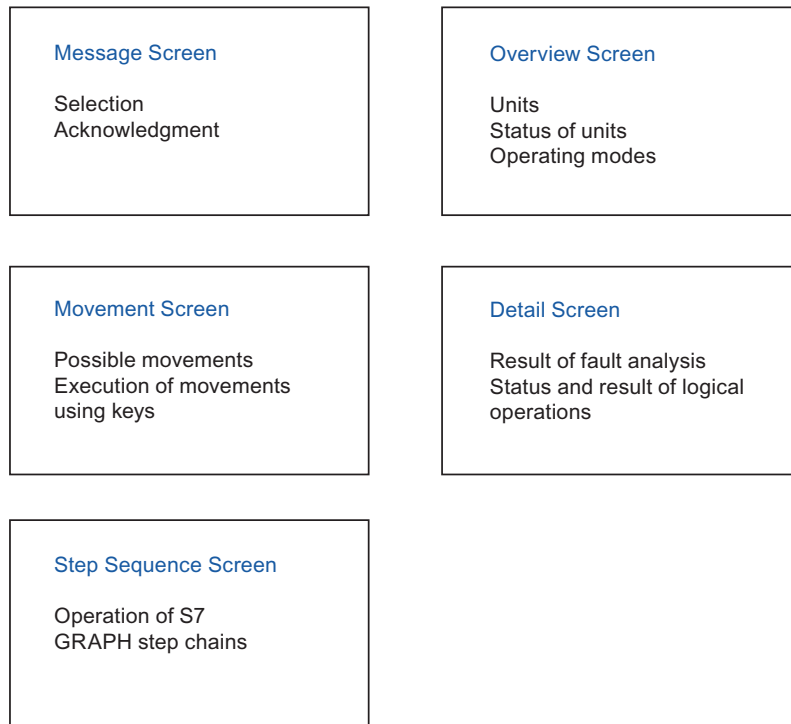
Figure 1-3   The different diagnostic screens

Standardization

The user interface on the operating unit is standardized so that operation follows a uniform pattern for all systems and components.

A detailed description of the individual diagnostic screens is given under the topic "Display on the operating unit".

See also

How a process diagnostic is configured (Page 13)

What process diagnostics can achieve (Page 7)

Display on the operating unit (Page 17)

1.5 How a process diagnostic is configured

System concept

ProAgent is a universal system concept and designed for optimum interaction between STEP7, STEP7 option packages and the operating unit configuration program, WinCC flexible.

Configuring the process diagnostics is quick and simple to perform. It makes no difference whether you integrate process diagnostics into a new project to be created or into an existing project.

Subtasks

Just as when configuring an system, there are two main subtasks involved in implementing a process diagnostics:

1. Programming the PLC

2. Configuring the operating unit

ProAgent, like WinCC flexible, is only used for the second step, i.e. configuring the operating units.
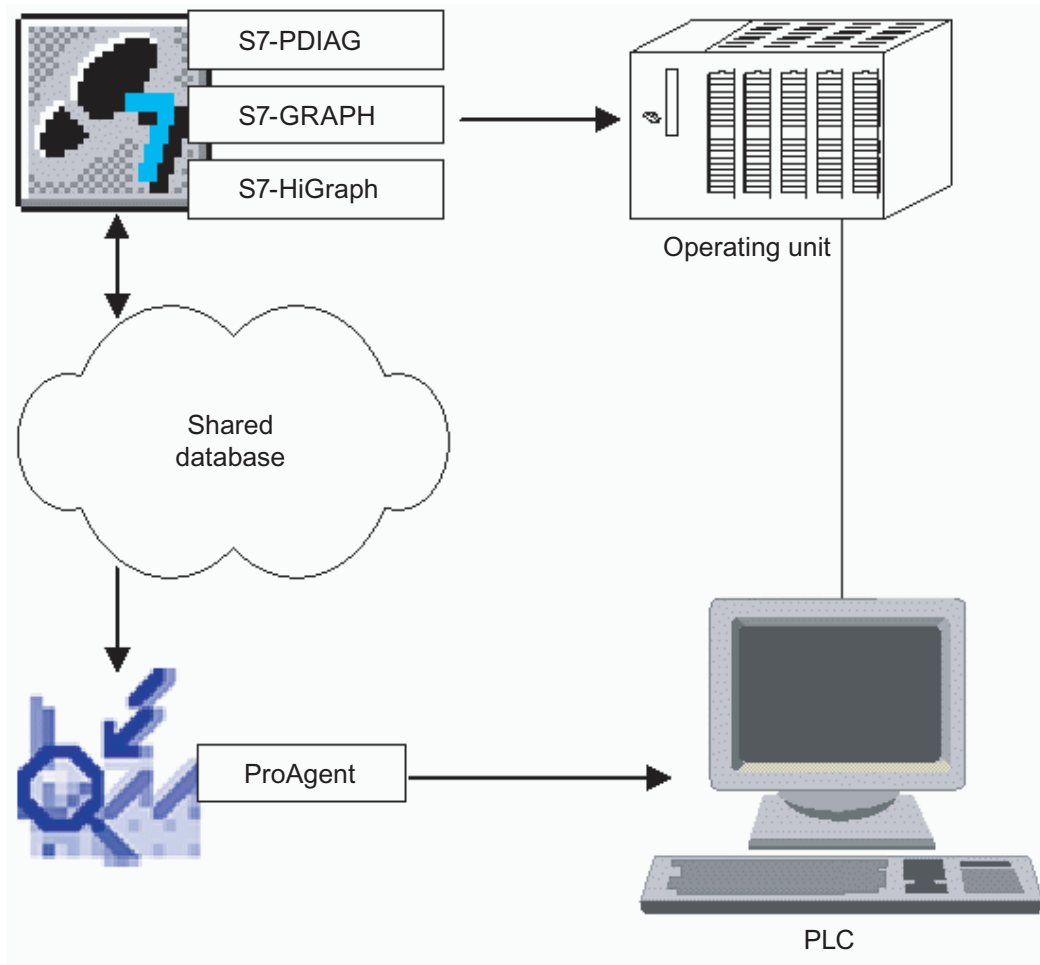
Figure 1-4   Configuring process diagnostics

Programming the PLC

Depending on the programming language you are using for the PLC, the preparations for the process diagnostics will differ as follows:

- If you are using S7-GRAPH or S7-HiGraph, your programs are automatically capable of diagnostics.

- If you are programming in LAD/CSF/STL, you need the S7-PDIAG option package. S7-PDIAG creates additional modules for monitoring your process for the purposes of fault detection. This is mostly done automatically.

Thanks to the global nature of S7 process diagnostics, you can also work with different programming languages within the same system - entirely as circumstances demand. You can also detect and locate process faults in "mixed" sequential and logic control systems.

Common database as interface

When translating the PLC program, the STEP 7 option packages store all the data required for the process diagnostics in a shared database.

WinCC flexible then accesses that database when the operating unit is configured during the next stage.

Configuring the operating unit

Once the STEP 7 program has been created, the process diagnostics can be configured for the operating unit. It is only at this stage that the WinCC flexible option package ProAgent comes into play.

It goes without saying that you do not need to repeat any of the entries already made in STEP 7. All relevant information has been stored in the shared database that WinCC flexible now accesses.

This is what makes the process of configuration in WinCC flexible so quick and easy to complete. All you have to do is

Incorporating diagnosis

Selecting the PLC

Selecting units

Compiling and downloading
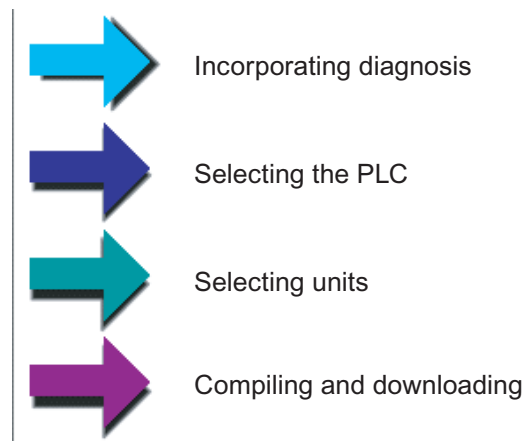
Figure 1-5   Configuring the operating unit for process diagnostics

The first step involves adopting the standard diagnostic screens supplied with ProAgent.

The screens are now fully ready. If, in certain situations, you should nevertheless wish to modify any of the screens to suit your own particular requirements, that presents no problem.

You then select the PLC to which the operating unit is connected.

Next, you select the units of your S7 PLC for which you wish to set up a process diagnostics. This selection is quite simple: WinCC flexible compiles a list from the shared database and all you need to do is click the relevant units.

Finally, you simply compile and transfer your project as usual.

See also

1.6   Before You Start

Requirements

ProAgent is integrated into WinCC flexible and into the rest of the S7 environment and therefore are only a part during the creation of a process diagnostics. With ProAgent as well as with WinCC flexible, the operating unit is exclusively configured, not the PLC.

In order to configure a process diagnostics, certain prerequisites must be met: These can be summarized as follows:

- WinCC flexible must be installed integrated in STEP 7.

- ProAgent must be installed.

- The programming of the PLC must have been previously executed. For this, you can insert KOP/FUP/AWL and S7-PDIAG or S7-GRAPH or S7-HiGraph. These packages can also be used parallelly for the same PLC.

- If this PLC was programmed with KOP/FUP/AWL, additional modules S7-PDIAG for error recognition must have been created for error detection. Error recognition must have been activated.

- The PLC program must have been translated.

See also

How a process diagnostic is configured (Page 13)

Display on the operating unit

2

2.1 Display on the operating unit

Introduction

When configuring the process diagnostics, you can use the diagnostic screens included with the standard project for ProAgent. The contents of the screens can be adapted dynamically to the technological units of the installation.

Standardization

The entire user interface has been standardized, so that all installations and sections of installations are controlled along uniform lines.

Diagnostic screens

The following diagnostic screens are integrated in the included standard project for ProAgent:

- The Diagnostic Start Screen, as the point of entry and distribution for the diagnostic functions.
- The Message Screen, in which the diagnosable messages can be selected and processed.
- The Overview Screen, in which the operator can see at a glance which operating mode and state the individual units are in.
- The Motion View for quick rectification of an error.
- The Step View, in which you can run individual steps manually, reinitialize sequences of steps and adjust these to match the program.
- The Detail View, which shows the result of the error analysis which is performed automatically by ProAgent.

See also

What are the individual diagnostic screens used for? (Page 19)

How to activate diagnostics (Page 18)

How the diagnostic screens are linked to one another (Page 25)

Scope and function of the global key set (Page 27)

Structure of the diagnostic screens (Page 26)

2.2 How to activate diagnostics
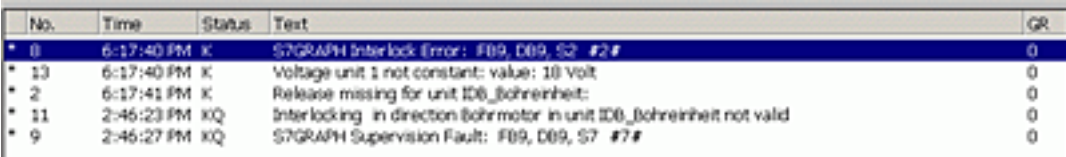
Diagnosable messages

WinCC flexible showed you the possibility to work with message lines and message views: Depending on the configuration, fault messages are displayed in a message line or in a message view.

The message line and messages view are still used - even if process diagnostics were configured using WinCC flexible and ProAgent. With the proper configuration of the message view, diagnosable messages are now, however, identified by an asterisk * preceding the message number.

Activate the "Diagnosable" column in properties of the alarm view.

You can only carry out a diagnostics for that type of message.

	No.	Time	Status	Text		GR
*	8	6:17:40 PM	K	S7GRAPH Interlock Error: F89, D89, S2 #2#		0
*	13	6:17:40 PM	K	Voltage unit 1 not constant: value: 18 Volt		0
*	2	6:17:41 PM	K	Release missing for unit ID8_Bohreinheit:		0
*	11	2:46:23 PM	KQ	Interlocking in direction Bohrmotor in unit ID8_Bohreinheit not valid		0
*	9	2:46:27 PM	KQ	S7GRAPH Supervision Fault: F89, D89, S7 #7#		0

Figure 2-1   Structure of an alarm message

Diagnostics Start Screen

The way in which you start the diagnostics depends on the project concerned. In the simplest case, there is a key that is used to activate the Diagnostic Start Screen. From there you can then move to other diagnostic screens as required.

Other routes

Your project may also provide specific keys for moving directly to individual diagnostic screens.

You then start the diagnostics from those screens, bypassing the Diagnostic Start Screen.

Message acknowledgment

ALARM-S messages requiring acknowledgment can be acknowledged in the message view with "ACK". If the alarm message belongs to an acknowledgment group, when it is acknowledged, all other alarm messages in that group are acknowledged at the same time, as normal.

See also

What are the individual diagnostic screens used for? (Page 19)

Message view (Page 140)

2.3 What are the individual diagnostic screens used for?

Process diagnostics

Certain additional standard diagnostics screens can be integrated in the configuration for process diagnostics. Process diagnostics is handled in these screens.

The diagnostics screens are usually standardized and only differ slightly at the different HMIs. The following diagrams show examples of diagnostics screens on a PC.

Diagnostics Start Screen
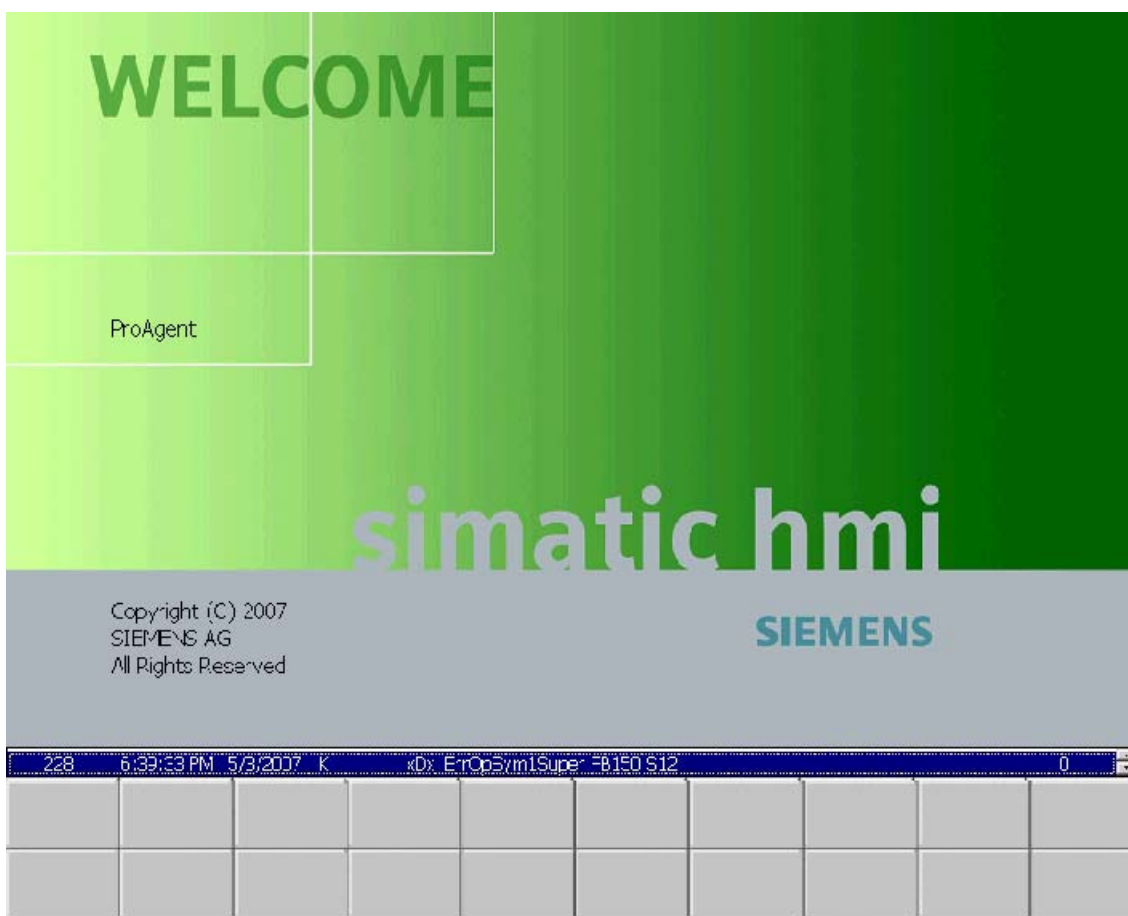
Figure 2-2   Diagnostics start screen (example on PC)

The Diagnostic start screen, as the point of entry and distribution for the diagnostics functions. From here you can branch off to the Message Screen and to the Overview Screen where you can obtain an overview of active faults.

Whether the diagnostics screen is actually used depends on the respective configuration.

Message Screen

Diagnosable alarm message

	Nr.	Ora	Data	Stato	Testo	GR
*	3	23.10.26	10/05/2007	KG	vDv = M 100.0 FB 4 NW 1 --xErrOpAbs1x--ErrOpAbs1--	1
*	9	23.12.39	10/05/2007	K	S7GRAPH Interlock Error: FB114, DB114, S1 E_Step1	0

Global key set
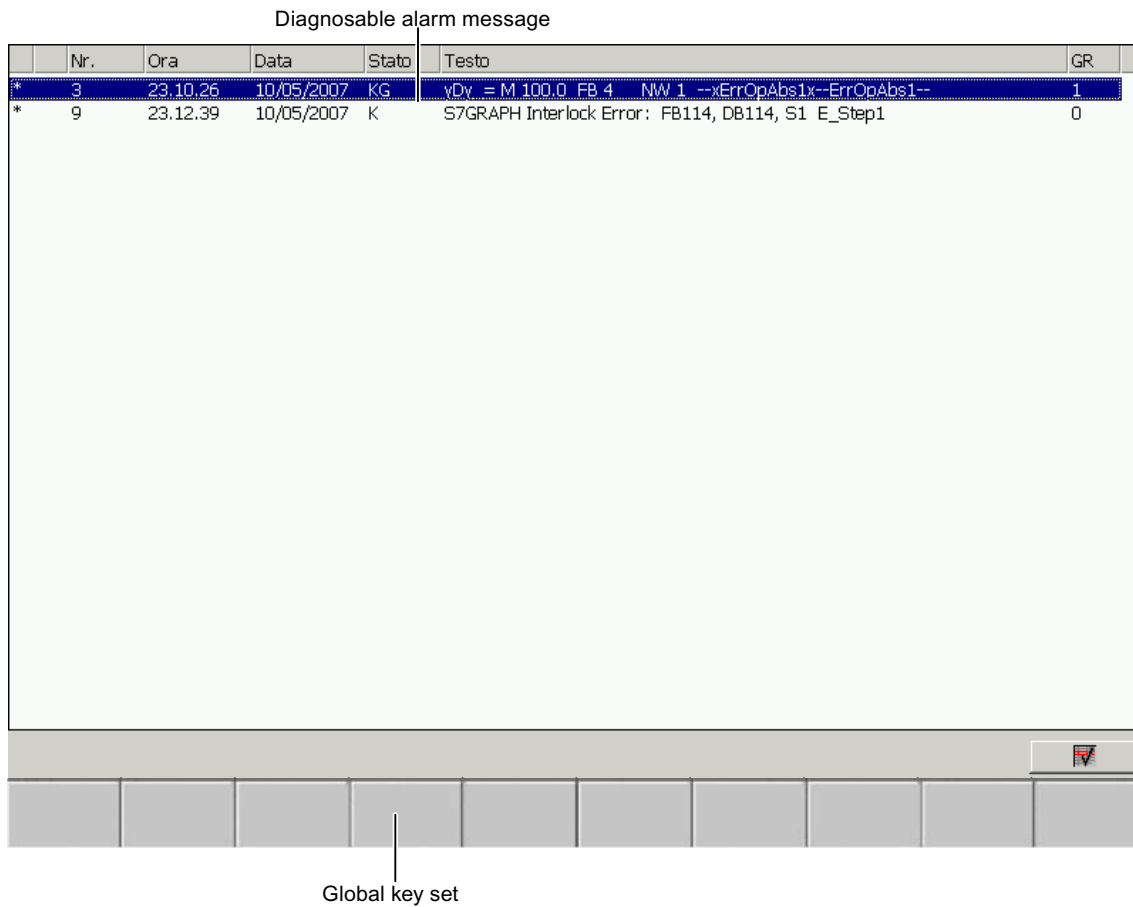
Figure 2-3   Message Screen (example on PC)

Like the diagnostics start screen, the message view serves as a point of entry into the diagnostics. Its structure is similar to the traditional fault message page, but additional keys are offered to select other diagnostics screens.

Messages that can be diagnosed are marked by an asterisk * in front of the message number. You can only carry out a diagnostics for these messages.

You will find a detailed description of the message screen can be found under "Message screen".

Overview Screen

blocked unit
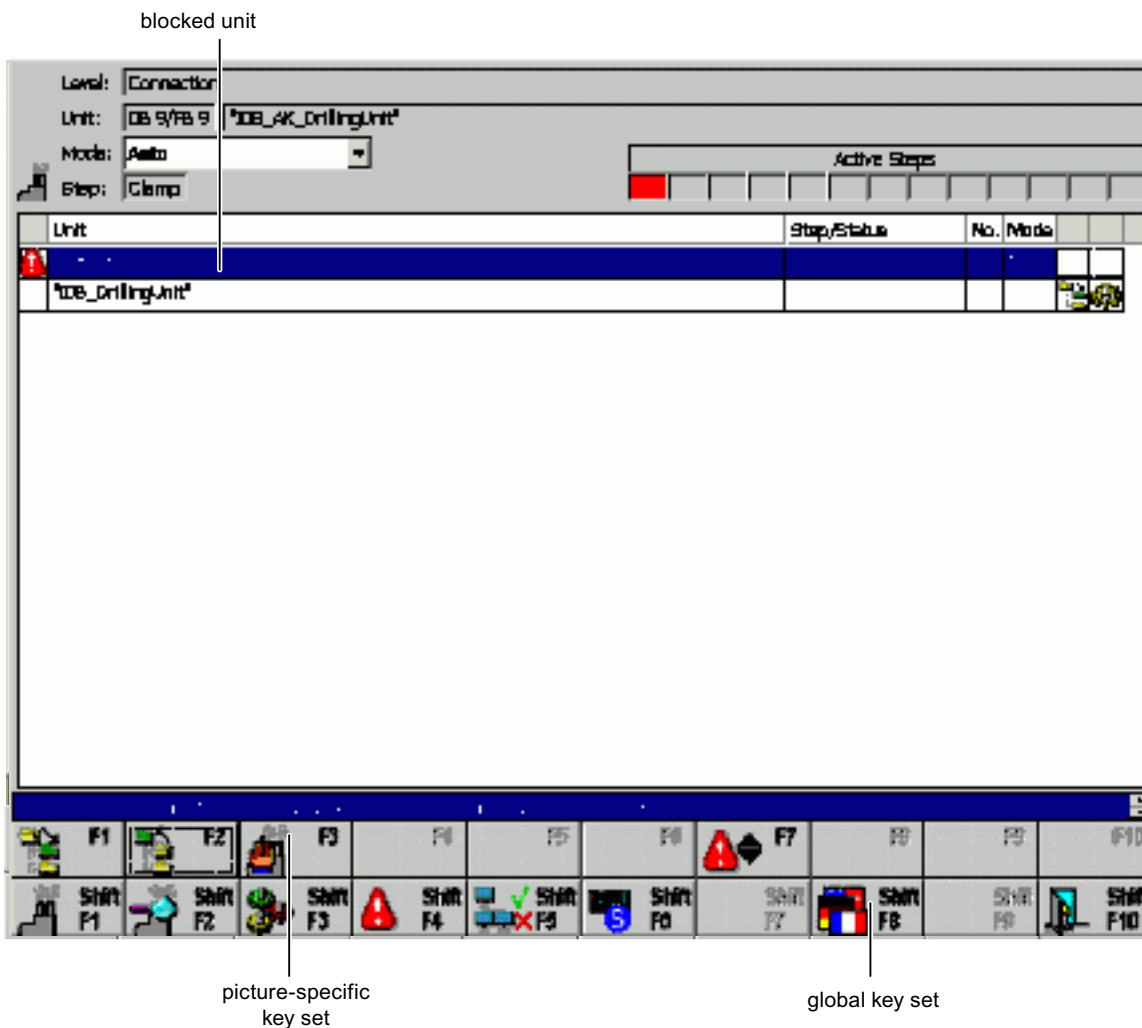
Figure 2-4   Overview Screen (example on PC)

The overview screen shows all available units in your system.

This shows you the current operating mode and condition of each individual unit at a glance. Faulty units are marked accordingly. If a fault was eliminated, this mark will disappear.

If your system has units that were programmed in S7-GRAPH, you can use the step sequence key to set or reset each step of the sequence.

You will find a detailed description of the Overview Screen can be found under "Overview screen".

Detail View

these signals lead to the process error   Result of Logic Operation

Global key set   Message line   Picture-specific
                                                                    key set
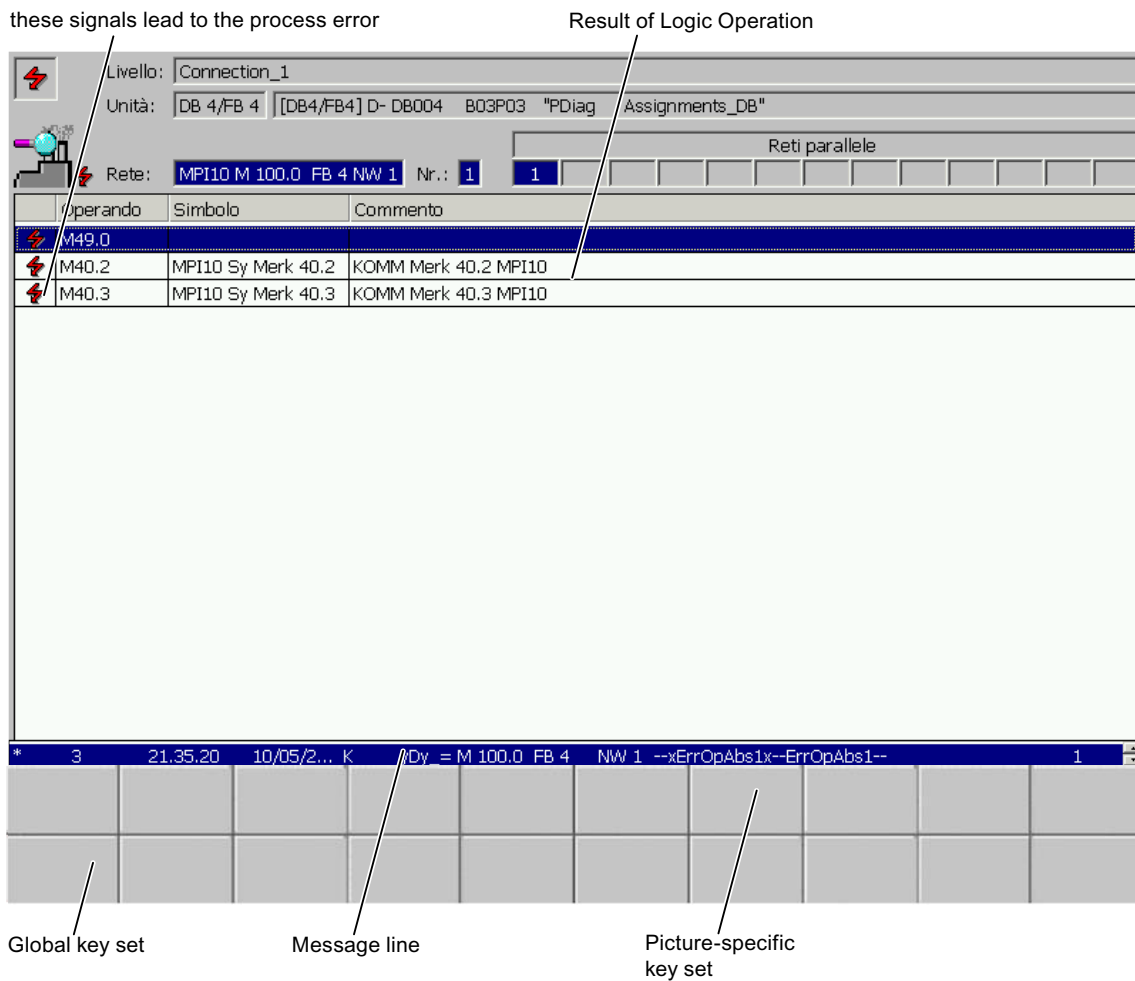
Figure 2-5   Detail View: Signal list variant (example on PC)

The process diagnostics analyzes which signals caused an error message in the control program. The Detail View shows the result of this analysis. This way, you do not only recognize that an error has occurred but will also see its cause right away.

The Detail View will show the corresponding section from the STEP 7 program code as a signal list in STL or LAD. At the same time, the status bits of the addresses and all the results of logic operation can be displayed in the STL and LAD display. Signals that have caused a fault message are highlighted.

A detailed description of the Detail View can be found under "Detail View".

Motion View

movement blocked   movement possible

picture-specific
key set

global key set
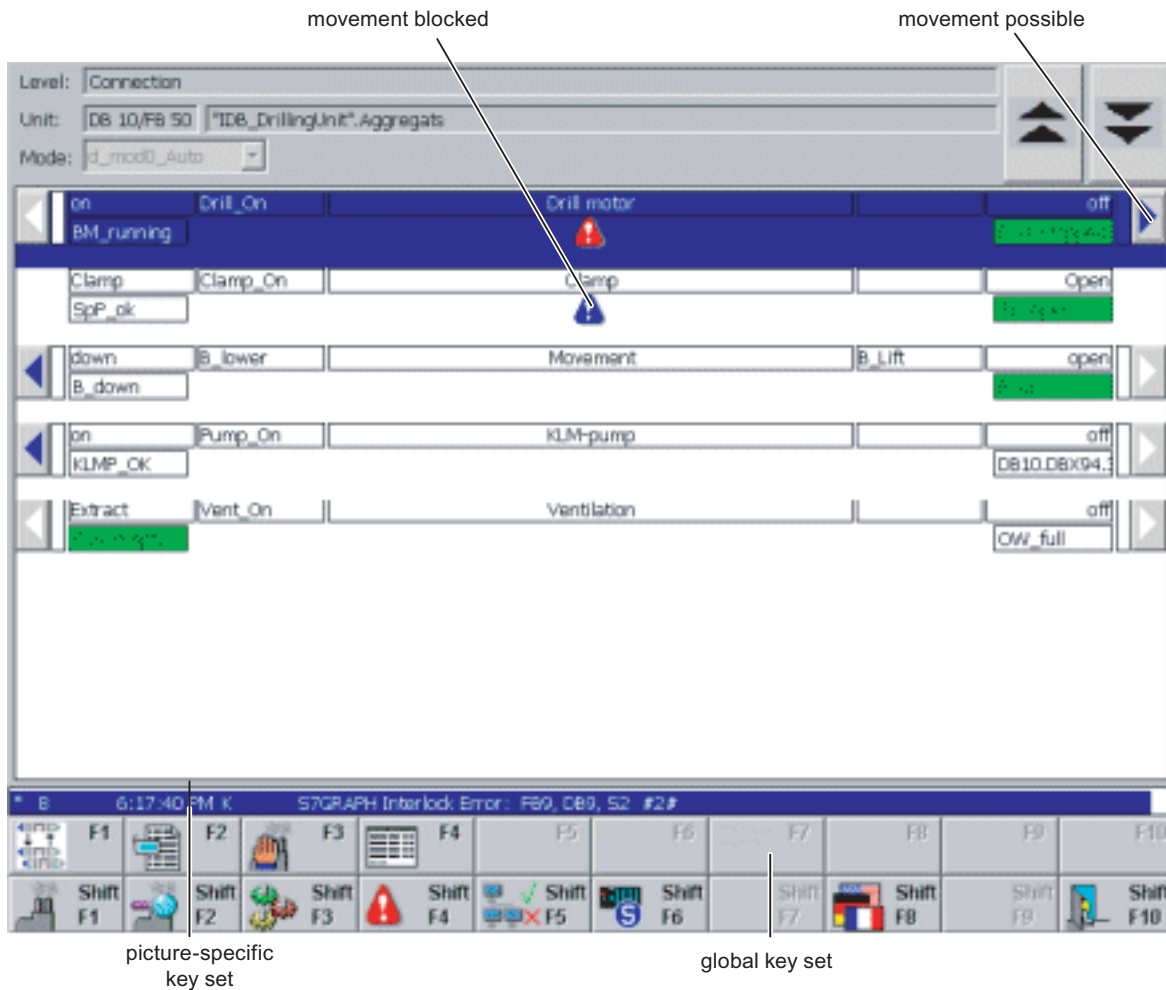
Figure 2-6   Motion View (example on PC)

The Motion View supports you in troubleshooting. It allows you to execute specific movements for individual units by means of the keys along the edge.

By means of the displayed symbols you will see at a glance whether a movement is active and which target position it is in.

A detailed description of the Motion View is available in the "Motion View" topic.

Step View
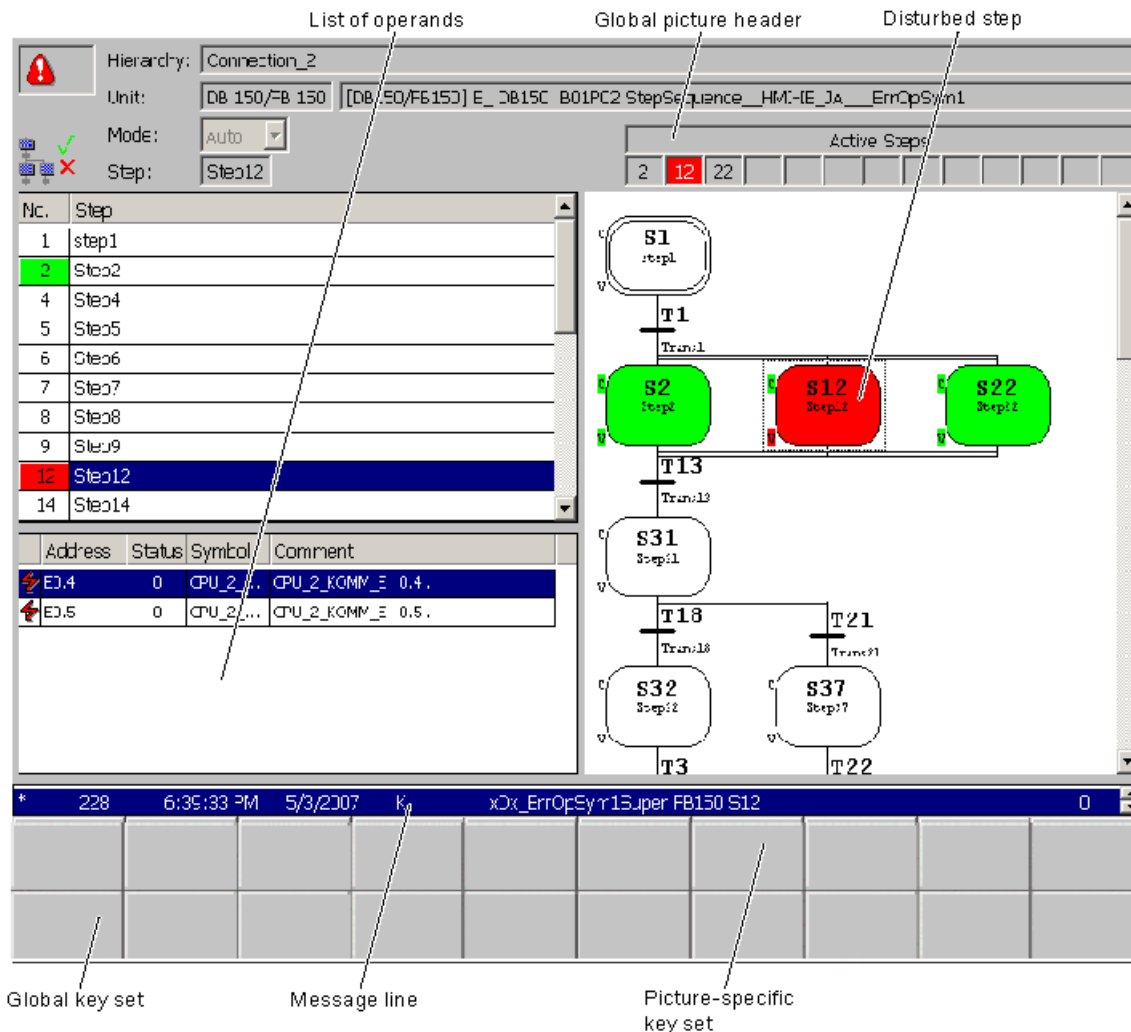
Figure 2-7   Step View (example on PC)

The Step View returns three different representations of the step sequence.

- The step sequence list returns all steps of the sequence. Faulty and active steps are marked in color. You can initialize the step sequence or individual steps in this view.

- Single-step mode only lets you select a single step and view the corresponding addresses. Diagnostics functions can be enabled using the toolbar buttons.

- The step diagram outputs a graphical view of the steps. The operator can select steps and transitions. You can scale the view in the step diagram based on these values: 25%, 50%, 75%, 100%, 150%, 200%, 400%.

A detailed description of the Step View can be found under "Step View".

See also

How the diagnostic screens are linked to one another (Page 25)

2.4   How the diagnostic screens are linked to one another

Five diagnostic screens

The five Diagnostic Screens Message Screen, Overview Screen, Detail View, Step View and Motion View are interconnected via keys from the global key set, enabling you to switch back and forth between individual screens.

One Diagnostic Start Screen

There is also a Diagnostic Start Screen, which often serves as the point of entry into the diagnostics (see "How to activate diagnostics").

See also

What are the individual diagnostic screens used for? (Page 19)

Overview Screen (Page 35)

Step View (Page 89)

Message Screen (Page 28)

Detail View (Page 47)

Motion View (Page 77)

How to activate diagnostics (Page 18)

2.5 Structure of the diagnostic screens

General aspects

All diagnostics screens - except for the start screen - are structured in three parts: one specific part for each diagnostics screen is embedded between a global screen header and a global key set. Above the keys is a message line displaying the oldest alarm message.

ProAgent-Screen

picture-specific
section
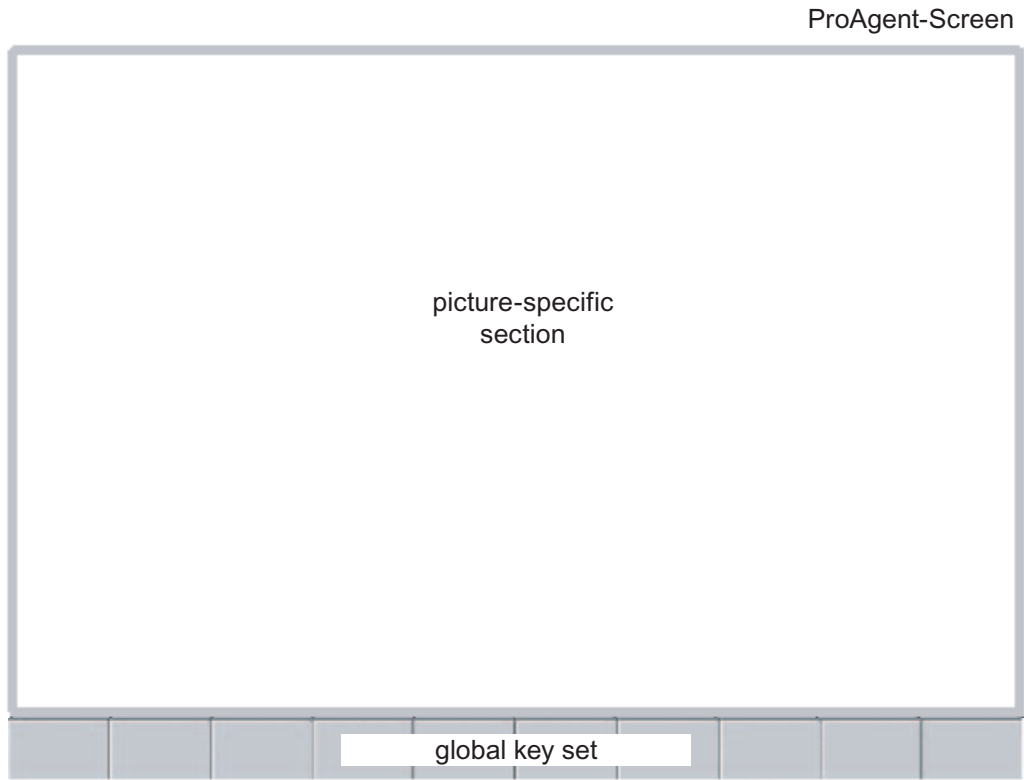
global key set

Figure 2-8   Sections of the diagnostic screens

Clear partitioning of diagnostic screens into one screen-specific and two global sections make sure you can quickly find your bearings when running the different screens.

Global key set

In addition to a number of screen-specific keys, you can also use various global screen keys in all diagnostic screens.

The topic "Scope and function of the global key set" explains in detail which keys are available in each case and the function each one performs.

See also

Scope and function of the global key set (Page 27)

2.6 Scope and function of the global key set

Global key set

In addition to a number of screen-specific keys, you can also use various global screen keys in all diagnostic screens.

Multi Panel 270/277, OP270/277 and TP270/277 only provide a limited number of programmable keys. Some of the functions of the global key set must be executed using other keys on these devices or are not available.

Key or button	Name	Function
	Overview Screen	Use this key to open the Overview Screen.
	Detail View	Use this key to call up the Detail View.
	Motion View	Use this key to open the Motion View.
	Message Screen	Use this key to open the Message Screen.
	Step View	Use this key to open the Step View.
	S7-Manager	Use this button to change directly to SIMATIC Manager and to work with other SIMATIC applications.
	Network entry	This key is used to view a selected message or step sequence directly in the tool in which it was programmed. • Step sequences are visualized in S7-GRAPH. • S7-PDIAG units are displayed in the LAD/FBD/STL Editor. • The program opens the STEP 7 hardware diagnostics when process control or "Report system error" messages are generated.
	Status/Control	Use this key to call up a screen with a "Status/Control Variable" field. This enables you to monitor and control the addresses of the relevant control program in a tag table. Detailed information on Status/Control can be found in the "Runtime Manual".
	Language	Use this key to switch languages where a multilingual project has been compiled.
	Back	Use this key to return to the Diagnostic Start Screen. You can change this functionality by implementing corresponding functions (see "ProAgent functions for selecting diagnostic screens").
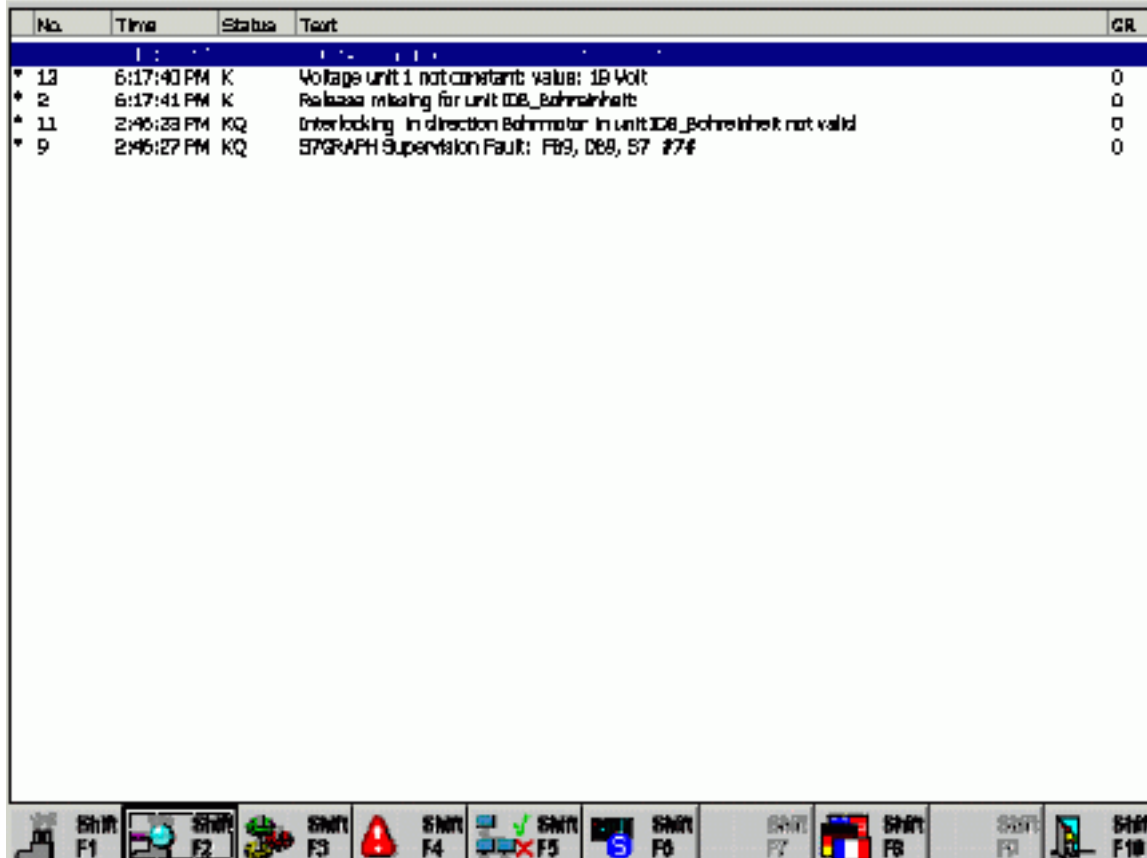
See also

2.7 Message Screen

2.7.1 Message Screen

The purpose of the Message Screen

Figure 2-9   Message Screen (example on PC)

The Message Screen displays all pending process messages. The messages are listed on the screen in chronological order.

The Message Screen frequently serves as the entry point to diagnostics. On it, you can observe whether faults occur and which faults those are and you can then switch to any of the other diagnostic screens as required.

Additional functions compared to the message page

The Message Screen is structured in a very similar way to a normal message page. However, it provides some additional information and functions.

This enables you to see by a glance at an asterisk next to the message number which messages are diagnosable. You can then carry out a process diagnostics for those messages.

You can select a specific message and use keys to call up other context-sensitive diagnostic screens such as:

● Detail View: This screen shows an excerpt from the program code that caused the selected alarm message.

● The Overview Screen: this screen shows an overview of the various units in your system.

See also

2.7.2   What you see on the Message Screen

Familiar layout

Basically, the layout of the Message Screen is the same as the normal message pages you are familiar with from the standard functionality.

Additional functions

Compared with the normal way in which messages are displayed, however, there are a few minor changes.

The important feature is the identification of diagnosable messages by means of an asterisk "*" at the beginning.
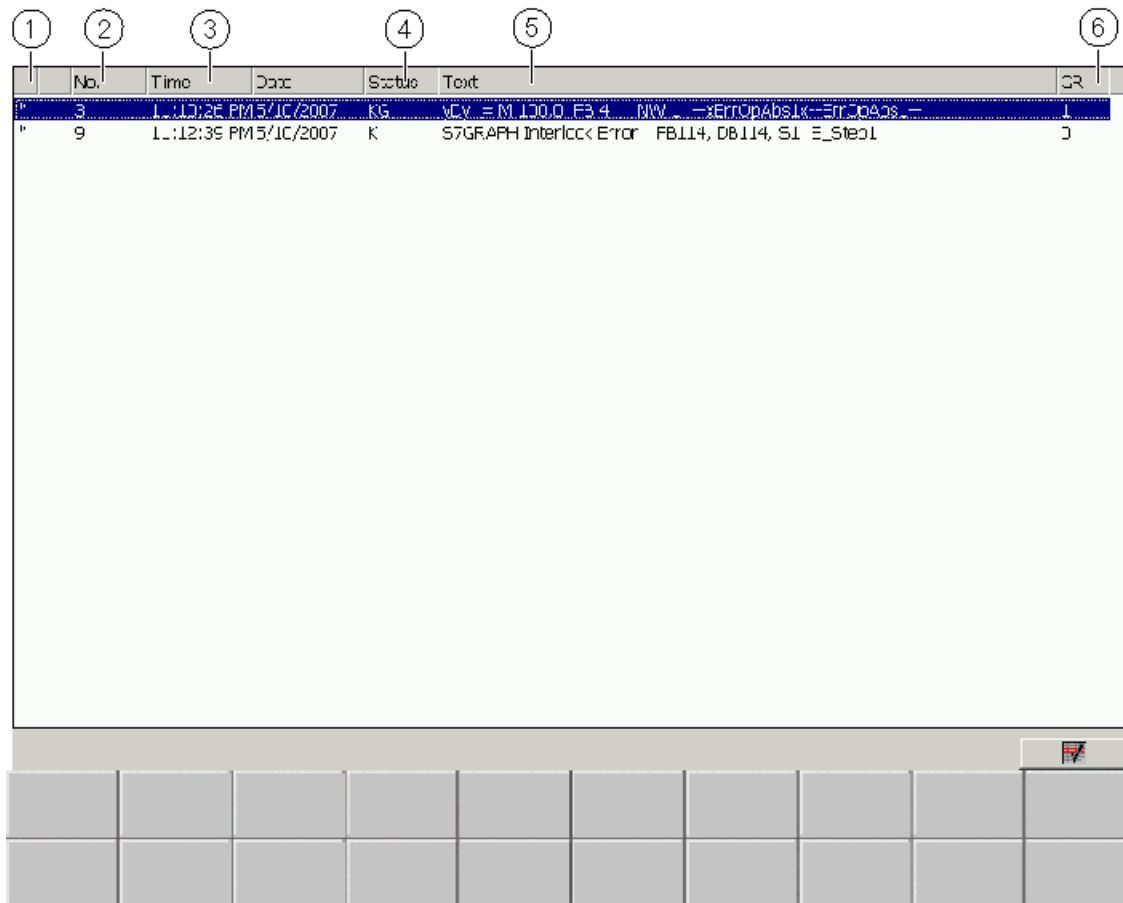
Figure 2-10   Message Screen (example on PC)

(1) An asterisk is displayed here if the message displayed is diagnosable. For this type of message only, you can call up the Overview Screen, the Detail View, the Motion View or the Step View.

(2) The message number is shown here.

(3) Here you can see the time of the arriving event.

(4) The date of the arriving event is displayed here.

(5) Here you can see the message status:

"K": Message Came In

"G": Message Went Out

"Q": Message Acknowledged

(6) Here you can see the message text configured with STEP 7.

Displaying the result of criteria analysis in the message text

The message text can also display the operands that gave rise to the fault. In this way the system operator obtains the most important information about the system fault in the message window itself or in the message line without having to switch to the Diagnostic Screens.

When the faulty operands are displayed in the message text, they are archived together with their last accompanying process value when the message is archived.

For the faulty operands to be displayed and archived, appropriate dummy entries must be inserted in the ALARM_S message text. For more information about this topic see "Displaying the result of criteria analysis in the message text".

See also

Overview Screen (Page 35)

Step View (Page 89)

Detail View (Page 47)

Motion View (Page 77)

How to work with the Message Screen (Page 32)

Keys in the Message Screen (Page 31)

Displaying the results of the criterial analysis in the message text (Page 241)

2.7.3 Keys in the Message Screen

Application

The number of keys/buttons configured in the Message Screen is limited by the number of keys/buttons available on the unit. You can, however, assign other functions to these keys/buttons or to additional buttons.

Keys available in the Message Screen:

Key or button	Name	Function
	Overview Screen	Use this key to open the Overview Screen.
	Detail View	Use this key to call up the Detail View. You must have selected a diagnosable message first.
	Motion View	Use this key to open the Motion View. You must have selected a diagnosable message first.
	Step View	Use this key to open the Step View. You must have selected a step sequence.
	S7-Manager	Use this button to change directly to SIMATIC Manager and to work with other SIMATIC applications.
	Network entry	This key is used to view a selected message directly in the tool in which it was programmed. The program opens the STEP 7 hardware diagnostics when process control or "Report system error" messages are generated.
	Status/Control	Use this key to call up a screen with a "Status/control" field. This enables you to monitor and control the addresses of the relevant control program.

Key or button	Name	Function
	Language	Use this key to switch languages where a multilingual project has been compiled.
	Back	Use this key to return to the Diagnostic Start Screen. You can change this functionality by implementing corresponding functions (see "ProAgent functions for selecting diagnostic screens").

See also

How to work with the Message Screen (Page 32)

What you see on the Message Screen (Page 29)

Selecting diagnostic screens (Page 153)

2.7.4 How to work with the Message Screen
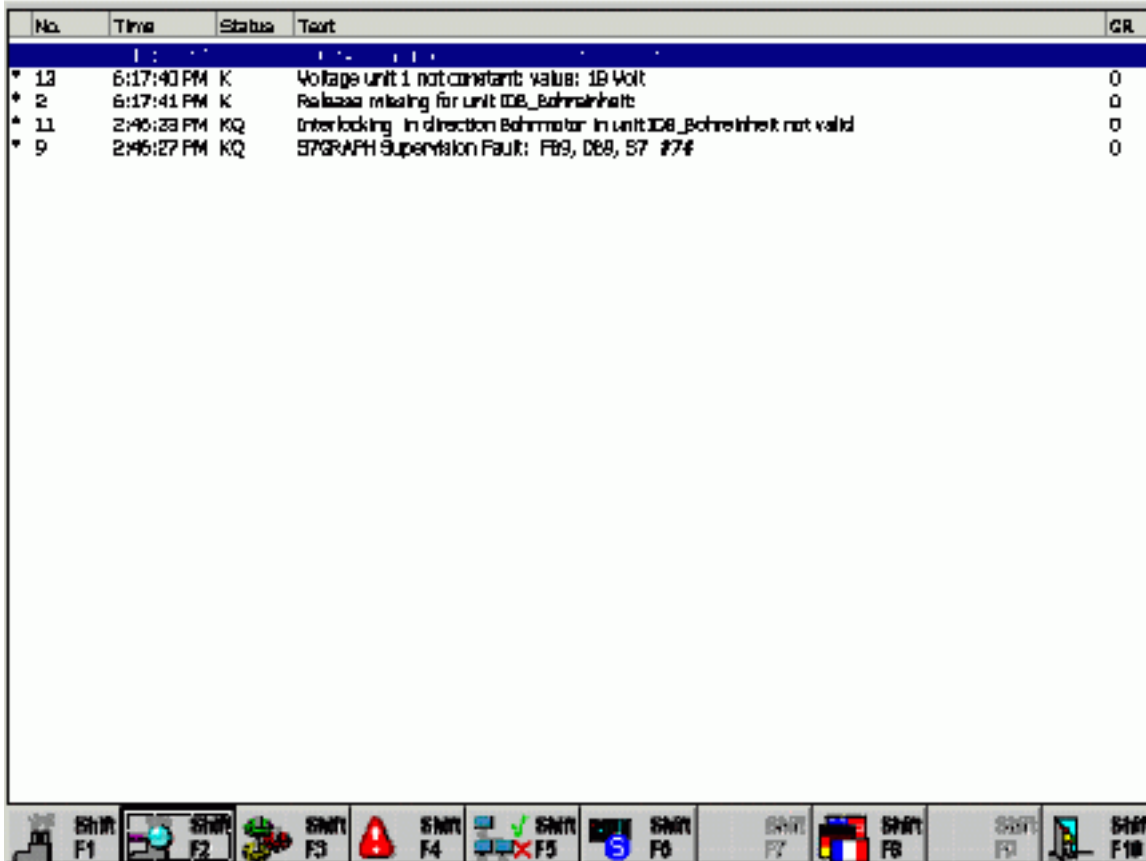
Practical procedure

This section gives a general outline of how to use the Message Screen in practice.

Objectives

You have opened the Message Screen in order to obtain an overview of the pending alarm messages. You wish to carry out a process diagnostics for specific messages.

No.	Time	Status	Text	GR
13	6:17:40 PM	K	Voltage unit 1 not constant: value: 18 Volt	0
2	6:17:41 PM	K	Release missing for unit DB_Bohreinheit	0
11	2:46:23 PM	KQ	Interlocking in direction Bohrmotor in unit DB_Bohreinheit not valid	0
9	2:46:27 PM	KQ	S7GRAPH Supervision Fault: FB9, DB9, S7 #7#	0

Figure 2-11   Message Screen (example on PC)

Selecting a message

Before performing process diagnostics for a specific alarm message, select the message concerned. To do this, click the corresponding message with the mouse or move the selection bar with the arrow keys to the corresponding point.

Before changing to the corresponding diagnostic screen, the `MessageViewEvaluateError` function is called up in order to register the unit, movement and criteria analysis associated with the message for the purpose of process diagnostics.

If a number of messages are displayed in different screen areas and no message has the focus, the message in the screen area with the highest priority is selected. If several message diaplys are shown, the `MessageViewShowErrorDefinition` function selects the message displays in the following order of priority:

1. Message display with focus (dotted rectangle)

2. Alarm message window

3. Message line

4. Alarm display in the template

5. Message display in the basic screen

Switching to the Overview Screen

To obtain an overview of which units of your system are affected by the faults, use this key to switch to the Overview Screen. From there, you can subsequently move on to the Motion View in order to manually execute individual movements for a specific unit.

Switching to the Detail View

Once you have selected the required message, you can press this key to switch to the Detail View. This shows you a list of the signals responsible for triggering the alarm message.

Switching to the Motion View

Once you have selected a message you can use this key to switch directly to the Motion View, i.e. without having to use the "indirect route" via the Overview Screen. The Motion View shows all movements for the units where there are faults and allows you to execute those movements directly as well.

Switching to the Step View

If you have selected a message based on an S7-GRAPH step sequence, you can use the "Sequence" key to switch directly to the Step View. There you can search for specific steps and enable or disable one or more steps in the step sequence.

Exiting the Message Screen

You can switch directly from the Detail View to the other diagnostic screens or also exit diagnostics:

Switches to the Diagnostic Start Screen

See also

> Overview Screen (Page 35)
>
> Step View (Page 89)
>
> Detail View (Page 47)
>
> Motion View (Page 77)
>
> What you see on the Message Screen (Page 29)
>
> Keys in the Message Screen (Page 31)

2.8 Overview Screen

2.8.1 Overview Screen

The purpose of the Overview Screen
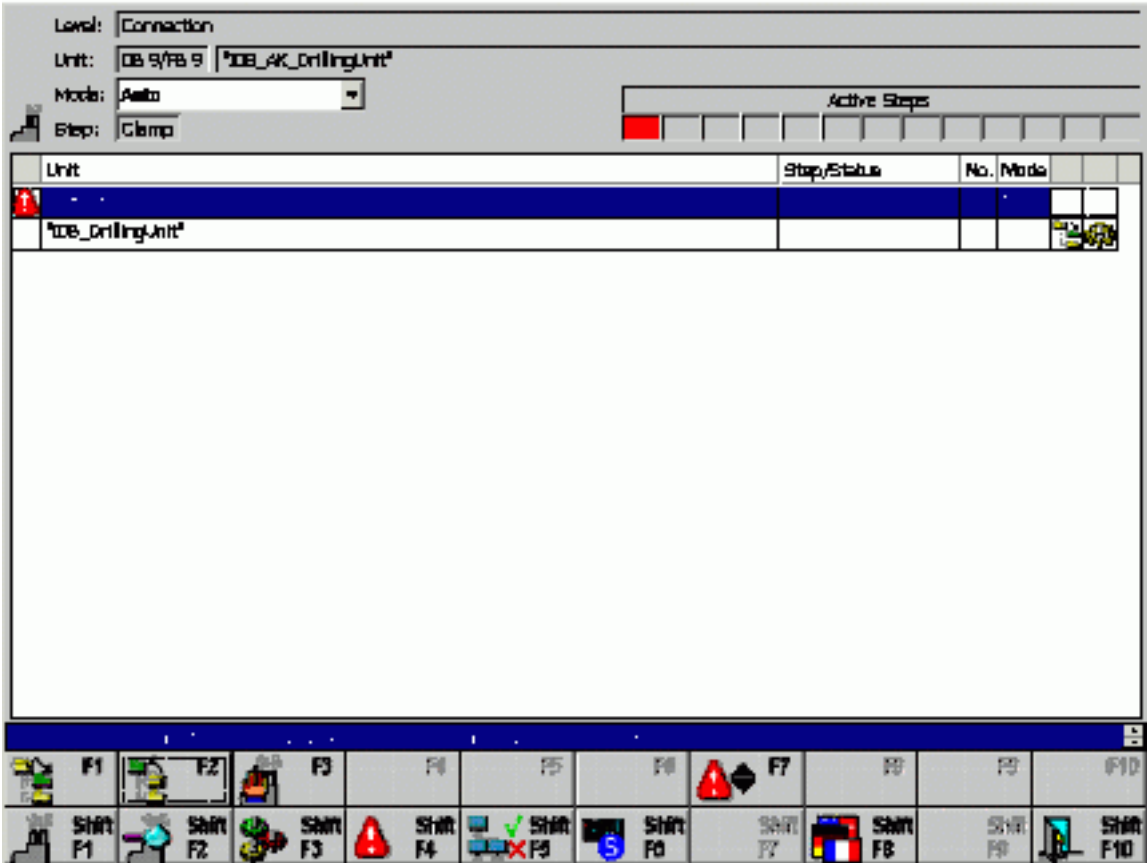
Figure 2-12   Overview Screen (example on PC)

> The Overview Screen shows all the diagnosable units in your system.

It gives you the following information about each unit:

- whether it has a fault

- if programmed accordingly: which operating mode you are in (e.g. manual or automatic mode)

- whether there are subordinate or superior units

- whether a movement exists for it

- in the case of S7-GRAPH sequences, which step in the sequence of steps is currently active

- in the case of S7-HiGraph units, which status is currently active.

If there are faults on more than one unit, you can see on which one the fault first occurred. In that way, you can tell immediately where the actual cause lies and which faults are consequential errors.

Functions

You can select a unit from the list and, if programmed accordingly, set its operating mode. For example, you can switch from Automatic to Manual mode in order to be able to rectify a fault manually.

Once you have selected a unit, you can analyze it in more detail on the Detail View and then switch to the Motion View to execute individual movements manually in order to rectify the fault.

If you have selected a unit that was programmed using S7-GRAPH, you can use the Step View to search for specific steps and to activate or deactivate individual steps or the entire sequence.

See also

Step View (Page 89)

Detail View (Page 47)

Motion View (Page 77)

What you see in the Overview Screen (Page 36)

How to work with the Overview Screen (Page 41)

2.8.2   What you see in the Overview Screen

General layout

Like all the diagnostic screens, the Overview Screen has a standardized layout. There are only minor differences between the various types of operating units.

The illustration below shows an example of the Standard Overview Screen as it appears on a PC.
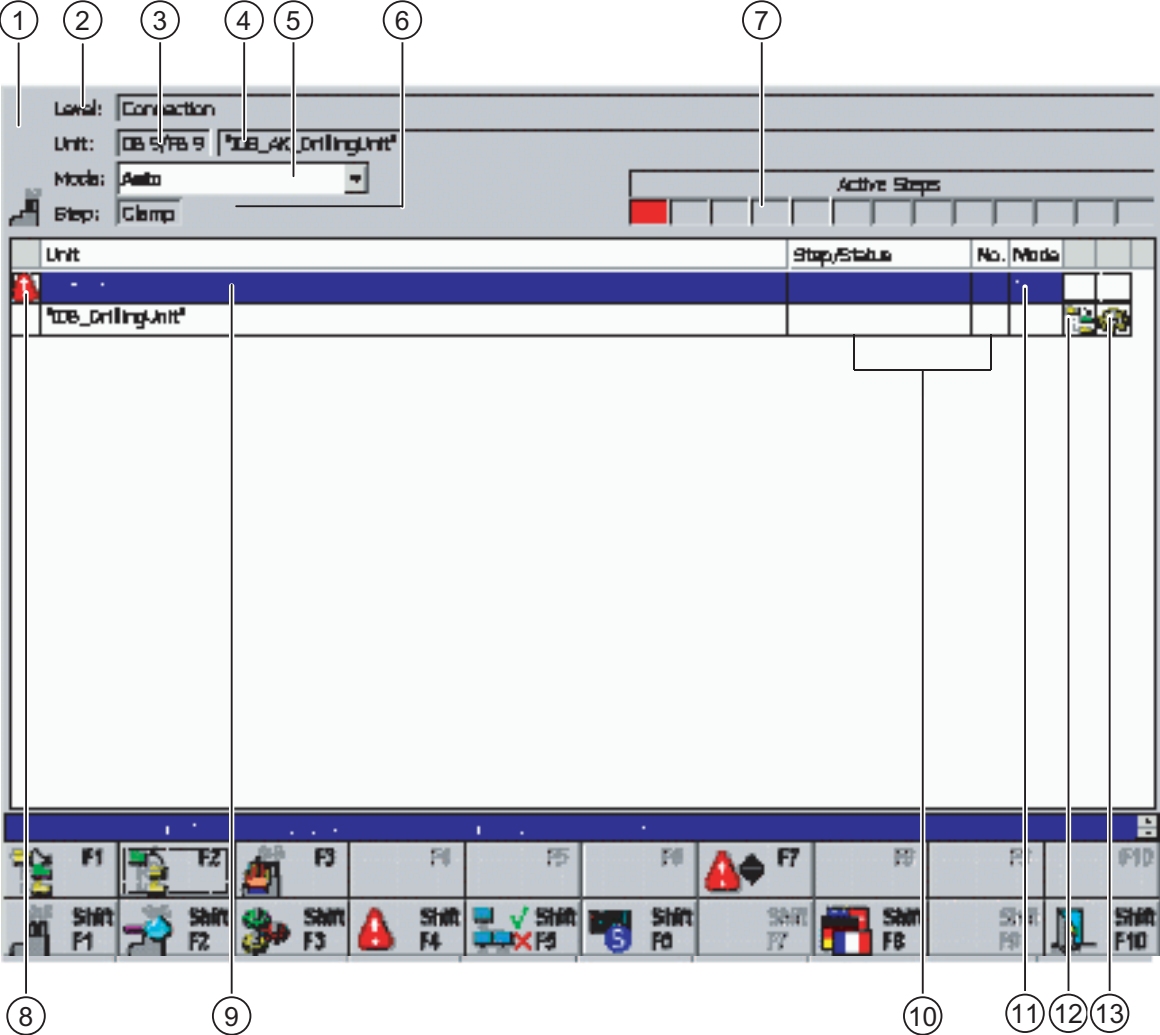
Figure 2-13   Overview Screen (example on PC)

Display mode

The top left field gives you information about the display mode:

The "Warning triangle" icon is displayed here if only the blocked units are displayed. If this icon is not shown then all the units are displayed (see "Changing the display mode").

Information about the selected unit

The top section of the display shows detailed information relating to the unit selected by the cursor.

(2) The "Level" field displays the PLC assigned to the unit and the complete hierarchical path.

(3) The "Unit no." field tells you the block type (FB/FC and DB) and the block number of the selected unit.

(4) The complete name of the unit appears in the "Unit" box. This name depends on the programming of the PLC:

● If the unit was programmed in "S7-PDIAG", this is the icon of the block or, if this does not exist, an absolute name.

● If the unit was programmed in "S7-GRAPH", this is a sequence name.

● If the unit was programmed with S7-HiGraph, this is the name of a group of graphs or a status graph of lower rank.

(5) The current mode of the unit is displayed in the "Operating mode" box. You can change modes with the "Operating mode" key.

If no operating mode is defined in the STEP 7 program then the field will be empty. In this case, you cannot set the operating mode.

The contents of the bottom line of the display are determined by the programming of controller:

If the unit was programmed in "S7–PDIAG", this line will not be displayed.

If the unit was programmed in "S7-GRAPH", the following will be displayed:

(6) The "Step" field shows the name of the first active step.

(7) The numbers of the active steps appear in these boxes. The numbers of the steps with faults always appear first reading from left to right. They are shown in red. If there are more active steps than can be displayed, the following icon is shown: ▶▶.

If the unit was programmed with "S7-HiGraph" and a corresponding process connection was created, the following will be displayed:

(6) The "Status" field shows the name of the first active status.

(7) This field displays the number of the active status.

Overview of units

The center section of the display shows a table of all diagnosable units in your system. The order in which they are displayed depends on the attributes that you assigned the units when programming them (e.g. in S7-PDIAG in the "Properties > Units" dialog box). The Overview Screen in ProAgent is structured in accordance with the attributes "belongs to screen" (screen number) and "position in screen" (position number):

● Units with the same screen number are arranged according to position number.

● If they also have the same position number, units are sorted into alphabetical order by name.

● Units for which no screen number and position number have been set appear in alphabetical order at the end of the list.

(8) Displayed in the left of the table is the current status of a unit:

 The "Warning triangle" icon indicates that a unit is blocked. The unit on which the fault occurred first is identified by a flashing icon. This indicates to you that this fault is not a secondary fault.

 The "Connection errored" icon indicates that connection to the PLC is errored or an addressing error has occurred.

 The "Inconsistency alert" icon indicates that the data for this network has changed in the STEP 7 configuration. In a criteria analysis the network data is read by ProAgent directly from the PLC.

 The "Consistency error" icon indicates that the data for this network is not consistent with the STEP 7 database. Regenerate your project before continuing.

(9) The "Unit" box indicates the name of a unit stored in the PLC program. This is:

- the icon of a module or an absolute designator if the unit was programmed in "S7-PDIAG"

- a sequence name if the unit was programmed in "S7-GRAPH"

- if programmed with "S7-HiGraph", the name of a status graph.

(10) The content of the next two boxes depends on how the unit was programmed:

- if "S7-PDIAG" is used, nothing is displayed

- if "S7-GRAPH" is used, the "Step name" is displayed and the "No." box shows the number of the active step.

- if "S7-HiGraph" is used, the "Status name" is displayed and the "No." column shows the number of the active status.

(11) In the "Mode" column you can see which operating mode is currently set for that unit. You can change modes with the "Operating mode" key.

If no operating mode is defined in the STEP 7 program, this column will be empty. In this case, you cannot change the operating mode.

(12) To the right of the "Mode" column you can see whether there is a higher-level or lower-level unit available for the unit concerned:

 This icon refers to a subordinate unit.

 This icon refers to a superior unit.

 This icon indicates that there is a lower-level unit and a higher-level unit.

Click on the corresponding icon to change the displayed level.

(13) On the far right you can see whether there is a movement for the unit concerned:

 If there is a movement for the unit then the "Movement" icon is displayed. With the "Movements" key, or with the appropriate configuration by clicking on the icon, you can switch to the Motion View.

(14) Here you can scroll up and down in the list of units by clicking the mouse if more units are present than can all be displayed in the list at the same time.

See also

2.8.3   Keys in the Overview Screen

Application

The number of keys/buttons configured in the Overview Screen is limited by the number of keys/buttons available on the unit. You can, however, assign other functions to these keys/buttons or to additional buttons.

You can use the following keys on the Overview Screen:

Key / button	Name	Function
	Change Overview Screen	This key is used to change between the two Overview Screens on devices with 6-inch display unit. Due to the small size of this device's display, the Overview Screen must be divided into two screens.
"Enter"	Down one level	Use this key to switch to a lower-level hierarchical unit.
"Backspace"	Up one level	Use this key to switch to a higher-level hierarchical unit.
	Operating modes	Use this key to change the operating mode of the selected unit. The operating modes that are possible depend on how the unit has been programmed.
	All/blocked	Use this key to toggle the display mode between display of all units and display of units with faults only.
	Acknowledge unit	Use this button to acknowledge the selected unit.
	Detail View	Use this key to call up the Detail View.
	Motion View	Use this key to open the Motion View.

Key / button	Name	Function
	Message Screen	Use this key to open the Message Screen.
	Step View	Use this key to open the Step View.
	S7-Manager	Use this button to change directly to SIMATIC Manager and to work with other SIMATIC applications.
	Network entry	This key is used to view a selected message or step sequence directly in the tool in which it was programmed. • Step sequences are visualized in S7-GRAPH. • S7-PDIAG units are displayed in the LAD/FBD/STL Editor.
	Status/Control	Use this key to open a screen with "Status/control" field. This enables you to monitor and control the addresses of the relevant control program.
	Language	Use this key to switch languages where a multilingual project has been compiled.
	Back	Use this key to return to the Diagnostic Start Screen. You can change this functionality by implementing corresponding functions (see "ProAgent functions for selecting diagnostic screens").

See also

2.8.4   How to work with the Overview Screen

What you need to do

This chapter gives a general outline of how to use the Overview Screen most effectively in practice.

Objectives

You have opened the overview screen to see which units are faulty in you system. You wish to see which unit caused the fault and what triggered it. Finally you want to move individual components of the system in a certain way to eliminate the fault.
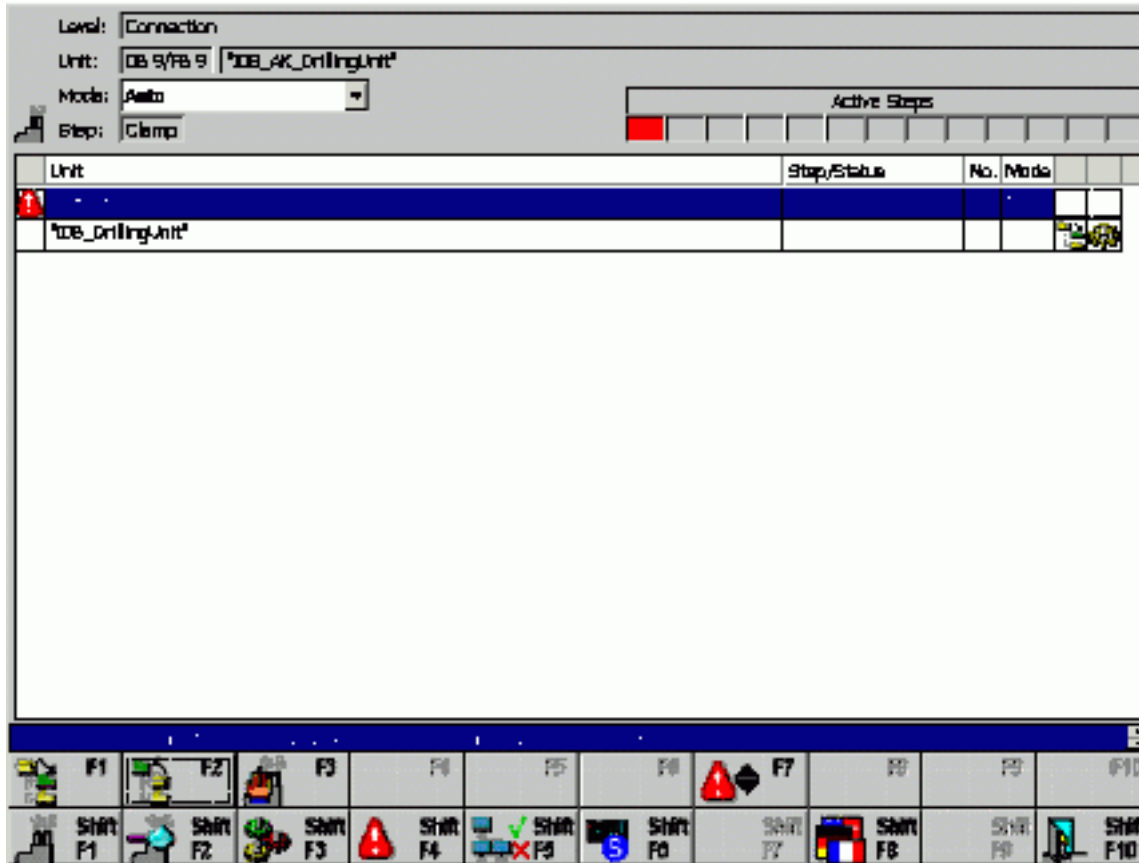
Figure 2-14   Overview Screen (example on PC)

Which units are faulty?

 First, you wish to see an overview of the faulty units. You can move the selection bar through the list with the cursor keys. All faulty units are marked by the icon "Warning triangle".

In order to view only the faulty units, you can switch the display mode by using the key "all/faulty". The non-faulty unit are no longer displayed, you can scroll through the faulty units by simply moving the selection bar.

This setting will remain intact until you restart the WinCC-flexible Runtime operation or if you switch the display mode to "all units" with you key.

Which unit had a fault first?

The icon "Warning triangle" will blink next to the unit that had the first fault. It is very probable that the cause of the fault can be found here and that the other faults are subsequent errors of this fault.

Oldest faulty unit

When determining the oldest faulty unit, the priority of the corresponding message will be considered with preference.

If you would like to ensure that the oldest faulty unit always blinks in the overview screen, you cannot use different priorities with the messages. The subject "Configuring Alarm_S-Meldungen" describes how to assign priorities for messages.

Information about the unit

You will select the unit marked with the blinking warning triangle. In the upper part of the display, you will now see detailed information about this unit: The module type and the module number, a text assigned to the unit, the currently set operating mode as well as the step numbers or the status numbers of the active steps (see "What you will see in the overview screen").

Detail analysis

 If the cause of the fault is not obvious, you should examine this fault more thoroughly in order to see which linking results caused the error message in the program code. Therefore, you will call the Detail View using this key.

Switching to manual operation

If you know the cause of the fault, of course you would like to correct the problem promptly so that the system can continue operation. To that end, you can execute specific movements on particular units in manual mode, for example.

In order to change the operating mode, you will select the unit in which you wish to trigger a movement.

 Use the "Operating modes" key to open a corresponding selection list.

Initiate movements

 If you have marked the unit or subunit that you would like to move and if you have set the correct operating mode, you will use this key to switch to the Motion View.

Retrieve Step View

If you have selected a unit that was programmed in S7-GRAPH, you can use the "Sequence" key to switch direct to the Step View. There you can search for specific steps and enable or disable one or more steps in the step sequence.

If the icon "Movement" appears to the right of a step sequence, a movement unit was assigned to this step sequence in S7-GRAPH (see "Prerequisites for the PLC program"). The assigned movement unit is treated as part of the step sequence and is not displayed as a separate unit. You can switch to the movement view with the "Movement" key.

Exiting the overview screen

You use this key to return to the Diagnostic Start Screen.

Or you can switch to the message screen with this key. There you can observe whether further faults will occur.

See also

Overview Screen (Page 35)

Step View (Page 89)

Detail View (Page 47)

Motion View (Page 77)

What you see in the Overview Screen (Page 36)

Basic requirements of the PLC program (Page 99)

Keys in the Overview Screen (Page 40)

Changing the display mode (Page 46)

Configuring ALARM_S messages (Page 241)

Changing operating mode (Page 46)

2.8.5   Hierarchical units on the Overview Screen

Hierarchical units

When programming a PLC it is possible - depending on the programming language used - to define a hierarchy of the units. In the case of S7-PDIAG a unit can therefor be equated with a module which, as a rule also, represents a process unit. By virtue of the multi-instance concept of STEP 7, a unit can also contain other units.

As soon as at least one subunit has a fault, the immediately superior unit is also marked as having a fault. The marker is thus passed on from one level to the next right up to the highest hierarchical level.

Note

When the PLC is programmed in S7-GRAPH, there are no hierarchical units.

Recognizing hierarchical units

In this way you can tell whether there are any more hierarchical layers associated with a unit.

If there are only subordinate units related to a particular unit, this icon is shown to the right of the relevant unit.

If there are only superior units related to a particular unit, this icon is shown to the right of the relevant unit.

This icon indicates that there are a lower-level unit and a higher-level unit for a given unit.

Changing hierarchical level

To switch between hierarchical levels you must first select the unit for which you want to see the subordinate or superior units. You can view the child units by pressing the "Lower level" key or by clicking the corresponding icon. Use the "Higher level" key or click on the corresponding icon to view the parent units.

When you move down a hierarchical level, only the subordinate units of the selected unit are shown.

When switching to a higher level in the hierarchy, all units at this level will be shown.

See also

2.8.6   Changing the display mode

Display modes

You can determine whether the overview screen displays all or only the faulty units.

To switch to the other display mode, press the "All/faulty" key.

When do I use which mode?

To limit the display to only the faulty units, is especially practical if your system includes many individual units. However, if you want to select a normal (non-faulty) unit (e.g. to trigger a movement), you must reset the display mode to show all units.

Recognizing the current mode

You will be able to see which display mode is active in the display field at the top, marked by a graphic icon:

*   The "Warning triangle" icon is displayed here if only the faulty units are displayed.

*   This icon will not appear if you see all units and can select them, regardless whether they are faulty or not.

See also

What you see in the Overview Screen (Page 36)

Keys in the Overview Screen (Page 40)

2.8.7   Changing operating mode

Objectives

If you know the cause of the fault, of course you would like to correct the problem promptly so that the system can continue operation. To that end, you can execute specific movements on particular units in manual mode, for example.

Note

Whether it is necessary or possible to switch to manual mode or to another mode prior to triggering manual movements depends on your PLC program.

To change the operating mode you must first select the unit on which you wish to change the operating mode. If the unit does not belong to the unit level displayed you must first change unit level.

Use the "Operating modes" key to open a selection list. Here you can select the operating mode in question using the mouse or the cursor keys.

Once you have selected the unit or subunit that you wish to move and have set the correct operating mode, use this key to switch to the Motion View and execute the required movement.

See also

Motion View (Page 77)

What you see in the Overview Screen (Page 36)

What you see on the Motion View (Page 79)

Keys in the Overview Screen (Page 40)

2.9 Detail View

2.9.1 Detail View

Use of the detail view

The backtracking of an error to the corresponding positions in the program code is called a criteria analysis. The detail view shows the result of the criteria analysis.

Signal list, STL or LAD

Depending on the configuration, the diagnostics result is either displayed in a detailed signal list, in a detailed statement list (STL) or a ladder diagram (LAD). You can switch between these displays by simply pressing a key.
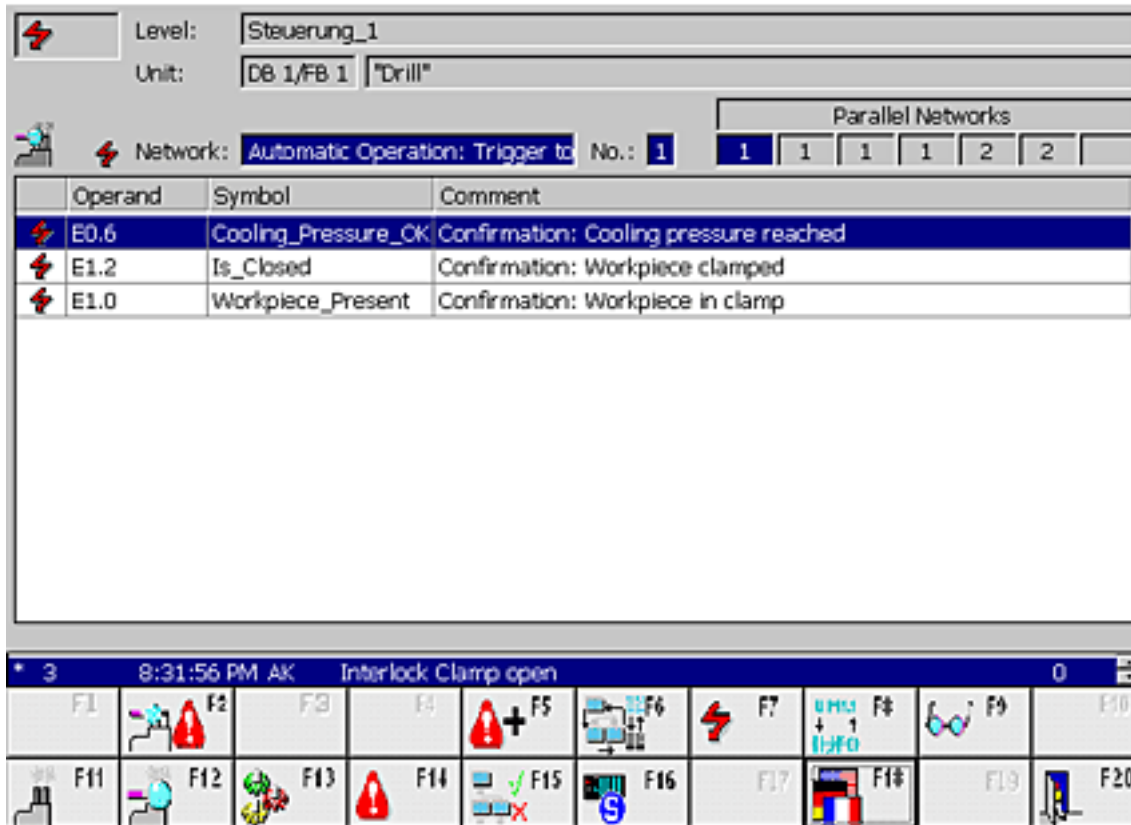
Figure 2-15   Detail View (example of signal list variant on PC)
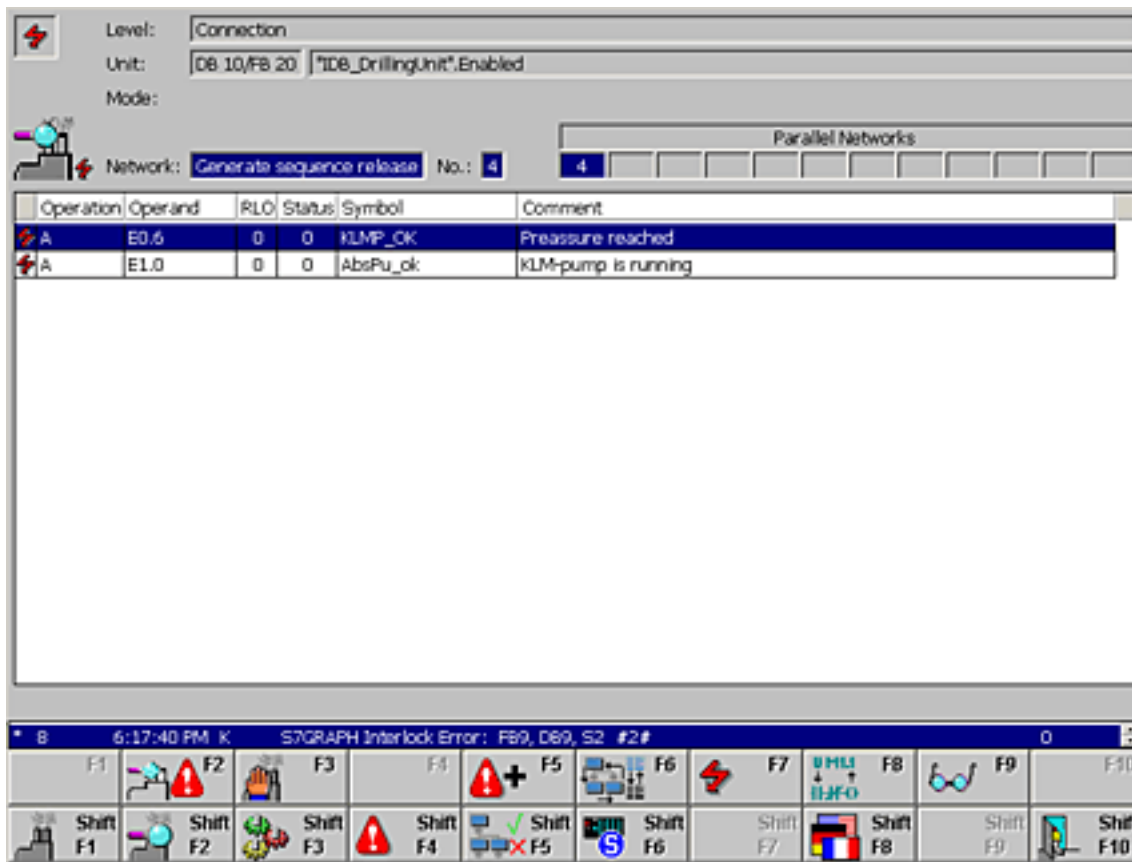
Figure 2-16   Detail View (example of STL variant on PC)
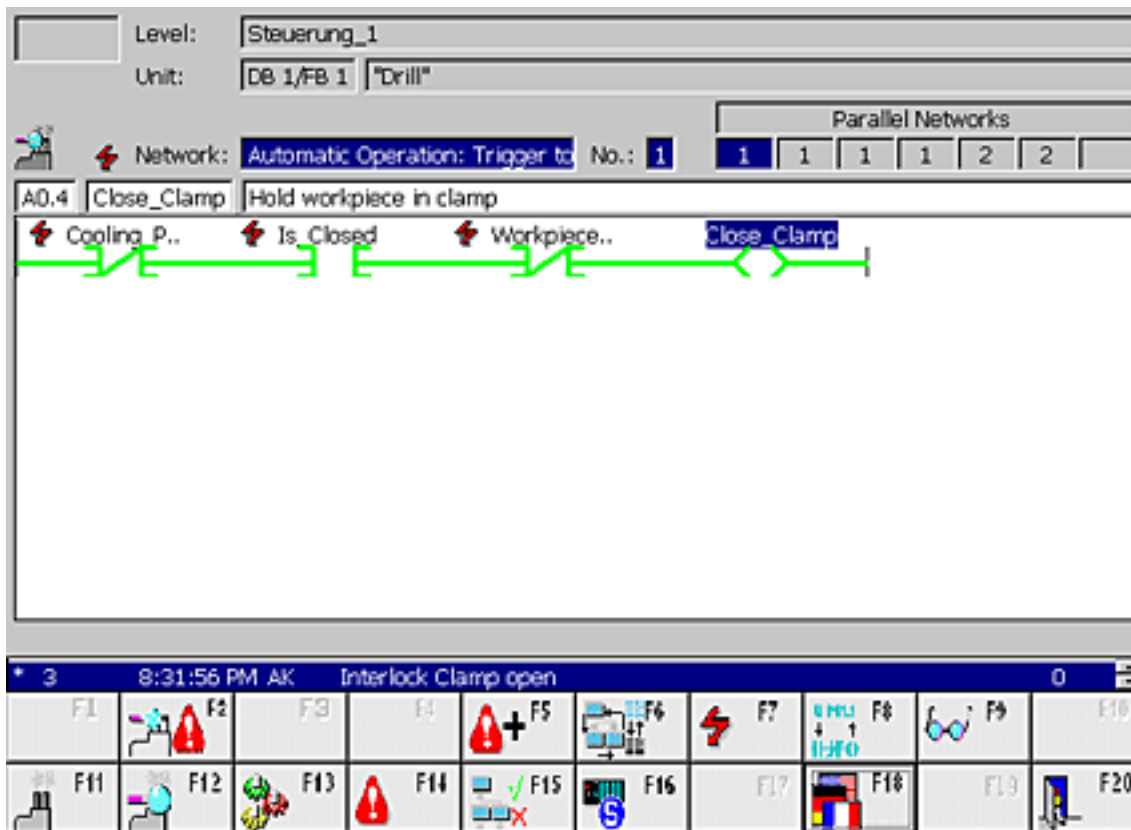
Figure 2-17   Detail View (example of LAD on PC)

In the LAD display, no all commands can be shown. The following can be displayed:

`U op, UN op, U(, O op, ON op, O(, O, ), NOT, = op, S op, R op, Label`

(`op`=Operand; `Label` only at the netork start, `U` corresponds to `A` in IEC display)

If a command that cannot be displayed in LAD must be displayed, a system message will be shown. Then you can switch to the signal lists and from there to the STL display via a key.

Note

If you use non-binary operands and signal edge operations within a diagnostics network, ProAgent cannot execute a criteria analysis. This will lead to blank detail views!

Program section

The display of the STEP 7 program code lists the positions of the PLC program that have triggered a process error. This should not be mistaken for a program error.

Actually, the occurrence of the process error caused a certain status, which causes the process to be monitored. This status is typical for a fault in the system. This is why the monitoring was programmed this way.

As the process diagnostics can monitor a variety of statuses and because interdependencies can be defined this way, it is interesting to se which signals caused the fault message.

You can deduct from this information what caused the fault and how it can be eliminated most rapidly.

Additional information

In addition to the program code, operands, icons and comments can be displayed. Parallel to this, you will see the status of the operands and all linking results.

All signals whose statuses have contributed to the fault message are marked. This way you will recognize immediately which conditions caused the occurrence of a fault message.

See also

2.9.2 Structure of the Detail View

Faults displayed

The faults displayed, when the Detail View is opened, depend on the screen from which it was called up:

- If you have called up the Detail View from the Message Screen (or from the message page/message window) you will first have had to select a message there. The Detail View then shows the fault which triggered the message you have selected on the Message Screen.

- If you have called up the Detail View from the Overview Screen you will have first had to select a unit. In the Detail View you can now see the oldest fault for this unit.

General layout

Like all the diagnostic screens, the Detail View has a standardized layout. There are only minor differences between the various types of operating unit.
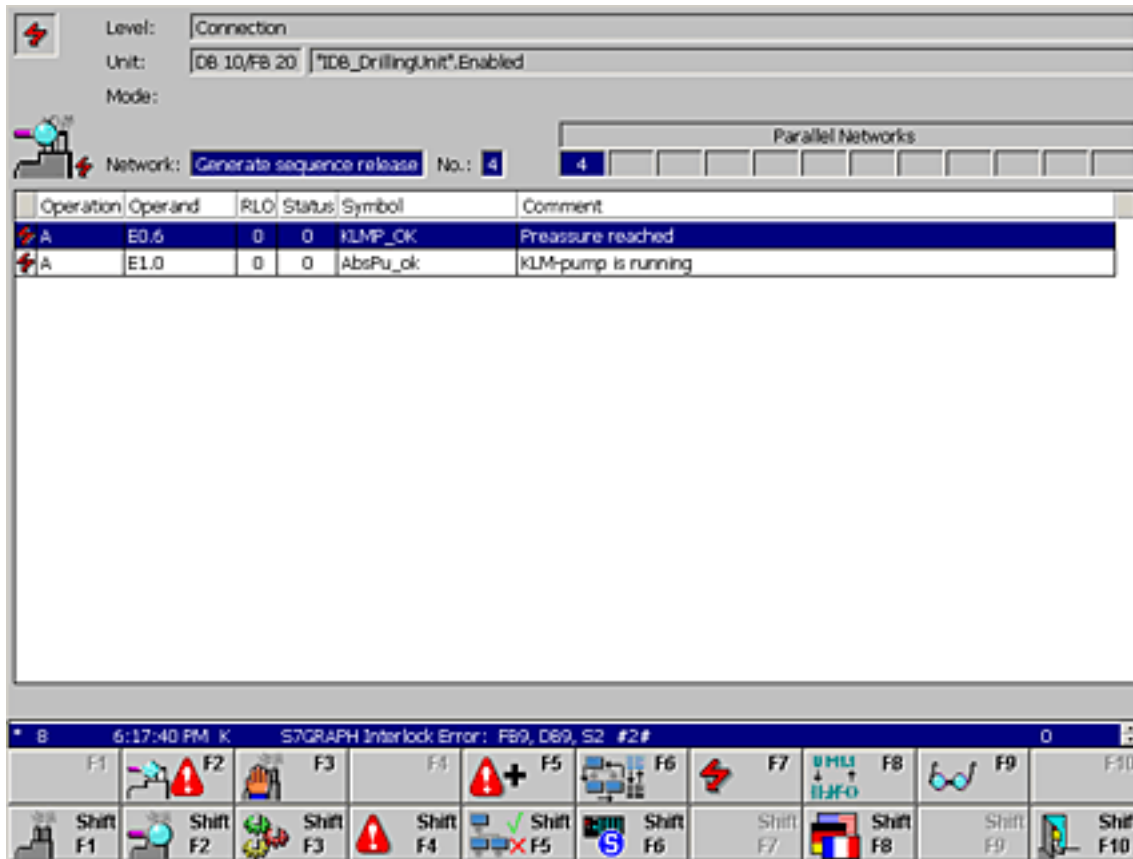
Figure 2-18   Detail View (example of STL variant on PC)

The top section of the Detail View contains detailed information about the unit in which the process fault has occurred.

The corresponding element is shown in the middle. The illustration shows an example of the Detail View in STL format as it appears on a PC. For an illustration and description of the signal list mode please refer to "Displaying the element as a signal list", and for an illustration of the LAD format see the section headed "Displaying element in LAD".

The bottom part of the screen contains a message line showing the oldest alarm message and the global and screen-specific key set.

See also

Overview Screen (Page 35)

Message Screen (Page 28)

Detail View (Page 47)

Information on the unit in the Detail View (Page 53)

Displaying element in LAD (Page 59)

Displaying the element as a signal list (Page 56)

How to work with the Detail View (Page 62)

2.9.3 Information on the unit in the Detail View

Overview

The top section of the Detail View contains detailed information about the unit in which the process fault has occurred.
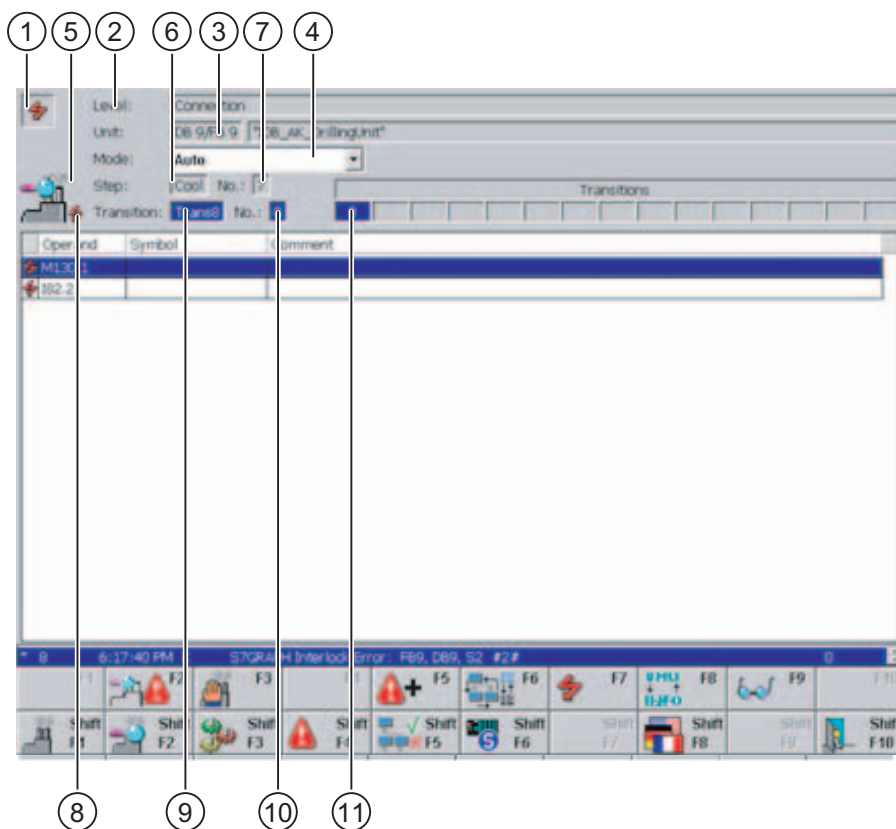
Figure 2-19   Detail View (as shown on the S7-GRAPH unit on a PC)

(1) At the top left, you obtain information on the display mode:

 The "lightning flash" icon appears if partial view is active - this lists only those instructions and/or switches that have not been performed (see "Switching between partial and full view").

 The icon is struck through if there are no faults and thus no element is displayed.

 The "Spectacles" icon appears if the current status bits are displayed rather than the status bits at the time of occurrence of the fault (initial values) (see "Switching between initial values and current status").

 The "Connection errored" icon indicates that connection to the PLC is errored or an addressing error has occurred.

 The "Inconsistency alert" icon is displayed if the data for this network has changed in the STEP 7 configuration. In a criteria analysis the network data is read by ProAgent directly from the PLC. For further information please refer to "Changes during commissioning".

 The "Consistency error" icon indicates that the data for this network is not consistent with the STEP 7 database. Regenerate your project before continuing.

(2) The "Level" field displays the PLC assigned to the unit and the complete hierarchical path.

(3) The "Unit no." field tells you the block type (FB/FC and DB) and the block number of the selected unit. The "Unit" field displays the name of the unit you selected.

(4) The current mode of the unit is displayed in the "Operating mode" box. You can change modes with the "Operating mode" key.

If no operating mode is defined in the STEP 7 program then the field will be empty. In this case, you cannot set the operating mode.

The displays and contents of the following fields depend on the programming of the unit:

Programming in S7-GRAPH:

If the unit was programmed in S7-GRAPH you will have two lines of information on the faulty step and/or the blocked transition.

(5) The "Lightning flash" icon appears here if the currently displayed step is blocked.

(6) The "Step" field displays the step name.

(7) The number of this step is displayed in the "No." box.

(8) The "Lightning flash" icon appears here if the currently displayed transition is blocked.

(9) You can see the transition name in the "Transition" box.

(10) The "No." box displays the number of this transition.

(11) The "Subsequent transitions of selected step" field lists the user numbers of the subsequent transitions currently possible for the step selected. The selected transition is highlighted here. If more subsequent transitions are possible than can be displayed then this field will also contain the icon: .

If a transition with a fault is displayed here as the unit then parallel transitions are displayed here.

Programmed in S7-HiGraph:

If the unit was programmed in S7-HiGraph you will have two lines of information on the faulty status and/or the faulty transition.
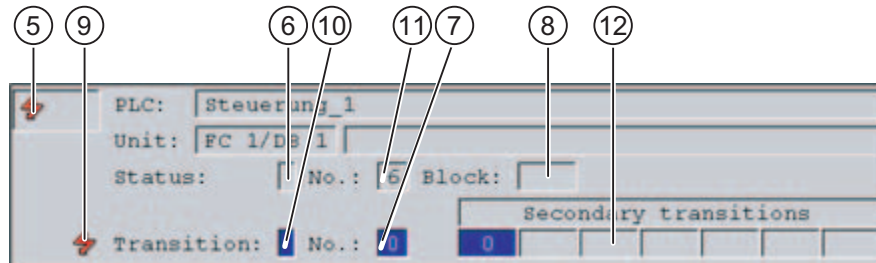
(5) The "Lightning flash" icon appears here if the currently displayed status is faulty.

(6) The "Status" field shows the name of the status.

(7) The number of this status is displayed in the "No." box.

(8) The "Block" field shows the block type (FB/FC and DB).

(9) The "Lightning flash" icon appears here if the currently displayed transition is blocked.

(10) You can see the transition name in the "Transition" box.

(11) The "No." box displays the number of this transition.

(12) The "Subsequent transitions of selected status" field lists the user numbers of the subsequent transitions currently possible for the status selected. The selected transition is highlighted here. If more subsequent transitions are possible than can be displayed then this field will also contain the icon: ▶▶.

If a transition with a fault is displayed here as the unit then the elements of the transitions can be seen here.

Programmed with S7-PDIAG:

If the unit was programmed with S7-PDIAG, you will see only one more information line.
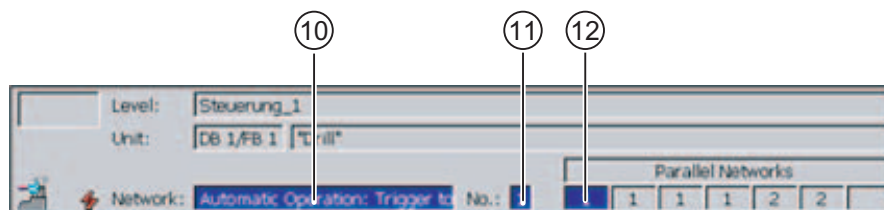
(10) The "Network" field displays the name of the selected network.

(11) The "No." box displays the number of the network you selected.

(12) The "Parallel networks" field lists the existing networks for the selected unit. The selected network is highlighted here. If more networks exist than can be displayed then this field will also contain the icon: ▶▶.

Representation of the element

The center section of the screen shows an excerpt from the STEP 7 program code for the element with the fault. You can choose between display as a signal list and display in STL or LAD.
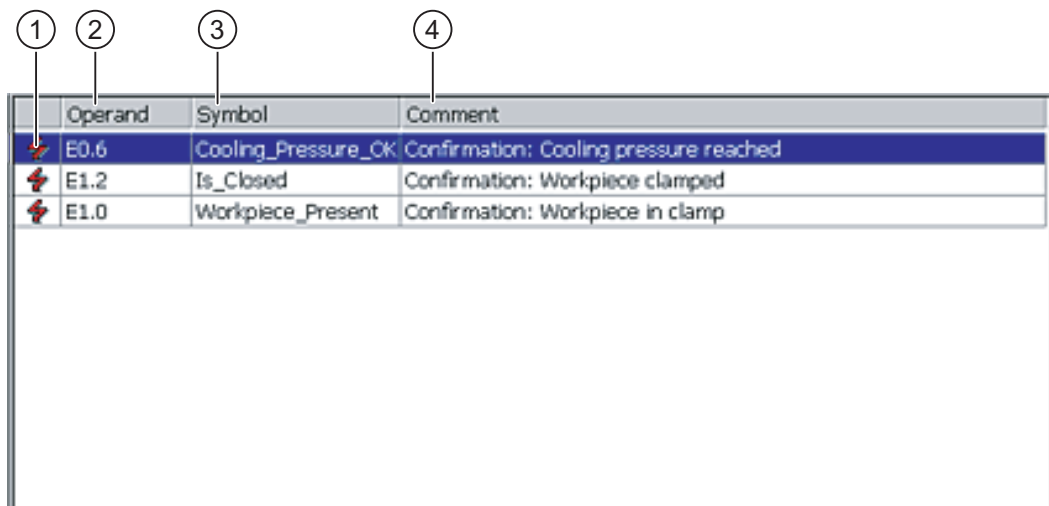
See also

2.9.4   Displaying the element as a signal list

Overview

In the signal list view of the STEP 7 program code the middle part of the Detail View shows only the signals which resulted in an alarm message being triggered. This gives you a quick overview of the faults that have occurred:

Figure 2-20   Detail View: Displaying the element as a signal list

The following elements are displayed:

(1) The "Lightning flash" icon appears here because the signal shown next to it has contributed to an alarm message.

(2) "Signal": The individual operands are displayed here. If German is set as the language on the operating unit then SIMATIC view will be used. If not, the operands will be shown in IEC view.

(3) "Symbolism": Lists the icon of the signal in accordance with the text or graphic list in STEP 7.

In the case of tags within DBs, only the iconism is displayed if a iconic identifier has been stored in the text or graphic list. If no icon was generated then the operating unit shows the absolute address of the tags.

(4) "Comment": Displays a comment on the signal in question, if this was stored in STEP 7 in the text or graphic list.

See also

2.9.5 Displaying element in STL

Overview

In the STL view of the STEP 7 program code the middle part of the Detail View highlights only the instructions which resulted in an fault message being triggered:

Figure 2-21   Detail View: Displaying element in STL

The following elements are displayed:

(1) The "Lightning flash" icon appears here if the adjacent signal has contributed to an alarm message.

When partial view is active, these are the only switches displayed (see "Switching between partial and full view").

(2) "Operation": If German is set as the language on the operating unit, the operators will be shown in SIMATIC view. If not, IEC view will be used.

(3) "Operand": Displays the individual addresses. Here too, the display depends on whether SIMATIC or IEC display mode is set.

Note

The SIMATIC or IEC display mode setting for operations and operands in the Detail View is imported from STEP 7.

(4) "VKE": Here, the corresponding linking result will be displayed.

(5) "Status": The status of the operands appears here. The information displayed relates either to the values at the time of occurrence of the fault (initial values) or the current status (see "Switching between initial values and current status").

(6) "Symbol": Lists the symbol of the signal in accordance with the symbol list in STEP 7.

(7) "Comment": Displays a comment on the signal in accordance with the symbol list in STEP 7.

Note

The SIMATIC or IEC display mode setting for operations and operands in the Detail View is imported from STEP 7.

Expanded display in the Detail View

The program code displayed is not always totally identical with the program code that has been entered in STEP 7. In order to keep the section of program code displayed as meaningful as possible, the view in the Detail View also takes into account the expanded display possibilities of the elements.

See also

2.9.6 Displaying element in LAD

Overview

In the LAD view of the STEP 7 program code the middle part of the Detail View highlights only the instructions which resulted in an fault message being triggered:
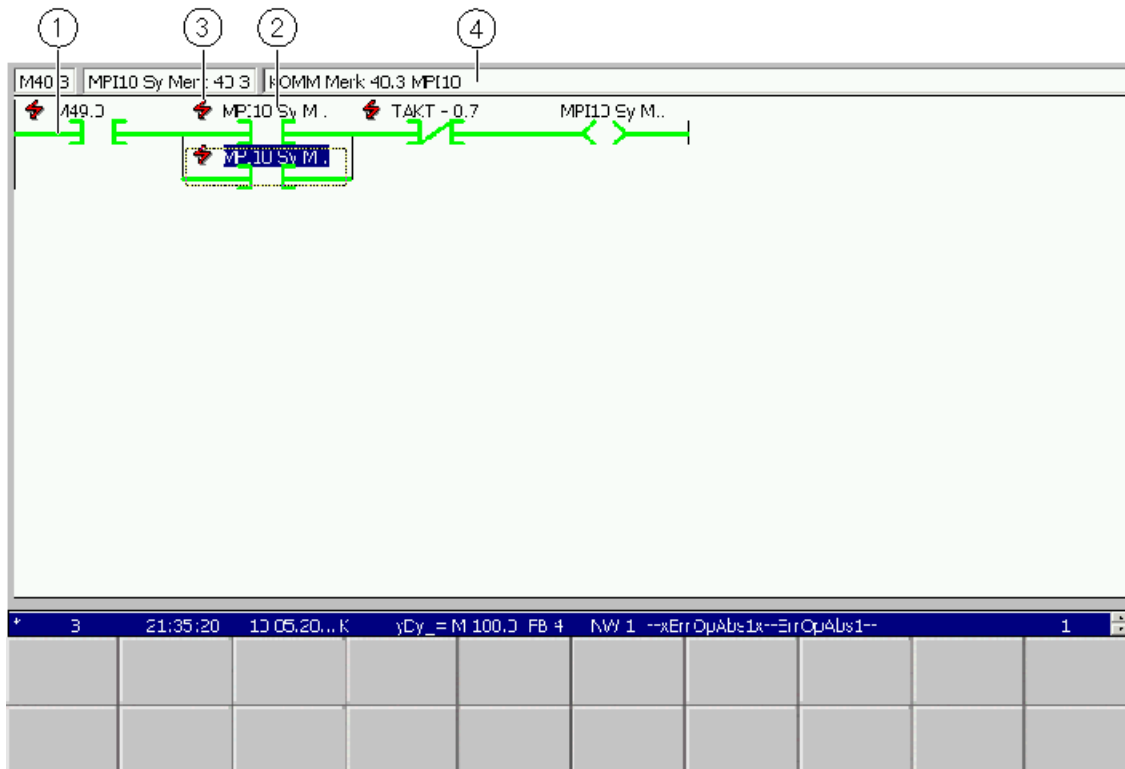
Figure 2-22   Displaying element in LAD

The details are displayed:

(1) The contacts: A switched contact is displayed as a solid green line, an unswitched contact by a dotted blue line.

The information displayed relates either to the status at the time of occurrence of the fault (initial values) or the current status (see "Switching between initial values and current status").

(2) Absolute operand: If German is set as the language on the operating unit, the operands will be shown in SIMATIC view. If not, IEC view will be used.

(3) The "Lightning flash" shows that the subsequent contact on the right has contributed to an alarm message.

When partial view is active, these are the only switches displayed (see "Switching between partial and full view").

(4) An additional line of text that shows the absolute name, the icon and the comment for the selected operand.

In the case of tags within DBs, only the iconism is displayed if a iconic identifier has been stored in the text or graphic list. If no icon was generated then the operating unit shows the absolute address of the tags.

You can switch between the individual operands with the mouse or the cursor keys. The displayed text will change accordingly.

Note

Parenthesized expressions cannot be displayed in LAD. It is not possible to display the signal flow with the aid of status colors if supplementary NOT operations are included in the network.

Expanded display in the Detail View

The program code displayed is not always totally identical with the program code that has been entered in STEP 7. In order to keep the section of program code displayed as meaningful as possible, the view in the Detail View also takes into account the expanded display possibilities of the elements.

See also

Branch instructions (Page 72)

Multiple assignments (Page 73)

Auxiliary networks (Page 71)

Displaying element in STL (Page 57)

Displaying the element as a signal list (Page 56)

Exclusion operands (Page 74)

Structure of the Detail View (Page 51)

How to work with the Detail View (Page 62)

Switching Between partial and full view (Page 67)

Switching between initial values and current status (Page 68)

2.9.7 Keys in the Detail View

Application

The number of keys/buttons configured in the Detail View is limited by the number of keys/buttons available on the unit. You can, however, assign other functions to these keys/buttons or to additional buttons.

You can use the following keys on the Detail View:

Key / button	Name	Function
	Analyze fault	Use this key in the Detail View to launch criteria analysis for the currently selected message.
	Operating modes	Use this key to change the operating mode of the selected unit. The operating modes that are possible depend on how the unit has been programmed.
	Next error	Use this key to change to the next error of the unit or subunit.
	More output	Use this key to change within an error. • S7-GRAPH: The change takes place consecutively to all transitions and then to the locking condition for the step (see "Changing fault or transition"). • Lock error: First changes to the step's locking condition and then to the first transition. • S7-HiGraph: Depending on the error selected, you change either to the subsequent transition of a status or to the transitions leading to a status. • S7-PDIAG: In the case of multiple assignments to a monitored address, the change is to the next network containing an assignment to that address.
	All / faulty addresses	This key is used to toggle between full and partial view of the criteria (see "Switching between partial and full view"). In the partial view, only those criteria that have led to a fault are displayed. This key is not active in signal list display mode.
	List / STL / LAD	You can use this key to switch between signal list, STL and LAD display modes.
	Initial value / current status	With this key you will determine which status and therefore which linking results will be displayed: Values at the time of occurrence of the fault (initial values) or the current status (see "Switching between initial values and current status").
	Overview Screen	Use this key to open the Overview Screen.
	Motion View	Use this key to open the Motion View.
	Message Screen	Use this key to open the Message Screen.
	Step View	Use this key to open the Step View.
	S7-Manager	Use this button to change directly to SIMATIC Manager and to work with other SIMATIC applications.

Key / button	Name	Function
	Network entry	This key is used to view a selected message or step sequence directly in the tool in which it was programmed. • Step sequences are visualized in S7-GRAPH. • S7-PDIAG units are displayed in the LAD/FBD/STL Editor. • The program opens the STEP 7 hardware diagnostics when process control or "Report system error" messages are generated.
	Status/Control	Use this key to open a screen with "Status/control" field. This enables you to monitor and control the addresses of the relevant control program.
	Language	This key can be used to switch languages where a multilingual project has been compiled.
	Back	Use this key to return to the Diagnostic Start Screen. You can change this functionality by implementing corresponding functions (see "ProAgent functions for selecting diagnostic screens").

See also

2.9.8 How to work with the Detail View

Practical procedure

This chapter gives a general outline of how to use the Detail View in practice.

Objectives

You have opened the Detail View in order to see which signals in the control program have resulted in a particular alarm message. By doing so you can tell which monitoring routine triggered the error message and accordingly where the fault is to be found.

The center section of the screen shows an excerpt from the program code for the elements with the fault. The elements which have led to an alarm message are highlighted.
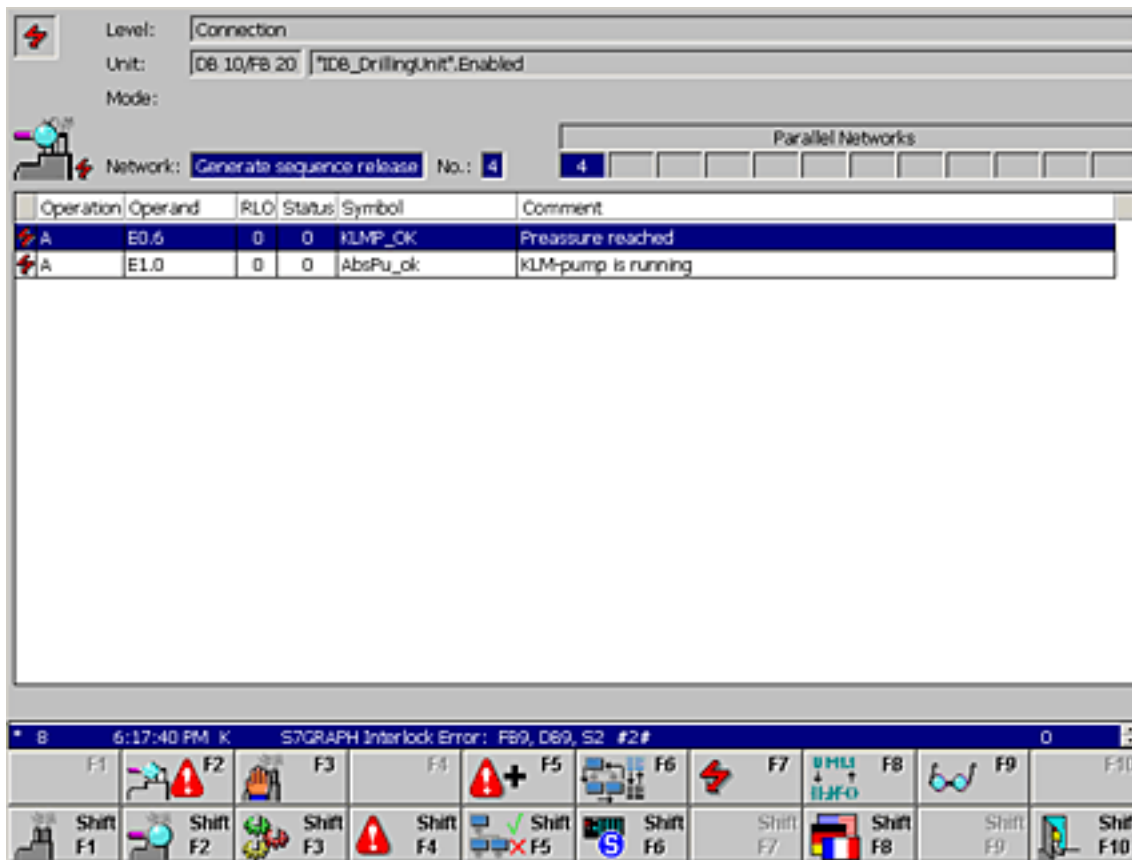
Figure 2-23   Detail View (example of STL variant on PC)

Which unit?

The top two lines of the display show you to which unit the excerpt from the program code shown belongs. Here you can see the text assigned to the unit in STEP 7.

Which expression?

The following lines vary depending on the programming language in which the unit specified above was programmed:

- If the unit was programmed in S7-PDIAG then the relevant network is shown. In the case of multiple assignments, the other possible networks for the unit selected are shown to the right of this.

- If the unit was programmed in S7-GRAPH, the number of the active step and the assigned text are displayed. The following line then provides information on the transitions.

- If the unit was programmed in S7-HiGraph the number of the active status and the text assigned appears here. The following line then provides information on the transitions.

Which transition?

If the unit for which the program code is being displayed was programmed in S7-GRAPH or S7-HiGraph, the third line shows which transitions belong to the step shown. The transition to which the displayed program code belongs is marked.

Signal list, STL or LAD

If you prefer STL or LAD display modes you can switch from signal list display mode to STL display mode at any time using the "List/STL/LAD" key. If you activate this key again you will switch to LAD display mode. Pressing the key again will take you back to signal list display mode.

Getting information from signal list display mode

	Operand	Symbol	Comment
⚡	E0.6	Cooling_Pressure_OK	Confirmation: Cooling pressure reached
⚡	E1.2	Is_Closed	Confirmation: Workpiece clamped
⚡	E1.0	Workpiece_Present	Confirmation: Workpiece in clamp

The signal list shows only signals with a fault, together with the associated icons and comments.

This gives you an overview of the essential information on the faults that exist so that you can analyze the cause of the fault quickly.

Getting information from STL display mode

Operation	Operand	RLO	Status	Symbol	Comment
A	E0.6	0	0	KLMP_OK	Preassure reached
A	E1.0	0	0	AbsPu_ok	KLM-pump is running

The statement list shows the individual operators and icons, status bits, logical operation results, icons and remarks. All statements that have led to an alarm message being triggered are marked with a "lightning flash" icon.

This means you can see right away where your fault monitoring system gave the alarm. If you examine the instructions concerned, you will quickly be able to locate the cause of the fault. The logical operation results will help you in that regard.

Getting information from the LAD display mode
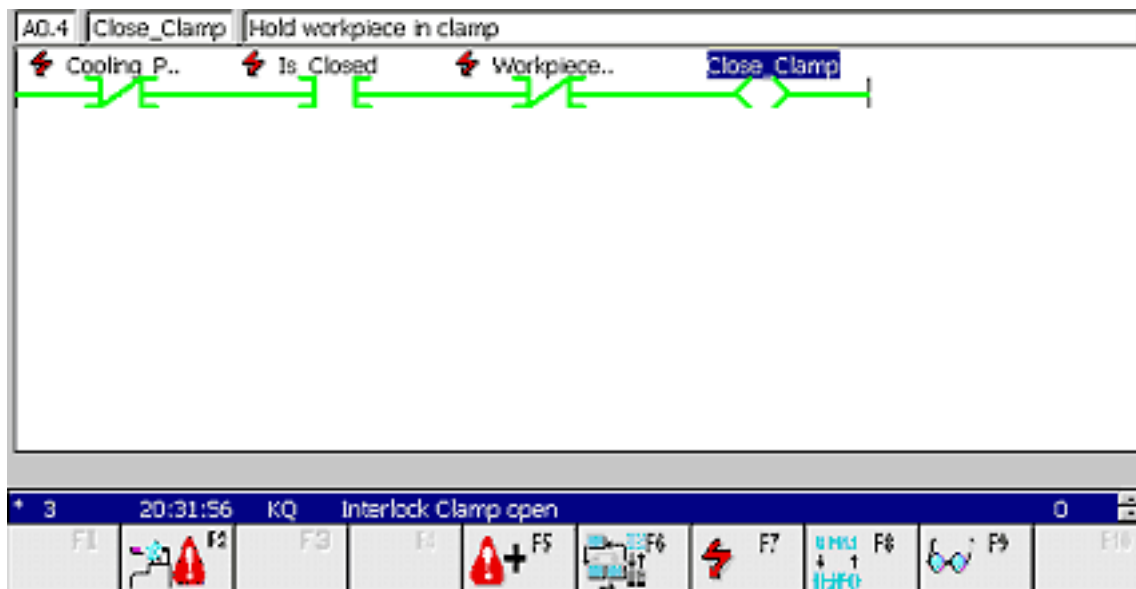
The ladder diagram shows the individual switches and operands. As in the Step 7 LAD/STL/FDB editor, the status is indicated by the color of the switch lines:

- Enabled contacts are represented by continuous green lines
- Disabled contacts are represented by broken blue lines

The line above the ladder diagram shows the icons and comments for the operands selected.

With this information, you can ascertain just as easily as in STL display mode at what point your fault monitoring system gave the alarm and how the fault occurred.

More elements

Use this key to change to the next error - in other words, to the next fault action of the unit.

Use this key to switch within the fault to the next transition or to other elements affected.

For further details please refer to "Changing fault or transition".

Modifying the view options

You can adapt the type of display to your requirements:

If you want to see all signals, including those that did not cause a fault, press this key (see "Switching be reduced and complete displays")
This key is not active in the signal list display.

If you wish, you can have the current status bits displayed instead of the status bits at the time the error occurred (initial values). To do this, press this key (see "Switching between initial values and current status").

Criteria analysis for the selected message

The lower section of the Detail View displays the current messages. For each of these messages you can have a criteria analysis displayed right there in the Detail View.

Select the message for which you wish to carry out a criteria analysis and use this key.
The corresponding criteria analysis is displayed.

For further information on the topic `MessageViewShowErrorDefinition`, please refer to "ProAgent functions for selecting Diagnostic Screens".

Changing the analysis mode

The Detail View shows the network which is associated with the current diagnostics ALARM_S message or with the current step of a step sequence. The analysis mode setting defines the network is to be visualized.

However, the step analysis mode is only active if no ALARM_S message is active and you have not selected an error definition of a unit.

Select the step for criteria analysis, and then press this key.

The corresponding criteria analysis is displayed.

Exiting the Detail View

You can switch directly from the Detail View to the other diagnostic screens or also exit diagnostics:

Switches to the Overview Screen

Switches to the Motion View

Switches to the Step View

Switches to the Message Screen

Switches to the Diagnostic Start Screen

See also

Detail View (Page 47)

Changing fault or transition (Page 69)

Switching Between partial and full view (Page 67)

Switching between initial values and current status (Page 68)

Keys in the Detail View (Page 60)

Selecting diagnostic screens (Page 153)

Structure of the Detail View (Page 51)

Changing the display mode (Page 46)

2.9.9 Switching Between partial and full view

Option

On the Detail View in STL or LAD display mode you can choose whether you want to:

- View all instructions of an element displayed (= full view)

- Or whether you only want to see statements that have caused the monitored signal to be put in the wrong status (= partial view)

To toggle between the two states, press the "All/faulty addresses" key. In partial view the "Lightning flash" icon is displayed in the top left next to the "Controller" field.

The icon is struck through if there are no faults and thus no element is displayed.

Partial view is particularly useful if you want to be able to quickly locate the critical statements that have resulted in the issue of an alarm message.

On the Detail View in signal list display mode the "All/faulty addresses" key is not active, since only faulty units are shown here anyway.

See also

Structure of the Detail View (Page 51)

Keys in the Detail View (Page 60)

How to work with the Detail View (Page 62)

2.9.10   Switching between initial values and current status

Initial values

By default, those status bits displayed are those which were valid at the moment at which the fault monitoring system first detected the process fault. For that reason those values are also referred to as initial values. They remain until the next fault occurs.

These values are also the basis on which the results of logic operation (RLOs) are founded.

In the case of sequences of steps the status is only shown if the corresponding step is active.

Current status

As an alternative to the initial values you can also query the current status. Viewing the current status allows you to monitor online what effect corrective measures have on the condition of the system.

If you have set the display mode to signal list mode or partial view (see "Switching between partial and full view"), you can see right away if the fault has been eliminated. In that case, no more signals are displayed on the screen.

Toggling

To toggle between the initial values and the current status, press the "Initial values/current status" key. When the current status is displayed, the "Spectacles" icon appears top left next to the "Unit level" box.

See also

> Switching Between partial and full view (Page 67)
>
> Keys in the Detail View (Page 60)
>
> Structure of the Detail View (Page 51)
>
> How to work with the Detail View (Page 62)

2.9.11 Changing fault or transition

Switch errors

> A unit can have more than one error. Now you can continue with the next error of this unit by using the key.

> Use the key "Next error" to switch to the same unit or a subunit.

> The display of the expressions in the upper area of the display is then adapted accordingly (see "Informationen about the unit in the detail view").

Switch transition

> Sometimes, the cause of an error cannot be recognized at first sight:
>
> On S7-PDIAG units, only one network is displayed in the detail view. However, the cause of the fault may be located in more than one network.
>
> On S7-GRAPH units, the locking conditions of the step or of individual transitions can be triggers for the error message.
>
> On S7-HiGraph units, the expiration of the monitoring time or individual transitions of a status graph can trigger an error message.

> With the key "Next expression" you switch to the next expression within an error:
> - With S7-PDIAG units: From one connected network to the next.
> - With S7-GRAPH units that report a locking error: From the locking condition of the step to the initial and then to all other transitions.
> - With S7-GRAPH units that report a monitoring error: Switching from one transition to the next.
> - With S7-HiGraph units: If a monitoring time error occurs, all subsequent transitions will be displayed in sequence.
>
>   In the case of a status error the transition that led to the fault state is shown.

> The display of the expressions in the upper area of the display is then adapted accordingly (see "Informationen about the unit in the detail view").

Multiple assignments of monitored operands

With multiple assignments on a monitored operand, the cause of the error can be located in several networks.

Then you will be able to switch between the connected networks with the "Next expression" key.

You can tell which network is currently being displayed from the information in the top part of the Detail View. The module number displayed in the first line, however, will remain unchanged.

See also

Keys in the Detail View (Page 60)

Multiple assignments (Page 73)

Information on the unit in the Detail View (Page 53)

Structure of the Detail View (Page 51)

How to work with the Detail View (Page 62)

2.9.12   Enhanced options with S7-PDIAG

2.9.12.1   Enhanced options with S7-PDIAG

Displayed program code

The program code displayed is not always totally identical with the program code that has been entered in STEP 7. In order to keep the section of program code displayed as meaningful as possible, the view in the Detail View also takes into account the expanded programming possibilities with S7-PDIAG. This applies to auxiliary networks, branch instructions, multiple assigments and exclusion operands.

See also

Detail View (Page 47)

Branch instructions (Page 72)

Multiple assignments (Page 73)

Auxiliary networks (Page 71)

Displaying element in LAD (Page 59)

Displaying element in STL (Page 57)

Displaying the element as a signal list (Page 56)

Exclusion operands (Page 74)

2.9.12.2   Auxiliary networks

Overview

The program code displayed is not always totally identical with the program code that has been entered in STEP 7. To provide you with an excerpt that is as meaningful as possible, ProAgent displays the networks created in S7-PDIAG.

For example, the complete assignment may be used instead of a flag. This enables you to trace a signal back to the peripheral more easily.

Auxiliary networks are shown in symbol list, STL and LAD display modes of the Detail View.
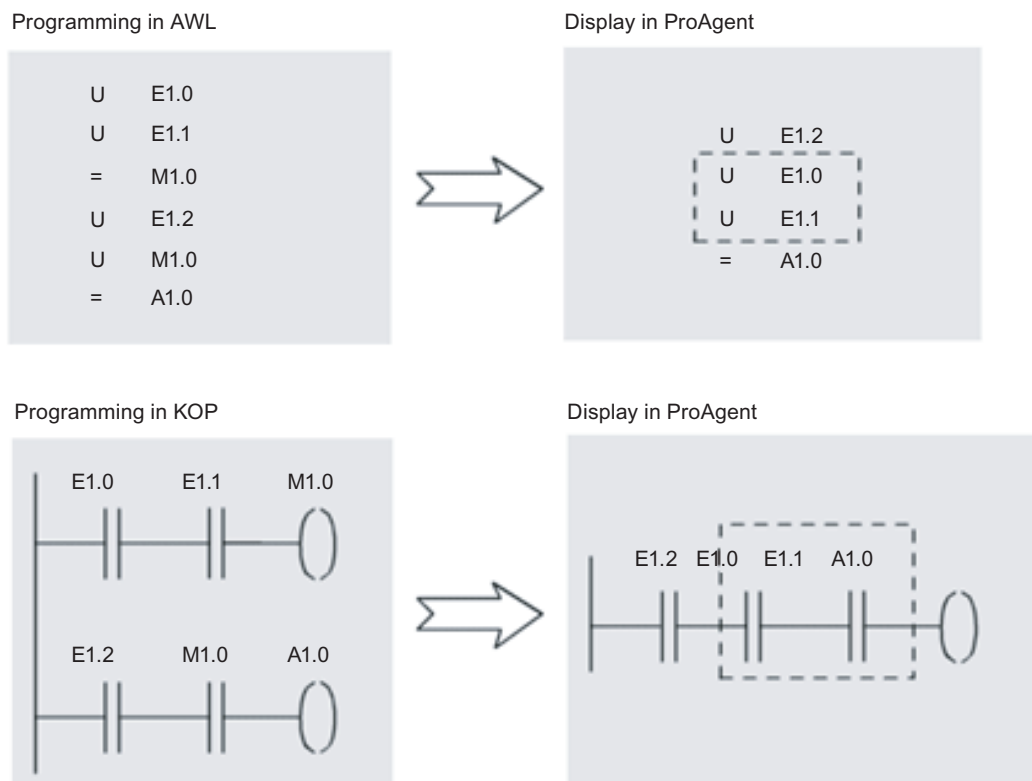
Figure 2-24   Auxiliary network in STL and LAD

Comparative operations

Comparative operations and non-binary operands within a diagnostic network in STEP 7 result in blank Detail Views.

See also

Displaying the element as a signal list (Page 56)

Displaying element in STL (Page 57)

Displaying element in LAD (Page 59)

2.9.12.3 Branch instructions

Overview

ProAgent's criteria analysis is in a position to resolve even complex PLC programs with labels and display them on the operating unit.

The display in STL is such that all code parts that can be evaluated become visible.
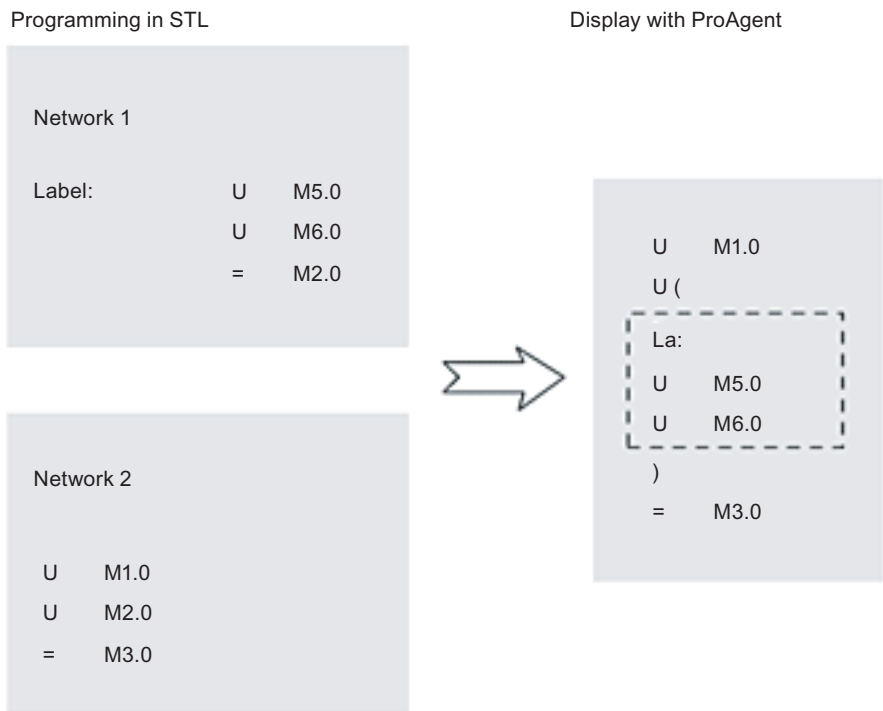
Figure 2-25   Resolving branch instructions

Labels external to the start of a network

In the LAD display mode of the Detail View, display is possible only if the label is at the start of the network. In STL display mode display is always possible, but in the case of labels the display device sets the initial query. The following statement is the basically treated like the start of a network.

> ⚠ **CAUTION**
>
> When using labels in monitored networks, it is not always possible to determine with certainty in the Detail View which operands are giving rise to the fault. Labels or branch instructions should therefore not be used in monitored networks.
>
> To program even more complex tasks in STL in an orderly manner, interim results must be stored in auxiliary flags and linked to the other operands in the monitored network.

Parenthesized expressions cannot be displayed LAD. It is therefore not possible to display the signal flow with the aid of status colors if supplementary NOT operations are included in the network.

See also

Displaying the element as a signal list (Page 56)

Displaying element in STL (Page 57)

Displaying element in LAD (Page 59)

2.9.12.4   Multiple assignments

Overview

If your PLC program performs multiple assignments to a monitored operand - for example, with SET/RESET or even with a direct assignment - you can switch between all the networks affected in the Detail View at the press of a key.
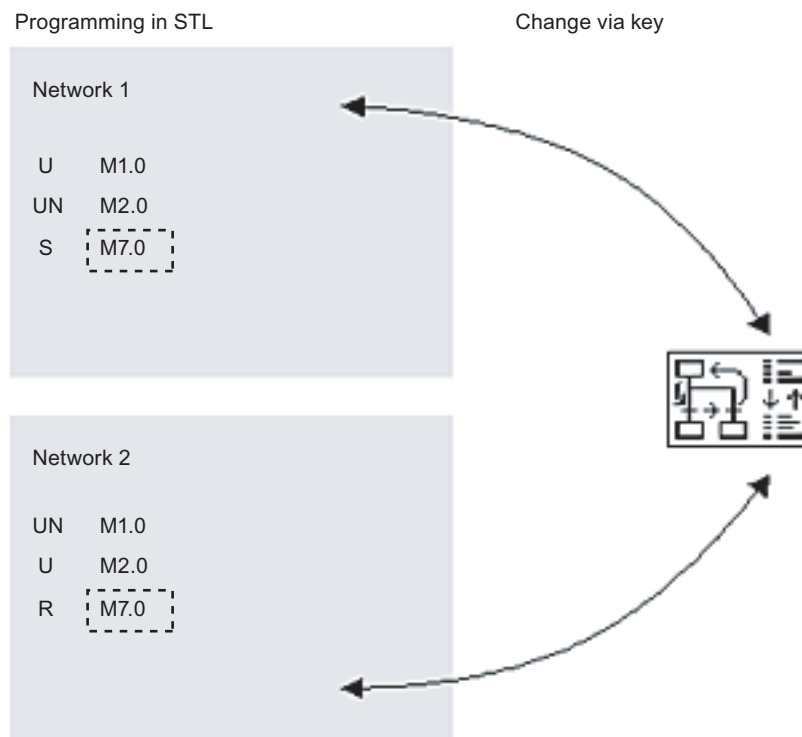
Figure 2-26   Multiple assignment of monitored operand M 7.0

You can tell which network is currently being displayed from the information in the top part of the Detail View.

See also

Displaying the element as a signal list (Page 56)

Displaying element in STL (Page 57)

Displaying element in LAD (Page 59)

2.9.12.5 Exclusion operands

Requirements

Exclusion operands can only be defined for units which were programmed in S7-PDIAG 5.3 or higher.

In the case of S7-HiGraph units, the exclusion operands are created automatically.

What are exclusion operands?

The criteria analysis treats all operands equally. This may result in subnets being identified as failed which strictly speaking are contributory to the cause of the error from a logical point of view; but with additional knowledge they can be excluded as being contributors to the cause of the error.

One example is the different system operating modes which, by definition, can never occur simultaneously on a unit, or individual operands for different product versions which similarly cannot be produced simultaneously.

For this reason S7-PDIAG features the option of defining exclusion operands in a text or graphic list. In the case of S7-HiGraph units, the exclusion operands are created automatically.

If exclusion operands have been created, then ProAgent only selects icons in the network as failed

- where the exclusion operand is linked with U and recorded with a value of 1, or

- where the exclusion operand is linked with UN and recorded with a value of 0.

Reverse logic of inclusion operands:

If the exclusion operand is linked with UN and if the exclusion operand has the value 1, the operands of the associated subnets are not identified as being in error.

Note

Exclusion operands should always be programmed at the start of a subnet. Otherwise, in certain circumstances too many failed operands are displayed in the Detail View.

Example

The following example shows operand monitoring of A 1.0 to state "0" with modes "Auto"and "Manual":

Without excursion operands

Figure 2-27   Example of exclusion operands

From a strictly logical point of view, the marking of the faulty lines in the upper section of the program is correct. However, the subnet processing the "Manual" operating mode cannot be a cause of faults by definition, since the system is already in "Auto" operating mode and cannot be in another operating mode at the same time.

Taking this additional knowledge into account, a considerably clearer error identification is shown in the lower section of the program.

Display by ProAgent

Due to the definition of the exclusion operands in S7-PDIAG, fewer lines are identified as contributing to the error in the Detail View.

You can use the "All/faulty operands" key to toggle between partial and full view as usual (see "Switching between partial and full view"):

With partial view, correspondingly fewer lines are displayed.

With full view, all the lines can still be seen, but fewer lines are identified by the "lightning flash" icon as being contributory factors.

In either case, visibility is distinctly improved and analysis is facilitated.

See also

Switching Between partial and full view (Page 67)

Displaying element in LAD (Page 59)

Displaying element in STL (Page 57)

Displaying the element as a signal list (Page 56)

2.10 Motion View

2.10.1 Motion View

The purpose of the Motion View
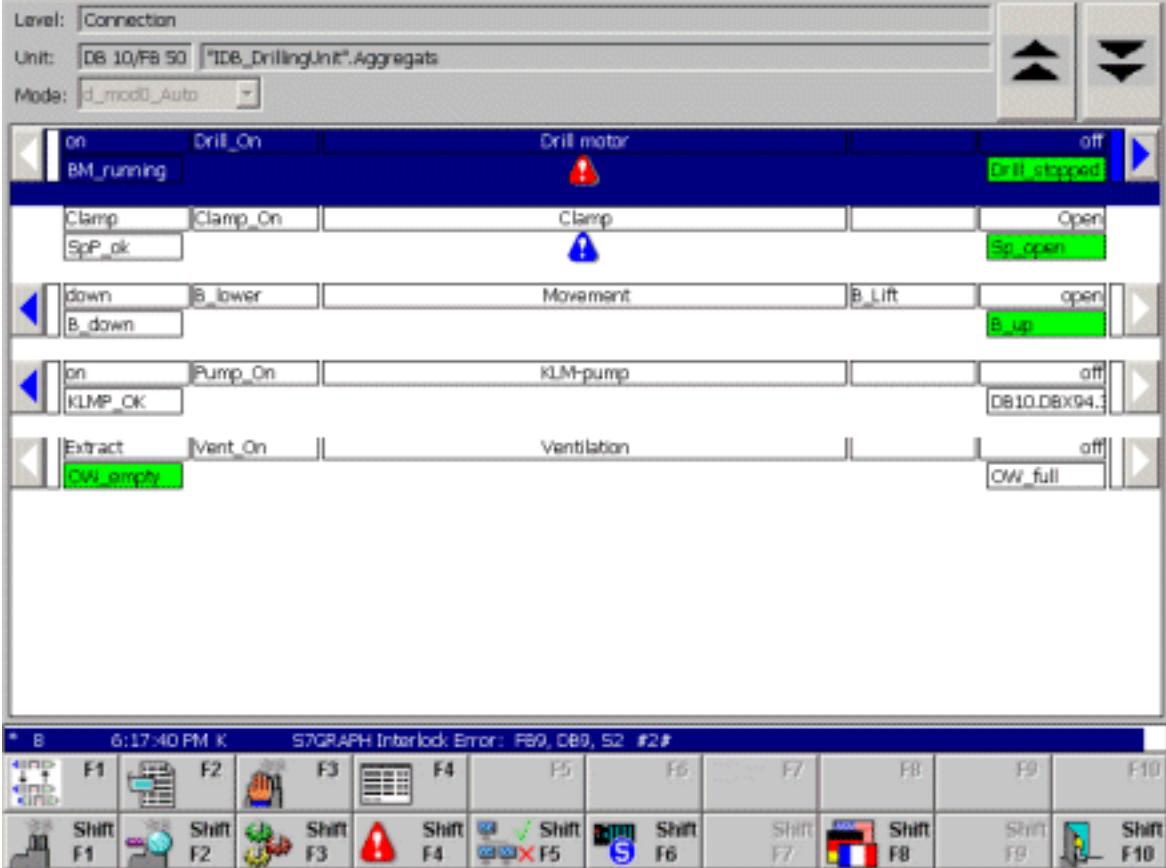
Figure 2-28   Motion View (example on PC)

The Motion View helps you when rectifying a fault or operating the system. It allows you to execute specific motions for individual units manually by means of keys. For example, you could move the die of a stamping press back to its starting position before removing a jammed workpiece.

Each movement can be executed in two directions, e.g. in/out, open/close, up/down, forward/backwards.

Note

With programming with S7-GRAPH, motions cannot be defined. However, in S7-GRAPH you can assign motions from S7-PDIAG to a unit.

The number of motions shown in the motion display may not be changed during runtime. Otherwise runtime could become inoperable.

Blocked motions

If a motion is disrupted or blocked by another panel and hence cannot be executed, then you will recognize this by the "warning triangle" icon in the Message Screen.

Sequence in the Motion View

The sequence of motions in ProAgent's Motion View is the sequence established when the motion concerned was configured in S7-PDIAG's Motion View. The sequence of motions can be defined only inside a unit.

End positions

The Motion View also shows which end positions have already been passed. This means that on a stamping press, for example, you could see what the current position of the die is. If the motion has a fault you can see at what point it is blocked.

Prerequisites

A controller must have been suitably programmed in order that motions can be triggered at the HMI device. The UDT "motion" (UDT2) must be used and appropriately interconnected. More detailed information on programming motions is provided in the S7-PDIAG manual.

Note

The Runtime language used in Runtime must also be present in the STEP 7 project. Otherwise, the STEP 7 texts will not be displayed in the Motion View.

Using direct keys

The OP/TP/MP 270 / 277 / 370 and MP 377 provide direct DP keys and Panel PCs provide the direct key module for plant control. You use the direct keys to set bits in the I/O area of the SIMATIC S7 directly from the HMI device.

Direct keys enable you to implement operating actions quickly without any communication-related delay. They are essential, for example, in stepping mode.

Note

When using direct keys, the functions `MotionViewStart` and `MotionViewStop` should be removed from the Motion View.

Defining the device ID

If the same motion is controlled at several HMIs, you must use the expanded UDT "motion" (UDT2), so that the HMI can assign the motion uniquely using the device ID in the UDT2.

The device ID identifies the HMI by means of a unique number. In ProAgent-Editor, you must assign a unique HMI ID to each HMI as a device identifier.

⚠ **CAUTION**

In order to scroll from one motion to the next in the motion display, please note the following: After scrolling through the motions, the operator must wait until the display indicates that these motions can be used before attempting to handle further motions.

A motion can be used if the "Left" and "Right" buttons are displayed next to it. ◀▶

If the operator scrolls the motions and then immediately tries to handle another motion, it is possible - for a few moments - to be still handling the motion that was previously displayed at this position. This is dependent on the time required to run through the messages and reset the previous motion bit.

See also

What you see on the Motion View (Page 79)

Keys in the Motion View (Page 83)

Defining the scope of diagnostics (Page 122)

How to work with the Motion View (Page 84)

2.10.2   What you see on the Motion View

Function

The Motion View shows a list of all the motions configured for a unit and their subordinate hierarchy levels.

General layout

Like all the diagnostic screens, the Motion View has a standard layout. There are only minor differences between the various types of operating unit.

The following illustration shows an example of the Motion View on a PC.
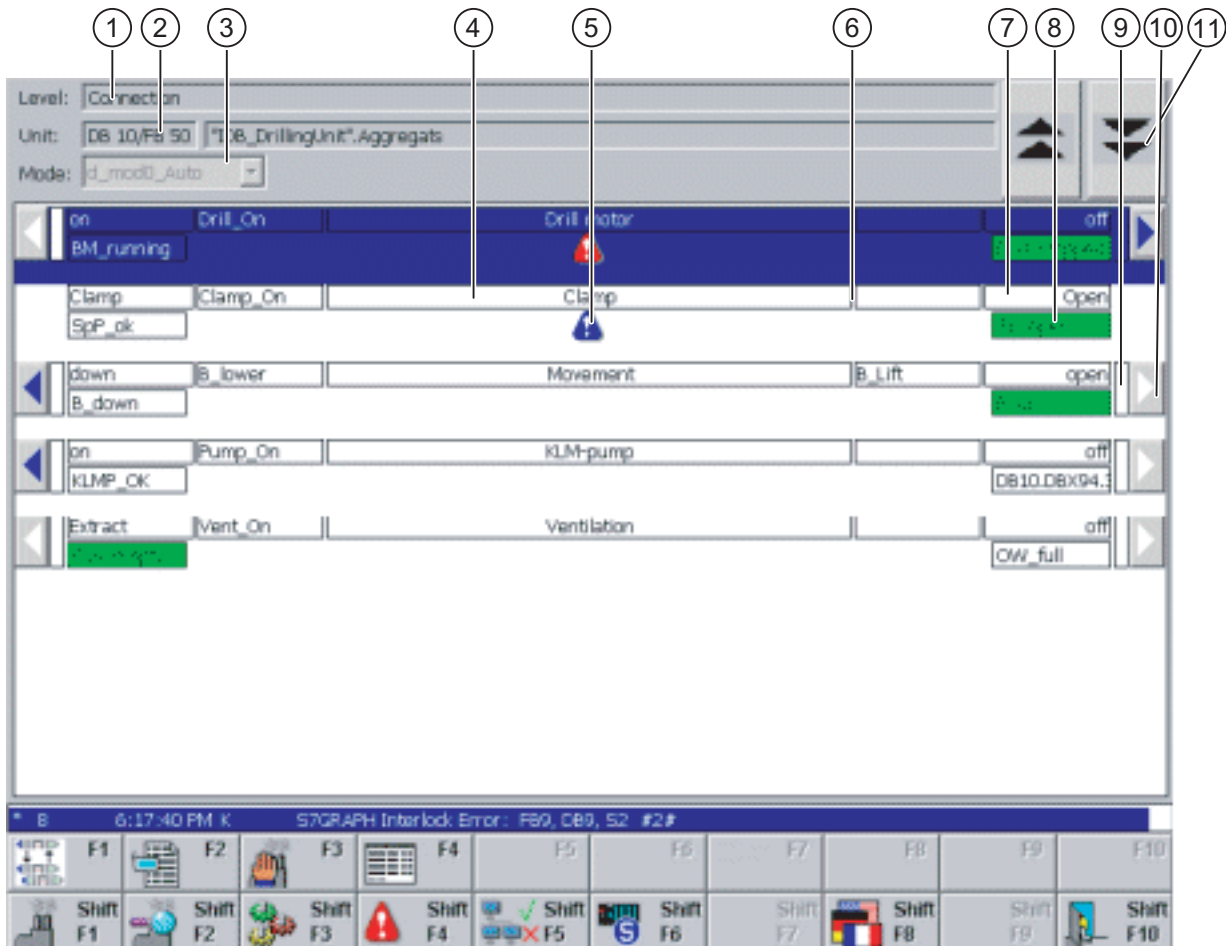
Figure 2-29   Motion View (example on PC)

Information about the unit

The first line shows information about the selected unit. The selected unit is that unit of your system for which the motions are displayed further down the screen.

Which unit is the selected unit depends on where the Motion View was activated from.

- If you activated the Motion View from the Message Screen, the selected unit is determined by the alarm message that was highlighted by the cursor on exiting. The unit to which that alarm message is attributable becomes the selected unit on the Motion View.

- If you activated the Motion View from the Overview Screen, the selected unit is the unit that was highlighted by the cursor when the Overview Screen was quit.

- If you opened the Motion View from the overview list of motions then the unit selected is the unit to which the motion highlighted on exiting the overview list belongs.

Specifically, the information about the selected unit is made up of the following details:

(1) The level to which the unit belongs is displayed in this field.

(2) In this field you see the type of component, the component number and the complete name of the selected unit.

(3) The current mode of the unit is displayed in the "Operating mode" box. You can change modes with the "Operating mode" key.

If no operating mode is defined in the STEP 7 program then the field will be empty. In this case, you cannot set the operating mode.

List of motions

Below the information on the selected unit is a display of the motions.

The individual motions are arranged underneath each other.

The order of the display depends on the attributes that the units have been assigned in the "Properties" > "Units" dialog box in S7-PDIAG. The Motion View in ProAgent is built in accordance with the attributes "Belongs to screen" and "Position in screen". If no default values are specified at that stage, or if individual positions are assigned twice over (including on several CPUs), the order is alphabetic.

Each movement can be executed in two directions, e.g. in/out, open/close, up/down, forward/backwards. One direction of motion is iconized by the left side of the screen and the other by the right side.

The two keys immediately to the left and right of the representation of the relevant motion are assigned to each motion. These keys are used to execute the motions.

Each motion line is made up of the following elements:

(4) This shows you what motions are involved. The text was assigned to the motion when configuring the unit (tag name of the motion). Only the last two parts of the tag name, separated by ".", are shown.

(5) A fault identifier will be displayed here in case of fault:

- If motion is blocked then a warning triangle appears as a fault identifier.

- If motion is blocked by another operating device then a blue warning triangle appears.

- If the connection to the PLC is disrupted or an address error occurs then the "Faulty connection" icon is displayed.

(6) Here the output from which the motion is controlled is displayed. Use the "Icon / absolute" key to switch between the icon display and absolute display of the output if corresponding attributes were stored during programming in S7–PDIAG under "Controlled operand direction 1" and "Controlled operand direction 2".

(7) This shows you which direction of motion is iconized by which side of the screen. This motion is executed when you press the adjacent key or the corresponding traversing key.

(8) Here you are shown a iconic representation of various target positions. In addition, an explanatory text is displayed for each target position if this was configured.

A target position corresponds to a specific motion (e.g. a specific belt position, a specific angle of rotation etc.). There can be several target positions for a motion.

- If a target position has not yet been reached it is shown as an outline.
- If a target position has been reached, it is shown against the configured background color (default: green).

(9) While a motion is being executed the rectangle next to the button that you can use to initiate the motion is blue.

(10) If you are using a PC as the operating unit then the triangle in the margin is designed as a command button. You can click it with the mouse or press the function key indicated. On all other operating units it refers to the corresponding soft key.

The triangle also indicates to you whether or not a motion can be executed:

- If the motion can be executed, the triangle is displayed in blue
- As long as the motion is being executed the triangle blinks in blue
- if the motion cannot be executed because it is blocked or locked by an interlock (e.g. the last target position has already been reached), the triangle is displayed simply as an outline.

(11) With these buttons you can page forward or backward in the List of motions.

Target position modes in the S7-PDIAG Motion View

From S7-PDIAG V5.0 HF3 and higher you can use the S7-PDIAG Motion View to configure different display modes for the selected movement to all target positions. The target positions of movements are displayed in ProAgent's Motion View in accordance with the configured S7-PDIAG display modes.

Different functions can be performed at a given target position:

- multilingual text,
- absolute or iconic names of address references, or
- decimal numbers.

For detailed information on displaying target positions please refer to "Target position modes in the S7-PDIAG Motion View".

See also

Overview Screen (Page 35)

Message Screen (Page 28)

Detail View (Page 47)

Keys in the Motion View (Page 83)

Target position modes in the S7-PDIAG Motion View (Page 244)

How to work with the Motion View (Page 84)

2.10.3   Keys in the Motion View

Application

The number of keys/buttons configured in the Motion View is limited by the number of keys/buttons available on the unit. You can, however, assign other functions to these keys/buttons or to additional buttons.

You can use the following keys on the Motion View:

Key / button	Name	Function
	Page change	With these keys you can, with sorted motions, page forward or backward between pages in the List of motions.
		You can also perform these actions using the ProAgent function "MotionViewScroll".
Ctrl F1 to Ctrl F12 (PC)	Buttons on the side Softkeys	You use these keys to trigger the individual motions. A motion can only be executed if the triangle icon has a blue background. As long as the motion is being executed the triangle blinks in blue. If the icon is displayed simply as an outline, the motion cannot be executed. A motion is activated for the whole time you keep the key pressed. If execution of the motion is successful, the square next to the triangle icon is likewise highlighted blue.
	Subunits	This key is used to specify whether only the motions of the selected (superior) unit are displayed or all motions of subordinate units as well (see "Hierarchical units on the Motion View"). The (top-level) unit is the unit in this instance which was selected in the screen from which the Motion View was called.
	Symbol / absolute	This key can be used to select symbolic or absolute visualization of outputs that are controlled by the motions. The corresponding attributes must have been stored during programming in S7-PDIAG.
	Motions list	Use this key to open the motions list in order to select further motions.
	Overview Screen	Use this key to open the Overview Screen.
	Detail View	Use this key to call up the Detail View.
	Message Screen	Use this key to open the Message Screen.
	Step View	Use this key to open the Step View.
	S7-Manager	Use this button to change directly to SIMATIC Manager and to work with other SIMATIC applications.

Key / button	Name	Function
	Network entry	Use this button to display the selected S7-PDIAG unit directly in the LAD/FBD/STL Editor.
	Status/Control	Use this key to open a screen with "Status/control" field. This enables you to monitor and control the addresses of the relevant control program.
	Language	This key can be used to switch languages where a multilingual project has been compiled.
	Back	Use this key to return to the Diagnostic Start Screen. You can change this functionality by implementing corresponding functions (see "ProAgent functions for selecting diagnostic screens").

See also

How to work with the Motion View (Page 84)

What you see on the Motion View (Page 79)

Selecting diagnostic screens (Page 153)

Hierarchical units in the Motion View (Page 87)

2.10.4   How to work with the Motion View

What you need to do

This chapter gives a general outline of how to use the Motion View most effectively in practice.

Objectives

You want to remove a block and to do so, you wish to initiate some motions on the blocked unit manually. You also want to see which motions are blocked.
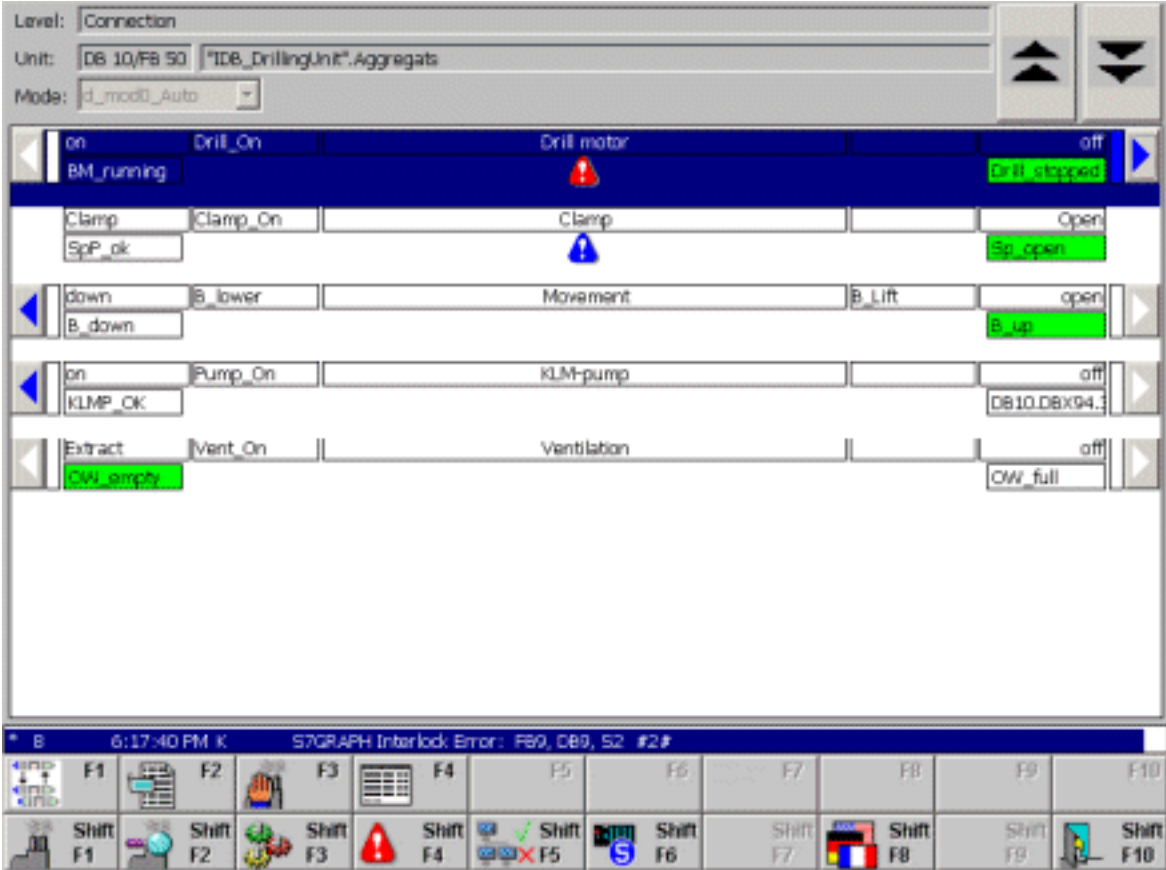
Figure 2-30   Motion View (example on PC)

Which unit?

The header of the display tells you that you are in the right unit since only the motions belonging to this unit are displayed.

Which motions?

The rest of the screen lists all the available motions one below the other on separate lines. With the cursor keys on the upper right, you can page to the next or previous page if more motion is possible than can be shown on the screen.

If a unit also has hierarchically subordinate units, you can use this key to view the motions of those subunits as well (see "Hierarchical units on the Motion View").

If you wish to initiate a motion that is not currently shown you can use this key to open a list of all the motions. Here you can quickly select the desired motion and open the associated Motion View.

Which faults?

You recognize that a motion is blocked by the fact that the "warning triangle" icon appears in the center of the line under the name of the motion.

Whether a motion can be executed in a particular direction is indicated by the triangle icons at either end of each line:

A triangle icon on a blue background indicates that the motion can be carried out in the specified direction. As long as the motion is being executed the triangle blinks in blue

If the triangle icon is displayed simply as an outline, the motion in the specified direction cannot be executed.

Note

If a motion cannot be triggered, this does not mean that it is blocked. It may be that specific interlocks have been stored in the PLC program or a motion has already reached its extremity.

Executing a motion

You have now found the motion that you wish to execute and established that it is not blocked and can be executed.

To trigger the motion:

- On an operating unit (OP/TP/MP, Panel PC), use the key or button to which the relevant triangle icon is pointing (that is, to the right or left next to the display).

- On a PC, press the function keys for the corresponding triangle icon (e.g. "Ctrl F1").

- If your operating unit has a mouse or touch panel, click or press the corresponding triangle icon.

⚠ **WARNING**

Do not switch between the keyboard and the mouse when operating the motions.

Tracking a motion

The corresponding triangle and the square displayed next to it blink blue during the motion.

As soon as a particular target position is reached, the corresponding target position icon changes its appearance as follows:

- white rectangle: target position not yet reached

- green rectangle: target position reached or exceeded

Exiting the Motion View

You can switch directly from the Motion View to the other diagnostic screens or also exit diagnostics:

switches to the Overview Screen

switches to the Detail View

switches to the Message Screen

switches to the Diagnostic Start Screen

See also

Motion View (Page 77)

What you see on the Motion View (Page 79)

Keys in the Motion View (Page 83)

Hierarchical units in the Motion View (Page 87)

2.10.5   Hierarchical units in the Motion View

Hierarchical units

When programming a PLC it is possible - depending on the programming language used - to define a hierarchy of the individual units. In the case of S7-PDIAG a unit can therefore be equated with a module which, as a rule, also represents a process unit. By virtue of the multi-instance concept, a unit can also contain other units.

Display

The Motion View always shows all movements for a specific unit of your installation. Which unit this is depends on the screen from which the Motion View was retrieved (see "What you will see in the Motion View").

If there are a number of hierarchical levels between the units of a system, the Motion View initially shows only the movements for the current unit.

If you want to trigger movements of subordinate units, you must switch displays.

Switch display

In order to also see the movements of subordinate units, use the "Subunits" key.

After switching displays, all movements of subordinate units are displayed.

In order to hide the movements of subordinate units, use the "Subunits" key again.

See also

Keys in the Motion View (Page 83)

What you see on the Motion View (Page 79)

How to work with the Motion View (Page 84)

2.11 Step View

2.11.1 Step View

Purpose of the Step View

The Step View helps you to rectify faults in an S7-Graph sequence of steps.
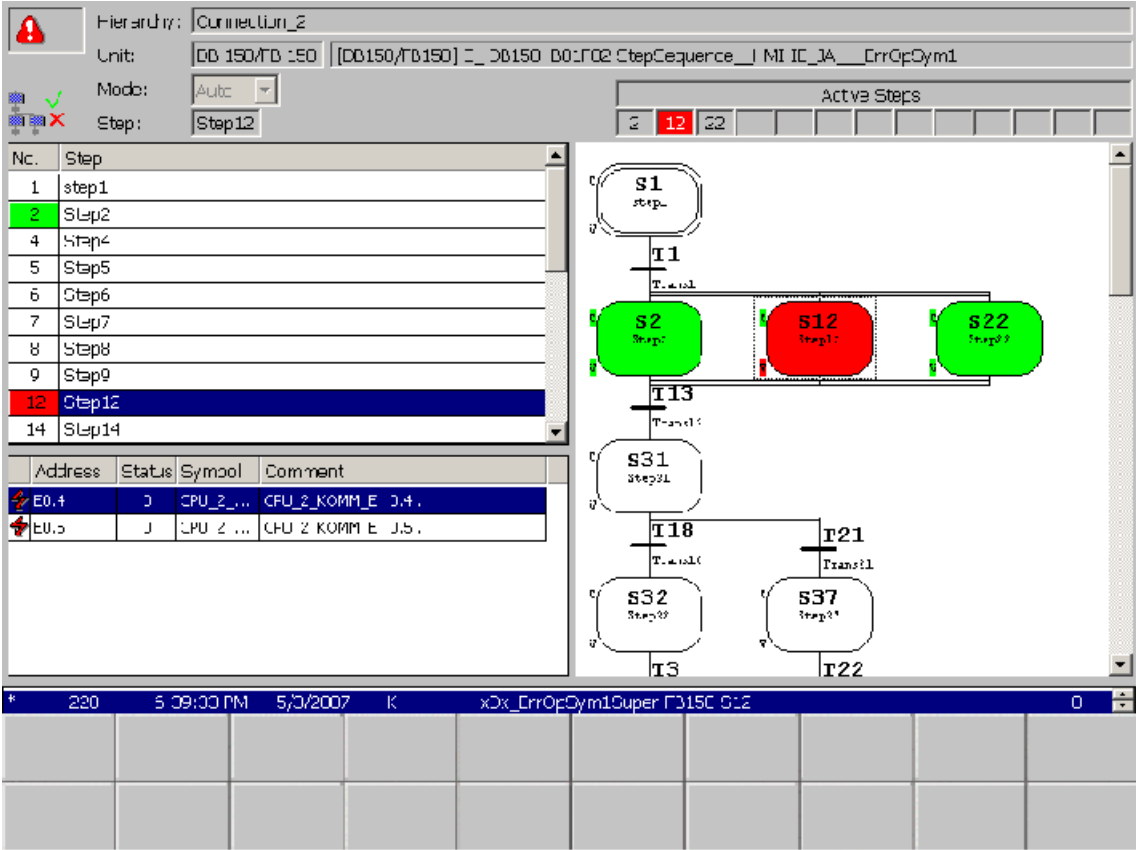
Figure 2-31   Step View (example on PC)

Structure

Structure of the Step View:

- The step list returns information about the unit selected from the diagnostics screen in which you called the Step View.

  – Name

  – Current step, including the name and number

- The list of faulty addresses on the bottom left of the screen returns information about the address of the selected step.

- The step diagram on the right area of the screen returns a graphical view of the steps. You can select steps and transitions. The corresponding networks are displayed on the bottom left area of the monitor screen.

Functions

In the Step View you can

- Manually choose to enable/disable specific individual steps

- Initialize or disable the step sequence

⚠ WARNING

The operator who uses the Step View must take appropriate measures to ensure consistency of the step sequence. In particular inconsistent states may develop at the step sequence or in the system particularly when you manually enable/disable steps.

Note

Step View on panels with 6" display

The new Step View is not suited for use on panels with 6" display because of their insufficient resolution.

See also

What you see on the Step View (Page 90)

Keys in the Step View (Page 93)

How to work with the Step View (Page 94)

2.11.2   What you see on the Step View

Standardized structure

The structure of the Step View is standardized similar to the diagnostics screens. The Step View contains information about the unit, a step list and an address list, and the graphical view of the step sequence.

The figure below shows an example of the Step View on a PC.
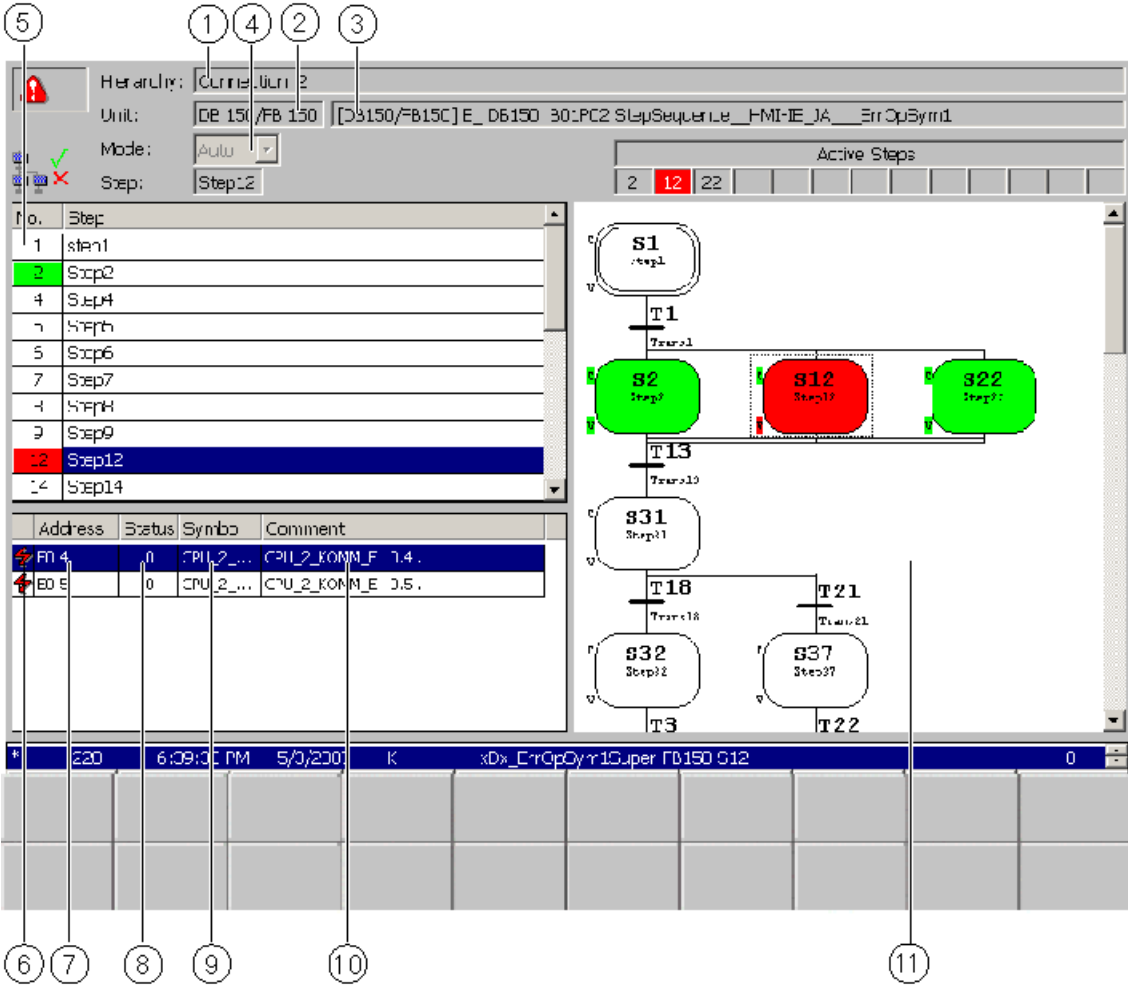
Figure 2-32   Step View (example on PC)

Information on the display mode

The top left field gives you information on the display mode:

The "Warning triangle" icon indicates a unit error. The unit on which the fault occurred first is identified by a flashing icon. This indicates to you that this fault is not a secondary fault.

The "Connection error" icon indicates an error in the connection to the controller or an addressing error.

The "Inconsistency alert" icon indicates that the data for this network have changed in the STEP 7 configuration. In a criteria analysis the network data are read by ProAgent directly from the controller.

The "Consistency error" icon indicates that the data for this network are not consistent with the STEP 7 database. Regenerate your project before continuing.

Information about the selected unit

The upper area of the display returns detailed information about the unit selected in the diagnostics screen in which the Step View was called.

(1) The name of the higher-level unit is returned in the "Unit level" field.

(2) The "Unit no." field returns the block type (FC or DB) and the block number of the selected unit.

(3) The step sequence name is returned in the "Unit" field.

(4) The currently set mode of the unit returned in the "Mode" field.

Step list

The upper left area of the Step View displays the steps of the selected step sequence.

(5) Outputs a list of all steps of the selected step sequence. All step names and step numbers are displayed. The step status is identified by its color:

- Green = active

- Red = faulty

- Light blue = initial step

The program automatically displays a section of the step list which matches the graphical view of the step sequence on the right half of the screen.

List of faulty addresses

The address list remains blank when a branch is focused.

Elements in particular displayed in the address list:

(6) Column "Type" returns the type of error:

- C = Interlock error

- = Supervision error, or missing address in a transition

(7) "Address" column: Displays the individual addresses.

(8) "Status" column: The address status can assume the following values.

- 0 = no signal

- 1 = signal may not be present

(9) "Symbolism" column: Lists the symbol of the signal in accordance with the symbol list in STEP 7.

(10) "Comment" column: Displays a comment on the signal in accordance with the symbol list in STEP 7.

Step diagram

(11) The right section of the screen shows a graphical view of the step sequence similar to the view in S7-GRAPH. This area also determines the contents visualized in the step list and address lists.

The color coding identifies the step status and the currently focused object of the step sequence:

- Object on blue rectangular background: Object is focused
- Green = step is active
- Red = step error
- Light blue = initial step

You can scroll the step diagram using the cursor keys when operating in manual mode. The graphical view is automatically corrected in auto mode in order to visualize at least one active step in the view.

You can zoom the graphical view using the "+" and "-" buttons.

See also
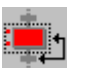
2.11.3   Keys in the Step View

Application

You can use the following keys on the step view:

Symbol	Name	Function
	Unit detail view	With this key you can activate the selected unit and switch to the detail view.
	Zoom in step diagram	Zooms the step diagram by the next higher zoom factor.
	Zoom out step diagram	Zooms the step diagram by the next lower zoom factor.
	Operating modes	Use this key to change the operating mode of the selected unit: • Automatic operation, • Manual operation • Stepping mode.
	Switch network mode	Toggles the detail view between the transition network and step network.
	Deactivate sequence	Use this key to deactivate all the steps in the step sequence. No further steps will be executed.
	Initialize sequence	Use this key to start the step sequence with the initial steps defined.

Symbol	Name	Function
	Deactivate step	With this key you deactivate the selected step. To do this, you must be in "Manual mode".
	Activate step	With this key you activate the selected step. To do this, you must be in "Manual mode".
	Next step	This key activates the next step. "Stepping mode" is prerequisite.
	Acknowledge faults	Use this key to acknowledge a monitoring fault that has arisen during operation (supervision condition met).
	Overview Screen	Use this key to open the Overview Screen.
	Detail view	Use this key to call up the detail view.
	Motion view	Use this key to open the motion view.
	Message Screen	Use this key to open the Message Screen.
	Step view	Use this key to open the step view.
	S7-Manager	Use this button to change directly to SIMATIC Manager and to work with other SIMATIC applications.
	Network entry	This key is used to view a selected message or step sequence directly in the tool in which it was programmed. • Step sequences are visualized in S7-GRAPH. • S7-PDIAG units are displayed in the LAD/FBD/STL Editor.
	Status force	Use this key to call up a screen with a "Status force Variable" field. This enables you to monitor and control the addresses of the relevant control program in a tag table. Detailed information on Status force can be found in the "Runtime Manual".
	Language	Use this key to switch languages where a multilingual project has been compiled.
	Back	Use this key to return to the Diagnostic Start Screen. You can change this functionality by implementing corresponding functions (see "ProAgent functions for selecting diagnostic screens").

See also

Scope and function of the global key set (Page 27)

How to work with the Step View (Page 94)

2.11.4 How to work with the Step View

Practical procedure

This section provides a general outline of practical, efficient work with the Step View.

Objectives

You want to eliminate a fault by activating steps in the sequence on which the unit with the fault is based.
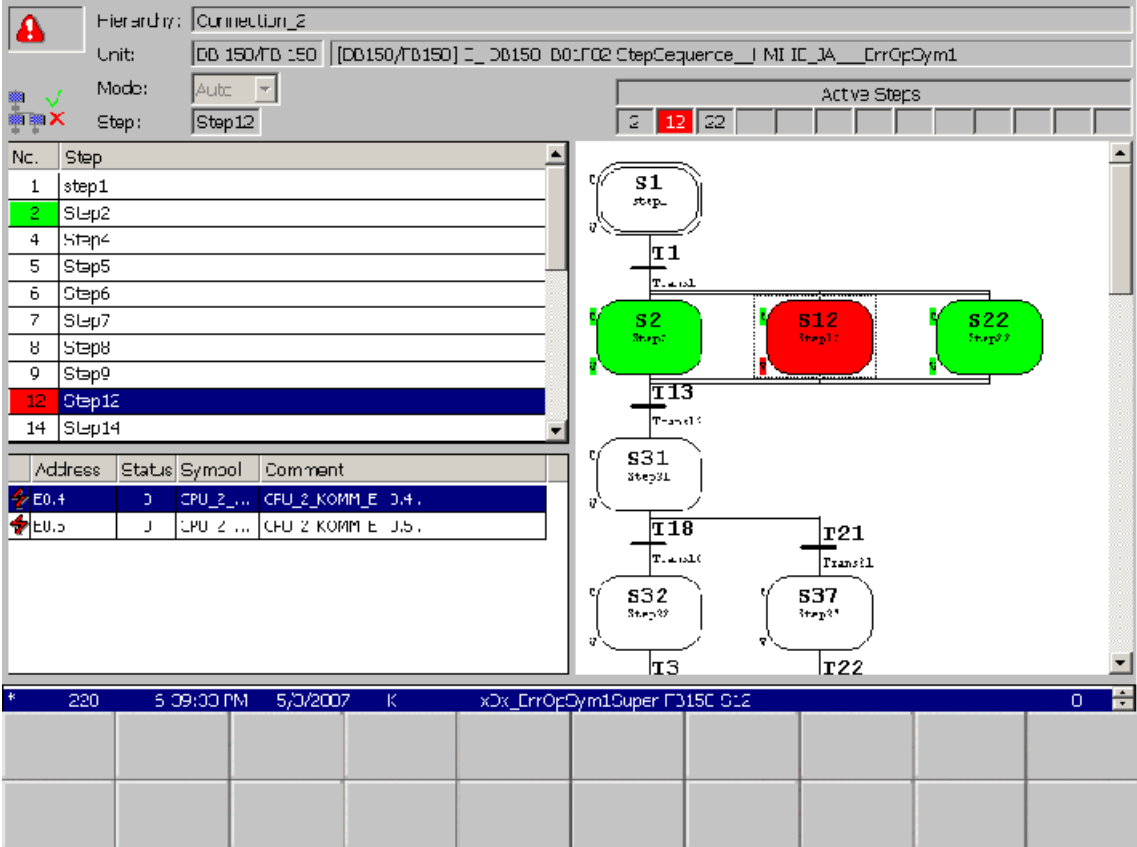
Figure 2-33   Step View (example on PC)

⚠ WARNING
The operator who uses the Step View must take appropriate measures to ensure consistency of the step sequence.

Workflow

Start by analyzing the type of error if an error is detected in the S7-Graph step sequence.

Change from auto mode to manual or stepping to troubleshoot the fault. You can synchronize the step sequence with the process sequence and return to auto mode after having eliminated the fault.

Which unit?

In the "Unit" box, check that you are in the right sequence as only the steps associated with this sequence are displayed.

Deriving error information from the Step View

The color coding in the step diagram on the right section of the screen identifies the step status and the currently focused object of the step sequence:

- Object on blue rectangular background: Object is focused

- Green = step is active

- Red = step error

- Light blue = initial step

The graphical view is automatically corrected in auto mode in order to visualize at least one active step in the view. You can scroll the step display using the cursor keys when operating in manual mode. You can zoom the graphical view using the "+" and "-" buttons.

The step sequence list on the top left provides a brief overview of the available steps. Active steps are identified by the green color, and faulty steps by the red color.

The address list on the bottom left returns details about the type and cause of the fault. Information provided:

- Type of fault:

    - ⚡ C = Interlock error

    - ⚡ = Supervision error, or missing address in a transition

- Missing or faulty addresses

- Status of the address (0 = no signal, 1 = signal may not be present)

- Signal symbolism and comment

Selecting the mode of operation

Change to "Manual mode" in order to troubleshoot faults.

Click the "Change mode" button to open the mode selection dialog box.

Operating modes available:

- Auto mode:
  The next step is automatically called as soon as the transition is fulfilled.

- Manual mode:
  You can go to the next step using the "Activate step", regardless of whether or not the transition condition is fulfilled.

- Stepping mode:
  Provided the transition condition is fulfilled, you can activate the next step using the "Activate step" button.

Select the operating mode from the "Operating mode" dialog box using the mouse or the cursor keys. Confirm your selection by clicking "Apply" or by pressing "ENTER".

Executing single steps

If the step sequence is in "Manual" mode, you can activate single steps irrespective of whether the transition condition is fulfilled.

If the step sequence is in "Stepping mode", you can activate specific steps irrespective of whether the transition is fulfilled.

Use this key to activate the selected step.

Use this key to deactivate the individual step selected.

Executing single steps

If the step sequence is in "Manual" mode, you can activate single steps irrespective of whether the transition condition is fulfilled.

 Use this key to activate the selected step.

 Use this key to deactivate the individual step selected.

If the step sequence is in "Stepping mode," you can switch to the next step.

 This key activates the next step in the step sequence.

⚠️ **WARNING**

Manually activating and deactivating steps can give rise to inconsistent states of the step sequence or system.

Acknowledge faults

If a monitoring fault occurs during operation then you can acknowledge an error message.

 Use this key to acknowledge a runtime monitoring fault.

Using the step sequence

In the Step View you can also activate or deactivate the entire sequence of steps.

If you press the "Initialize" key, you will restart the entire sequence of steps with the initial steps defined.

Pressing the "Disable" key deactivates all steps of the sequence. No further steps will be executed.

Viewing unit details

If you need to have detailed information on the unit displayed in the step sequence display, switch to the corresponding Detail View.

You can press this key to activate the step sequence display and switch to the Detail View.

Exiting the Step View

You can switch directly from the Step View to the other diagnostic screens or also exit diagnostics:

Switches to the Overview Screen

Switches to the Detail View

Switches to the Motion View

Switches to the Message Screen

Switches to the Diagnostic Start Screen

See also

Prerequisites for the project configuration
3

3.1 Prerequisites for the project configuration

This chapter will show you which prerequisites must be fulfilled during the programming of the PLC i n order for the process diagnostics to be embedded into a project.

The different steps that are necessary to integrate process diagnostics into a WinCC flexible project are described in detail.

Furtheremore, you will find out how to upgrade an existing project using process diagnostics.

3.2 Basic requirements of the PLC program

Requirements

A process diagnosis requires that both the PLC and the operating module be configured. WinCC flexible with ProAgent can only be used for configuring the operating unit.

Note

A diagnosable PLC program is a basic requirement in order to use WinCC flexible plus ProAgent.

Programming language

The PLC is programmed either in STEP 7 (STL or LAD), S7-GRAPH or S7-HiGraph.

- If you are using LAD/CSF/STL, you will need the S7-PDIAG options pack. S7-PDIAG allows you to extend the PLC program so that individual signals such as for the status of inputs, outputs, markers, etc. are monitored.

- If you are using S7-GRAPH or S7–HiGraph Version 5 or higher, you will not need an additional option pack. The PLC programs are automatically diagnosable.

You will likewise need the S7-PDIAG options package only if you want to trigger movements for S7-GRAPH units.

The procedure for programming the PLC and the particular aspects to be considered when doing so are explained in the "Documentation for S7-PDIAG", for "S7-GRAPH" and/or for "S7-HiGraph".

Points to bear in mind

The control program must run without errors.

Make quite sure that the language settings of the PLC program and the WinCC flexible project are in agreement:

- If you are working with more than one language, the languages to be selected and configured in WinCC flexible must have been configured in the PLC program

- If you are working in one language only, the same language must have been used in the PLC program as is to be used to configure the operating unit

- The PLC program must have been compiled.

What you must remember when using S7-PDIAG

If you are working with S7-PDIAG, bear the following points in mind:

- The FB for fault detection in the OB1 must be called.

- The program may not contain loops, because the FB for fault detection is only called once per cycle.

- Fault detection in S7-PDIAG for the individual monitors must be activated.

- Initial value recording for the individual monitors must be activated, if you perform a criterial analysis in the Detail View.

- The UDT "Movement" must be used, if you would like to use the "Motion View". The UDT "Movement" sets up a standardized interface to the Motion View.

- If several units may display the same movements, they must use the UDT "Movement" expanded by the HMI_ID (UDT2).

What you must remember when using S7-GRAPH

If you are working with S7-GRAPH, bear the following points in mind:

- You can assign a FB/DB pair to a sequence of steps under "Extra">"Block Settings">"Process Diagnostics".

In ProAgent, this unit of movement (the FB/DB pair) will be handled in the Overview Screen as part of a sequence and will not be shown as a separate unit.

 Instead, the "Motions" symbol will appear next to the assigned unit.

- The error handling and the criteria analysis for ALARM_S messages of the movement unit continue to be active. You can move back and forth to the movement unit at the sequence.

- Make certain that the generation of diagnostic data is enabled.

What you must remember when using S7-HiGraph

Make certain that the generation of diagnostic data is enabled.

Message procedure for ALARM_S

If you are using ProAgent, the ALARM_S message procedure is already preset in WinCC flexible. ALARM_S messages belong to the "S7 Messages" message class.

For more Information about ALARM_S, please refer to the information system for "WinCC flexible".

Message text

During PLC programming you also define the message texts that appear as alarm messages on the operating unit. In other words, the text of diagnosable messages is not entered in the "Message" editor in WinCC flexible as would normally be the case, but in STEP 7. The advantage of this is that you can use the messages on different display units but only have to enter them once.

For an overview of the general procedure as for example in the case of S7-PDIAG, please refer to the topic "How to configure ALARM_S messages".

Dummy entries in message texts

By inserting dummy entries into the ALARM_S message text you can also have the message text display the symbols and remarks relating to the operands that led to the fault. In this way the system operator obtains the most important information about the system fault in the message window itself or in the message line without having to switch to the Diagnostic Screens.

For more detailed information on the topic of showing the result of criteria analysis in a message text, please refer to "Displaying the result of criteria analysis in the message text".

See also

Detail View (Page 47)

Motion View (Page 77)

Steps involved in upgrading a configuration to include process diagnostics (Page 108)

Shared data basis with STEP 7 (Page 102)

Displaying the results of the criterial analysis in the message text (Page 241)

Configuring ALARM_S messages (Page 241)

3.3 Shared data basis with STEP 7

Accessing the database

STEP 7 and its optional packages save all data required for process diagnostics to a shared database.
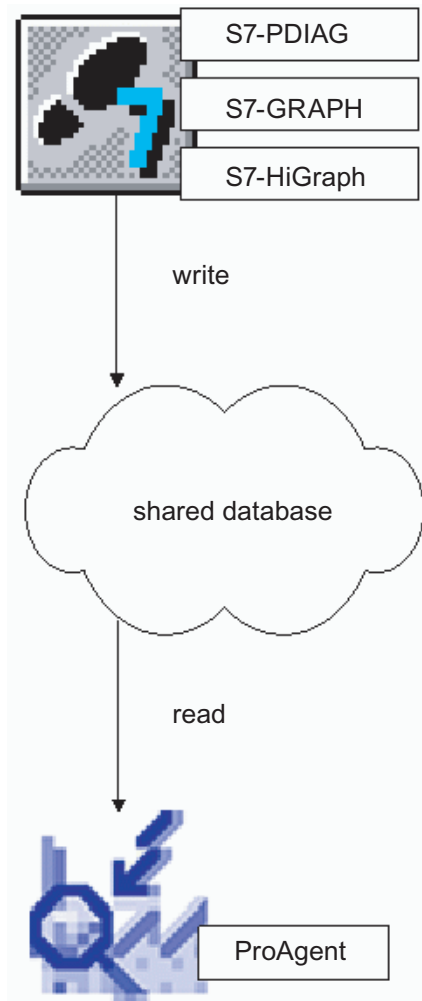
Figure 3-1   Shared database

WinCC flexible accesses the required information about the controllers present from that database, i.e.

- Which units are diagnosable?
- Which signals are monitored for which states?
- Which message texts have been defined?

Updating the database

Always compile the monitoring blocks before starting configuration in ProAgent after modifying the control program.

Note

The database is not updated if you make changes in STEP 7 without subsequently recompiling the monitoring blocks. WinCC flexible will then not have access to the latest data!

During commissioning, in the event of minor changes in S7-PDIAG you can apply the data relevant to diagnostics direct to the CPU. You then do not have to recompile your ProAgent project for the time being.

Content requirements

At certain times, the data stored in the database must meet specific "minimum requirements" for use by WinCC flexible.

It is always preferable, of course, if the control program is already complete and fully tested. In practice, however, this will not always be the case and you may want to be working on the control program and the HMI device configuration at the same time.

The table below shows which data are absolutely necessary at which point. A description of the individual steps can be found in the section "Overview of configuration steps in WinCC flexible".

Configuring	Prerequisites
Integrating the diagnostic screens	System planning (WinCC flexible/STEP 7)
Linking the diagnostic screens	System planning (WinCC flexible/STEP 7)
Selecting the units	Definition of monitoring functions (STEP 7)
	Compiled monitoring blocks (STEP 7)
Compiling and downloading	Final translated control program (STEP 7)

Data consistency

Controllers and HMI devices exchange data but not their programs during operation. As the programmer, you are responsible for ensuring that the latest version of the relevant program is used on each device.

If, therefore, changes are made to the control program at some later date, you must also recompile and re-download the HMI device configuration so that there are no inconsistencies between devices.

When compiling the HMI device configuration, the stored messages and diagnostic data are imported from the database shared with STEP 7.
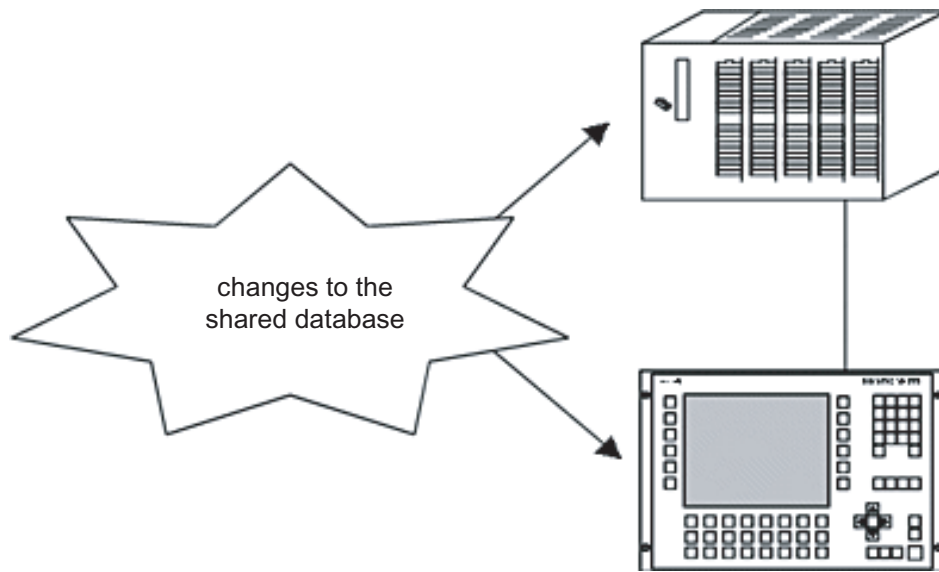
Figure 3-2   Interdependencies

Faster compilation with S7-PDIAG V.5.0

If you are using S7-PDIAG version 5.0 or higher, only the messages and diagnostic data that are not in agreement with the status of the HMI device configuration is imported from the database. This accelerates compilation markedly.

If the configuration is already at the same status as the shared database, the project does not need to be compiled and the system will not therefore offer this option. In this case a message will be displayed accordingly.

Note

You can further reduce the compilation time by judiciously arranging units into groups in S7-PDIAG. When doing so, consider how the groups are allocated to the HMI device. If changes are made to the S7-PDIAG configuration you only have to recompile and re-download the HMI device configurations affected by the S7-PDIAG changes. (see also "Selecting the units").

Forcing compilation (S7-PDIAG version 5.0 or higher)

When compiling the WinCC flexible/ProAgent project, ProAgent synchronizes only the diagnostic data which has changed. In the event of difficulty, you can force complete synchronization or compilation of the diagnostic data. To do this you must first carry out a full compilation of all units in S7-PDIAG (menu command "Process diagnostics" > "Compile all"). You can then recompile your configuration in WinCC flexible.

See also

Upgrading existing projects

4

4.1 Upgrading existing projects

This chapter will show you which prerequisites must be fulfilled during the programming of the PLC i n order for the process diagnostics to be embedded into a project.

Furtheremore, you will find out how to upgrade an existing project using process diagnostics.

4.2 PLC program and project requirements when upgrading

Basic requirements of the PLC program

A diagnosable PLC program is a basic requirement in order to use WinCC flexible plus ProAgent. And the same is true whether you are creating a new project or upgrading an existing project to include process diagnostics.

For an overview of these requirements please refer to the topic "Requirements of the PLC program"

Requirements of the project

No particular requirements are placed on the WinCC flexible project being upgraded.

One basic requirement for upgrading with ProAgent, however, is that the operating unit being configured must be a diagnosable operating unit or a PC.

Your project can include more than one PLC including ones which do not meet the requirements for process diagnostics. In that case, however, those PLCs will not be capable of diagnostics.

You can also integrate several different diagnosable PLCs into your project and you can program these with different languages, depending on the respective requirements: e.g. a PLC in STL and with S7-PDIAG, another PLC in S7-GRAPH.

Uniform design

Information on how you can modify the diagnostic screens so that they are visually in harmony with the rest of your system configuration is also given under the heading "Modifying the diagnostic screens".

See also

4.3 Steps involved in upgrading a configuration to include process diagnostics

Overview

Upgrading an existing project to include process diagnostics is not significantly different from the process of creating a new project with diagnostic capability.

The diagram below shows the steps required in chronological order:
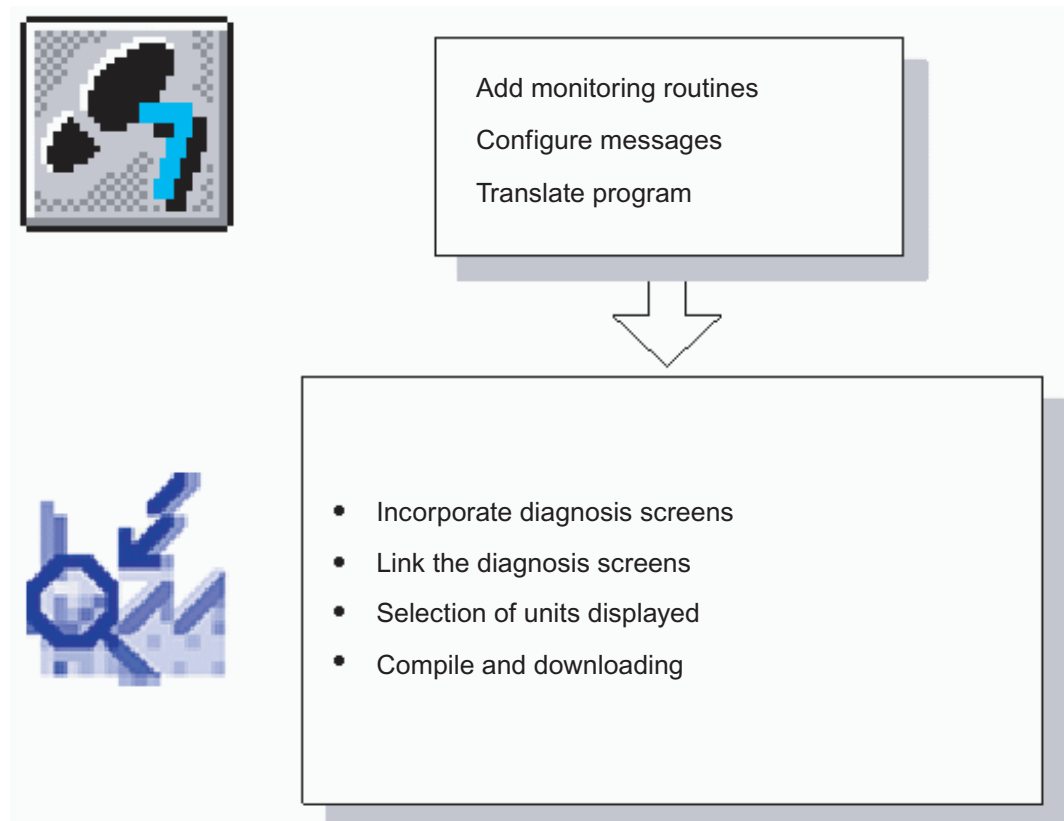
Figure 4-1   Configuration steps involved in upgrading a configuration to include process diagnostics

---

Note

A special list of the steps needed to upgrade a project to diagnosable status can be found under the heading "Overview of configuration steps in WinCC flexible".

Requirements for the PLC program

As universal system tools, WinCC flexible and ProAgent are closely linked with the STEP 7 software.

An overview of the minimum requirements which the PLC program must fulfill so that you can define a process diagnostics in WinCC flexible can be found under the heading "Requirements of PLC program and project when upgrading".

In order that you do not have to define the same data more than once, the system uses a common database as an interface. As a rule, therefore, the PLC program should exist and have already been compiled before you start working in WinCC flexible.

A list of which steps should have been completed in STEP 7 and at what point is given in the section "Shared data basis with STEP 7".

Configuration steps with WinCC flexible

The process of configuration in WinCC flexible requires only a few operations.

The list below outlines the special considerations when upgrading an existing project.

1. Incorporating the diagnostic screens: Start by copying the supplied standard diagnostic screens into your project. This can be done easily via the clipboard.

2. Linking the diagnostic screens: You must create a means of accessing the diagnostic screens from the existing screens. Normally, a function for selecting the Diagnostic Start Screen is entirely adequate. Conversely, you must provide a means of returning from the diagnostic screens to your own screens. The simplest way of doing this is to configure an appropriate screen selection function on the Diagnostic Start Screen. The remaining steps are the same as for creating a new project, i.e.:

3. Selecting the units.

4. Compiling and downloading.

See also

PLC program and project requirements when upgrading (Page 107)

Linking diagnostic screens (Page 134)

Steps in the configuration of a diagnostics (Page 111)

How to generate and transfer a project that can be diagnosed (Page 127)

Incorporating the diagnostic screens (Page 113)

Defining the scope of diagnostics (Page 122)

Configuring a process diagnostics

5

5.1 Steps in the configuration of a diagnostics

Overview

The diagram below shows the chronological sequence of all steps to be completed when configuring a process diagnostics.
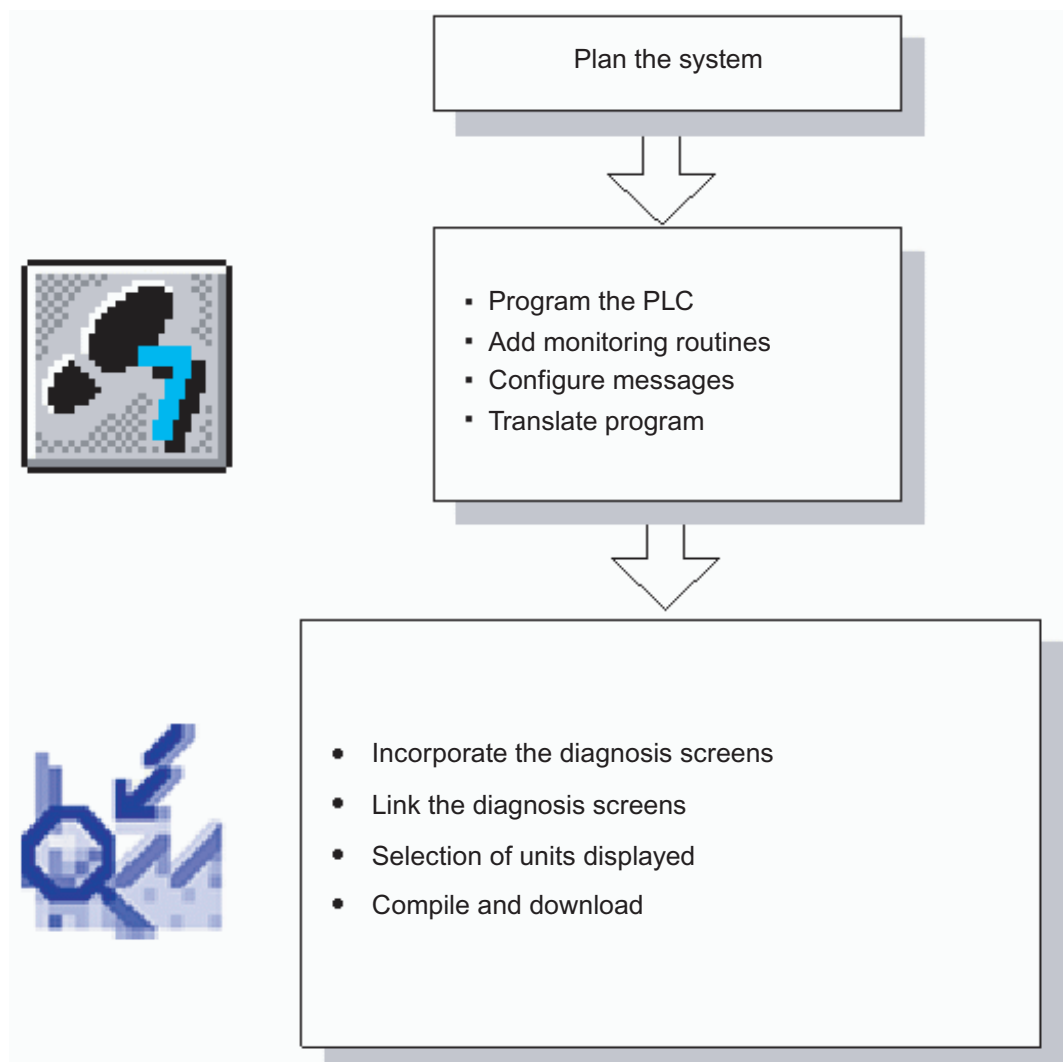
Figure 5-1   Configuration steps for a process diagnostics

Note

For a special list of the steps needed when upgrading an existing configuration, please refer to the topic "Overview of the steps required when upgrading".

Requirements for the control program

As universal system tools, WinCC flexible and ProAgent are closely linked with the STEP 7 software.

A breakdown of the minimum requirements to be satisfied by the control program is given in the section "Requirements of the control program".

In order that you do not have to define the same data more than once, the system uses a common database as an interface. As a rule, therefore, the control program should exist and have already been compiled before you start working in WinCC flexible.

A list of which steps should have been completed in STEP 7 and at what point is given in the section "Shared data basis with STEP 7".

Configuration steps with WinCC flexible

The process of configuration in WinCC flexible requires only a few operations:

1. Integrating the diagnostic screens

   First you create screens in the project, in which each of the ProAgent screen objects are configured. You can copy the diagnostics screens from the included standard project to your own project when configuring a device with 6-inch or 10-inch display.

2. Linking the diagnostic screens

   In order to be able to activate the diagnostic screens once they have been integrated, you must assign one or more keys the appropriate screen selection function(s). In order to be able to return to your system screens from the diagnostic screens, call the function `SaveScreen` (see "ProAgent functions for selecting diagnostic screens").

3. Selecting the units

   This next step involves selecting the units of your system for which you wish to be able to carry out a process diagnostics.

4. Selecting the display classes (optional)

   Finally, you can specify that the alarm messages of particular display classes should be displayed.

5. Compiling and downloading

   Once configuration is complete, compilation and transfer to the HMI device is carried out as usual.

See also

Basic requirements of the PLC program (Page 99)

PLC program and project requirements when upgrading (Page 107)

Linking diagnostic screens (Page 134)

Retrieving any diagnostic screen (Page 120)

Retrieving the diagnostic start screen (Page 118)

How to make the diagnostic start screen the start screen of your project (Page 117)

How to generate and transfer a project that can be diagnosed (Page 127)

Incorporating the diagnostic screens (Page 113)

Defining the scope of diagnostics (Page 122)

Selecting diagnostic screens (Page 153)

5.2 Incorporating the diagnostic screens

Integrated operation

You use ProAgent to configure a device for operation and monitoring. Its central function, therefore, is to provide the operator with an easy-to-use interface by means of which it is possible to identify process faults at a glance and rectify them quickly.

Note

ProAgent requires that WinCC flexible has been installed in (integrated into) STEP 7. If you have only used WinCC flexible as a stand-alone product up to now, please first consult the "WinCC flexible Information System" for details regarding its use in an integrated environment.

Ready-to-use diagnostic screens

When ProAgent is installed, a STEP 7 project with all of the standard ProAgent configuration is created in the WinCC-flexible-STEP 7 directory under Examples\PROAGENT. The STEP 7 project contains a project with diagnostics screens for 6-inch and 10-inch displays. They need only to be integrated into your configuration.

Note

The included diagnostics screens are designed for use in a WinCC flexible project for devices with 6-inch or 10-inch displays.

You configure your own screens for all other operating units by integrating ProAgent screen objects.

Since ProAgent is used in many different countries around the world, the standard diagnostic screens supplied have been given English names as follows:

Name	Diagnostics screen
ZP_PROAGENT	Diagnostics Start Screen
ZP_ALARM	Message Screen
ZP_DETAIL	Detail View
ZP_MOTION	Motion View
ZP_STEP	Step View
ZP_UNIT	Overview Screen

Note

All the standard configurations are configured with the setting "Full screen". You can change these settings in the "Device settings" section of the project window.

Copying the diagnostic screens

Copy the standard project from the STEP 7 directory under Examples\ProAgent into your WinCC flexible project directory. Rename the project and make the necessary changes in the respective diagnostic screens.

Alternatively, you can also copy the screens from the standard project into the WinCC flexible project.

To do so, you must have both your own project and the ProAgent standard project open at the same time. The default project is available in the STEP 7 directory at EXAMPLES\ProAgent_WinCCflexible.

You can now select the desired screens in the project window of the ProAgent standard project and then use the menu selections "Edit" > "Copy" and "Edit" > "Paste" to add them to your own project.

The diagnostic screens are now available for use in your project. All the necessary functions have been copied along with the screens.

Continuing configuration

You can now continue with the process of configuration as normal. However, do not forget to configure a screen change from your system screens to the new diagnostic screens and back again (refer to "Linking the diagnostic screens").

Easy to adapt

It goes without saying that you can also modify or add to the diagnostic screens supplied and thus seamlessly integrate them in your systems. Important information on this subject can be found in the section "Modifying the diagnostic screens".

See also

What are the individual diagnostic screens used for? (Page 19)

What you see in the Overview Screen (Page 36)

What you see on the Step View (Page 90)

What you see on the Message Screen (Page 29)

Detail View (Page 47)

What you see on the Motion View (Page 79)

Basic requirements of the PLC program (Page 99)

Linking diagnostic screens (Page 134)

Steps in the configuration of a diagnostics (Page 111)

Shared data basis with STEP 7 (Page 102)

5.3   Modifications during the commissioning of an S7-PDIAG project

Copy network data relevant to diagnostics to PLC

In S7-PDIAG version 5.0 or higher, network data relevant to diagnostics can be stored direct in the PLC. If you activate this mode in S7-PDIAG (menu selection "Extras" > "Settings" > "Translate", with the checkbox "Copy network data relevant to diagnostics to PLC" activated), you can view smaller changes to the monitored networks directly in the ProAgent detail display.

The ProAgent project does not have to be recompiled for this. This can save you a lot of time, particularly during the commissioning phase.

Note

Prior to final commissioning of the modified S7-PDIAG project you should carry out a final compilation of the ProAgent project to ensure correct functioning of the operating unit.

When should you select "Copy network data relevant to diagnostics to PLC"?

Testing the following changes in the S7-PDIAG configuration does not require recompilation in ProAgent:

- adding or removing operands in monitored networks

- changing the network logic or the operators in monitored networks

- changing the monitoring time

In these cases it is sufficient to recompile your S7-PDIAG configuration and reload the CPU. The operating unit then reads the modified operands, operators or monitoring times direct from the CPU. Synchronization with the STEP 7 data basis is not required for this data.

Limitations

If "Copy network data relevant to diagnostics to PLC" is active, the following data can still only be read from the shared STEP 7 data basis and can therefore not be displayed or at least not with current values:

- symbols and remarks for newly added operands
- modified symbols and remarks for existing operands
- modified message texts

This data will first be correctly displayed again after the compilation and transfer of the WinCC flexible project.

> In the Overview and Detail Views, the S7-PDIAG units are flagged with the "Inconsistency alert" symbol when their network data has been read straight from the CPU if it is not possible to display all symbols, remarks and network names correctly.
>
> If new monitors have been added in your S7-PDIAG configuration, again you must compile in ProAgent as usual.

Further information on "Copy network data relevant to diagnostics to PLC" can be found in the "Documentation on S7-PDIAG".

See also

Shared data basis with STEP 7 (Page 102)

Steps in the configuration of a diagnostics (Page 111)

Basic requirements of the PLC program (Page 99)

5.4 Linking the diagnostic screens

5.4.1 Linking the diagnostic screens

Principle

Once you have incorporated the diagnostic screens, you then have to make them accessible to the operator. Depending on your type of project, there are several possibilities to link the diagnostic screens:

- Your project is only intended for process diagnostics. It contains only diagnostic screens and no other system screens. In this case, your project should not start with the supplied diagnostic start screen in Runtime.
- Your project will contain other system-specific screens in addition to the diagnostic screens. In such cases, it is useful to make one of those screens the start screen or to create a general start screen.

- You do not want to start the process diagnostics with a start screen but with a diagnostic screen (e.g. directly with the detail view). In this case, you must specify in your configuration which unit should be displayed in the diagnostic screen.

- In this section you will see how to proceed with the different linking variants.

See also

Retrieving any diagnostic screen (Page 120)

Retrieving the diagnostic start screen (Page 118)

How to make the diagnostic start screen the start screen of your project (Page 117)

5.4.2 How to make the diagnostic start screen the start screen of your project

Application

Once you have incorporated the diagnostic screens, you then have to make them accessible to the operator. In the simplest case your project can be used solely for process diagnostics, i.e. it contains only diagnostic screens and no other system screens. Your project should therefore start with the Diagnostic Start Screen.
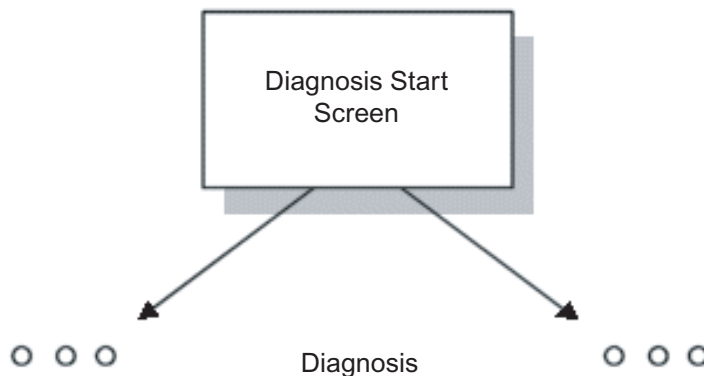
Figure 5-2   Use of diagnostic screens only

Procedure

The diagnostic screens are already linked to one another.

All you have to do is to make the Diagnostic Start Screen the start screen of your project as follows:

1. In the "Device settings" area of the project window, double click on the entry "Device settings".

   The device settings will open.

2. In the "Start Screen" selection list, select the ZP_PROAGENT screen. This is the Diagnostic Start Screen.

The Diagnostic Start Screen will be automatically displayed on the operating unit with WinCC flexible RT after the project is started. And from that point you can access all the other diagnostic screens one after the other by means of keys.

See also

How the diagnostic screens are linked to one another (Page 25)

Basic requirements of the PLC program (Page 99)

Steps in the configuration of a diagnostics (Page 111)

Incorporating the diagnostic screens (Page 113)

Shared data basis with STEP 7 (Page 102)

5.4.3 Retrieving the diagnostic start screen

Application

Normally, your project will contain other system-specific screens in addition to the diagnostic screens. In such cases, it is useful to make one of those screens the start screen or to create a general start screen.

From that point you can then control your system in the normal way. In addition, you configure a key which can be used to start the diagnostic package as you would a subroutine. The key in question activates the Diagnostic Start Screen from where you can then access all other diagnostic screens.

Advantage: The project is very easy to create and maintain. Operation is largely separate from operation of the system.

Disadvantage: The indirect route to the diagnostic functions via the diagnostic start screen is not as straightforward from the operator's point of view as direct selection of the diagnostic screens.
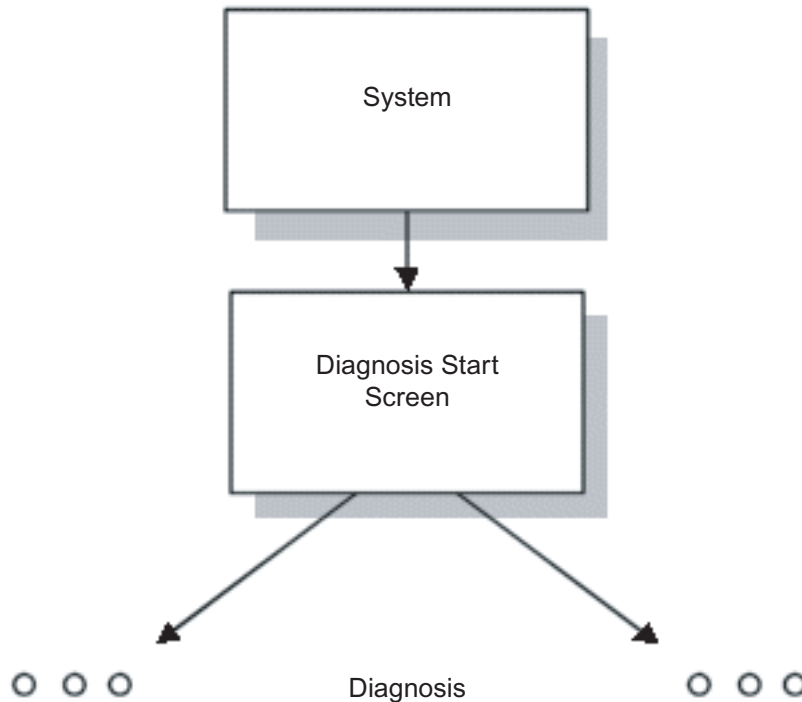
Figure 5-3   Access to diagnostic functions via Diagnostic Start Screen

Procedure

Configure a screen selection function for the Diagnostic Start Screen as follows:

1. First use the Parameter ZP_PROAGENT to assign the function `AktiviereBild` to a key in your system screen.

   When, subsequently, the key concerned is pressed, it opens the Diagnostic Start Screen from where all other diagnostic screens can be accessed by means of keys.

   You must also make sure that you provide a means of returning from the Diagnostic Start Screen to your own system screens.

2. Assign the function `AktiviereBild` to a key in the Diagnostic Start Screen and enter as a parameter the name of the system screen to which the system should return once the diagnostic is completed.

   You can use the symbol ZP_ESC as the icon.

See also

Shared data basis with STEP 7 (Page 102)

Steps in the configuration of a diagnostics (Page 111)

Basic requirements of the PLC program (Page 99)

5.4.4 Retrieving any diagnostic screen

Function

You can bypass the Diagnostic Start Screen by calling the Message Screen or the Overview Screen direct from any other screen in your project.

From the Message Screen or the Overview Screen you can then go to the Detail View, the Step View or the Motion View.

Which unit will be displayed together with the associated diagnostic data when you call the Detail, Step Sequence or Motion View depends on the configuration in the calling screen:

*   If you configure the function `MessageScreenShowErrorDefinition` to a key, the operator must first select a diagnosable alarm message in the message screen, in the message window or in the message line, before he retrieves the diagnostic screen.

*   If you configure the function `SelectUnit` to a key, the operator receives information about a specific unit.
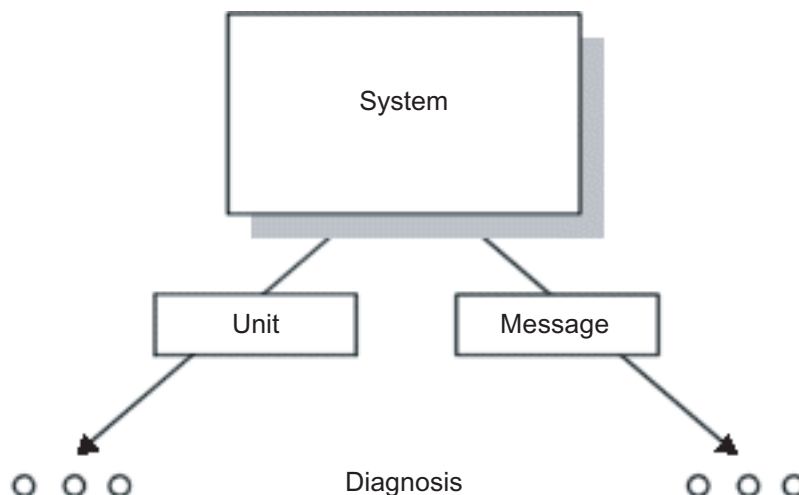
Figure 5-4   Direct access to individual diagnostic screens

Call via the diagnosable alarm message

Aim

The operator has selected a diagnosable alarm message. He wants to be able to call a diagnostic screen from a screen of your project and find information about the unit associated with the alarm message selected.

Procedure

1. If you want to assign a button open the screen from which you want to go to one of the Diagnostic Screens.

2. Click the key that is to be used for selecting the screen.

3. First configure the function `SaveScreen`to the key. Use the default event (Press key). Configuring the function ensures that you will return correctly from the diagnostic screen to your system screen.

4. For the same event, configure the function "`MessageScreenShowErrorDefinition`" as the next function for the same key. This function "must" be executed before the screen is selected. As the event, use the default setting (Press key).

5. Finally configure the function `ActivateScreen`. Here too, you should use the default setting (Press key) as the result. Specify the following parameters:

   – the screen name ZP_ALARM if you wish to activate the Message Screen

   – the screen name ZP_UNIT, if you wish to call the Overview Screen

   – the screen name ZP_DETAIL if you wish to activate the Detail View

   – the screen name ZP_MOTION if you want to activate the Motion View

   – the screen name ZP_STEP if you want to activate the StepSequenceScreen

The diagnostic screen concerned can now by accessed directly using the key configured.

 This key takes the operator back to the system screen from which the diagnostics was opened.

Call via a unit

By using the function `Select ProAgent unit` you can specify the DB/FB number to select a unit and switch to the desired diagnostic screen.

For more information about "ProAgent select unit", please refer to the reference for the ProAgent functions.

Aim:

The operator wants to be able to call a diagnostic screen from a screen of your project and find information about a specific unit.

Procedure:

1. Execute steps 1 through 3 as described in "Call via an alarm message".

2. For the same event, configure the function `SelectUnit`as the next function for the same key. Use the default event (Press key). Specify the unit directly by means of its DB/FB number or dynamically with the aid of a tag via the PLC.

If you change to the Detail View, the criteria analysis for the oldest alarm on the selected unit is automatically displayed.

See also

Overview Screen (Page 35)

Step View (Page 89)

Message Screen (Page 28)

Motion View (Page 77)

Basic requirements of the PLC program (Page 99)

Steps in the configuration of a diagnostics (Page 111)

MeldungsbildZeigeFehlerdefinition (function) (Page 220)

SelectUnit (function) (Page 174)

Shared data basis with STEP 7 (Page 102)

5.5 Defining the scope of diagnostics

Overview through targeted selection

In WinCC flexible, you can always precisely define the controllers, groups and units that you want to monitor with a specific operating unit. It may be, for example, that your system has more than one HMI device. In that case, you would naturally only want to carry out diagnoses on each HMI device for the units actually operated by the HMI device in question.

Note

To avoid the HMI devices reciprocally blocking the movements when you initiate a movement from the Motion View, always monitor a unit with movements on one HMI device only.

ProAgent

Use the "ProAgent" editor to specify which units should be included in the process diagnostics. You can select the individual units, groups or connections by clicking them.
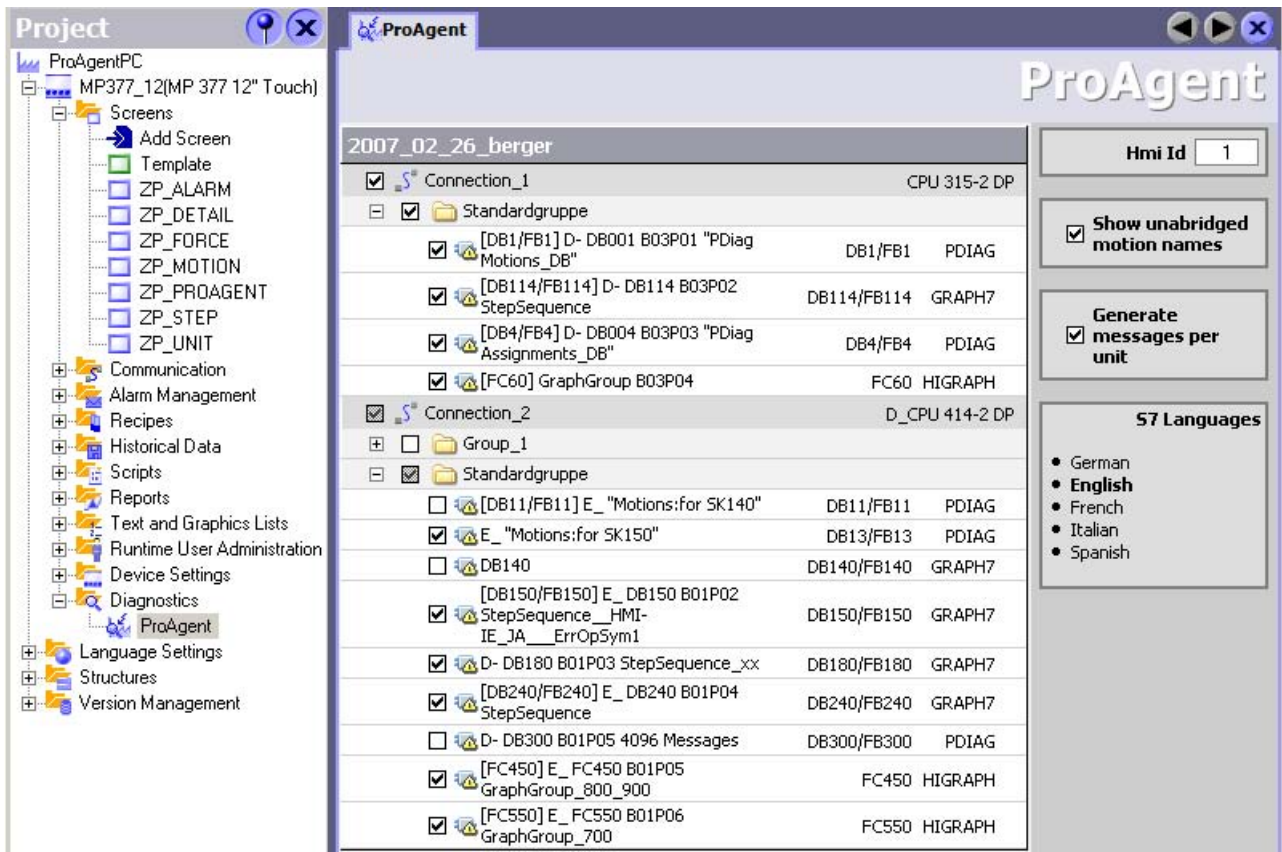
Figure 5-5   Units for diagnosis

Only those units that are diagnosable are offered for selection, e.g. those that were programmed accordingly in S7-PDIAG, S7-GRAPH or S7-HiGraph.

Note

WinCC flexible will read the required information from the database shared with STEP 7. If you are not able to find a certain diagnosable unit on the list that you might expect to find, regenerate the control program (see "Shared database with STEP 7").

The tree structure shown corresponds to the hierarchy that results from the control program concerned. If you are using S7-PDIAG version 5.0 or higher, you can combine the individual units to form groups. These groups will also be displayed when units are selected in WinCC flexible.

Note

Reorganization of a STEP 7 project

Any unit selection in ProAgent is lost if a complete reorganization of a STEP 7 project is carried out using the "Save as... / With reorganization (slow)" function. The units for which process diagnostics is required therefore have to be reselected in ProAgent after this function has been executed.

Generate message per unit

ProAgent imports the messages of all units selected for diagnostics in WinCC flexible by default.

- If you disable the "Generate messages per unit" check box, ProAgent only imports the messages of units defined accordingly in WinCC flexible, "Messages > Customize > Message settings". The exclusion of irrelevant messages saves HMI memory.

- **All** messages of the selected units are imported to ProAgent if you enable the "Generate messages per unit" check box.

Organizing units into groups (as of S7-PDIAG V. 5.0)

With S7-PDIAG version 5.0 or higher, you can combine the individual units within a controller to form groups.

When the S7-PDIAG configuration is changed, you need only reopen the HMI device configurations and download.

Example
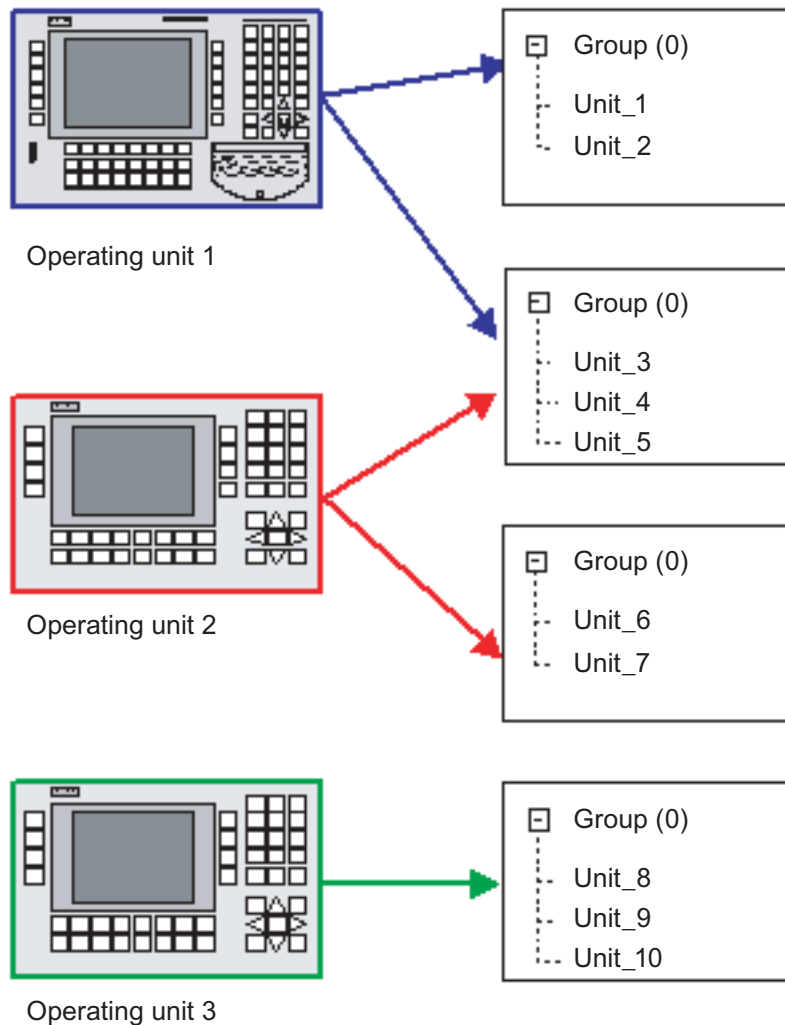
Figure 5-6   Assignment of HMI devices to various groups

With the system configuration illustrated, in the event of changes affecting units in group (0) you only have to regenerate and re-download the configuration for HMI device 1. The other configurations are unaffected by the change. They cannot therefore be recompiled.

Selecting groups or units

To select a group or unit in the "ProAgent" editor for the diagnostic:

1. Activate the group or unit that you wish to select for the diagnostic.

    When you have selected a group or connection, the data will be automatically synchronized with the STEP 7 project the next time that the project is opened so that it is not necessary to also select the other configured units. If you make changes in the STEP 7 project while the WinCC flexible project is open, the changes will be automatically incorporated in the WinCC flexible project.

Result

The selected units are diagnosable during operation, i.e. messages concerning the selected units are displayed on the HMI device.

Note

Only select units for diagnostics if you are actually using diagnostics, that is, if you actually want to be able to configure Diagnostic Screens or use ProAgent functions. Otherwise you will be using system resources on the HMI device unnecessarily.

Removing groups or units

To remove a group or unit in the "ProAgent" editor:

1. Deactivate the group or unit which should not be diagnosed.

Result

Process diagnostics can then not be performed on that unit during operation.

Enter the device ID

You can assign the display device a unique number using the device ID (Hmi ID). The device ID is needed for allocating movements.

Enter the device ID directly in the ProAgent editor.

So that the device ID can be utilized, it is necessary to use the UDT "Movement" expanded by the device ID (UDT2), supplied with effect from S7-PDIAG V5.0 HF3 and higher. This is important if the same movements can be displayed on more than one HMI device at once.

The expanded UDT "Movement" (UDT2) is described in the "S7-PDIAG Manual" for Version 5.0 HF3 and higher.

See also

What are the individual diagnostic screens used for? (Page 19)

Basic requirements of the PLC program (Page 99)

Steps in the configuration of a diagnostics (Page 111)

Functions (overview) (Page 166)

Shared data basis with STEP 7 (Page 102)

5.6   How to generate and transfer a project that can be diagnosed

Proceed as follows

A monitoring of the consistency of the project will automatically be executed in the background while creating a project. An additional consistency monitoring will be executed with each transfer to the operating unit. If the project is without errors, you can transfer the project to the operating unit and start Runtime by using the [image] button.

See also

Shared data basis with STEP 7 (Page 102)

Steps in the configuration of a diagnostics (Page 111)

Basic requirements of the PLC program (Page 99)

How to port a diagnosable project to a computer without STEP 7 (Page 127)

5.7   How to port a diagnosable project to a computer without STEP 7

Computer without STEP 7

Perhaps you only have WinCC flexible with ProAgent and STEP 7 installed on your workstation, but would like to use a laptop or PG to take along a completed project to a machine on location.

Although all of the data shared with STEP 7 is in principle in the shared database (see "Shared database with STEP 7") and WinCC flexible with ProAgent must actually be integrated in STEP 7 in order to run, it is possible - within limits - to use WinCC flexible to open, compile and download (to an operating unit) an existing WinCC flexible project as a stand-alone project.

This is possible since an internal working copy of all of the required data is stored in the WinCC flexible project (HMI file).

> ⚠ CAUTION
>
> When opened with WinCC flexible as a stand-alone project, there is of course no synchronization with shared database.
>
> You are responsible yourself for ensuring that data is synchronized with the shared database if any changes are subsequently made to the STEP 7 program.

Limitations

All dialog boxes relevant to diagnostic functions can be selected in the stand-alone mode of WinCC flexible, but cannot be used.

Exporting a project

To copy a WinCC flexible project from a STEP 7 project to another computer, proceed as follows:

1. Start the SIMATIC Manager.

2. Open the STEP 7 project.

3. Select the operating unit whose project you want to copy.

4. Via the menu item "Edit" >"Object Properties", open the "Properties" window.

5. Make a note of the path specified for "Configuration file" and the name of the file with the extension $*.HMI$. This is the project you are looking for.

6. Copy the file (using the Windows Explorer, for example) to the computer and directory of your choice.

You can now open the project on the destination computer using WinCC flexible alone. If you make any changes, you can integrate them into the project later (see "WinCC flexible Information System").

See also

Basic requirements of the PLC program (Page 99)

How to generate and transfer a project that can be diagnosed (Page 127)

Shared data basis with STEP 7 (Page 102)

Configuring the diagnostic screens in detail

6

6.1 Configuring the diagnostic screens in detail

This section gives you detailed background information on how you can change the standard diagnostic screens, if needed, and create your own diagnostic screens.

In this context you will find out which ProAgent specific screen objects are available in WinCC flexible and how you configure them. In addition, you will get an overview on how you can use the functions in your diagnostic screens.

6.2 Modifying diagnostic screens or creating your own screens?

Standard screens

You can use the diagnostic screens, supplied by ProAgent, to configure the process diagnostics for a computer. Hence you can solve all diagnostics quests without having to go into great detail about the configuration.

You can skip the subject "Configuration of the diagnostic screens in detail" as long as you do not change anything in the diagnostic screens.

Meaningful adaptions

The diagnostic screens have a standard design, which is similar to the flexible standard screens supplied by WinCC flexible. This design displays the best possible compromise between different requirement profiles, and cannot go into details with special requirements.

You can adapt the diagnostic screens to their specific system screens with relatively little effort. Therefore, the process diagnostics can also be optically incorporated into your system visualization.

If your system is very complex, you can choose to use a smaller font, so that more units can be displayed in the display at the same time.

You can adapt the layout to you remaining project at any time, use a different icons or colors, change the assignment of keys, and secure certain functions with a password.

Configuration of your own diagnostic screens

While installing ProAgent, the screen objects overview screen, Detail View, Motion View and Step View will be added to the tool box in WinCC.

Create a screen object for each screen and integrate the screen object, to configure you own diagnostic screens.

See also

> Structure of the diagnostic screens (Page 26)
>
> Customizing standard screens (Page 131)
>
> Creating your own diagnostic screens (Page 132)

6.3 Internal structure of the diagnostic screens

Conventions

> The powerful process diagnostic system involves a particularly complex process and therefore demands that certain rules and conventions are adhered to. The diagnostic screens supplied with ProAgent conform to those rules.
>
> If you make modifications to the screens you should make sure that you do not break any of the rules.

Common prefix ZP_

> So that all the elements which affect process diagnostics are listed together in the different editors of WinCC flexible, all names begin with the abbreviation "ZP_". (The "Z" ensures that these elements are placed at the end of the lists - in other words, they appear after your own elements. The "P" stands for "ProAgent".)
>
> Since ProAgent is used in a large number of countries all over the world, all names are in English.

Diagnostic screen names

> The names of the standard diagnostic screens supplied are as follows:

Name	Diagnostic screen
ZP_PROAGENT	Diagnostics Start Screen
ZP_ALARM	Message Screen
ZP_UNIT	Overview Screen
ZP_DETAIL	Detail View
ZP_STEP	Step View
ZP_MOTION	Motion View
ZP_FORCE	Status/Control screen (not on OP/TP/MP270/277)

See also

6.4 Customizing standard screens

Applications

In principle, there is scarcely any limit on the way the standard screens can be customized by the many and varied options offered by the WinCC flexible screen editor. The following sections therefore offer just a few ideas for frequent applications.

Further information on the procedure can be found under the topic Customizing and configuring ProAgent screen objects and in the "WinCC flexible Information System".

Diagnostics Start Screen

In the Diagnostic Start Screen you can replace the WinCC flexible logo, for example, with your own company logo and embed additional symbols in your system.

Open the ZP_PROAGENT screen in the WinCC-flexible "Screens" editor to make your modifications.

Font size and character set

You can change the font size and character set of the diagnostic screens. When doing so, observe the basic rules of text design. The size of the text should, therefore, be matched to the importance of the information contained in the text, but also to the distance the operatorwill probably be away from the screen. The font should correspond to that of your other system screens.

If you use a large font size, make sure that longer texts still have sufficient room.

You can change the font size and the character set exactly as you are accustomed to when working with the WinCC-flexible screen objects.

Icons on Keys

You can change the icons on the global and screen-specific keys by editing the icon linked with the key in the WinCC flexible Screen editor. Right-click the button in the "Screens"

editor of WinCC flexible, and then select "Properties" from the shortcut menu. You can edit the icon on the "Icon" tab.

See also

What are the individual diagnostic screens used for? (Page 19)

Creating your own diagnostic screens (Page 132)

Modifying diagnostic screens or creating your own screens? (Page 129)

Internal structure of the diagnostic screens (Page 130)

6.5 Creating your own diagnostic screens

Introduction

Use the screen objects included with ProAgent to create your own diagnostics screens.

The same principles apply as for WinCC flexible screens

The procedure for creating diagnostic screens does not differ greatly from that for creating other screens for your system, since they are also configured in the WinCC flexible screen editor.

Consequently, the principles described in the "WinCC flexible documentation" under the keyword "Screens" also apply for diagnostic screens.

Display elements for diagnostics

After installing ProAgent, the WinCC flexible Screen editor will have not only the message view but also four new screen objects, which you can use in your diagnostic screens.

Screen object	Name	Description
	Overview display	Use this to show the operator the diagnosable units in your system. For instance, you can define which languages (S7-PDIAG, S7-GRAPH or S7-HiGraph) are to be used in your STEP 7 project and whether all units or only units with a fault are to be displayed.
	Detail display	Use this to show the operator which instructions in the program have resulted in a particular alarm message. Among other things, you can define what display type (signal list, STL or LAD) should be preconfigured.
	Motions display	This allows the operator to trigger specific movements for a unit manually. For instance, you can define the mode of movement release.

Screen object	Name	Description
	Message display	The display view, with which you are already familiar from WinCC flexible, has been extended with an extra column in ProAgent to show the diagnosability of the messages.
	Step sequence display	Use this to show the operator a list of all the step sequences and steps which have been configured for a unit and its subordinate hierarchical levels. You can alternatively use the graphical view of the step sequences.

The functioning of these screen objects depends on certain requirements being met. So make sure you note the information on the individual screen objects if you integrate them into your own diagnostic screens.

You can also incorporate more than one of the diagnostic elements a Diagnostic Screen. Except for step sequence displays, these may not be the same type. For instance, it is therefore possible to combine an overview display with a detail view or two step sequence displays. However, it is not possible to configure two overview displays in a diagnosis screen.

Functions for diagnostics

Specific functions are available for process diagnostics once ProAgent has been installed. Some of these functions require certain ProAgent screen objects to be used.

Detailed information on this can be found under the topic "Using ProAgent functions" and in the reference section.

See also

Overview display (Page 141)

Step sequence display (Page 145)

Message view (Page 140)

Detail view (Page 142)

Movement display (Page 144)

Customizing standard screens (Page 131)

Using ProAgent functions (Page 152)

Internal structure of the diagnostic screens (Page 130)

Modifying diagnostic screens or creating your own screens? (Page 129)

Configuring overview display (Page 148)

Configuring a step sequence display (Page 151)

Configuring a message view (Page 147)

Configuring detail view (Page 149)

Configuring movement display (Page 150)

6.6 Linking diagnostic screens

Opening your own diagnostic screens

You can incorporate your own diagnostic screens into your project just like the standard screens provided, i.e. normally by configuring a corresponding screen selection by assigning it to a key. In addition, however, you must be take account of the following:

- To allow you to return to the system screen from which the process diagnostics was activated, before you select the first diagnostic screen you must execute the function `SaveScreen`. You can then restore the last screen by configuring the function `RestoreScreen` to the back key.

- If your pocess diagnostics is to display diagnostics data for the alarm message selected in the respective message view, before selecting the screen you must execute the function `MessageScreenShowErrorDefinition`.

Linking your own diagnostic screens

Both the detail view and the movement display require a diagnosable unit to have been selected. This selection can be carried out in the message view or in the overview display.

You should therefore start the process diagnostics with a Diagnostic Screen that contains a message view or an overview display. From there you can go on to a detail view or a movement display.

See also

Customizing standard screens (Page 131)

MeldungsbildZeigeFehlerdefinition (function) (Page 220)

BildWiederherstellen (function) (Page 192)

StoreScreen (function) (Page 191)

Creating your own diagnostic screens (Page 132)

6.7 Working with users and groups

Purpose

Buttons and keys can be protected by password. Use of those keys/fields is then restricted to suitably authorized and qualified personnel. Such a password protection can, of course, also be implemented in the diagnostics screens.

By assigning a user to another group, you can prevent a user from:

- selecting certain screens,
- selecting the operating mode,
- displaying the Motion View

The "User Administration" editor is used to administer users and groups.

For more information about working with users and groups, please refer to the "WinCC flexible Information System".

See also

Customizing standard screens (Page 131)

Creating your own diagnostic screens (Page 132)

6.8 Multilingual Projects

Language change

All texts displayed in the diagnostic screens are multilingual, if this is supported by STEP 7. While executing the function `SetLanguage`, the screen will be restructured in the according language.

Most texts are not configured by WinCC flexible, but will be supplied by the S7-packages. There will be conflicts, if there are no texts for the in WinCC flexible configured language in STEP 7. In this case there will be a corresponding warning during the generation in WinCC flexible. While running, the text will be displayed in the standard language.

For more information about configuration in different languages, please refer to "WinCC flexible Information System".

See also

Creating your own diagnostic screens (Page 132)

Customizing standard screens (Page 131)

6.9 Project documentation for ProAgent projects

Project documentation for WinCC flexible

To document your ProAgent project use the WinCC flexible project documentation (menu option "Project" > "Print project documentation").

If in the "Print project documentation" dialog you activate "ProAgent" on the "Content" tab, then the following data are output in the project documentation:

- HMI ID of the project
- The total number of imported messages
- The total number of imported fault definitions

- Project languages: Preset language and further languages
- STEP 7 project
- Name of each selected connection
- Name of each selected group
- Name, original language and block of each selected unit

If you create project documentation containing ProAgent screen objects for your project screens, then the ProAgent screen object characteristics will be output in the documentation.

For more information about project documentation, please refer to "WinCC flexible Information System".

6.10 Operation of movements

Ensuring backup in the event of operating unit failure

> ⚠️ **WARNING**
>
> In the event of failure of your operating unit whilst executing a movement using buttons or keys, the bit initiating the movement may get stuck until ProAgent is restarted. When this is done, the movement will continue to be executed.

To prevent uncontrolled execution of the movement you must monitor the failure of the operating unit in the PLC via a life bit. This life bit is changed cyclically. In the event of failure of the operating unit the PLC must stop the movement immediately.

The life bit is configured in the coordination area between the operating unit and PLC in the "Communication" editor (see "WinCC flexible Information System"). Ensure that the cycle time of the life bit set is sufficient for the movement reaction time required in your system.

Delays caused by the communication process

In the movement display movements can be initiated:

- by clicking the mouse on the corresponding button
- by pressing the appropriate function key
- by executing the functions `MovementScreenStartMovement` or `MovementScreenStopMovement`

For all three operating options you must expect a certain amount of delay between activating the key or button and the setting or resetting of the bit in the corresponding UDT_Motion in the PLC.

Number of displayed movements

> **⚠ WARNING**
>
> The number of movements displayed in the movement display may not be changed in runtime, otherwise this could lead to the inoperability of the operation display.

Direct keys

You can avoid these communication delays by using direct keys that can set bits in the PLC using separate PLC inputs. Quick operating actions are essential, for example, for typing mode.

On the Panel PC, HMI direct key modules are available for such applications.

ProAgent supports DP direct keys on Panels (TP/OP) and MultiPanels.

Note

When using direct keys, the functions `MovementScreenStartMovement` and `MovementScreenStopMovement` should be removed from the Motion View. This way you can be certain, that when the key is released, the movement will stop immediately.

A movement which is additionally started using the `MovementScreenStartMovement` function can only be stopped by executing the `MovementScreenStopMovement` function, which is slower compared to cancellation by means of the direct keys. This will also disable the direct key functionality (depending on the programming of the movement in the PLC program).

More information

Further information on the topic of direct keys can be found

* under the heading "Motion View"
* in the "Communication" User's Guide and in the "Operating Manual" for the operating unit concerned.

See also

Motion View (Page 77)

Customizing standard screens (Page 131)

Creating your own diagnostic screens (Page 132)

MotionViewStop (function) (Page 182)

MotionViewStart (function) (Page 179)

6.11 Example: More than one diagnostic display in a screen

Application

In ProAgent you can configure several different types of diagnostic displays in one screen.

Configuring of several diagnostic displays of the same type (for instance two detail views) in one screen is only permitted for step sequence displays.

A sensible combination of several diagnostic displays would be, for example, a detail view, a step sequence display and a message view.
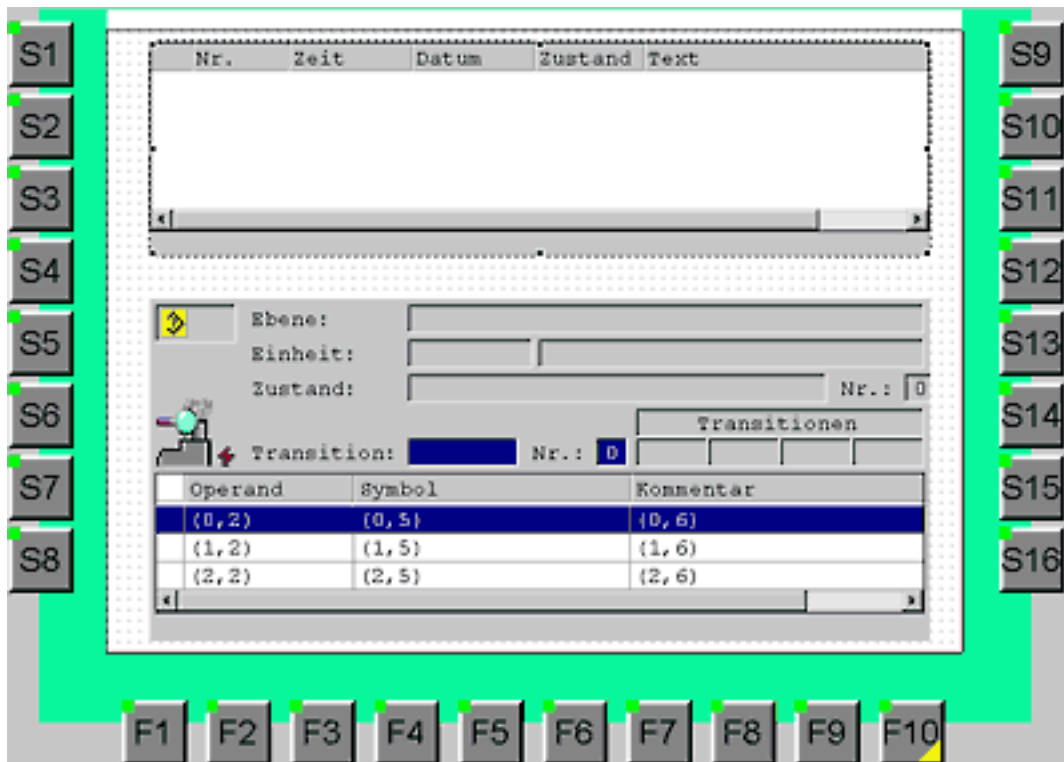
See also

Customizing and configuring ProAgent screen objects (Page 139)

Creating your own diagnostic screens (Page 132)

6.12   ProAgent screen objects

6.12.1   Customizing and configuring ProAgent screen objects

Display elements for diagnostics

After installing ProAgent, the WinCC flexible Screen editor will have not only the message view but also four new screen objects, which you can use in your diagnostic screens.

Screen object	Name	Description
	Overview display	Use this to show the operator the diagnosable units in your system. For instance, you can define which languages (S7-PDIAG, S7-GRAPH or S7-HiGraph) are to be used in your STEP 7 project and whether all units or only units with a fault are to be displayed.
	Detail display	Use this to show the operator which instructions in the program have resulted in a particular alarm message. Among other things, you can define what display type (signal list, STL or LAD) should be preconfigured.
	Motions display	This allows the operator to trigger specific movements for a unit manually. For instance, you can define the mode of movement release.
	Step sequence display	Use this to show the operator a list of all the step sequences and steps which have been configured for a unit and its subordinate hierarchical levels. You can alternatively use the graphical view of the step sequences.
	Message display	The display view, with which you are already familiar from WinCC flexible, has been extended with an extra column in ProAgent to show the diagnosability of the messages.

You can get a description of these ProAgent specific screen objects in this section.

See also

6.12.2 Message view

Information displayed

Message view (or message display) is the central component in the Message Screen. It displays messages in the form of a table, e.g.:

- ALARM_S messages on a SIMATIC S7-300 or SIMATIC S7-400 CPU
- the S7 diagnostic buffer on a SIMATIC S7-300 or SIMATIC S7-400 CPU
- bit messages
- message events from a particular message archive

In addition, you can combine the display of message events from the following message classes:

- Alarm messages
- Event messages
- System messages
- S7 diagnostic event

For use in diagnostic screens the message view was expanded by a column that uses an asterisk to show that the message in question is diagnosable.

Purpose

In diagnostic projects you use the message view so that the operator can select the diagnosable message for which he wants to carry out more precise process diagnostics (e.g. with a detail view or a movement display).

If a message is selected in a message view and the function `MessageScreenShowErrorDefinition` in initiated, then the unit belonging to the message, the corresponding movements and the associated network are preselected for display in a diagnostic screen.

Optional operating elements

If necessary, you can overlay the following buttons:

- ACK to acknowledge alarm messages
- HELP to display help text

The individual columns can be overlaid or hidden as desired and can be edited on the operating unit like a table, e.g.:

- arrange order of columns
- set column width

A detailed description of operating a Message View can be found under the heading "Working with the Message Screen".

In the case of the message view there are no specific ProAgent functions available for configuring other operating elements.

See also

How to work with the Message Screen (Page 32)

What you see on the Message Screen (Page 29)

MeldungsbildZeigeFehlerdefinition (function) (Page 220)

Creating your own diagnostic screens (Page 132)

Message view (Page 140)

6.12.3   Overview display

Information displayed

Overview display is the central component in the Overview Screen. It shows the diagnosable units of your system in the form of a table.

When configuring you specify whether all the units are to be shown or only those with faults.

The following are shown for each unit:

- whether it has a fault
- if programmed accordingly in STEP 7, which operating mode you are in (e.g. manual or automatic mode)
- whether there are subordinate or superior units
- whether a movement exists for it
- in the case of S7-GRAPH sequences, which step in the sequence of steps is currently active
- in the case of S7-HiGraph units, which status is currently active.

Purpose

In diagnostic projects you use the overview display so that the operator can recognize the unit on which the fault first occurred. He can then tell immediately where the actual cause lies and which faults are consequential errors.

In the overview display the operator can select the unit for which he

- would like a more precise process diagnostics (e.g. performed using a detail view)
- wants to initiate associated movements (e.g. using a movement display)

Optional operating elements

The individual columns can be overlaid or hidden as desired and can be edited on the operating unit like a table, e.g.:

- arrange order of columns
- set column width

You can configure further screen elements for an overview display with the aid of ProAgent functions.

A detailed description of operating an overview display can be found under the heading "Working with the Overview Screen".

See also

How to work with the Overview Screen (Page 41)

What you see in the Overview Screen (Page 36)

Functions in the overview display (Page 154)

Creating your own diagnostic screens (Page 132)

Configuring overview display (Page 148)

6.12.4 Detail view

Information displayed

Detail display is the central component in the Detail View. It is also used in the Step View. It shows the result of the criteria analysis, i.e. the points in the controller program that triggered a process fault.

During configuration you specify the way in which the detail display will first be shown:

- as a clear symbol list containing only the statements that resulted in an alarm message being triggered

- in STL display mode, in which all statements for the selected unit are displayed with operators, addresses, status bits, results of logical operations, symbols and comments

- in LAD display mode, as a ladder diagram with individual switches and addresses

Additional information is shown for each unit depending on the programming language used.

You also define the analysis mode in this view:

- "Messages": The Detail View shows the network associated with the currently selected ALARM-S message for diagnostics.

- "Step sequence": The Detail View shows the network associated with the currently selected step or transition if no ALARM-S message is active and you have not selected any error definition of a unit.

Purpose

In diagnostic projects you use the Detail View so that the operator can see which statements in the program led to a particular alarm message. The operator can tell straight away which monitoring function triggered the error message and the corresponding error location.

Unit displayed

The Detail View always shows information on the unit or subunit currently selected. You need to take this into account when integrating a screen with a Detail View. The following integration options exist:

- Before the Detail View is called, a diagnosable message - which triggered the "Activate" event - will be selected in a message display. This way the function `MessageViewShowErrorDefinition` is executed. The selected message is noted in ProAgent and the first associated network is displayed when the detail display is opened.

- Before opening the detail display, an overview display is opened. Here the operator selects the unit on which he wants detailed information in the detail display. When the detail display is opened, the oldest pending message for the selected unit is found and the associated network is displayed.

- A step sequence display is called before the detail display is opened. The operator selects the unit for which he requires detailed information in the detail display. The program shows the network associated with the selected step or transition when the detail display is called in "Step sequence" analysis mode.

If you do not realize either of these options then networks will be shown for the unit still selected from earlier.

Optional operator controls

The individual columns can be overlaid or hidden as desired and can be edited on the operating unit like a table, e.g.:

- Arrange order of columns
- Set column width

You can configure further screen elements for a detail display with the aid of ProAgent functions.

A detailed description of operating a detail display can be found under the heading "Working with the Detail View".

See also

How to work with the Detail View (Page 62)

Functions in the detail display (Page 156)

MeldungsbildZeigeFehlerdefinition (function) (Page 220)

Creating your own diagnostic screens (Page 132)

Structure of the Detail View (Page 51)

Configuring detail view (Page 149)

6.12.5   Movement display

Information displayed

Movement display is the central component in the Motion View. It shows a list of all movements configured for a unit and their subordinate hierarchy levels.

During configuration you specify:

- whether all the displayed movements are enabled (i.e. can be initiated by the operator)

- how many movements are displayed

- how many target positions are displayed per movement

- whether operators can page forward or backward in the Motion View by pressing keys

> ⚠ **WARNING**
>
> The number of movements displayed in the movement display may not be changed in runtime, otherwise this could lead to the inoperability of the operation display.

You can also choose "All Views" as a parameter. The function then takes effect on all screen objects of the particular view type.

Unit displayed

The movement display always shows the movements belonging to the unit currently selected. You need to take this into account when integrating the screen with a movement display in your project. The following options exist:

- Before opening the movement display a diagnosable message is selected in a message view. Afterward the `MessageScreenShowErrorDefinition` is executed. The selected message is noted in ProAgent and the related unit and corresponding movements are displayed when retrieving the movement display.

- Before opening the movement display, an overview display is opened. Here the operator selects the unit for which he wants to initiate movements. When the movement display is opened the movements belonging to the unit currently selected are always shown.

- The operator is provided with a key which can be used to call the movement list. Here he can select movements and then execute them using a movement display.

If you do not realize either of these options then movements will be shown for the unit still selected from earlier.

Purpose

In diagnostic projects you use the movement display so that the operator can remove a fault by initiating manual movements on the unit with the fault.

In addition, the operator can see in the movement display which movements are blocked.

Optional operating elements

You can configure further screen elements for a movement display with the aid of ProAgent functions.

Sequence in the Motion View

The sequence of movements in the Motion View can be configured in S7–PDIAG. However, the sequence of movements in the Motion View can only be defined within the movements of a unit.

Abbreviated movement names

In order to be able to display the right-hand part of the movement name on the operating unit, the left part of the name is truncated. This is done by searching for the second point from the right in the movement name and removing the left part of the name.

If you allocate the names of movements yourself, you should make sure that you do not include points in names and that names are not too long for the display.

See also

What you see on the Motion View (Page 79)

Functions in the motion display (Page 159)

Functions in the motions list (Page 161)

MeldungsbildZeigeFehlerdefinition (function) (Page 220)

Creating your own diagnostic screens (Page 132)

6.12.6 Step sequence display

Purpose

The step sequence display supports you in troubleshooting faults in an S7-Graph step sequence and shows the states of the steps.

Information displayed

The step sequence display can be used for two different representations:

- Step list
- Step diagram (alternative view)

For each step the following is displayed:

- Step faulty, active or inactive
- Step name and number

During the configuration, you specify which names should be displayed in the header: The unit and/or the unit hierarchy.

Optional operator controls

The step list columns can be edited on the HMI similar to a spreadsheet. Example:

- Arrange order of columns
- Set column width

You can zoom the step diagram on the HMI based on fixed zoom ratios.

You can configure further screen elements for a step sequence display with the aid of ProAgent functions.

A detailed description of operating a step sequence display can be found under the heading "Working with the Step View".

See also

6.12.7 Instructions

6.12.7.1 Introduction to configuring ProAgent screen objects

The introduction which follows will show you how to configure the following ProAgent screen objects in the WinCC flexible Screen editor:

- Message view
- Overview display
- Detail view
- Movement display
- Step sequence display

See also

6.12.7.2   Configuring a message view

Default Message Screen as template

The Message Screen supplied with ProAgent is an example of the use of the message view. You can open the Message Screen ZP_ALARM in the WinCC flexible Screen editor and check the settings for your own configuration.

Procedure

1. In the "Extended Objects" group in the toolbox, select the pictured symbol.

2. Position the mouse pointer where you want to put the message view. Hold down the left mouse button and drag the field to the size you want.

3. In the properties window in the "General" group under "Message classes" for the process diagnostic, activate "S7 Messages".

4. In the properties window in the "General" group, select whether the current or already archived messages should be displayed:

   – Select "Messages", if you want to display the current control messages in the queue or awaiting acknowledgement.

   – Choose "Message archive" if you want to select messages from a message archive. If you have configured ALARM_S messages with dummy entries for operands with faults, archived alarm messages will be displayed in place of the dummies. For more information about this topic, see "Displaying the result of criteria analysis in the message text".

5. In the properties window in the "Properties" > "Columns" group, select which columns should be displayed and whether they can be modified by the operating unit. For process diagnostics activate the "Diagnosable" column.

6. In the properties window in the "Properties" > "Display" group, select which operating elements on the operating unit are available, and how many messages will be displayed.

7. Modify the font type and size for the header area, column headers and display area as needed in the properties window in the "Properties" > "Fonts" group.

8. In the properties window in the "Properties" > "Safety" group, activate "Enable" to limit entries to those made by authorized persons.

9. Select the "Animation" group in the properties window, if you want to dynamicize the message view in runtime.

10. Select the "Events" group, if you want to configure a function list in a message view.

See also

Message view (Page 140)

Displaying the results of the criterial analysis in the message text (Page 241)

Creating your own diagnostic screens (Page 132)

6.12.7.3 Configuring overview display

Default Overview Screen as template

The Overview Screen supplied with ProAgent is an example of the use of the overview display. You can open the Overview Screen ZP_Unit in the WinCC flexible Screen editor and check the settings for your own configuration.

Procedure

1. In the "Extended Objects" group in the toolbox, select the pictured symbol.

2. Position the mouse pointer where you want to put the overview display. Hold down the left mouse button and drag the field to the size you want.

3. Select the columns and units to be displayed in the "Properties" > "Appearance" area of the properties window: all or only the faulty units.

4. In the properties window under "Properties" > "Appearance", select how many units should be displayed and whether the overview display should be scaled to suit.

5. In the properties window under "Properties" > "Appearance", select the presentation of the display and set whether the operator can change the order of the columns.

6. In the properties window under "Properties" > "Appearance" choose whether header lines should be displayed for the overview display and determine the appearance of the header area.

7. Modify the font type and size for the header area, column headers and display area as needed in the properties window in the "Properties" > "Fonts" group.

8. If you want to define the position of the display as exactly as possible then select the "Properties" > "Display" entry.

9. Select the "Animation" group in the properties window, if you want to dynamicize the overview display in runtime.

10. Select the "Events" group, if you want to configure a function list in an overview display.

    For the "BewegungsKlick" event you can configure a screen change to the Motion View.

Detailed information on the individual tab cards can be found in the "Tooltip".

See also

Overview display (Page 141)

Creating your own diagnostic screens (Page 132)

6.12.7.4   Configuring detail view

Default Detail View as template

The Detail View supplied with ProAgent is an example of the use of the detail display. You can open the Detail View ZP_DETAIL in the WinCC flexible Screen editor and check the settings for your own configuration.

Procedure

1. In the "Extended Objects" group in the toolbox, select the pictured symbol.

2. Position the mouse pointer where you want to put the detail display. Hold down the left mouse button and drag the field to the size you want.

3. In the properties dialog box of the "Properties" > "General" group, go to "Default display type" and select the representation of the program code to be shown first in the detail view:

   – Symbol list display mode

   – STL display mode or

   – LAD display mode

4. Select the analysis mode of the detail display: "Messages" or "Step sequence".

5. In the properties dialog box of the "Properties" > "Appearance" group, select how many lines are to be displayed and whether the size of the detail display should be modified accordingly.

6. In the properties window under "Properties" > "Appearance" choose whether header lines should be displayed for the detail display and determine the appearance of the header area.

7. In the properties window under "Properties" > "Appearance", select whether the operator can change the order of the columns.

8. Modify the font type and size for the header area, column headers and display area as needed in the properties window in the "Properties" > "Fonts" group.

9. If you want to define the position of the display as exactly as possible then select the "Properties" > "Display" entry.

10. Select the "Animation" group in the properties window, if you want to dynamicize the detail display in runtime.

11. Select the "Events" group if you want to configure a function list in the detail display.

Detailed information about the individual tab cards can be found in the "Tooltip".

See also

Detail view (Page 142)

Creating your own diagnostic screens (Page 132)

6.12.7.5 Configuring movement display

Default Motion View as template

The Motion View supplied with ProAgent is an example of the use of the movement display. You can open the Motion View ZP_MOTION in the WinCC flexible Screen editor and check the settings for your own configuration.

Procedure

1. In the "Extended Objects" group in the toolbox, select the pictured symbol.

2. Position the mouse pointer where you want to put the movement display. Hold down the left mouse button and drag the field to the size you want.

3. Go to "Movement Control" in the properties window under "Properties" > "General" to define whether the movement should be enabled as soon as it is displayed. In Touch Panels it makes good sense to ensure that only the "selected movement" can be controlled.

4. Under "Operand name" define how you want operand names to be shown.

5. Define the number of end positions to display per movement

6. Go to "Properties" > "Appearance" in the properties window to select the number of units to be displayed and whether to scale the motion view to suit hits number.

7. The number of displayed movements may not be changed during runtime.

8. Define whether to display header lines for the motion view and determine the appearance of the header area.

9. Define whether buttons should be displayed with which the operator can page forward or backward with a sorting movement.

10. Modify the font type and size for the header area, column headers and display area as needed in the properties window in the "Properties" > "Fonts" group.

11. If you want to define the position of the display as exactly as possible then select the "Properties" > "Display" entry.

Colors of target positions

If a target position is active because its target position bit is set, green is used as the default background color for that target position. The color denoting that a target position is active can also be configured for each target position:

● The movement view must be set to the online mode in WinCC flexible. Online mode can be selected when the zoom setting is 100% by pressing SHIFT+ENTER or by using the menu.

● In online mode, the cursor switches to the "Fill color" symbol over the target positions. This indicates that you can modify the Target position active color by clicking the various target positions. You can select from the whole range of WinCC flexible colors by clicking your way through them all.

See also

Movement display (Page 144)

Creating your own diagnostic screens (Page 132)

6.12.7.6 Configuring a step sequence display

Default Step View as template

The Step View supplied with ProAgent is an example of the use of the step sequence display. You can open the Step View ZP_STEP in the WinCC flexible Screen editor and check the settings for your own configuration.

Procedure

1. In the "Extended Objects" group in the toolbox, select the pictured symbol.

2. Position the mouse pointer where you want to put the step sequence display. Hold down the left mouse button and drag the field to the size you want.

3. Go to "Properties" > "General" in the Properties window to select for which unit the Step View should display information:

   – Checkbox deactivated: Information about the unit chosen by the operator in Runtime in the Diagnostic Screen is displayed.

   – Check box activated: Choose the unit from the selection list for which the information should be displayed.

4. Select "Alternative view" to visualize the step sequence display as a step diagram.

5. In the properties window under "Properties" > "Appearance" choose whether header lines should be displayed for the step sequence display and determine the appearance of the header area.

6. Define whether an additional button should be displayed. You can press this button to activate the unit for this step sequence display and call up the Detail View.

7. Also choose how many steps are to be shown and whether the size of the step sequence display should be scaled to suit.

8. Define the display and whether or not the operator is allowed to manipulate the order of columns in the step list.

9. Modify the font type and size for the header area, column headers and display area as needed in the properties window in the "Properties" > "Fonts" group.

10. If necessary specify on the "Enable" tab control under what conditions the field for runtime should be displayed or hidden.

11. If you want to define the position of the display as exactly as possible then select the "Properties" > "Display" entry.

12.Select the "Animation" group in the properties window, if you want to dynamicize the step sequence display in runtime.

13."Select the "Events" group in the properties window, if you want to configure a function list in a step sequence display.

For the "Click" event you can configure a screen change to the Detail View.

Detailed information about the individual tab cards can be found in the "Tooltip".

See also

6.13 Using ProAgent functions

6.13.1 Using ProAgent functions

Functions for diagnostics

Specific functions are available for process diagnostics once ProAgent has been installed. Some of these functions require certain ProAgent screen objects to be used.

In this section you will find out, how you can use the functions in your diagnostic screens and how they will work together during Runtime.

Detailed information on individual functions can be found in the reference.

6.13.2　Selecting diagnostic screens

Overview

ProAgent functions are available for your own Diagnostic Screens that allow you to influence the selection of the screens. These functions perform the following tasks:

- In a Diagnostic Screen instead of the unit belonging to the oldest pending alarm message, the unit belonging to the message selected in the message view should be displayed.

- It is ensured that the operator can open the system screen again from which he started the diagnostics.

Note

On the standard screens supplied with ProAgent the corresponding functions for selecting the diagnostic screens have already been configured. If you use these screens unchanged you can skip this topic.

Displaying diagnostic data for the message currently selected

The ProAgent default screens are configured so that the operator will be shown a process diagnostics for the unit associated with the oldest pending alarm message.

You can configure your own screens so that the operator can select a message from a message display and receive the process diagnostics for the associated unit in the diagnostic screen just by pressing a key.

To achieve this, the function `MessageViewShowErrorDefinition` must be executed before selecting the diagnostic screen. This function checks whether the selected fault is diagnosable. If so, after screen selection information on the unit, movement or criteria analysis affected by the fault is displayed.

It is possible to configure more than one message display in one screen. In this case, execute the `MessageViewShowErrorDefinition` function instead of the `MessageViewEvaluateError` function before you select a diagnostics screen. You can use this function to define which message display will be taken into account when the diagnostic data are prepared.

The operator can also select a diagnosable message from system screens and then switch straight to the diagnostic screens.

The message with the highest priority in the screen area will be displayed in the diagnostic screen.

Selecting a unit and switching to a diagnostic screen

By using the function `SelectUnit`, you can select a unit by specifying its DB/FB number and switch to the desired diagnostic screen. You can specify the unit directly during configuration or dynamically with the aid of a tag via the controller.

This enables you to select a unit from user-defined screens and switch to the desired diagnostic screen.

If you change to the Detail View, the criteria analysis for the oldest alarm on the selected unit is automatically displayed.

Switching back to the last screen

To allow you to switch back to the last system screen or diagnostic screen opened, before you select the new screen, you must execute the function `SaveScreen` . The current screen number will then be saved.

Only one screen number can be saved each time with the `SaveScreen` function. If you call up this function again, the previously saved screen number will be overwritten.

The operator can recall the screen with the last screen number saved. To do this, you must provide a key in your screen to which the function `RestoreScreen` is configured.

 This function is configured in the standard diagnostics screens for the key shown on the side.

See also

What you see on the Message Screen (Page 29)

MeldungsbildZeigeFehlerdefinition (function) (Page 220)

SelectUnit (function) (Page 174)

BildWiederherstellen (function) (Page 192)

StoreScreen (function) (Page 191)

Message view (Page 140)

Creating your own diagnostic screens (Page 132)

6.13.3   Functions in the overview display

Application

In diagnostic screens with an overview display it is a good idea to assign functions to keys to allow the operator

- To influence the content of the overview display

- To call the Step View in order to set the operating mode

- To acknowledge the selected unit

Note

Depending on your system, it might make sense to protect the display of a Step View and the acknowledgement of messages by a password.

In order to prevent changing the operating mode, hide the line "Operating mode" in the associated screen object.

Display all units or only units with faults

When configuring the overview display you specify whether all the units are to be shown or only those with faults. The operator can switch this setting at runtime, if you provide a key on which the function `UnitViewToggleFaultMode` is configured.

In the standard overview screen, this function is configured on the key shown at the left.

Display subordinate and/or superior unit

When programming a controller it is possible - depending on the programming language used - to define a hierarchy of the units. As soon as at least one subunit has a fault, the immediately superior unit is also marked as having a fault. In order for the operator to be able to establish the hierarchical level at which a fault has occurred, he must be able to switch to and fro between the different levels. For this purpose, you should configure the `UnitViewShowSubordinatedUnits` function on a key, and the `UnitViewShowSuperiorUnit` function on another key.

The `UnitViewShowSubordinatedUnits` function in the standard overview screen is assigned to the keys shown on the side. On the MP270/277 it is assigned to the ENTER key.

In the standard overview screen the `UnitViewShowSuperiorUnit` function is configured on the key shown adjacent or on the BACKSPACE key.

Indication of step sequences

If a unit has been programmed in S7-GRAPH, the operator can execute specific steps in the step sequence selected in the Step View.

If you have selected a unit that was programmed in S7-GRAPH, you can use the "Sequence" key to switch direct to the Step View.

Changing operating mode

In order for the operator to be able to remove a fault in the system he must switch to manual mode after programming the controller. Only then can he initiate specific movements for individual units and so remove the fault. The operator can change to manual mode by selecting this operating mode from a corresponding selection list. In order for the operator to be able to call up this selection list you must assign the function `SelectOperatingMode` to a key in your diagnostic screen.

How the operating mode is displayed depends on how the controller is programmed:

- In S7-PDIAG, the operating mode display is controlled by using the UDT1 (with operating mode) or the UDT3 (without operating mode) during unit definition. In addition the object properties of the unit can be used in S7-PDIAG to define whether the operating mode is displayed and whether it can be selected.

- In S7-Graph the operating mode of the sequence of steps is always displayed. In S7-Graph, menu option "Tools" > "Application settings" > "Compile/Save" can be used to prevent the operating mode from being selected.

- In the case of S7-HiGraph units, operating modes are not supported at all.

 In the standard overview screen, this function is configured on the key shown at the left.

Acknowledging the unit

Acknowledging units is not to be confused with acknowledging messages!

For each unit there is one bit on the controller which can be used for acknowledging the unit. This bit can be set using the `UnitViewAcknowledgeUnit` function.

Configure the function `UnitViewAcknowledgeUnit` on a key for this purpose. When the system is running, pressing that key will acknowledge the selected unit.

In order to be able to acknowledge a unit, the UDT "Unit" must be used in S7-PDIAG. The corresponding bit is only set by the function `UnitViewAcknowledgeUnit`. The controller has to reset the bit after acknowledgement.

This function is not realized in the Standard Overview Screen.

See also

Overview display (Page 141)

UnitViewSubordinateUnits (function) (Page 213)

UnitViewAcknowledgeUnit (function) (Page 208)

SelectOperatingMode (function) (Page 172)

Creating your own diagnostic screens (Page 132)

6.13.4 Functions in the detail display

Application

In diagnostic screens with a detail display it is a good idea to assign functions to keys to allow the operator

- To influence the content of the detail display

- To influence the display mode of the detail display

- To be able to switch from one fault or transition to the next

- To change the analysis mode

Criteria analysis for the currently selected message

If you execute the `MessageViewShowErrorDefinition` function before a screen with detail display is called, the operator will be directly shown the criteria analysis for the currently selected message.

 This function has already been configured to the key alongside in the Standard Detail View.

Further information on the topic of using a message to call a diagnostic screen can be found under the heading "How to open the Diagnostic Start Screen in your project".

Display all addresses or only addresses with faults

In the detail display all the addresses can be shown or only those with faults. To permit the operator to switch this display, configure a key to trigger the `DetailViewToggleReducedMode` function.

 This function has already been configured to the key alongside in the Standard Detail View.

In the symbol list view, the function `DetailViewToggleReducedMode` will not work, since this only shows the faulty units anyway.

Display initial values or current status

In the detail display you can have the current status bits displayed instead of the initial values (status bits at the time the error occurred). To permit the operator to switch this display, configure a key to trigger the `DetailViewToggleStatusMode` function.

 This function has already been configured to the key alongside in the Standard Detail View.

Moving from one fault to the next

Several messages may be pending for a unit. To enable the operator to switch to the next fault message of the currently selected unit or subunit, configure a key to trigger the `DetailViewChangeDisturbanceView` function.

 This function has already been configured to the key alongside in the Standard Detail View.

Switching from one blocked transition to the next

Only one element can be shown in the Detail View at a time. However, the cause of the fault may be located in more than one element. If programmed in S7-GRAPH or S7-HiGraph these elements may be individual transitions; if programmed in S7-GRAPH they may also be the locking condition of the step.

To enable the operator to switch to the next faulty element on this unit, configure a key to trigger the `DetailViewChangeExpression` function.

This function has already been configured to the key alongside in the Standard Detail View.

Changing the display Signal list > STL > LAD

To enable the operator to switch between the displays of the Detail View, configure a key to trigger the `DetailViewToggleRepresentationMode` function. In runtime, a press of this key will suffice to switch the display of the Detail View from Signal list > STL > LAD > Signal list, etc.

This function has already been configured to the key alongside in the Standard Detail View.

Changing operating mode

In order for the operator to be able to remove a fault in the system he must switch to manual mode after programming the controller. Only then can he operate specific movements or step sequences of individual units.

The operator can change to manual mode by selecting this operating mode from a corresponding selection list. In order for the operator to be able to call up this selection list you must assign the function `SelectOperatingMode` to a key in diagnostic screen.

This function has already been configured to the key alongside in the Standard Detail View.

Changing the analysis mode

The detail display shows the network which is associated with the current ALARM_S message for diagnostics, or with the current step of a step sequence. The analysis mode setting defines the network that to be visualized.

Allow the operator to change between the "Step sequence" and "Messages" analysis mode by configuring a button which can be used to call the `DetailViewChangeAnalyzeMode` function.

This function is assigned in the standard Detail View to the key shown on the side by setting the "--- Change ---" parameter.

See also

Detail view (Page 142)

MeldungsbildZeigeFehlerdefinition (function) (Page 220)

Creating your own diagnostic screens (Page 132)

DetailViewChangeAnalyzeMode (function) (Page 194)

DetailViewChangeExpression (function) (Page 196)

DetailViewChangeDisturbanceView (function) (Page 205)

DetailViewToggleStatusMode (function) (Page 204)

DetailViewToggleReducedMode (function) (Page 202)

Retrieving the diagnostic start screen (Page 118)

6.13.5 Functions in the motion display

Use

In diagnostic screens with a movement display it is a good idea to assign functions to keys to allow the operator

● to expand the movement display to additionally show movements of subordinate units

● to be able to display the outputs as symbols or as absolute output

● to initiate and stop movements

Displaying movements of subordinate units

If there are a number of hierarchical levels between the units of a system, the Motion View initially shows only the movements for the current unit. Only movements than can be displayed can be initiated. In order for movements of subordinate units to be able to be initiated the movement display must be expanded to include subordinate units.

To enable the operator to also be able to see movements of subordinate untis on the operating unit, configure a key that initiates the function `MotionViewToggleHierarchyMode`.

 This function has already been configured to the key alongside in the standard Motion View.

Toggling the display of outputs and target positions

In the movement display the outputs and target positions that can be initiated by the movements can be displayed as symbols or absolute. The corresponding attributes must have been stored during programming in S7-PDIAG.

To allow the operator to switch the display of the outputs, configure a key that triggers the function `MotionViewToggleSymbolicNameMode`.

This function has already been configured to the key alongside in the standard Motion View.

Starting and stopping movements

Each movement can be executed in two directions, e.g. in/out, open/close, up/down, forward/backwards. The movement directions are stored during programming in S7-PDIAG.

In the movement display the side of the display (right or left) simply symbolizes the direction of the movement. Thus the movement direction on, open, up or forward may be assigned to the left hand side of the display, for example, and off, close, down or back to the right hand side.

Movements that can be seen in the movement display can be initiated or stopped with function keys, mouse clicks or using functions.

In order to use functions for movement control you must configure corresponding keys for each movement displayed.

- To initiate a movement, configure the function `MotionViewStart` to a key. As the event, select Press key. As parameter, specify the position of the movement in the display and the side of the display (right or left) assigned to the direction of movement that you want.

- To stop a movement, configure the function `MotionViewStop` by assigning it to the same key as the function `MotionViewStart`. As the event, this time select "Release key". As parameter, specify again the same position of the movement in the display and the same side of the display (right or left).

Reallocating movements

After a loss of connection or due to a software error, movements can remain allocated to a particular operating unit. So that these busied movements can be allocated to another operating unit again, the diagnostic function `MotionViewAssignMovements` can be configured in the Motion View.

When this diagnostic function is triggered, the movements displayed will be reallocated, even if they are already busied. When movements are deselected they are released again.

Note

When the operating unit concerned is reinitialized, the movement elements `Manual_Enable1/2` and `Display_Order` of all movements are reset to 0 and are therefore available for occupation by other operating units.

Changing operating mode

In order for the operator to be able to remove a fault in the system he must switch to manual mode after programming the PLC. Only then can he operate specific step sequences of individual units.

The operator can switch to manual mode by selecting this operating mode from a corresponding selection list. In order for the operator to be able to call up this selection list you must assign the function `SelectOperatingMode` to a key in diagnostic screen.

This function has already been configured to the key alongside in the standard Motion View.

See also

Movement display (Page 144)

Functions in the motion display (Page 159)

Creating your own diagnostic screens (Page 132)

MotionViewAssignMovements (function) (Page 176)

MotionViewToggleSymbolicNameMode (function) (Page 187)

MotionViewStop (function) (Page 182)

MotionViewStart (function) (Page 179)

MotionViewToggleHierarchyMode (function) (Page 184)

MovementsSetTimeout (Page 189)

Configuring movement display (Page 150)

6.13.6   Functions in the motions list

Use

Generally, not all movements are visible in the Motion View. However, you can show the operator a list of the movements of all units. In this overview he can select the movement he wants. If a movement display is then opened, this movement will be triggered there.

Displaying the movement list

To allow the operator to call up the movement list, configure a key that triggers the function `MovementScreenShowMovementList`.

This function has already been configured to the key alongside in the standard Motion View.

See also

BewegungsbildBewegungslisteZeigen (function) (Page 178)

Creating your own diagnostic screens (Page 132)

6.13.7 Functions in the step sequence display

Application

In diagnostic screens with a step sequence display it is a good idea to assign functions to keys to allow the operator to carry out the following functions:

- Enable or disable steps
- Initialize or disable step sequences
- Change the operating mode of a step sequence
- Change the view of the step sequence display
- Zoom the step diagram

Operating steps and sequences of steps

In step sequence display all the steps in a sequence of steps are listed together with their status. Sequences of steps or individual steps can be operated using function keys, the mouse or functions.

In order to use functions for the Step View, you must configure an appropriate key or button for every function.

- To set or reset a step, configure the function `StepViewSetStep` or `StepViewResetStep` on a key. Select "Press key" as the event.
- To reset or deactivate a step, configure the `StepViewResetSequence` or `StepViewDisableSequence` function on a key. Select "Press key" as the event once more.
- Assign the `StepViewSetNextStep` function to a button which can be used to initiate a transition to the next step of a step sequence. Select "Press key" as the event once more.

Changing the operating mode of a step sequence

In order for the operator to be able to remove a fault in the system he must switch to manual mode after programming the controller. Only then can he operate specific step sequences of individual units.

The operator can change to manual mode by selecting this operating mode from a corresponding selection list. In order for the operator to be able to call up this selection list you must assign the function `SelectOperatingMode` to a key in diagnostic screen.

This function has already been configured to the key alongside in the Standard Step View ZP_STEP.

Layout of the step sequence display

The step sequence display allows two different layouts: Step list and step diagram. You can use the function keys, the mouse or functions to change the layout.

In order to use functions for the step sequence display, you must assign each function a corresponding key or button.

- Assign the `StepViewLayoutChange` function to a key which you can use to change between the step list and step diagram in the step sequence display. Select "Press key" as the event.

- Assign the `StepViewZoom` function including corresponding parameter values to two keys which you can use to change the zoom ratio in the step diagram. Select the "Press key" event.

  This function is assigned to the **<+>** and **<->** keys in the standard step sequence view ZP_STEP.

See also

Step sequence display (Page 145)

SelectOperatingMode (function) (Page 172)

StepViewChangeRepresentationMode (function) (Page 222)

StepViewSetStep (function) (Page 227)

StepViewDisableSequence (function) (Page 229)

StepViewResetSequence (function) (Page 231)

StepViewZoom (function) (Page 236)

Creating your own diagnostic screens (Page 132)

Reference

7

7.1 Reference

This reference lets you look up information on the following topics:

- System messages
- Functions

7.2 System messages

Overview

System messages inform you about critical operating conditions on the operating unit. As soon as such an operating condition occurs, the operating unit automatically displays a window showing a system message.

A description of the standard system messages is given in the device manual for your operating unit.

There are, however, a number of other system messages that are related to the process diagnostics functions. Only those system messages are described here.

You can look up the explanation easily by the message number.

Number	Cause	Remedy
320000	The movements are already being displayed by another device. The movements cannot be operated.	Deselect the movements on the other display devices and select the Motion View on the desired display device again.
320001	The network is too complex. The operands with faults cannot be shown.	Display the network in STL.
320002	More than one or no diagnosable Alarm Messages are selected. The unit belonging to the Alarm Message could not be selected.	Select a diagnosable alarm message in the Message Screen ZP_ALARM.
320003	There is no alarm message for the unit selected. A network cannot be shown in the Detail View.	Select the unit with a fault in the Overview Screen.
320004	The required signal states could not be read by the PLC. The operands with faults cannot be determined.	Check that the configuration on the display device and the PLC program loaded are consistent.
320005	The project contains elements of ProAgent that are not installed. ProAgent diagnostics cannot be performed.	To run the project, install the ProAgent option pack.

Number	Cause	Remedy
320006	You are trying to execute a function that is not possible in this configuration	Check the type of unit selected.
320007	No operands causing a fault have been found in the networks. ProAgent cannot display any blocked operands.	Switch the Detail View to STL display mode and check the status of the operands and exclusion operands.
320008	The diagnostic data saved in the configuration is not synchronized with that in the PLC. ProAgent can display only the diagnostic units.	Recompile the project and download it to the operating unit again.
320009	The diagnostic data saved in the configuration is not fully synchronized with that in the PLC. The diagnostic screens can be operated normally. ProAgent may be unable to display all diagnostic texts.	Recompile the project and download it to the operating unit again.
320010	The diagnostic texts saved in the configuration are not synchronized with those in STEP 7. The ProAgent diagnostic data is not updated.	Recompile the project and download it to the operating unit again.
320011	There is no unit with the number and FB number concerned. The function cannot be executed.	Check the parameters of function `SelectUnit` and the units selected in the project.
320012	The "Step sequence mode" dialog box is no longer supported.	Use Step View ZP_STEP from the appropriate standard project for your project. Instead of calling the function `Overview_Step_Sequence_Mode`, call the function `Activate_Screen` with ZP_STEP given as the screen name.
320013	No ProAgent/MP authorization is installed. A system message is issued periodically.	Use ProSave to download the ProAgent/MP authorization to your operating unit.
320014	The message view configured for the function MeldungsbildFehlerAuswerten could not be found. The selected error cannot be evaluated for ProAgent.	Check the parameters for the function MeldungsbildFehlerAuswerten.

7.3 Functions

7.3.1 Functions (overview)

WinCC flexible functionality is highly versatile. A description of those functions is provided in the WinCC flexible User's Manual and the WinCC flexible Online Help.

ProAgent supplements those general functions with a range of special functions required exclusively for process diagnostics. These functions are only available in WinCC flexible if ProAgent is installed.

All the process diagnostics functions will be found in the "ProAgent" group. Only these functions are described in this documentation.

The functions are alphabetically listed in the following reference section.

You can utilize the functions for configuring as described in the following:

Functions associated with screen selection

```
ActivateDiagnosticsScreen
SelectUnit
MotionViewList
SaveScreen
RestoreScreen
GoToSTEP7
MessageViewEvaluateError
MessageViewShowErrorDefinition
StartSimaticManager
```

Functions for an overview display

```
SelectOperatingMode
UnitViewAcknowledgeUnit
UnitViewShowSuperiorUnit
UnitViewShowSubordinatedUnits
UnitViewToggleFaultMode
GoToStep7
StartSimaticManager
```

Functions for a detail display

```
SelectOperatingMode
DetailViewChangeAnalyzeMode
DetailViewChangeExpression
DetailViewToggleRepresentationMode
DetailViewToggleReducedMode
DetailViewToggleStatusMode
DetailViewChangeDisturbanceView
GoToSTEP7
StartSimaticManager
```

Functions for a motion display

```
SelectOperatingMode
MovementsSetTimeout
MotionViewAssignMovements
MotionViewStart
```

```
MotionViewStop
MotionViewToggleHierarchyMode
MotionViewScroll
MotionViewToggleSymbolicNameMode
GoToSTEP7
StartSimaticManager
```

Functions for a step sequence display

```
SelectOperatingMode
GoToSTEP7
StepViewChangeRepresentationMode
StepViewAcknowledgeFaultSequence
StepViewClick
StepViewSetStep
StepViewResetSequence
StepViewDisableSequence
StepViewSetNextStep
StepViewResetStep
StepViewZoom
StartSimaticManager
```

See also

ActivateDiagnosticScreen (function) (Page 170)

SelectOperatingMode (function) (Page 172)

SelectUnit (function) (Page 174)

MotionViewAssignMovements (function) (Page 176)

BewegungsbildBewegungslisteZeigen (function) (Page 178)

MotionViewStart (function) (Page 179)

MotionViewStop (function) (Page 182)

MotionViewToggleHierarchyMode (function) (Page 184)

MotionViewScroll (function) (Page 186)

MotionViewToggleSymbolicNameMode (function) (Page 187)

MovementsSetTimeout (Page 189)

StoreScreen (function) (Page 191)

BildWiederherstellen (function) (Page 192)

DetailViewChangeAnalyzeMode (function) (Page 194)

DetailViewChangeExpression (function) (Page 196)

DetailViewToggleRepresentationMode (function) (Page 198)

DetailViewToggleReducedMode (function) (Page 202)

DetailViewToggleStatusMode (function) (Page 204)

DetailViewChangeDisturbanceView (function) (Page 205)

GoToSTEP7 (function) (Page 215)

UnitViewAcknowledgeUnit (function) (Page 208)

UnitViewFaultModeChange (function) (Page 210)

UnitViewSuperiorUnit (function) (Page 211)

UnitViewSubordinateUnits (function) (Page 213)

MessageScreenEvaluateError (function) (Page 218)

MeldungsbildZeigeFehlerdefinition (function) (Page 220)

StepViewChangeRepresentationMode (function) (Page 222)

StepSequenceScreenAcknowledgeError (function) (Page 223)

SchrittkettenbildKlicken (function) (Page 225)

StepViewSetStep (function) (Page 227)

StepViewDisableSequence (function) (Page 229)

StepViewResetSequence (function) (Page 231)

StepViewSetNextStep (function) (Page 232)

StepViewResetStep (function) (Page 234)

StepViewZoom (function) (Page 236)

Reference

7.3 Functions

StartSimaticManager (function) (Page 238)

7.3.2 ActivateDiagnosticScreen (function)

Application

Depending on the selected unit, switches to the specified screen. Which screen the system will switch to depends on which configuration language was used to configure the selected unit.

Syntax

ActivateDiagnosticsScreen (Screen Name for PDIAG, Screen Name for Graph7, Screen Name for HiGraph)

Use in scripts: No

Parameter

Screen Name for PDIAG

Name of the screen to which the system should switch if the selected unit was configured in S7-PDIAG.

Screen Name for Graph7

Name of the screen to which the system should switch if the selected unit was configured in S7-GRAPH.

Screen Name for HiGraph

Name of the screen to which the system should switch if the selected unit was configured in S7-HiGRAPH.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x

HMI device	Configurable
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

When a particular event occurs, you want to switch to a screen, which is selected in accordance with which STEP 7 language was used to configure the selected unit.

Notes about configuration

Assign this function to a key or a button and select the required screen.

Sequence on the HMI device

If the event occurs, the system will switch to the specified screen.

See also

Step sequence display (Page 145)

Functions in the step sequence display (Page 162)

Creating your own diagnostic screens (Page 132)

7.3.3   SelectOperatingMode (function)

Application

Sets the operating mode for the unit selected in the specified ProAgent display.

Syntax

SelectOperatingMode (screen object, operating mode)

Use in scripts: No

Parameter

Screen object

Name of the ProAgent display in which the operating mode of the selected unit is set.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

The "NoDirectSelection" operating mode is an exception where the functionality only affects a screen object.

Operating mode

Determines the operating mode of the HMI device: e.g. AUTO, HAND, TIPP, TOP or NoDirectSelection.

If you select "NoDirectSelection", whenever the function is called, a selection list will be displayed from which you can select the desired operating mode with the aid of the mouse or cursor keys.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	X
TP270	x
TP277	X
MP270B	x
MP277	X
MP270B Touch	x
MP277 Touch	x
MP370	x

HMI device	Configurable
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

On occurrence of a particular event in the overview display, you wish to change the operating mode of the selected unit or display a selection list of operating modes.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

When the event occurs, the selection list of operating modes will be displayed or the unit's operating mode will be changed directly.

See also

Overview display (Page 141)

Functions in the overview display (Page 154)

Creating your own diagnostic screens (Page 132)

Changing operating mode (Page 46)

7.3.4 SelectUnit (function)

Application

Selects a unit and jumps to the specified screen.

Syntax

SelectUnit (PLC, block type, DB number, FB/FC number, screen)

Use in scripts: No

Parameter

PLC

PLC of the unit to be selected

Block type

Determines whether the FB/DB number or the FC number is used:

- FB/DB number: FB/DB number is used.
- FC Number: FC number will be used.

DB number

Number of the data block (instance DB) of the higher ranking unit to be selected

FB/FC number

Number of the function block of the subunit to be selected (0 = undefined)

Screen

Number or name of the screen that should be called

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	X
TP270	x
TP277	X
MP270B	x
MP277	X

HMI device	Configurable
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to select a unit on a fixed or dynamic basis and display the associated diagnostic data.

Notes about configuration

Configure the `SelectUnit` function on this key or button. As event select "Press key" or in the case of a button "Press".

Sequence on the HMI device

When the event occurs, the unit of the corresponding PLC is selected and switched to the specified screen.

See also

Selecting diagnostic screens (Page 153)

Creating your own diagnostic screens (Page 132)

7.3.5 MotionViewAssignMovements (function)

Application

This function forces the allocation of the displayed movements to a display unit, even if the movements have already been allocated to another display unit.

This function is used in the following diagnostics screen:

• ZP_MOTION

Syntax

MotionViewAssignMovements (screen object)

Use in scripts: No

Parameter

Screen object

Name of the movement display in which the displayed movements have been forced.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

After a loss of connection or due to a software error, movements can remain allocated to a particular HMI device.

Notes about configuration

In order to be able to assign these movements to another HMI device, configure the `SelectUnit` function on a key or button. As event select "Press key" or in the case of a button "Press".

Sequence on the HMI device

When the function is triggered, the displayed movements are occupied by the HMI device which triggered it. Occupied movements are released again once they are deselected.

Note

When the HMI device concerned is reinitialized, the movement elements in UDT2 `Manual_Enable1/2` and `Display_Order` of all movements are reset to 0 and are therefore available for occupation by other HMI devices.

See also

Functions (overview) (Page 166)

7.3.6   BewegungsbildBewegungslisteZeigen (function)

Application

Displays a selection list of all available movements. Here the operator can select a movement which is then shown in the movement display so that it can be triggered.

This function is used in the following diagnostics screen:

- ZP_MOTION

Syntax

MotionViewList

Use in scripts: No

Parameter

--

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

On occurrence of a particular event you wish to call up a list for selecting movements.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

On occurrence of the event the selection list for the operating modes is displayed. Here the operator can select the movement that he wants to trigger in a movement display.

See also

Movement display (Page 144)

Functions in the motion display (Page 159)

Creating your own diagnostic screens (Page 132)

7.3.7 MotionViewStart (function)

Application

Starts a displayed movement shown in the specified movement display in the given direction.

Note

In order to be able to stop the movement again, you must configure the function `MotionViewStop` for the "Release Key" event of the same key.

This function is used in the following diagnostics screen:

- ZP_MOTION

Syntax

MotionViewStart (screen object, line, direction)

Use in scripts: No

Parameter

Screen object

Name of the movement display in which the movement is started.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Line

Line in the motion view in which the movement is displayed. The value of "Line" must lie between 1 and 8.

Direction

Specifies on which side of the movement display the movement direction will be shown:

- Right = movement direction is displayed on the right side.
- Left = movement direction is displayed on the left side.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x

HMI device	Configurable
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

On occurrence of a particular event, you wish to start a movement in the movement display in a particular direction.

Notes about configuration

Configure the function for a key or a button. Select the desired event, preferably "Press key" or in the case of a button "Press".

Select the parameters "Line" and "Direction" and set which movement is to be started and the direction in which it is to take place.

Sequence on the HMI device

The movement is triggered when the event occurs.

See also

Movement display (Page 144)

Functions in the motion display (Page 159)

Creating your own diagnostic screens (Page 132)

7.3.8 MotionViewStop (function)

Application

Stops a movement, which is being executed in a specific direction, and is displayed in the specified movement display.

Note

In order to start the movement you must configure the function `MotionViewStart` with the "Press key" event on the same key.

This function is used in the following diagnostics screen:

- ZP_MOTION

Syntax

MotionViewStop (screen object, line, direction)

Use in scripts: No

Parameter

Screen object

Name of the movement display in which the displayed movement will be stopped.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Line

Line in the motion view in which the movement is displayed. The value of "Line" must lie between `1` and `8`.

Direction

Specifies on which side of the movement display the movement direction will be shown:

- Right = movement direction is displayed on the right side.
- Left = movement direction is displayed on the left side.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

On occurrence of a particular event, you wish to stop a movement in the movement display that is currently being executed in a particular direction.

Notes about configuration

Configure the function by assigning it to the same key or the same button that you use to start the movement. In the case of a key select the event "Release key" and in the case of a button "Release".

Select the parameters "Line" and "Direction" and set which movement is to be stopped and in which direction this was previously being carried out.

Sequence on the HMI device

> On occurrence of the event the movement will be stopped.

See also

> Movement display (Page 144)
>
> Functions in the motion display (Page 159)
>
> Creating your own diagnostic screens (Page 132)

7.3.9 MotionViewToggleHierarchyMode (function)

Application

> Determines whether - in the specified movement display - only the movements of the selected unit will be displayed or all movements of the subordinate units of that unit as well.
>
> This function is used in the following diagnostics screen:
>
> ● ZP_MOTION

Syntax

> MotionViewToggleHierarchyMode (screen object)
>
> Use in scripts: No

Parameter

Screen object

> Name of the movement display in which it is defined which movements should be displayed.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x

HMI device	Configurable
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

On occurrence of a particular event, you wish to determine whether only the movements of the selected unit or the movements of all subunits are displayed in the movement display.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

On occurrence of the event, the extent of the movement display is changed.

See also

Movement display (Page 144)

Functions in the motion display (Page 159)

Creating your own diagnostic screens (Page 132)

7.3.10   MotionViewScroll (function)

Application

Goes to the next or previous page of a sorted movement display.

This function is used in the following diagnostics screen:

● ZP_MOTION

Syntax

MotionViewScroll (screen object, direction)

Use in scripts: No

Parameter

Screen object

Name of the movement display in which the page should be changed.

Direction

Defines in which direction should be paged:

● Page down: Change to the next page.

● Page up: Change to the previous page.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You would like to page in the movement display.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

On occurrence of the event, the extent of the movement display is changed.

See also

Movement display (Page 144)

Functions in the motion display (Page 159)

Creating your own diagnostic screens (Page 132)

7.3.11   MotionViewToggleSymbolicNameMode (function)

Application

In the given movement display, it switches the display of the original names and limit names between the two following representations:

- Symbolic names

- Absolute names

This function is used in the following diagnostics screen:

- ZP_MOTION

Syntax

MotionViewToggleSymbolicNameMode (screen object)

Use in scripts: No

Parameter

Screen object

Name of the movement display in which the representation of the name will be changed.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

When a particular event occurs, you want to switch the display mode for output names and target position names in the movement display: From symbolic to absolute or vice versa.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

On occurrence of the event, the display mode for the output names and target position names in the movement display is changed.

See also

Movement display (Page 144)

Functions in the motion display (Page 159)

Creating your own diagnostic screens (Page 132)

7.3.12 MovementsSetTimeout

Application

Sets the beginning of a period in the Motion View. The movement is automatically deselected on expiration of this period. This action locks the movement. This automatic deselection prevents a previously selected movement from being triggered unintentionally.

The length of the period is defined at the "MovementsSetTimeout" function.

This function is used in the following diagnostics screen:

- ZP_PROAGENT

Syntax

MovementsSetTimeout (timeout)

Use in scripts: No

Parameter

Timeout

Defines the timeout in seconds.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Screen	Connected

Application example

Objective

You want to prevent a previously selected movement from being triggered unintentionally.

Notes about configuration

Assign the function to your start screen (for example, ZP_PROAGENT) at the "Connected" event.

Sequence on the HMI device

Any movement being used remains selected. Movements not in use, for example, because the corresponding key is not operated, are automatically deselected on timeout.

See also

Movement display (Page 144)

Functions in the motion display (Page 159)

7.3.13 StoreScreen (function)

Application

Saves the number of the screen in which it is called. The function `RestoreScreen` reselects the screen whose number is saved. You can use these two functions to change to a specific screen.

The `SaveScreen` function only lets you save one screen at a given time; if called again, the function overwrites the previously saved screen number.

This function is used in the following diagnostics screen:

- ZP_PROAGENT

Syntax

SaveScreen

Use in scripts: No

Parameter

--

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to configure a key or button function for the screen which you can use to call one of the diagnostics screens and to return to the original screen.

Notes about configuration

Assign the `SaveScreen` function to this key or button. As event select "Press key" or in the case of a button "Press".

Always execute this function before you execute the `ActivateScreen` function.

Sequence on the HMI device

The HMI device saves the number of the current screen when it detects the configured event.

See also

Message view (Page 140)

Selecting diagnostic screens (Page 153)

BildWiederherstellen (function) (Page 192)

Creating your own diagnostic screens (Page 132)

7.3.14   BildWiederherstellen (function)

Application

Selects the screen whose number was previously saved with the function `SaveScreen`. You can use these two functions to change to a specific screen.

This function is used in the following diagnostics screen:

- ZP_ALARM

- ZP_UNIT

- ZP_DETAIL

- ZP_MOTION

- ZP_STEP

Syntax

RestoreScreen

Use in scripts: No

Parameter

--

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

Configure a key or button for the screen which you can use to return to the screen with the number most recently saved.

Notes about configuration

Assign the `RestoreScreen` function to this key or button. As event select "Release key" or in the case of a button "Release".

Sequence on the HMI device

The screen in which the `SaveScreen` function was previously called is opened when the configured event is detected.

See also

Message view (Page 140)

Selecting diagnostic screens (Page 153)

StoreScreen (function) (Page 191)

Creating your own diagnostic screens (Page 132)

7.3.15   DetailViewChangeAnalyzeMode (function)

Application

Toggles the "Step sequence" and "Message" analysis mode in the detail display.

- The detail display shows the network associated with the currently selected ALARM-S message for diagnostics when operating in "Messages" mode.

- In "Step sequence" mode, the detail display shows the network associated with the current step of the step sequence if no ALARM-S message is active and no error definition is selected.

This function is not used by the standard diagnostics screens.

Syntax

DetailViewChangeAnalyzeMode (mode)

Use in scripts: No

Parameter

Screen object

Name of the detail view into which the desired analysis mode will be changed.

Mode

Defines the type of change:

Mode	Effect
--- Change ---	Switches to the other respective analysis mode
Alarms	Changes to the "Alarms" analysis mode.
Step sequence	Changes to the "Step sequence" analysis mode.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to change to analysis mode in the detail display.

Notes on configuration

Assign a function with the "--- Change ---" parameter to a key or a button. Select the required event.

Sequence on the HMI device

The analysis mode is toggled in the detail display from step sequence to messages or vice versa when an event is detected.

See also

Detail view (Page 142)

Functions in the detail display (Page 156)

Creating your own diagnostic screens (Page 132)

7.3.16   DetailViewChangeExpression (function)

Application

This function changes to the next expression within a fault (of a message) situation in the specified detail display:

- On S7-PDIAG units you move from one participating network to the next.

- On S7-GRAPH units that report a monitoring error you switch from one transition to the next.

- On S7-HiGraph units all subsequent transitions will be displayed sequentially when a monitoring timeout is detected.

The function shows the transition which has caused an error state.

This function is used in the following diagnostics screen:

- ZP_DETAIL

Syntax

DetailViewChangeExpression (screen object)

Use in scripts: No

Parameter

Screen object

Name of the detail display in which the changes to the next expression within a fault or message.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to change to the next transition when a specific event is detected.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

The function selects the next transition and visualizes it in the detail display.

See also

Detail view (Page 142)

Functions in the detail display (Page 156)

Creating your own diagnostic screens (Page 132)

7.3.17   DetailViewToggleRepresentationMode (function)

Application

Changes cyclically in the defined detail display to the next layout in order to display the STEP 7 program code:

- Signal list
- STL
- LAD

This function is used in the following diagnostics screen:

- ZP_DETAIL

Syntax

DetailViewToggleRepresentationMode (screen object)

Use in scripts: No

Parameter

Screen object

Name of the detail view in which the type of display will be changed to the next.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to change to a specific layout in the detail display in order to visualize the program code when a specific event is detected.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

The view changes to the next layout when the configured event is detected.

See also

Detail view (Page 142)

Functions in the detail display (Page 156)

Creating your own diagnostic screens (Page 132)

7.3.18   DetailViewChangeNetworkMode

Application

Switches the detail view in the "Step sequence" analysis mode on the display of the transition network or step network, or switches to the other respective display mode.

This function is used in the following diagnostics screen:

- ZP_STEP

Syntax

DetailViewChangeNetworkMode (mode)

Use in scripts: No

Parameter

Screen object

Name of the detail view into which the desired display mode will be changed.

Mode

Defines the type of change:

Mode	Effect
--- Change ---	Switches to the other respective display mode
Transition network	Switches to the "Transition network" display mode
Step network	Switches to the "Step network" display mode

Configurable HMI devices

HMI device	Configurable
OP 270	Yes
OP 277	Yes
TP 270	Yes
TP 277	Yes
MP 270B	Yes
MP 277	Yes
MP 270B Touch	Yes
MP 277 Touch	Yes
MP 370	Yes
MP 370 Touch	Yes
MP 377	Yes
MP 377 Touch	Yes
PC	Yes

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to switch the detail view to the display mode of the step sequence analysis.

Notes on configuration

Assign a function with the "--- Change ---" parameter to a key or a button. Select the required event.

Sequence on the HMI device

When the event occurs, the display mode of the step sequence analysis in the detail view is switched from "Transition network" to "Step network" or is switched from "Step network" to "Transition network".

7.3.19   DetailViewToggleReducedMode (function)

Application

Toggles between the full and reduced visualization mode in the specified detail view. The reduced display only returns the signals which have caused a fault.

This function is used in the following diagnostics screen:

- ZP_DETAIL

Syntax

DetailViewToggleReducedMode (screen object)

Use in scripts: No

Parameter

Screen object

Name of the detail display in which you toggle between the full and reduced view.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x

HMI device	Configurable
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to change the detail display from normal to reduced mode or vice versa when a specific event is detected.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

The view toggles the full and reduced view when the configured event is detected.

See also

Detail view (Page 142)

Functions in the detail display (Page 156)

Creating your own diagnostic screens (Page 132)

7.3.20   DetailViewToggleStatusMode (function)

Application

Toggles between the following views of the signal status display in the specified detail display:

- Initial error state (initial values)
- Current status

This function is used in the following diagnostics screen:

- ZP_DETAIL

Syntax

DetailViewToggleStatusMode (screen object)

Use in scripts: No

Parameter

Screen object

Name of the detail display in which the signal status view is toggled.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x

HMI device	Configurable
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to change the view of signals when a specific event is detected: From the initial error state (initial values) to the current error status or vice versa.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

The function toggles the signal status views when a specific event is detected.

See also

Detail view (Page 142)

Functions in the detail display (Page 156)

Creating your own diagnostic screens (Page 132)

7.3.21   DetailViewChangeDisturbanceView (function)

Application

This function changes from one fault (or message) of a unit or subunit to the next fault (or message) in the specified detail display.

This function is used in the following diagnostics screen:

- ZP_DETAIL

Syntax

DetailViewChangeDisturbanceView (screen object)

Use in scripts: No

Parameter

Screen object

Name of the detail display in which the program changes to the next fault or message.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to change to the next fault of a unit when a specific event is detected.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

The function visualizes the next fault of the relevant unit in the detail display when the configured event is detected.

See also

Detail view (Page 142)

Functions in the detail display (Page 156)

Creating your own diagnostic screens (Page 132)

7.3.22   UnitViewAcknowledgeUnit (function)

Application

Acknowledges the selected unit in the specified overview display. One acknowledgment bit can be assigned to each unit. This bit is set when a unit is selected on the overview display and if this function is triggered

---

Note

The "Unit" UDT must be used in S7-PDIAG to allow unit acknowledgment. The ProAgent function only sets the corresponding bit. The PLC has to reset the bit after acknowledgement.

A unit acknowledgment should not be mistaken for a message acknowledgment.

This function is used in the following diagnostics screen:

- ZP_UNIT

Syntax

UnitViewAcknowledgeUnit (Screen object)

Use in scripts: No

Parameter

Screen object

Name of the overview display in which the selected unit is acknowledged.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x

HMI device	Configurable
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to trigger a unit acknowledgment when a specific event is detected.

Notes about configuration

Assign the function to a button or key, however, preferably to a global function key. Select the required event.

Sequence on the HMI device

The unit which was selected in the overview display is acknowledged when the configured event is detected.

See also

7.3.23   UnitViewFaultModeChange (function)

Application

Toggles the status of the view on the defined overview display between:

- All units
- Display only the faulty units for which messages are queued.

This function is used in the following diagnostics screen:

- ZP_UNIT

Syntax

UnitViewToggleFaultMode (screen object)

Use in scripts: No

Parameter

Screen object

Name of the overview display in which the scope of the display should be toggled.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to change the scope of the overview display when a specific event is detected.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

The scope of the overview display is changed when the configured event is detected.

See also

Overview display (Page 141)

Functions in the overview display (Page 154)

Creating your own diagnostic screens (Page 132)

7.3.24   UnitViewSuperiorUnit (function)

Application

Shows the units of higher ranking in the unit hierarchy when a unit is selected on the overview display.

This function is used in the following diagnostics screen:

- ZP_UNIT

Syntax

UnitViewShowSuperiorUnit (screen object)

Use in scripts: No

Parameter

Screen object

Name of the overview display in which the higher-level units of the selected unit are displayed.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to view the higher-level units of a unit selected in the overview display when a specific event is detected.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

The higher-level units of the unit hierarchy are displayed when the configured event is detected.

See also

Overview display (Page 141)

Functions in the overview display (Page 154)

Creating your own diagnostic screens (Page 132)

7.3.25 UnitViewSubordinateUnits (function)

Application

Shows the lower-level units of the unit selected in the overview display.

This function is used in the following diagnostics screen:

- ZP_UNIT

Syntax

UnitViewShowSubordinatedUnits (screen object)

Use in scripts: No

Parameter

Screen object

Name of the overview display in which the lower-level units of the selected unit are displayed.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to view the lower-level units of the unit selected in the overview display when a specific event is detected.

Notes about configuration

Assign this function to a key or a button and select the required event.

Sequence on the HMI device

The lower-level units are displayed when a specific event is detected.

See also

Overview display (Page 141)

Functions in the overview display (Page 154)

Creating your own diagnostic screens (Page 132)

7.3.26   GoToSTEP7 (function)

Application

Calls STEP 7 and visualizes the control program section which is associated with the selected message or unit.

This function is not used by the standard diagnostics screens.

Prerequisites

- STEP 7 is installed
- The STEP 7 project data are available

Syntax

GoToSTEP7(ProAgentControl)

Use in scripts: No

Parameter

ProAgentControl

Name of the screen object (message display, overview display, detail display, motion display or step sequence display) or "All units".

STEP 7 opens and branches to the defined section:

- ProAgentControl = message display

Selected message	S7 program	Jump to
S7-PDIAG FB/DB	LAD/FBD/STL Editor	Corresponding block
FC	LAD/FBD/STL Editor	Corresponding block
S7-Graph	S7-Graph Editor	Corresponding step sequence
System error message	Hardware diagnostics	Corresponding CPU
AS process control	Hardware diagnostics	Corresponding CPU

- ProAgentControl = overview display, detail display, motion display or step sequence display

Selected unit	S7 program	Jump to
S7-PDIAG FB/DB	LAD/FBD/STL Editor	Corresponding block in online mode
FC	LAD/FBD/STL Editor	Network in the block in which the error was detected
S7-Graph FB/DB	S7-Graph Editor	Faulty/active step of the step sequence

- ProAgentControl = all units

Selected unit	S7 program	Jump to
S7-PDIAG FB/DB	LAD/FBD/STL Editor	Corresponding block in online mode
FC	LAD/FBD/STL Editor	Network in the block in which the error was detected
S7-Graph FB/DB	S7-Graph Editor	Faulty/active step of the step sequence

Configurable HMI devices

HMI device	Configurable
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to view the source text in the STEP 7 program which has triggered the Alarm-S message selected in the screen.

Notes about configuration

Assign the function to a key or a button.

If, in the "Screen object name" parameter you have configured an alarm view, prior to calling this function you must call the ProAgent function "MessageViewEvaluateError". In the case of alarms with diagnostics capability, you have to determine the associated unit prior to entry.

Procedure:

1. Configure the function "MessageViewEvaluateError" on a key or button.

2. Configure the function "GotoSTEP7" on the same key or button.

Sequence on the HMI device

As soon as an Alarm-S message is output, any operation of the button or key calls the corresponding STEP 7 program and returns the message ID of the corresponding block.

See also

Message view (Page 140)

Overview display (Page 141)

Detail view (Page 142)

Movement display (Page 144)

Step sequence display (Page 145)

Functions in the overview display (Page 154)

Functions in the detail display (Page 156)

Functions in the motion display (Page 159)

Functions in the motions list (Page 161)

Functions in the step sequence display (Page 162)

Creating your own diagnostic screens (Page 132)

7.3.27   MessageScreenEvaluateError (function)

Application

Provides the corresponding diagnostics data for the message selected in the specified message view.

The unit, movement and network associated with the selected message are displayed when an overview display or a motion/detail display is called after this function is triggered.

You should use this function in screens with more than one message display in order to define the message display containing the messages intended as the starting point for diagnostics.

Syntax

MessageViewEvaluateError (screen object)

Use in scripts: No

Parameter

Screen object

Name of the message display in which the message is selected whose diagnostic data should be displayed.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You configured a screen which contains several message displays. One of these message displays serves as the starting point for process diagnostics. The operator can select a message and have the diagnostic data associated with the message displayed in a detail or motion display. Messages selected from the other message display of the same screen are ignored.

Assign a function to a key or button in the screen which contains the message display for opening a screen which contains the overview display, detail display or motion display.

Notes about configuration

Assign the MessageViewEvaluateError function to this key or button. Select the "Press key" event, or the button event "Press". Define the screen object name of the message display as

as parameter. To view the screen object name, open the pop-up menu in the message display with right-click, and then select "Properties" on the "Name" tab.

Always execute this function before you execute the `ActivateScreen` function.

Sequence on the HMI device

The HMI device reads the diagnostic data associated with the selected message from the PLC when the configured event is detected.

See also

Message view (Page 140)

Selecting diagnostic screens (Page 153)

Creating your own diagnostic screens (Page 132)

7.3.28 MeldungsbildZeigeFehlerdefinition (function)

Application

Provides the corresponding diagnostics data for the message selected in the message display.

The unit, movement and network associated with the selected message are displayed when an overview display or a motion/detail display is called after this function is triggered.

If a number of messages are displayed in different screen areas and No message has the focus, the message in the screen area with the highest priority is selected. If several message views are shown, the `MessageViewShowErrorDefinition` function selects the message views in the following order of priority:

1. Message display with focus (dotted rectangle)

2. Alarm message window

3. Message line

4. Alarm display in the template

5. Message display in the basic screen

This function is used in the following diagnostics screen:

● ZP_ALARM

Syntax

MessageViewShowErrorDefinition (screen object)

Use in scripts: No

Parameter

Screen object

Name of the message view in which the message is selected whose diagnostic data should be displayed.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to select a message in a message display and then view the associated diagnostic data in a detail display or motion display. Assign a function to a key or button in the screen which contains the message display for opening a screen which contains the overview display, detail display or motion display.

Notes about configuration

Assign the `MessageViewShowErrorDefinition` function to this key or button. Select the "Press key" event, or the button event "Press".

Always execute this function before you execute the `ActivateScreen` function.

Sequence on the HMI device

The HMI device reads the diagnostic data associated with the selected message from the PLC when the configured event is detected.

See also

Message view (Page 140)

Selecting diagnostic screens (Page 153)

Creating your own diagnostic screens (Page 132)

7.3.29   StepViewChangeRepresentationMode (function)

Application

Changes between the step list and the step diagram in the step sequence display.

This function is not used by the standard diagnostics screens.

Syntax

StepViewToggleDisplayMode

Use in scripts: No

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x

HMI device	Configurable
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to change the representation of the step sequence display.

Notes about configuration

Assign the function to a key or a button. Select the required event.

Sequence on the HMI device

The representation in the step sequence display changes when an event is detected: From the step list to the step diagram and vice versa.

See also

Functions in the step sequence display (Page 162)

Step sequence display (Page 145)

Creating your own diagnostic screens (Page 132)

7.3.30   StepSequenceScreenAcknowledgeError (function)

Application

Acknowledges a monitoring error in the indicated step sequence display.

Syntax

StepViewAcknowledgeFaultSequence (screen object)

Use in scripts: No

Parameter

Screen object

Name of the step sequence display in which the selected step sequence will be acknowledged.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to acknowledge a monitoring error when a specific event is detected.

Notes about configuration

Assign the function to a key or a button. Select the required event.

Sequence on the HMI device

The error in the step sequence is acknowledged when the configured event is detected.

See also

Step sequence display (Page 145)

Functions in the step sequence display (Page 162)

Creating your own diagnostic screens (Page 132)

7.3.31 SchrittkettenbildKlicken (function)

Application

Triggers the "Click" event in the step sequence display. If the step sequence display is configured to show a specific unit, this unit is activated before the "Click" event is triggered.

This function is used in the following diagnostics screen:

● ZP_STEP

Syntax

StepViewClick (screen object)

Use in scripts: No

Parameter

Screen object

Name of the step sequence display in which the "click" event is to be triggered.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to trigger the "click" event for a specific step sequence view. You can configure a function list for this event which then changes to the detail display, for example.

Notes about configuration

Assign the function to a key or a button.

Open the properties dialog box of the step sequence display whose name you defined as function parameter. Assign the "click" event to the required function list. For example, by means of a call of the ActivateDiagnosticsScreen function.

Sequence on the HMI device

Actions initiated when the operator presses the corresponding key or button:

- If the function of the step sequence display is programmed to display a specific unit, then this unit will be activated.

- The program triggers the "click" event and processes the function list.

See also

Step sequence display (Page 145)

Functions in the step sequence display (Page 162)

Creating your own diagnostic screens (Page 132)

7.3.32   StepViewSetStep (function)

Application

Activates the step currently selected in the specified step sequence display.

This function is used in the following diagnostics screen:

- ZP_STEP

Syntax

StepViewSetStep (screen object)

Use in scripts: No

Parameter

Screen object

Name of the step sequence display in which the selected step sequence will be activated.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You would like to enable the step selected in the Step View.

Notes about configuration

Assign the function to a key or a button. Select the required event.

Sequence on the HMI device

The step is activated in the step sequence display when the configured event is detected.

See also

> Step sequence display (Page 145)
>
> Functions in the step sequence display (Page 162)
>
> Creating your own diagnostic screens (Page 132)

7.3.33   StepViewDisableSequence (function)

Application

> Disables the step sequence currently selected in the specified step sequence display.
>
> This function is used in the following diagnostics screen:
>
> - ZP_STEP

Syntax

> StepViewDisableSequence (screen object)
>
> Use in scripts: No

Parameter

Screen object

> Name of the step sequence display in which the selected step sequence will be switched off.

> **Note**
>
> You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x

HMI device	Configurable
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You wish to deactivate the sequence of steps selected in the Step View.

Notes about configuration

Assign the function to a key or a button. Select the required event.

Sequence on the HMI device

The step sequence is deactivated in the step sequence display when the configured event is detected.

See also

Step sequence display (Page 145)

Functions in the step sequence display (Page 162)

Creating your own diagnostic screens (Page 132)

7.3.34   StepViewResetSequence (function)

Application

Initializes the currently selected step sequence in the defined step sequence display.

This function is used in the following diagnostics screen:

- ZP_STEP

Syntax

StepViewResetSequence (screen object)

Use in scripts: No

Parameter

Screen object

Name of the step sequence display in which the step sequence is to be initialized.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You wish to initialize the sequence of steps selected in the Step View.

Notes about configuration

Assign the function to a key or a button. Select the required event.

Sequence on the HMI device

The step sequence selected in the step sequence display is initialized when the configured event is detected.

See also

Step sequence display (Page 145)

Functions in the step sequence display (Page 162)

Creating your own diagnostic screens (Page 132)

7.3.35   StepViewSetNextStep (function)

Application

Continues with the next step in a step sequence display as soon as the transition conditions have been fulfilled. This function is only executed if the defined step sequence display is in stepping mode.

Syntax

StepViewSetNextStep (screen object)

Use in scripts: No

Parameter

Screen object

Name of the step sequence display in which you set the next step.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to set the next step in the step sequence display in stepping mode.

Notes about configuration

Assign the function to a key or a button. Select the required event.

Sequence on the HMI device

The next step is activated in the step sequence display when the configured event is detected.

See also

Step sequence display (Page 145)

Creating your own diagnostic screens (Page 132)

Functions in the step sequence display (Page 162)

7.3.36   StepViewResetStep (function)

Application

Deactivates the step currently selected in the specified step sequence display.

This function is used in the following diagnostics screen:

- ZP_STEP

Syntax

StepViewResetStep (screen object)

Use in scripts: No

Parameter

Screen object

Name of the step sequence display in which the selected step sequence will be deactivated.

Note

You can also select "All Views" as parameter. The functionality affects all screen objects of the particular view type.

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You would like to deactivate the selected step in the Step View.

Notes about configuration

Assign the function to a key or a button. Select the required event.

Sequence on the HMI device

The step is deactivated in the the Step View when the configured event is detected.

See also

Step sequence display (Page 145)

Functions in the step sequence display (Page 162)

Creating your own diagnostic screens (Page 132)

7.3.37   StepViewZoom (function)

Application

Zooms the step diagram by the next lower or higher zoom ratio. Zoom ratios used: 25%, 50%, 75%, 100%, 150%, 200%, 400%.

This function is used in the following diagnostics screen:

- ZP_STEP

Syntax

StepViewZoom (direction)

Use in scripts: No

Parameter

Direction

Direction	Function
Zoom in	Zooms the view by the next higher ratio
Zoom out	Zooms the view by the next lower ratio

Configurable HMI devices

HMI device	Configurable
OP270	x
OP277	x
TP270	x
TP277	x
MP270B	x
MP277	x
MP270B Touch	x
MP277 Touch	x
MP370	x
MP370 Touch	x
MP377	x
MP377 Touch	x
PC	x

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Application example

Objective

You want to create a more detailed and clearer layout of the view.

Notes about configuration

Assign the function to a key or a button. Select the required event.

Sequence on the HMI device

The step diagram is zoomed in or out by the corresponding zoom ratio when the configured event is detected.

See also

> Step sequence display (Page 145)

> Functions in the step sequence display (Page 162)

> Creating your own diagnostic screens (Page 132)

7.3.38   StartSimaticManager (function)

Application

> Calls SIMATIC Manager in PC Runtime.

> This function is not used by the standard diagnostics screens.

Syntax

> StartSimaticManager ()

> Use in scripts: No

Prerequisites

- PC Runtime
- STEP 7 is installed

Configurable HMI devices

HMI device	Configurable
PC	×

Configurable objects

Object	Event
Function key (global)	Press
	Release
Function key (local)	Press
	Release
Screen object	Press
	Release
	Click

Note

The current versions of S7-GRAPH (V5.0) and of STEP 7 Hardware Diagnostics (V5.1) do not support opening in read-only mode. These tools are always called in editing mode.

Always assign corresponding user authorizations to keys that can be used to access these tools.

Application example

Objective

You want to open SIMATIC Manager.

Notes about configuration

Assign the function to a key or a button. Select the required event.

Sequence on the HMI device

If installed, SIMATIC Manager opens when the event is detected.

The program outputs an error message if SIMATIC Manager is not installed:

"Unable to open SIMATIC Manager of STEP 7. Check whether STEP 7 is installed on your computer!"

See also

Functions in the overview display (Page 154)

Functions in the detail display (Page 156)

Functions in the motion display (Page 159)

Functions in the motions list (Page 161)

Functions in the step sequence display (Page 162)

Configuring for the process diagnostic on the STEP7 side

<div style="text-align: right">8</div>

8.1 Configuring for the process diagnostics on the STEP 7 side

Some of the configurations you make on the STEP 7 side, will affect the process diagnostics. The following topics will give you details on these interconnections:

- Configuring ALARM_S messages
- Displaying the results of the criterial analysis in the message text
- Target position modes in the S7-PDIAG Motion View

8.2 Configuring ALARM_S messages

Message configuration in STEP 7

ALARM_S messages are generally not configured in WinCC flexible but in STEP 7. The advantage of this is that you can use the messages on different display units but only have to enter them once.

With the message configuration in STEP 7, you can simply enter easy message texts without any formatting or you can utilize the possibilities of a system-specific message configuration. Depending on the display unit, you can display flashing text and configure additional informational text.

For further information on configuring ALARM_S alarms, refer to the STEP 7 documentation.

8.3 Displaying the results of the criterial analysis in the message text

Wildcards in message texts

By inserting dummy entries into the ALARM_S message text you can also have the message text display the symbols and remarks relating to the operands that led to the fault. In this way the system operator obtains the most important information about the system fault in the message window itself or in the message line without having to switch to the Diagnostic Screens.

For the faulty operands to be displayed and archived, appropriate dummy entries must be inserted in the ALARM_S message text.

The wildcards in the ALARM_S message texts are configured in the message dialogs of STEP 7.

The following wildcards are available:

@ErrOpSym1@:	for the symbol of the first faulty operand and/or
@ErrOpAbs1@:	for the absolute address of the first faulty operand and/or
@ErrOpCom1@:	for the comment of the first faulty operand and/or
@ErrOpAll@:	for the absolute operands, symbols and comments of all faulty operands
@ErrOpSta1@:	for the status of the faulty unit, 0 or 1
@ErrOpDes1@	for the status of the faulty unit, (system message: "Signal must not be present" or "Signal must be present")

If this message is received, the criteria analysis will be executed in the background on the display unit and - depending on the wildcard - the symbols or the comment is inserted in place of the respective wildcard.

When archiving a message that contains a wildcard, a text is also archived along with the rest in the last process accompanying value (independent of which of the three wildcards is included in the message text). When displaying the archived message, the faulty operands are displayed as they were when the message occurred.

Example: Using @ErrOpSym1@ and @ErrOpCom1@ in the message text

S7 PDIAG: Address Monitoring

General | Definition

Initial Diagnostic Address: "Spanner5"

Monitoring Definition

"Spanner5"

○ 1: Level 0
● 2: Level 1   ☐ Delay
○ 3: Edge 0->1   Time:
☑ Monitoring Active   ○ 4: Edge 1->0

Criteria Analysis

☑ Initial Value Acquisition   Negative Criteria Analysis

Message

Number: Priority: Text:
[   ]   [1 ▼]   @ErrOpSym1 (@ErrOpCom1@) close Spanner5

☑ With Acknowledgment   ● Message Configuration   [Configure...]
                          ○ Symbolic Name
                          ○ Symbol Comment

Associated Value:

☐ Record Assoc.Value   [   ]

[OK]   [Cancel]   [Help]

Figure 8-1   Message text with wildcards for criteria analysis

The wildcard @ErrOpSym1@ is replaced by the symbol of the first operand "PEU", and the wildcard @ErrOpCom1@ is replaced by the comment of the first operand "Periphery unclear":

Figure 8-2   Display of the message with inserted first faulty operand

Mailing AlarmS messages

> An activated AlarmS message with error operand is sent twice if message mailing is enabled. The message received is sent directly without replacement of the original "###" wildcards in the message text. The message is sent again with the replaced operands in the message text after the criteria analysis was completed.

8.4   Target position modes in the S7-PDIAG Motion View

Different display modes of the target positions

> From S7-PDIAG V5.0 HF3 and higher you can use the S7-PDIAG Motion View to configure different display modes for the selected movement to all target positions. The target positions of movements are displayed in ProAgent's Motion View in accordance with the configured S7-PDIAG display modes.

> With this, different functions can be performed at a given target position:

> - multilingual text,

> - absolute or symbolic names of address references, or

> - decimal numbers.

> For detailed information on displaying target positions please refer to "Target position modes in the S7-PDIAG Motion View".

> The following cases are possible:

Meaning of the target position modes:	Example for an address reference
Autom. default settings as text, free text: The display unit will show the text saved in the attribute "multi-lingual text". This text was automatically given the default settings by S7-PDIAG. The text is updated by changing background colors. The bits for the control of the update are taken from the UDT2.Final_Position[].	-
Autom. default settings as operand: The display unit shows the absolute or symbolic name of the operand specified in "Address reference". The name is updated by changing background colors. The update control bits are fetched from UDT2.Final_Position[]. If the target position bit has the value 1, the corresponding target position is filled with the configured background color.	M1.0
Editable operand (bit): The display unit updates the target position by means of the current value of the binary tag, which is described by the attribute "Address reference". The absolute or symbolic name of the operand specified in the address reference is displayed. The name is updated by changing background colors. The bits for the control of the update are taken from the address specified by the address reference. If the target position bit has the value 1, the corresponding target position is filled with the configured background color.	E1.0
Editable operand (free): The display unit shows the current decimal value of the signed tag, which is described by the attribute "Address reference" (possible operands: BOOL, Byte, WORD, DWORD). A signed decimal value is put out.	EW0

Examples for different target position modes

Here is an explanatory comparison of the configuration of the target positions in the S7-PDIAG Motion View and the display of the ProAgent Motion View.

Configuring S7-PDIAG

Target position	Use on HMI	Text/format text	Operand
1	Autom. default settings as text	Target position 1	--
2	Autom. default settings as operand	--	M1.0
3	Editable operand (bit)	--	E1.0
4	Editable operand (free)	--	EW0

Display in ProAgent

Target position text	Background color updated by
Target position 1	UDT2.Final_Position[0]
Symbol of M1.0	UDT2.Final_Position[1]

Target position text	Background color updated by
Symbol of E1.0	E1.0
Decimal value of EW0	UDT2.Final_Position[7]

Estimating memory requirements

<div style="text-align: right; font-size: 3em;">9</div>

9.1 Estimating memory requirements

This chapter contains information about the memory requirements of projects. You can use this information to estimate whether the memory of your operating unit is sufficient for the planned configuration.

9.2 System limits of diagnostics for ProAgent/MP

Storage space requirements

In ProAgent/MP there are quantity limitations due to the maximum size of the compiled WinCC flexible configuration file (FWX file). The following table lists the average storage requirement for each of the ProAgent elements:

ProAgent element:	Typical memory requirement in bytes in the FWX file per ProAgent element
Unit • + Unit names	1400 • + (2*number of characters)
Movement • + Motion names • + Direction names • + Faulty operands • + Final position names • + per final position, which is not updated via UDT_Motion.Final_Position[]	1000 • + (2*number of characters) • + (2*number of characters) • + (2*number of characters) • + (2*number of characters) • + 50
Network/step/transition (max. 64 signals per network) • + Network names	400 • + (2*number of characters)

ProAgent element:	Typical memory requirement in bytes in the FWX file per ProAgent element
Operand • + Symbolism • + Comment	40 • + (2*number of characters) • + (2*number of characters)
AlarmS message • + Message text • + Help text	100 • + (2*number of characters) • + (2*number of characters)

As the table shows, the storage requirement for ProAgent elements results is derived from a basic requirement plus a dynamic component that depends mainly on the length of the texts used. Texts in different languages need additional storage of approximately 10 + (2*number of characters) bytes per language.

Example

The following example lists the number of ProAgent elements for which the ProAgent data in the FWX file adds up to a storage requirement of 1 Mbyte on average:

Structures	Max. number
Units	20
Movements	80
Messages in a language without help texts	1000
Error monitoring	500
Networks/steps/transitions	500
Signals used in a language	3000
Maximum number of signals per network	64

The size of the configuration file includes the data for all the WinCC flexible and ProAgent elements. In principle, the compiled configuration file (FWX file) must be within the memory limits of the display unit.

9.3 System limits of diagnostics for ProAgent/PC

Quantity limitation

With ProAgent/PC, there is a quantity limitation, which mainly results from the desired WinCC flexible generation time of 5 minutes (with a Pentium IV, >= 2 GHz, >= 512 MB main memory).

The following nominal values result:

Structures	Max. number
Units	100
Movements	500
Messages in a language without help texts	4000
Error monitoring	4000
Networks/steps/transitions	4000
Signals used in a language	10 000
Maximum number of signals per network	64

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