SIEMENS

SINUMERIK 840Di/840D

ePS Network Services

Function Manual

Applies to:

Software	*Version*
ePS Network Services	4.5

Release 11/2007

SINUMERIK® Documentation

Printing history

Brief details of this edition and previous editions are listed below.

The status of each edition is shown by the code in the "Remarks" column.

Status codes in the "Remarks" columns:

A .... New documentation
B .... Unrevised reprint with new order no.
C .... Modified version with new revision level

Edition	Order No.	Remark
11/2007	--	C
11/2006	--	C
08/2006	--	C
04/2006	--	C
11/2005	--	C

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Preface

SINUMERIK® Documentation

The SINUMERIK documentation is organized in 3 parts:

- General documentation
- User documentation
- Manufacturer/Service documentation

An overview of publications, which is updated on a monthly and also provides information about the language versions available, can be found on the Internet at:

http://www.siemens.com/motioncontrol

Follow the menu items - "Support" → "Technical documentation" → "Overview of publications".

The Internet version of the DOConCD (DOConWEB) is available at:
http://www.automation.siemens.com/doconweb

Information about training courses and FAQs (Frequently Asked Questions) can be found at the following website:

http://www.siemens.com/motioncontrol, under the menu item "Support".

Target group

This publication is intended for project engineers, programmers, technologists (of machine manufacturers), and system startup engineers (of systems/machines).

Benefits

The Function Manual describes the functions so that the target group is familiar with and can select them. It provides the target group with the information required to implement the functions.

Utilization phase: Planning and configuration phase, implementation phase, setup and commissioning phase

Standard scope

This documentation only describes the functionality of the standard version. Additions or revisions made by the machine manufacturer are documented by the machine manufacturer.

Other functions not described in this documentation might be executable in the control. However, no claim can be made regarding the availability of these functions when the equipment is first supplied or in the event of servicing.

Further, for the sake of simplicity, this documentation does not contain all detailed information about all types of the product and cannot cover every conceivable case of installation, operation, or maintenance.
berücksichtigen.

Technical support

If you have any technical questions, please contact our hotline:

	Europe/Africa
Phone	+49 (0) 180 5050 222
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Internet	http://www.siemens.com/automation/support-request

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Note

Country-specific telephone numbers for technical support are provided under the following Internet address: Enter
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Questions about this documentation

If you have any queries (suggestions, corrections) regarding this documentation, please send a fax or E-Mail to the following address:

Fax	+49 9131 98 63315
E-mail	docu.motioncontrol@siemens.com

A fax form is available at the end of this document.

SINUMERIK Internet address

http://www.siemens.com/sinumerik

EC Declaration of Conformity

The EC Declaration of Conformity for the EMC Directive can be found on the Internet at: http://support.automation.siemens.com

or under the Order No. 15257461 or at the relevant branch office of the A&D MC Division of Siemens AG.

Safety instructions

This manual contains information that must be observed to ensure your personal safety and to prevent property damage. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring to property damage only, have no safety alert symbol. Depending on the hazard level, warnings are indicated in a descending order as follows:

Danger

Indicates that death or serious injury **will** result if proper precautions are not taken.

WARNING

Indicates that death or serious injury **may** result if proper precautions are not taken.

Caution

(With warning triangle) Indicates that slight personal injury may result if proper precautions are not taken.

Caution

(Without warning triangle) Indicates that property damage may result if proper precautions are not taken.

Notice

Indicates that an unwanted result or situation may result if the appropriate advice is not taken into account.

In the event of a number of levels of danger prevailing simultaneously, the warning corresponding to the highest level of danger is always used. If a warning notice with a safety alert symbol is to indicate physical injury, the same warning may also contain information about damage to property.

Qualified personnel

The associated device/system must only be set up and operated using this documentation. Only **qualified personnel** should be allowed to commission and operate the device/system. For the purpose of the safety information in this documentation, a "qualified person" is someone who is authorized to energize, ground, and tag equipment, systems, and circuits in accordance with established safety procedures.

Use as prescribed

Please observe the following:

WARNING

The device may be used only for the applications described in the catalog and in the technical description, and only in combination with the equipment, components and devices of other manufacturers where recommended or permitted by Siemens. This product can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

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Content

1

1 Introduction

1.1 Overview of functions

What are ePS Network Services ?

The ePS Network Services support machine tool manufacturers and manufacturing companies with maintenance and services. This is carried out using software services that are available on a CNC control, S7 control, IPC or standard PC.

This requires both a control on the machine that complies with the specifications, and Internet access.

The ePS Network Services include:

Remote access

Remote access to the control via a secure Internet infrastructure.
This service permits remote access to the control.

- Desktop control
- File transfer
- Chat
- Video ...

Control monitor services

Recording of events in a history and documentation of the current status of the control at this point. This allows the status of the device to be analyzed and compared with earlier states should a fault occur.

The current status of the machine is documented using the following events and data:

- Alarms, PLC events, time intervals, combinations of machine signals
- Limit value violation and time delay violation from condition monitoring
- Series of measurements/tests and operating performance monitors
- Manual help request by the machine operator in the event of faults
- HMI action log, machine data, NC status data
- PLC trace, PLC data blocks
- Certain files (e.g. log files) of the control

Condition monitoring services

Measurement and documentation of the current machine status on the basis of predefined, standardized tests and continuous recording of status characteristics (traverse path, traverse time and traverse operations for one axis). The test parameters can be defined centrally and configured with appropriate warning limits. Using series of measurements, it is also possible to identify trends and apply them as a basis for optimizing maintenance and service activities.

The machine operator can then carry out these predefined tests quickly and easily and without additional test equipment.

The following tests and monitors are available:

- Circularity test
- Synchronous operation axis test
- Universal axis test
- NC monitor
- PLC monitor

Data services

Save the current control archives (NCK and PLC archives) on the ePS Server. In the event of faults, they can be reimported into the controller in a controlled manner and used as reference for comparisons of control monitors.

Workflow services

Triggering of service and maintenance processes by notification via media that are internal and external to the system (SMS, e-mail, service cases). Planning, monitoring, and documentation of maintenance activities on the machine.

Maintenance schedules support you in the following tasks:

- "Look Ahead" maintenance relating to load and usage (see: Control monitors with machine and service triggers)
- Automated triggering of operating sequences when faults are detected (see: Maintenance schedules, maintenance jobs, fault help requests, and service cases).
- Planning condition monitors in terms of dates and content, and monitoring their processing (see: Maintenance schedules, maintenance jobs and control monitors)

The Workflow Services can respond to all event sources of the Control Monitor Services and Condition Monitor Services.

Administration services

Functions for the administration of the system:

- Creation and administration of machines
- Creation and administration of users
- Assignment of access rights for external organizations
- Access to use data / invoices

1.2 Operating concept

Overview

The functions of the ePS Network Services are divided into five main categories which can be reached via tabs. The "Machine information" and "Set up functions" tabs always apply to the selected machine.

Note

The availability of each function to the machine operator in each of the various roles is described in the Appendix.

Please see the descriptions in each section for details of the functions.

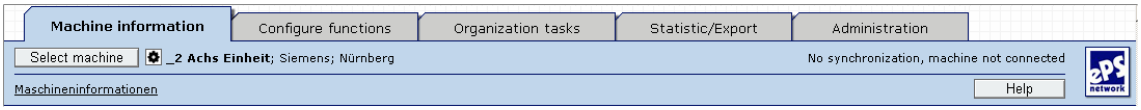

Fig. 1-1: Basic principle of operation

Tab / Section	Description
Machine information	The "Machine information" tab contains important information on a **particular selected machine**. It is divided into the following areas: • Machine overview • Corrective maintenance • Fault services • Remote access
Setting up functions	The "Set up functions" tab allows you to make all the settings that apply to a **particular selected machine**. It is divided into the following areas: • Corrective maintenance • Fault services • Global settings • Copying function settings • Client/server communication
Organizational tasks	The "Organizational tasks" tab contains func-

Tab / Section	Description
	tions and services that apply to **all machines** of an organization. It is divided into the following areas: • Maintenance jobs • Service cases
Statistics/export	The "Import/Export" tab contains functions and services that apply to **all machines** of an organization. It is divided into the following areas: • Multi-machine views • Import • Export • Overviews
Management	The "Administration" tab contains functions and services that apply to the settings of **an organization**. It is divided into the following areas: • Organization management • Personal settings

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2

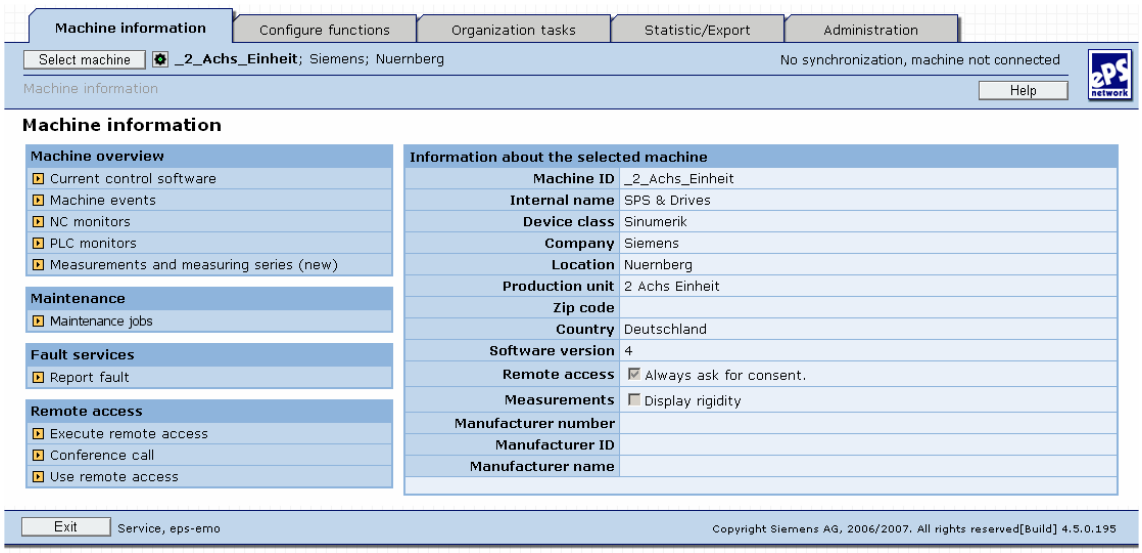
2 Machine information

2.1 Machine overview

Overview

Machine events in the machine information:

The machine events of an individual machine can be viewed in the same way as those of the multi-machine events (see Section 5.1.1 "Multi-machine views") and always refer only to the selected machine.



2.1.1 Current control software

Description of functions

In the Machine information area under **Current Control Software**, you can view all versions of the software packages currently installed on the control

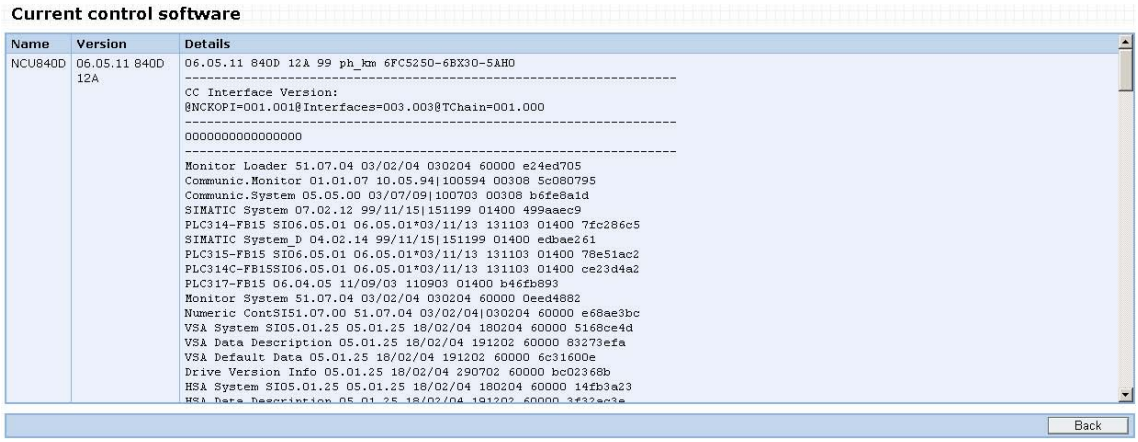


Fig. 2-1: Control software

Function	Description
Current control software	Displays the installed software version: The display depends on the device class. For device class SINUMERIK these are the NCU and HMI version.

2.1.2 Machine events - List view

Description of functions

Under **Machine events** in the **machine information** area you can view the following events for the selected machine as a list:

- Events from Control Monitor Services
  - Alarm or PLC events
  - Fault processing request
  - Cyclic events (time trigger)

  Events that have been configured by control monitors with the identification "Without entry in the machine events" do not generate an entry, and their details cannot be viewed either.

- Events from condition monitor services
  - Violated time delay limits from PLC or NC performance monitors
  - Limit value violation for measurement series / test series

- System events
  - NC/PLC archives created
  - Service sessions performed

For each **event**, you can view additional diagnostic information or triggered workflow services and evaluate them (in some cases graphically):

- Workflow services elements
  - Transmitted notifications (SMS / e-mail)
  - Generated maintenance jobs
  - Service cases

- Diagnostics data
  - Files
  - HMI action log
  - Machine data or NC status data
  - PLC traces or PLC data blocks

To ascertain differences between machine data, NC status data, and data of the HMI action log, you can compare this data with data of the same type for several events on the same machine.

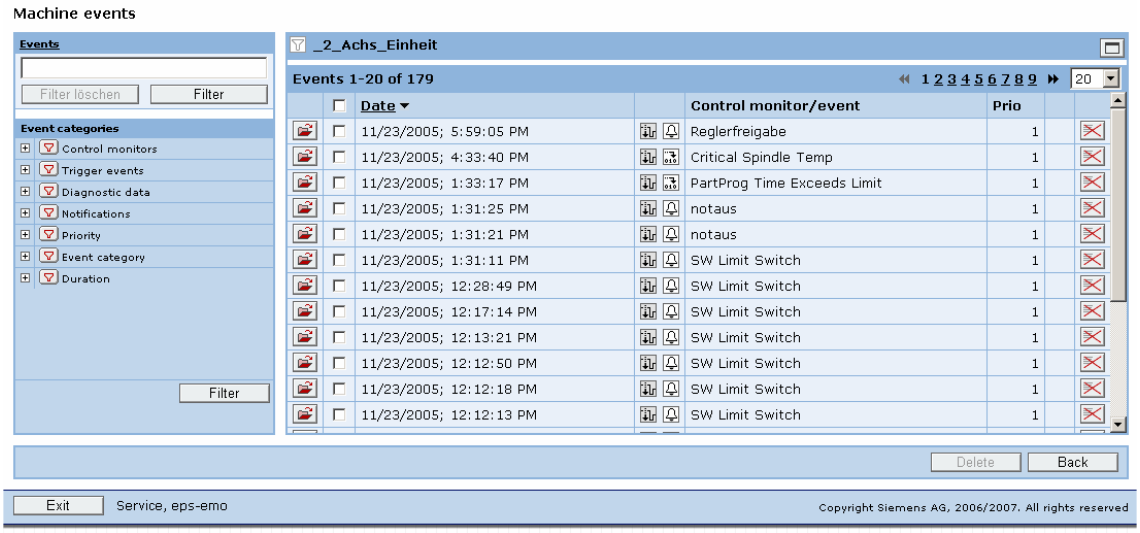


Fig. 2-2: Machine events - List view

Function	Description
Filter events	You can filter events according to their properties. Various filter criteria are available: • Filter according to type of event (alarm, PLC, time trigger, trigger from performance monitors, etc.) • Filter according to type of diagnostics data (e.g. files, PLC Traces) • Filter according to type of triggered Workflow Services Elements (e.g. maintenance jobs) • Filter according to event priority

Function	Description
	• Filter according to time periods (e.g. today, this week, from/to) **Note:** The filter can be hidden to make it easier to evaluate the event history at lower screen resolutions. However, the filter settings still remain active.
Find events	You can browse events using a free text search. The search is applied to the "Designation" and "Details" fields. **Note:** Localized alarm texts of the machine loaded into the ePS server are also found, even if another language is currently set on your workstation (browser).
Open event	You can open the detail view of events, for example, to view and compare diagnostics data.
Sort events	You can sort events according to time stamp (date), designation or priority. **Note:** If the list of events has already been reduced by filtering and/or a search, the reduced list is sorted.
Delete event Delete several events	You can delete individual events. You can delete several events simultaneously: • Click the check box in the "Select all" header, followed by the "Delete" button. • Select individual entries using the check boxes in the line and then click the "Delete" button. **Note:** You can select events in the control monitor services to be "not deletable" (e.g. for verification purpose). You cannot remove these from the list! **Notice:** Diagnostics data generated with an event are also deleted; however, triggered Workflow Services Elements (e.g. maintenance jobs) are not deleted!

2.1.3 Machine events - Detailed view

Description of functions

In the detailed view of an event you can view detailed information about a trigger event and the diagnostics data and triggered workflow service elements it generates.

The detailed view of an event is divided into three areas:

- Triggers
- Workflow actions: Opening displayed actions
  (maintenance job, notification)
- Diagnostics data: Opening displayed actions

The visualization is performed analogous to the configuration of a control monitor except for the restricted editing functions.

Fig. 2-3: Machine events - Detailed view

Note

The detailed information displayed for a particular event depends on the event type. The timestamp is displayed for all event types.

The time stamp is based on the time set on the machine, in order to achieve a true-to-life time-based payment for the event.

2.1.4 Evaluation of workflow actions

Description of functions

To view notifications, you can jump directly from the evaluation of one diagnostics data item to another, if it belongs to the same event.

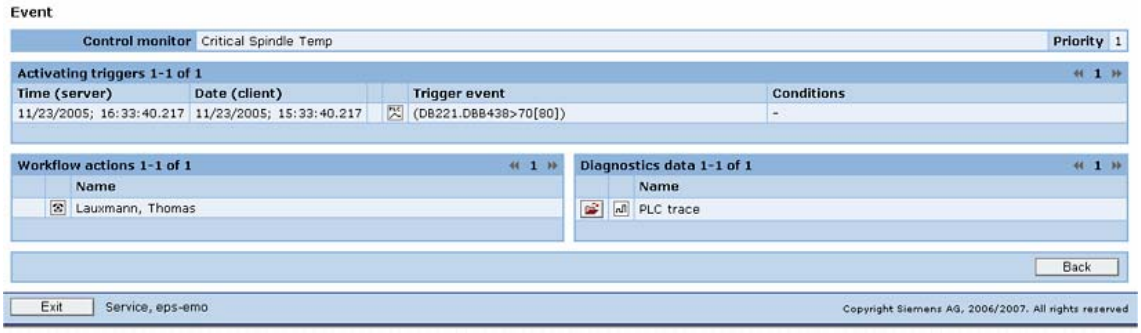


Fig. 2-4: Display of completed workflow actions

Function	Description
View workflow element	You can view workflow elements in detail. The workflow element will open, but it will not be possible to edit it (e.g. maintenance job). Note: Notifications and maintenance jobs cannot be edited.
Delete workflow element	You cannot delete workflow elements retroactively from events that have already occurred, since these show the documentation history. Note: Notifications, maintenance jobs and service cases cannot be deleted.

2.1.5 Evaluation of diagnostics data

Description of functions

ePS Network Services offers evaluation tools for data acquired from the actions. These are either a text viewer (e.g. for machine data) or contain graphic views (e.g. PLC trace). A comparison tool is available for the machine data, NC status data, and HMI action log data types of diagnostics data. You can switch directly between different diagnostics data records of an event.

The following evaluation tools are available for the various diagnostics data:

- Viewing file lists
- Viewing HMI action log
- Viewing machine data
- Viewing NC status data
- Viewing PLC trace (the view can be configured and offers evaluation - functions.)
- Viewing PLC data block/list
- Viewing PLC monitors

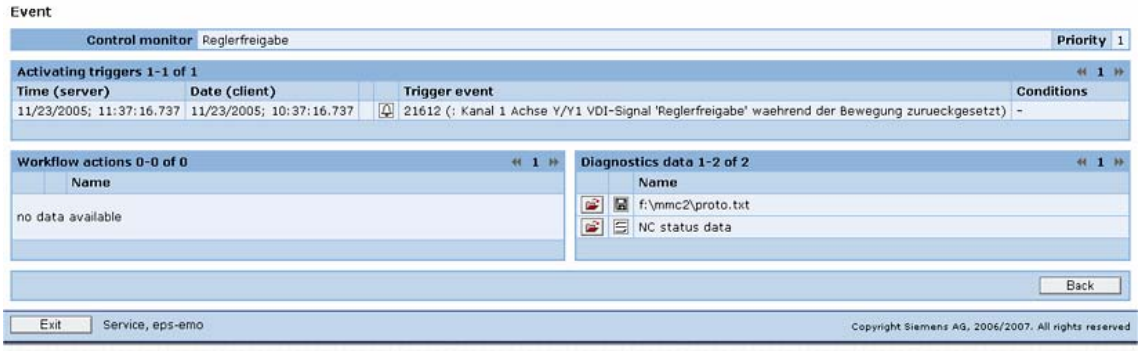


Fig. 2-5: Display of recorded diagnostics data

Function	Description
Diagnostics data	You can switch directly from viewing data for one action to viewing data for another, provided that it belongs to the same machine event.

File list

The files uploaded from the control with a particular event can be displayed in the Browser or in another application, or stored on a data carrier.

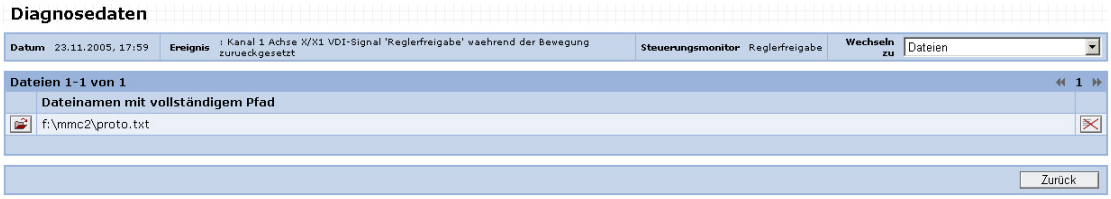


Fig. 2-6: List of uploaded files

Function	Description
Display/save file	You can open a file in either a separate browser window or another application. Alternatively, you can save the file to a data carrier. **Note:** The type of display depends on the data type and the applications installed on your system. Pure text or HTML documents are displayed in a separate browser window. Applications registered in the operating system are usually opened directly. You must save any files with unregistered data types and open them manually with your application.
Delete file	You cannot delete individual files from machine events; it is only possible to delete the entire event entry. **Note:** Deleting individual details from an event constitutes illegal manipulation of the archived document.

HMI action log

An HMI action log uploaded with an event can be displayed in the browser and compared with other HMI action logs.

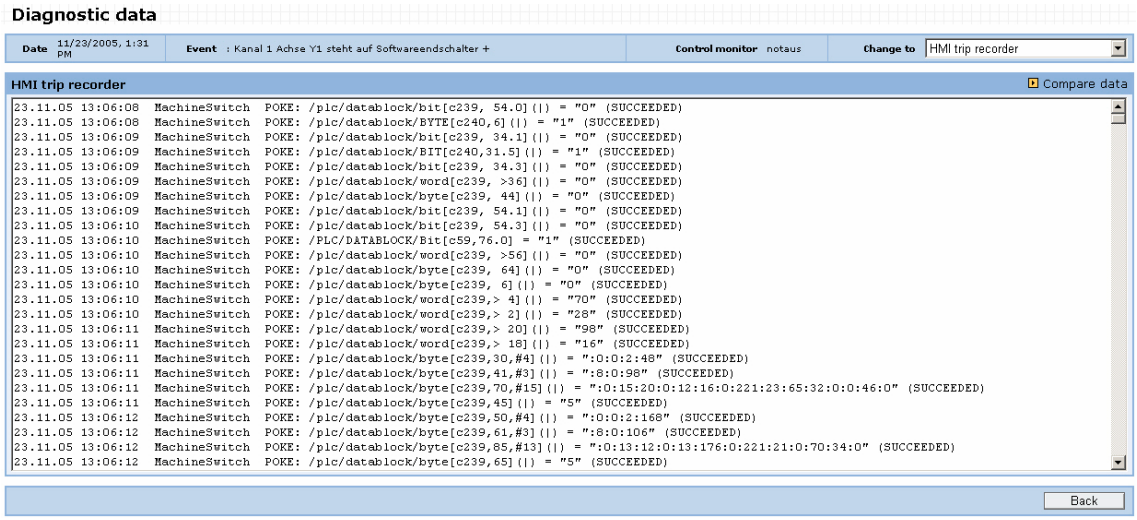


Fig. 2-7: HMI action log display

Function	Description
Display the HMI action log	You can display and evaluate the content of an HMI action log in a text window. **Note:** The content of the HMI action log is defined via local settings on the control (see Section 3.4 "Global settings"). The time stamp of the recorded information is generated from the PLC clock at the time of its occurrence.
Compare HMI action logs	You can compare the HMI action log currently selected with another. For this purpose, the system provides a list of all the HMI action logs available for the currently selected machine. The HMI action logs are displayed in two horizontally adjacent windows and can be compared with each other. The event is displayed for each HMI action log, together with the event details and time stamp.
Delete HMI action log	You cannot delete individual HMI action log files from machine events; it is only possible to delete the entire event entry. **Note:** Deleting individual details from an event constitutes illegal manipulation of the archived document.

Machine data

Machine data uploaded with an event can be displayed in the browser and compared with other machine data.

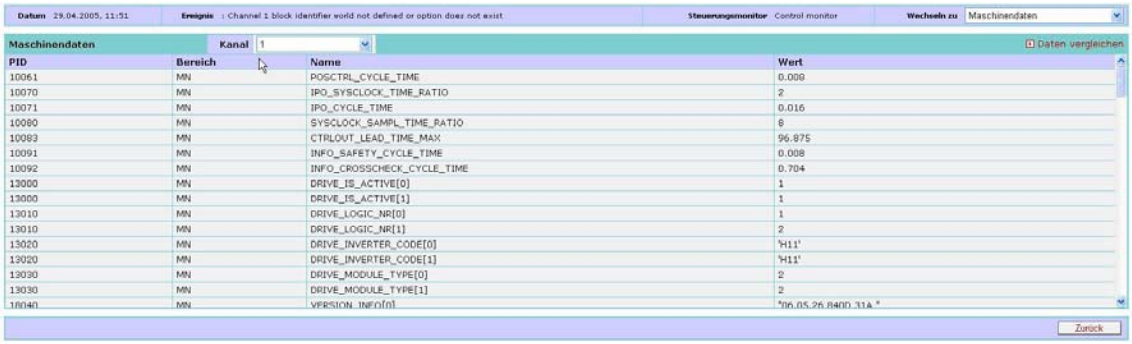


Fig. 2-8: Machine data display

Function	Description
Displaying machine data	You can display and evaluate the content of the machine data in a table. You can select which channel you want to view machine data for. **Note:** Machine data without a channel reference is displayed in the first channel. The machine data generated with control monitor services does not include any drive machine data.
Compare machine data	You can compare the machine data record currently selected with another. The system offers you a list of all available machine data records of the currently selected machine. The machine data values are displayed side by side for each machine data item. Any machine data items with different values in the original data record and the data record you are comparing with is highlighted. The event is displayed for each machine data record, together with the event details and time stamp. It is only possible to display differences. The system then hides all machine data with identical values in the original data record and data record being compared. **Note:** Drive machine data is not compared.
Delete machine data	You cannot delete individual machine data record files from machine events; it is only possible to delete the entire event entry. **Note:** Deleting individual details from an event constitutes illegal manipulation of the archived document.

NC status data

NC status data uploaded with an event can be displayed in the browser and compared with other NC status data.

Fig. 2-9: NC status data display

Function	Description
Display NC status data	You can display and evaluate the content of the NC status data in a table and evaluate it. **Notice:** The NC status data reproduces the status of the relevant NC variables **after an event occurs**. For some events (e.g. RESET alarms) there is a danger of misinterpretation as the event itself influences the variable value (example: pointer to current block is reset by alarm).
Compare NC status data	You can compare the NC status data record currently selected with another data record. The system offers you a list of all available NC status data records of the currently selected machine. The values of the NC status data records are listed next to each other by variable for comparison purposes. Any variable with different values in the original data record and the data record you are comparing is highlighted. The event is displayed for each NC status data record, together with the event details and time stamp. It is only possible to display differences. The system then hides all variables with identical values in the original data record and data record being compared.
Delete NC status data	You cannot delete individual NC status data items from machine events; it is only possible to delete the entire event entry.
	Note: Deleting individual details from an event constitutes illegal manipulation of the archived document.

PLC trace

PLC trace data created with an event can be displayed in the browser and evaluated with graphical tools. Signal curves can be checked by displaying variable values in the graphical display, setting markers, and zooming.

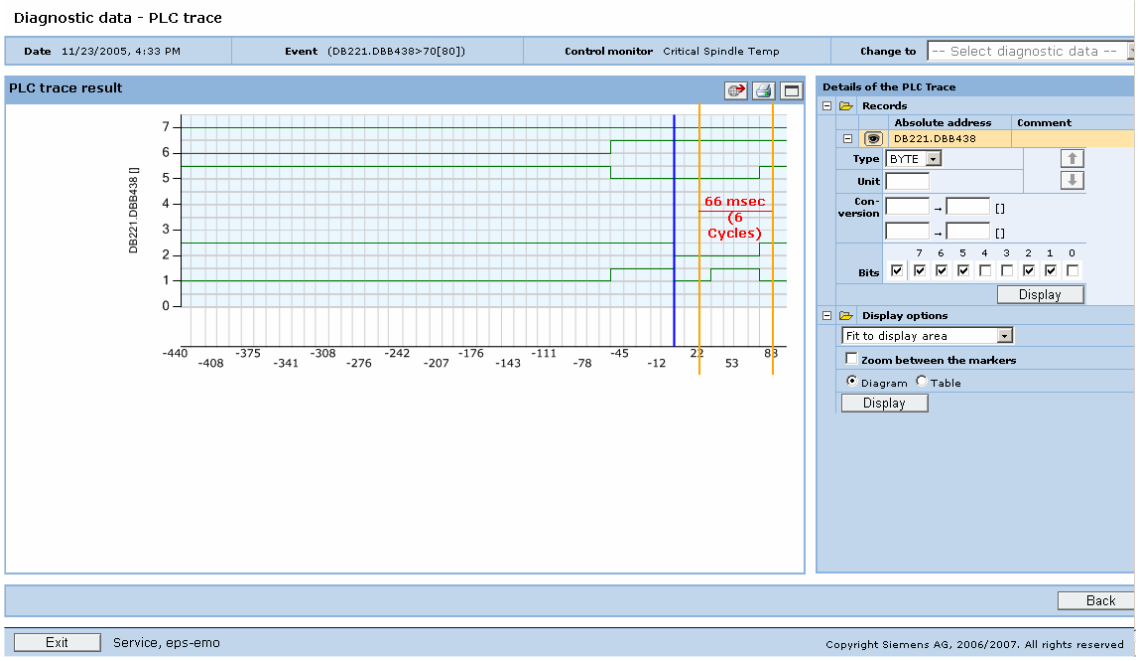


Fig. 2-10: PLC trace display as diagram

Function	Description
Change to	As this menu is a detail of the machine events, and several details may exist for the event, you can quickly change to other existing diagnostics data of the event via a menu.
Display elements	The PLC trace is displayed for all configured variables in the specified format. The signal triggering the recording is displayed and selected as 0 cycle / 0 time. Display updates the display with the predefined details for the PLC trace.
+ /–	Opening and closing of the details for: • Recordings • Display options • Variables
 PLC trace: Showing/hiding variables	Showing/hiding the graph of the variable in the display: For a clearer view, variables can be hidden in the display in order that individual variable configurations can be viewed.
Type	Format of the variables.

Function	Description
Unit	Dimension of evaluated variable values (e.g. ° C).
Conversion of display scaling	Evaluation of variable values for the dimension adjustment, linearly through two defined value assignments. The variables can be scaled linearly via two defined points for the display (e.g. byte value 16 corresponds to 20° C, byte value 128 corresponds to 90° C).
Bits	Display of a variable in byte format; not as a value, but individually as a binary signal for each selected bit. Variables configured as byte can also be displayed as individual bits (BOOL). If not all of the individual bits are required in the view, they can be specifically selected for the display.
 Variable display: Changing the sequence	The sequence of the variables can be changed so that they can be compared directly next to each other.
PLC trace: Time/cycles display	The horizontal axis is always displayed with a millisecond specification for each cycle. This can be changed to the cycle number, each calculated with the starting point 0 from the trigger.
Display options	PLC trace diagrams can be displayed in a default setting that can be evaluated on every monitor. A complete recording can be displayed in a compressed format, by means of a zoom setting in a single view. However, this may result in a loss of information. Every detail is displayed in an optimized compressed display, but in the smallest possible view. The minimum level of precision that can be set for the graph view is the pixel level, but marking should allow a cycle level of precision to be set dynamically.
Diagram/table	A graphical or tabular display of the variable values can be selected.
PLC trace: Data display Horizontal/vertical	The display of the data table can be changed from a horizontal (time/cycle axis) to a vertical (variable axis) view.
PLC trace: Markings	Markings can be set in the PLC trace display that are used for the difference calculation and display of the current values. The markings are retained when using the

Function	Description
	zoom function. Depending on the resolution, they can be positioned on a cycle-specific basis; the minimum level of precision that can be set is the pixel level, where all cycles appear between the markings.
 PLC trace: Data export	The PLC trace data can be exported as a file for further processing.
 PLC trace: Printing data	The PLC trace data can be printed on an installed printer.
 PLC trace: representation	The window for the PLC trace display can be maximized/minimized.

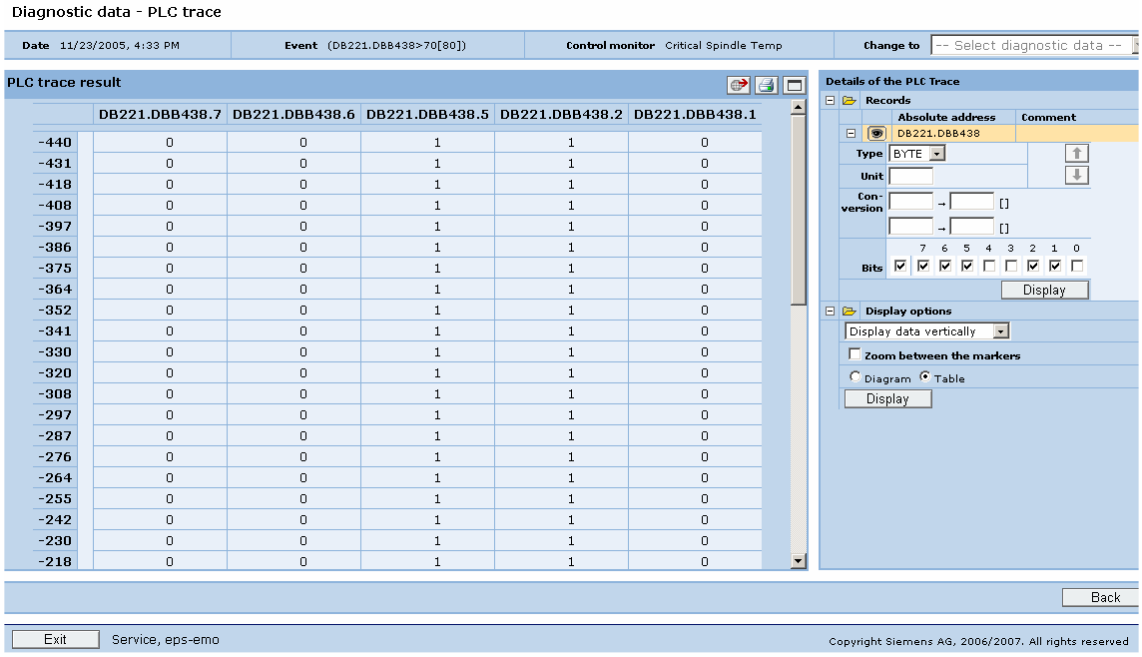


Fig. 2-11: PLC trace values displayed vertically

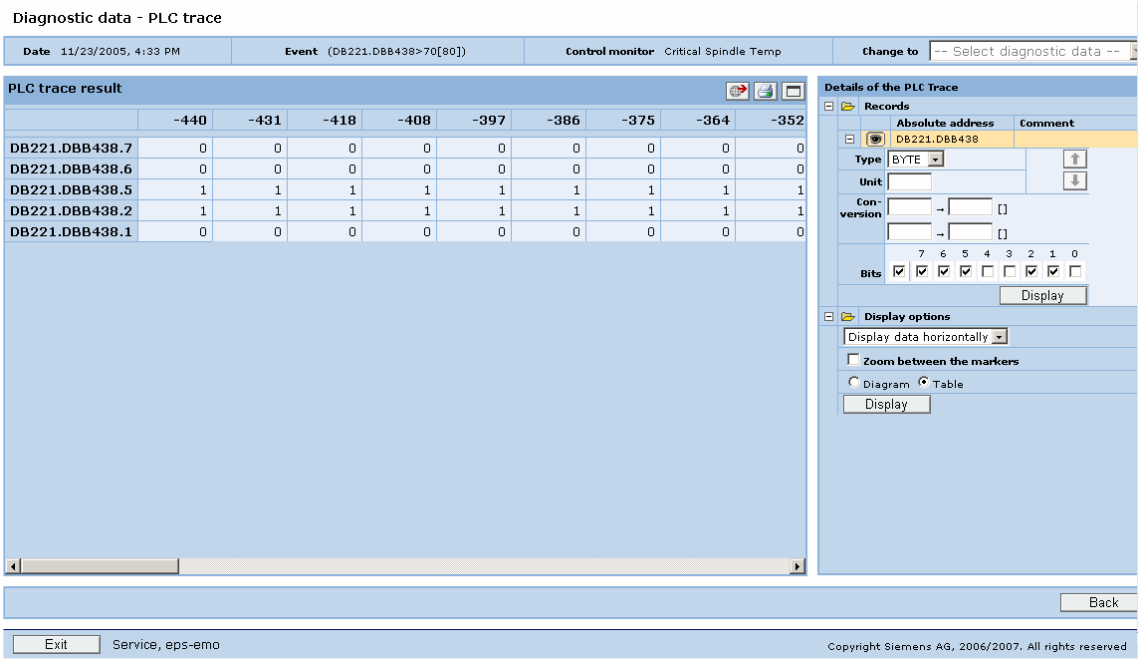


Fig. 2-12: PLC trace values displayed horizontally

PLC traces uploaded with an event can be displayed in the browser and evaluated with graphical tools. Incorrect signal curves can easily be found by displaying variable values in the graphical display, setting markers, and zooming.

PLC data blocks/list

PLC data blocks uploaded from the control on an event can be saved to a data carrier.

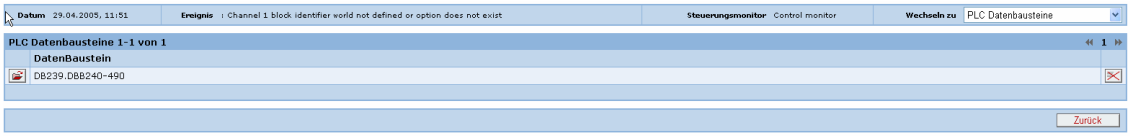


Fig. 2-13: PLC data block display

Function	Description
Save PLC data block	You can save a PLC data block to an external data carrier.
Delete PLC data block	You cannot delete individual PLC data blocks from machine events; it is only possible to delete the entire event entry. **Note:** Deleting individual details from an event constitutes illegal manipulation of the archived document.

PLC monitors

The data of a PLC monitor saved with a machine event can be displayed.

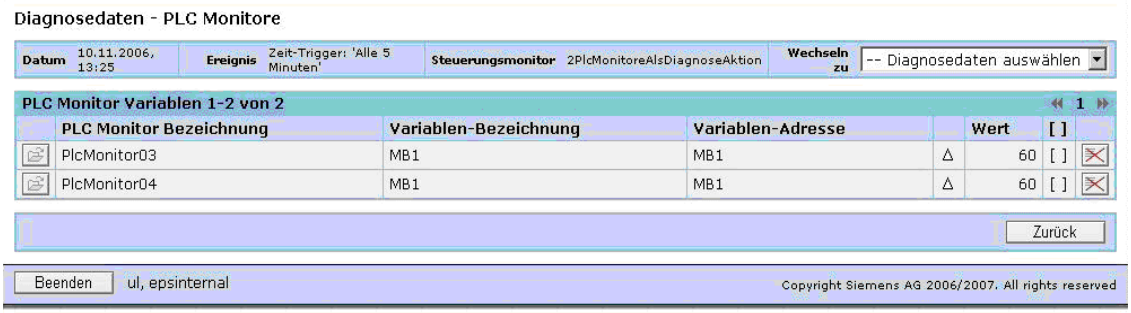


Fig. 2-14: PLC monitor data display

Function	Description
Open PLC monitor	You can open the PLC monitor and display the variations with time of all the recorded monitor data.
Delete PLC monitor data from the event	You cannot delete individual PLC monitor data items from machine events; it is only possible to delete the entire event entry. **Note:** Deleting individual details from an event constitutes illegal manipulation of the archived document.

2.1.6 NC monitors

Description of functions

The life-cycle loads of machine axes (linear, rotary, and main spindle) can be collected and analyzed using the monitors. NC variables (counters) related to maintenance, such as the traverse path, traverse time, or number of traverses are summated over the life cycle or time intervals and can be viewed by the machine operator in the form of time charts.

Maintenance can be performed based on this load data, in connection with warning limits and critical limits.

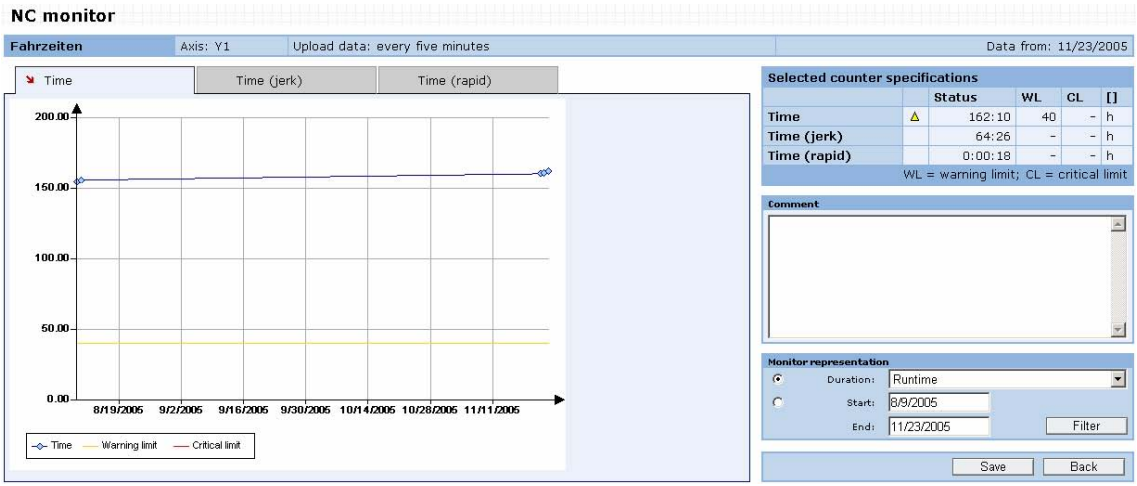


Fig. 2-15: Time chart NC monitor

This information provides support with specifying new machine designs because the real load data is available for machine dimensioning.

Availability and privileges

The time charts of the NC monitors can only be displayed on the PC. The current counter states of an NC monitor can also be viewed on the operator panel. The authorization required to use the NC monitors is described in detail in Appendix A.5.

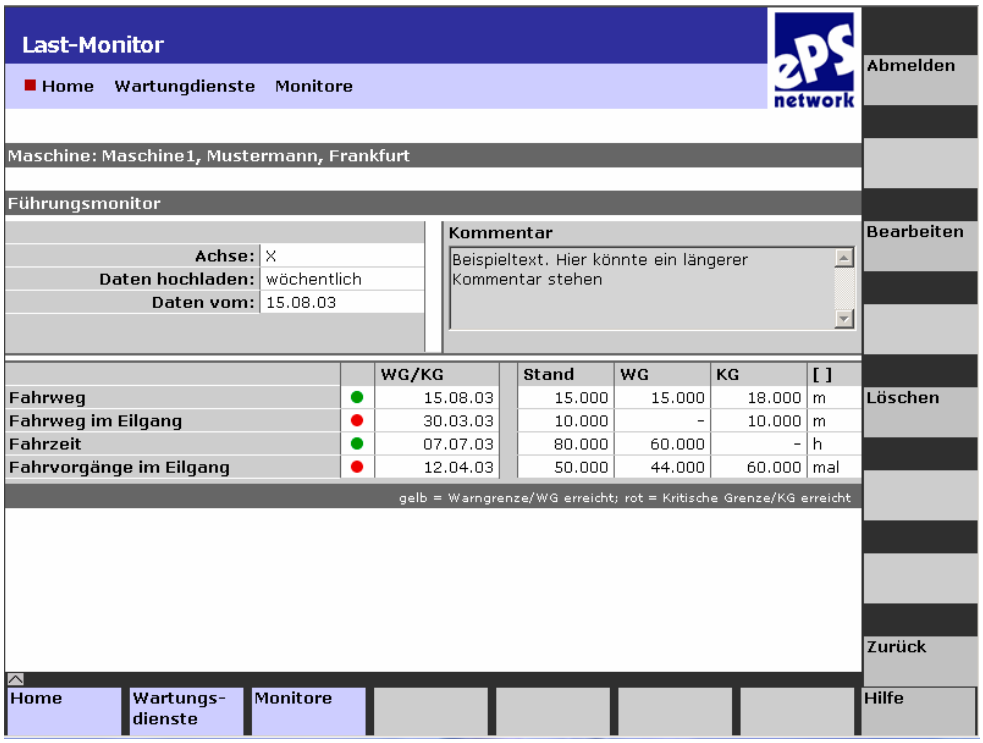


Fig. 2-16: Counter states of an NC monitor on the operator panel

2.1.7 PLC monitors

Description of functions

PLC monitors enable the recording in the PLC of changes over time of any status data. The PLC monitors are essentially for long-term recording in slow data recording cycles (as opposed to the PLC trace). This means that all the machine peripherals that are controlled and monitored by the PLC can be included in condition monitoring.

Up to 32 variables from the PLC can be recorded together in a PLC monitor in the same cycles. The PLC variables recorded can be inputs, outputs, counters, flags, and any data addresses in PLC blocks.

The variables recorded can be scaled and assigned freely definable units. Individual variables of a PLC monitor can be identified as counting variables (e.g. workpiece counters). These variables can be used in the configuration of interval triggers to trigger recurring actions after a certain number of counting units have elapsed. Counting variables are counted up monotonically. Resetting of the variables in the PLC is compensated for by the system because the count is resumed on the basis of the last value before reset.

Limit values can be configured for each variable for automatic monitoring of the state. Actions can be triggered when limit values are violated. This is the same as described for the control monitors.

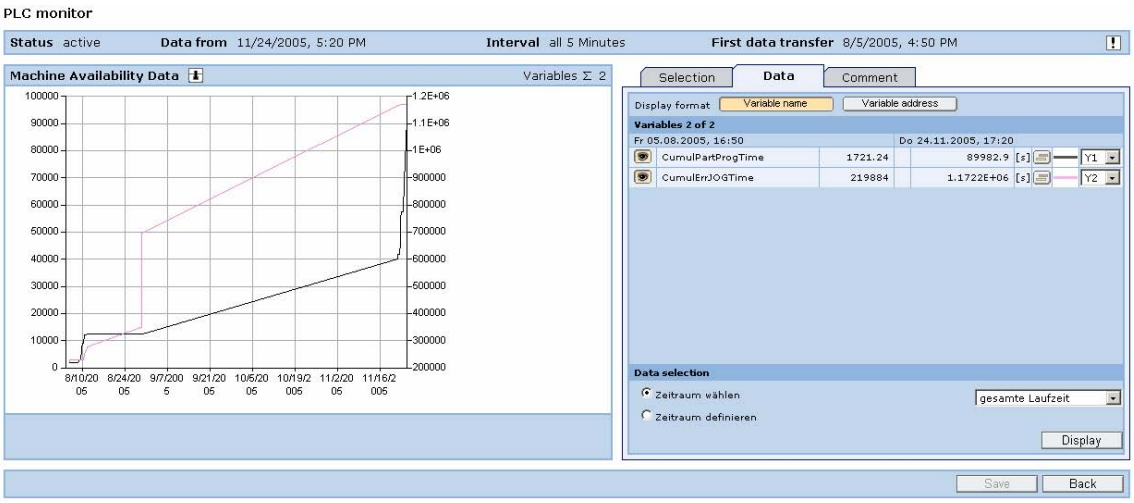


Fig. 2-17: Progression over time of variables of a PLC monitor

2.2 Measurements and measurement series

2.2.1 Analyzing on the PC

Description of functions

The performance and status of a machine and its modules can be analyzed with measurements and measurement series that have been performed on the machine. This includes measurement curves generated from the measurements and characteristics, as well as additional information about the measurement result. Trend curves can be generated from characteristics in measurement series. The machine operator can use the measurement results to make an analysis at a later point, while away from the machine. Status changes can be derived from the trend curves. Limit values will show whether any maintenance work is necessary at an early stage.

Selection and filter area

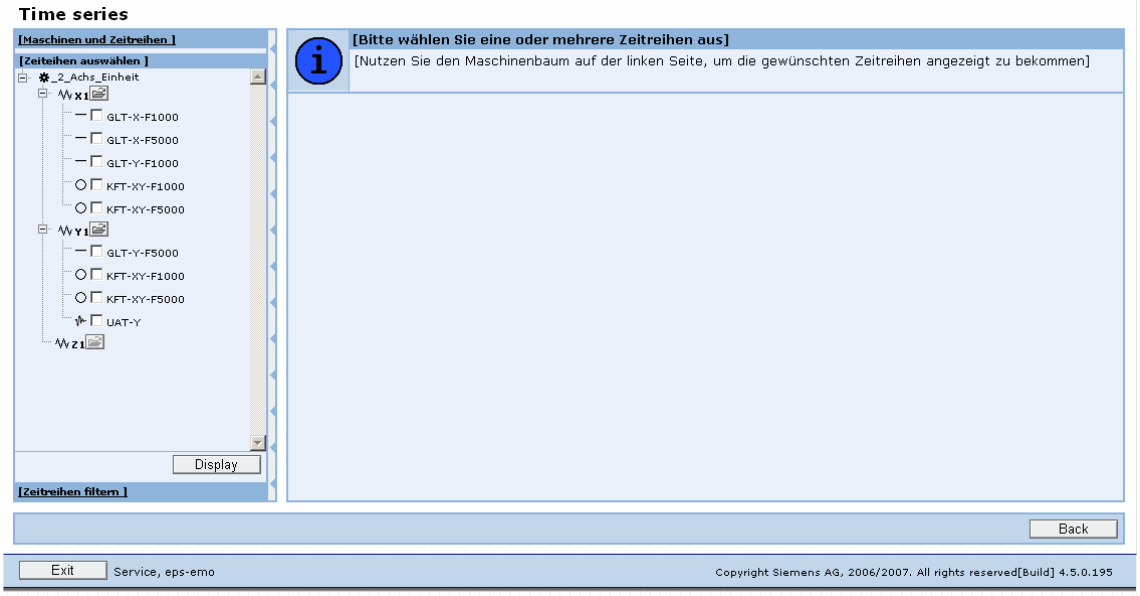


Fig. 2-18: Overview of the time series for the machine selected

Function	Description
Select the time series	The measurement series can be selected from the machine axes in the selection tree. It is possible to select several measurement series.
Select individual measurements	This function displays a table for the axis concerned containing all the measurements that do not belong to a measurement series. Several measurements for the display can be selected in the table.
Display elements	The "Display" function shows the selected measurement series in diagrams.

Function	Description
Filter time series Test types: ▪ Synchronous operation axis test ▪ Circularity test ▪ Universal axis test	This function opens the menu for the purpose of filtering the measurement series displayed in the selection. Measurement series can be filtered according to the type of measurement series.
Filtering	The "Filtering" function causes the selected filter setting to take effect.
Show/hide filter areas	This function shows or hides the entire filter area.

Displaying diagrams of the selected time series

If the user clicks the "Display" text button under the time series selection tree, the graphs for the selected time series are displayed.

Displaying the measurement results

You can view measurement results both on the machine operator panel and on the PC. Trend curves produced by measurement series can only be viewed on the PC.

The warning and critical limits of the characteristics can give the machine operator evaluation information about how far the qualitative state of the machine is from the limit criterion.

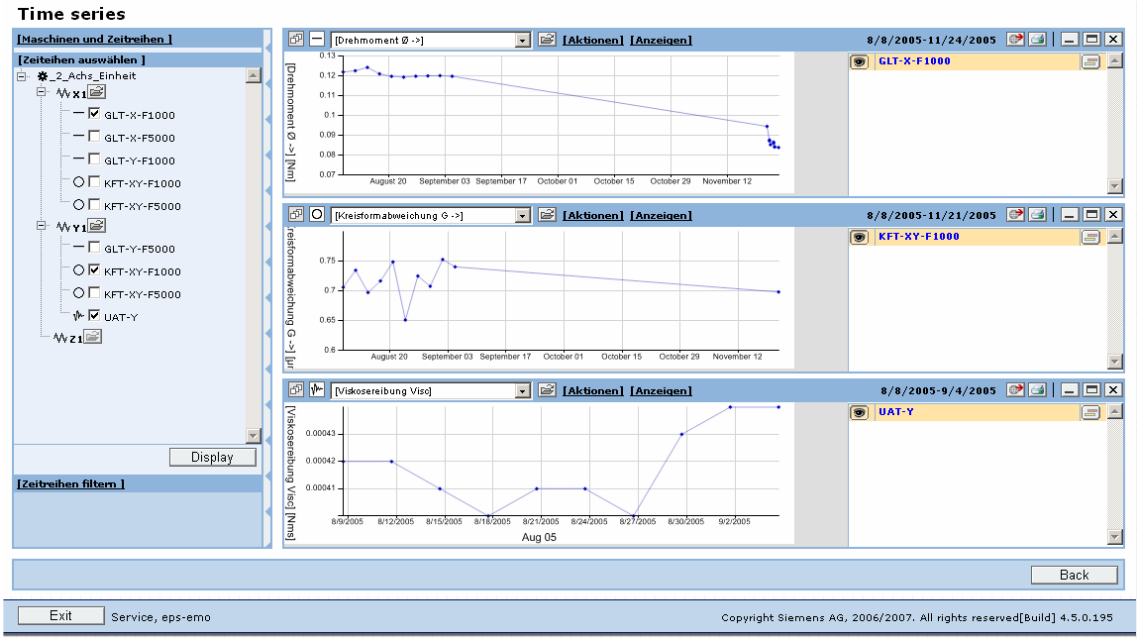


Fig. 2-19: Examples of time series

The trend curve can be generated from the measuring type-specific characteristics (characteristic over time) by cyclic repetition of individual measurements. This is

used in particular as a basis for condition-oriented maintenance. For this, measurement series can be generated based on existing individual measurements. This ensures that the measurement series is based on the same measurement.

Measurement series are used as the basis for condition-oriented maintenance because the trend curve and the limit values provide a basis for planning maintenance activities.

How each test is conducted is described in Section 2.3 Test series on the machine.

The machine operator can view the measurement results on the operator panel of the machine and on the PC. Trend curves derived from measurement series can only be viewed by the operator on the PC.

Individual measurements for an axis

Measurements that are not generated by the measurement series are displayed in a table. The measurements to be displayed can be selected in this table. Several measurements can be selected.

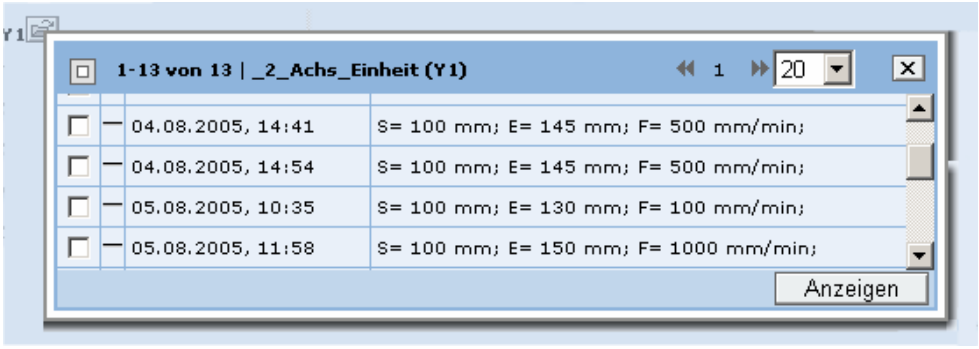


Fig. 2-20: Table of individual measurements

Displaying individual measurements

The "Display table of individual measurements" function opens each of the individual measurements selected in a separate diagram.

2.2.2 Operating diagrams

General control elements

Function	Description
Minimize diagram	Reduces the diagram so that only the header line is visible.
Restore diagram	Restores the minimized diagram to its standard size.
Maximize diagram	Magnifies the diagram so that it fills the entire diagram space.
Close diagram	Closes the diagram
Setting and displaying markings	A pair of markings can be set in the diagram. Left-click to set the first marking. Move the cursor without pressing any buttons to position the second marking, and then left-click. The markings can be reset if you wish. The markings are deleted by means of the "Delete markings" function in the "Display" menu.

Function	Description
Display in new diagram	If the user clicks the "Display in new diagram" button on the right-hand side next to the drop-down list box, a new diagram of the same type will be displayed below the diagram that is already shown. The regenerated diagram assumes all of the display properties of the original diagram (characteristic selected, markings, display, selection and sequence of time series, etc.), with the exception of its scale. In a new diagram, the scale is always set to Auto/Auto.

Changing the characteristic

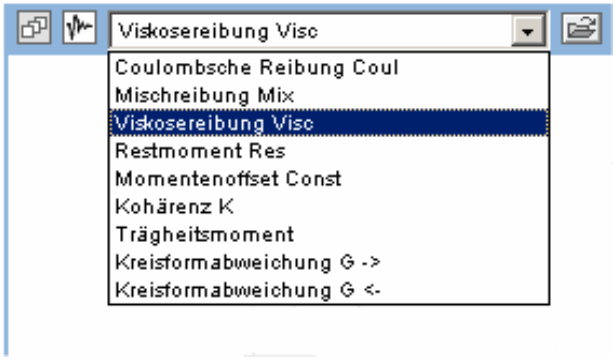


Fig. 2-21: Drop-down list box for characteristics of the circularity test.

The drop-down list box contains the list of characteristics for each test type. If the user selects a characteristic, the diagram that has been displayed up to this point will be replaced by the time series diagram for the characteristic selected.

"Actions" menu

Entries menu	
Warm boot	Regenerates the diagram.
All parameters	A table containing the parameters for all of the measurement series shown in the diagram is displayed.

Fig. 2-22: Parameters for all measurement series

"Display" menu

The display settings of the diagram may be controlled using this menu.

Entries menu	
Display all data	Displays the complete progression over time of the time series
Between the markings	Displays the time domain between the two markings
Last month | | | Last year	These options are used to select the zoom factor. When the zoom level is changed, the diagram is regenerated to reflect this; however, all of the other settings (in particular, the markings) remain the same.
Back to previous zoom	Generates the diagram with the previous zoom setting
Time-based distribution	The horizontal axis represents the time. The measuring points are plotted along this according to their date.
Equal distribution	The measured values are distributed equally across the X axis; it is not possible to draw any further conclusions about the time of the measurement from the points on the X axis.
Delete markings	Removes the markings from the diagram.

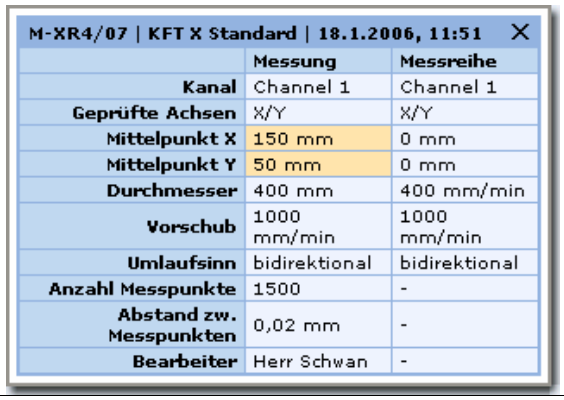
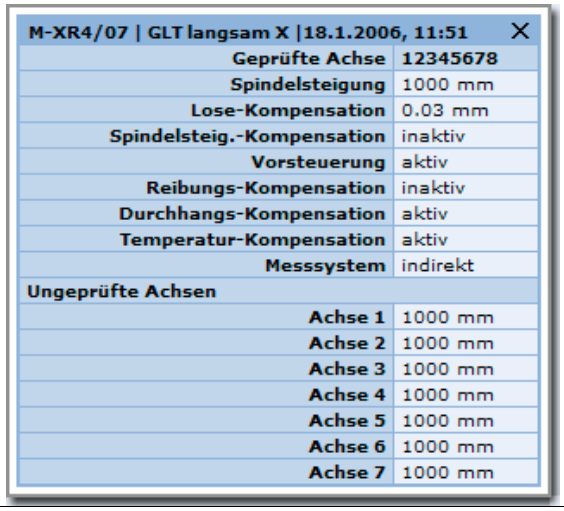
List of machines and time series with control elements

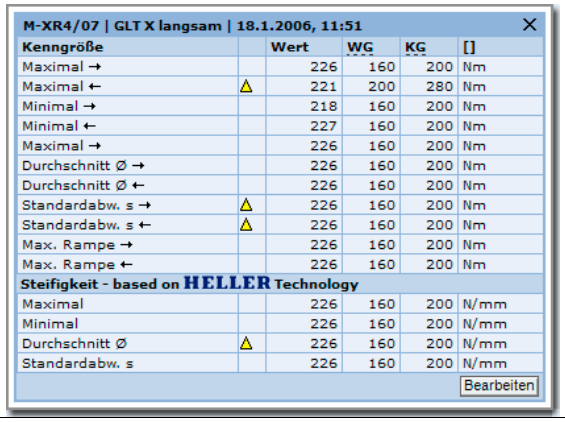
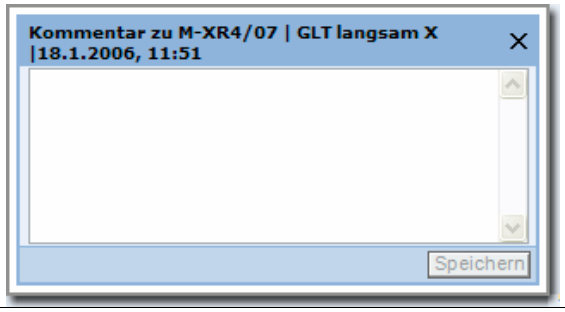
Fig. 2-23: Displaying/hiding individual measurement series

Function	Description
Hide measurement series	This function removes the measurement series graph from the diagram. The diagram is redrawn, which involves recalculating the scale.
Display limit values	This function plots the limit values of the selected measurement series in a line in the diagram. If the limit values are outside the range of values displayed, an icon indicating this will appear.

Context menu of the time series diagram

If the user points the cursor to an individual measuring point within the time series in the diagram and right-clicks, a context menu containing actions relating to that measuring point appears. The functions executed via the context menu relate to either the entire measurement range to which the measuring point belongs (i.e. the measurement range and the measurement), or simply the measurement represented by the data point.

Entries menu	
Measurement series comment	Displays the measurement series comment. This can be changed and saved.
Save graphic	
Measurement/measurement series parameters	
Supplementary conditions for measurement	

Entries menu	
Characteristic/limit values measurement	
Measurement comment	
Display measurement	Displays a diagram with the individual measurement selected below the time series diagram shown.

2.2.3 Control elements of the diagrams for individual measurements

Fig. 2-24: Header line for individual measurement diagram

Changing the diagram type

The drop-down list box contains the list of diagram types that are available for each type of test. If the user clicks a name of a type of diagram, it replaces the type that has been displayed up until this point.

New type of diagram in a separate diagram

If the user clicks the "Display in new diagram" button on the right-hand side next to the drop-down list box of diagram types, a new diagram of the same type will be displayed below the diagram that is already shown.

The new diagram adopts all of the display characteristics of the original diagram (markings, zoom, etc.), with the exception of the scale. The scale of a cloned diagram is always Auto/Auto.

Where individual measurement diagrams are concerned, the "Actions" menu and context menu have the same options:

Entries menu	
Parameter	Shows the pop-up window with the list of measurement parameters. The same pop-up window can be opened from the context of the time series.
Supplementary conditions	Shows the pop-up window with the list of measurement parameters.
Comment	Pop-up with measurement comment
Scaling	Setting for the diagram scale (for the synchronous operation axis test only). In the case of the diagrams for the circularity test and universal axis test, the "Actions" menu does not contain "Scaling".

Scaling for the synchronous operation axis test

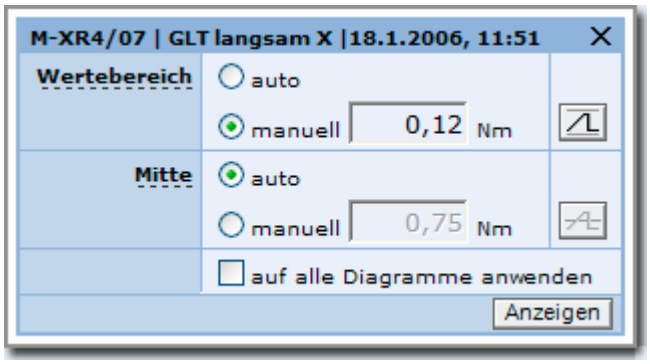


Fig. 2-25: Scaling for the synchronous operation axis test

"Display" menu

This menu is only available for the individual measurement diagram of the synchronous operation axis test.

Entries menu	
All without ramps	Displays the entire measuring range, but without the acceleration ramps
All with ramps	Displays the entire measuring range, including the acceleration ramps
Between the markings	Adjusts the zoom factor of the diagram at the area between the markings. This function assumes that both of the markings have been set.

Navigating to previous/next measurement

The two buttons for this function can be used to navigate to the previous or next measurement of the measurement series in question.

Displaying the characteristics and limit values

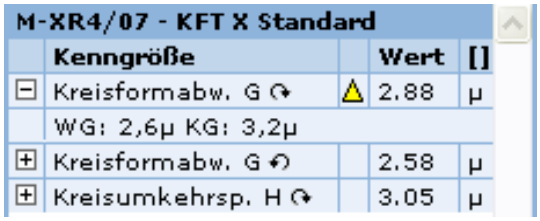


Fig. 2-26: Table of characteristics and limit values

2.2.4 Circularity test

Description of functions

The circularity test produces a polar plot of the circular path and circularity-specific characteristics:

- Circular deviation and
- Circular hysteresis

The measurement type-relevant parameters are also specified. The goal is to test the drive dynamics and accuracy of the two axes involved.

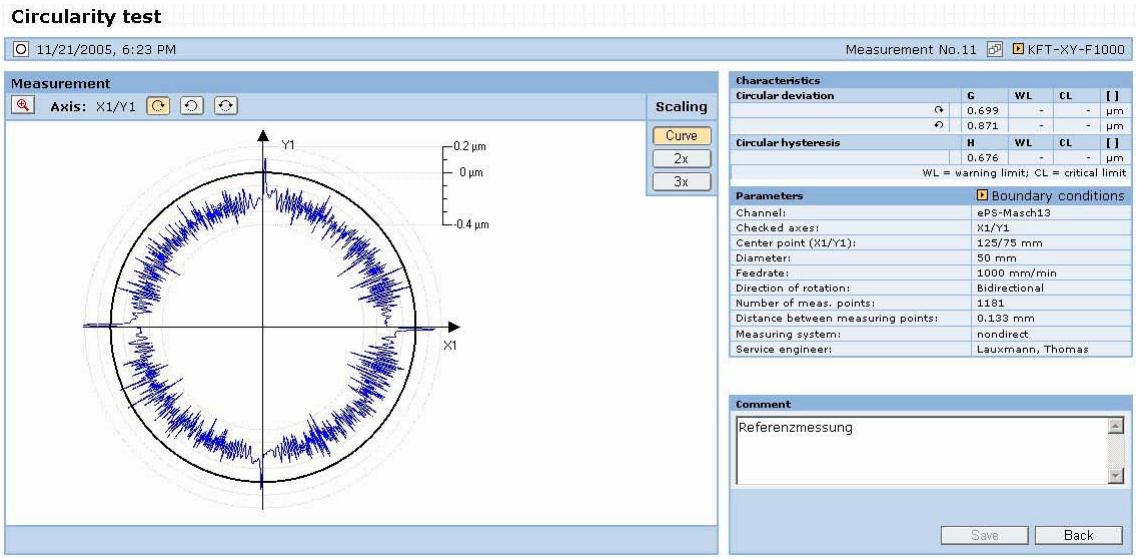


Fig. 2-27: Measuring result of a circularity test

2.2.5 Synchronous operation axis test

Description of functions

The synchronous operation axis test result returns the torque/force measurement curve over the axis position and various torque characteristics:

- Minimum/maximum torque
- Average torque
- Standard deviation
- Maximum torque of the acceleration ramp

For axes that also have a direct measuring system the overall rigidity curve over the axis position is also displayed. The following rigidity characteristics are also calculated:

- Min./max. rigidity
- Average rigidity
- Standard deviation of the rigidity

The synchronous operation axis test notifies the machine operator of faults and interference resistances from feed axis elements. The curve of the recorded values indicates at which axis position the disturbance is located. A trend analysis of the characteristics will indicate any change in the status of the drive train.

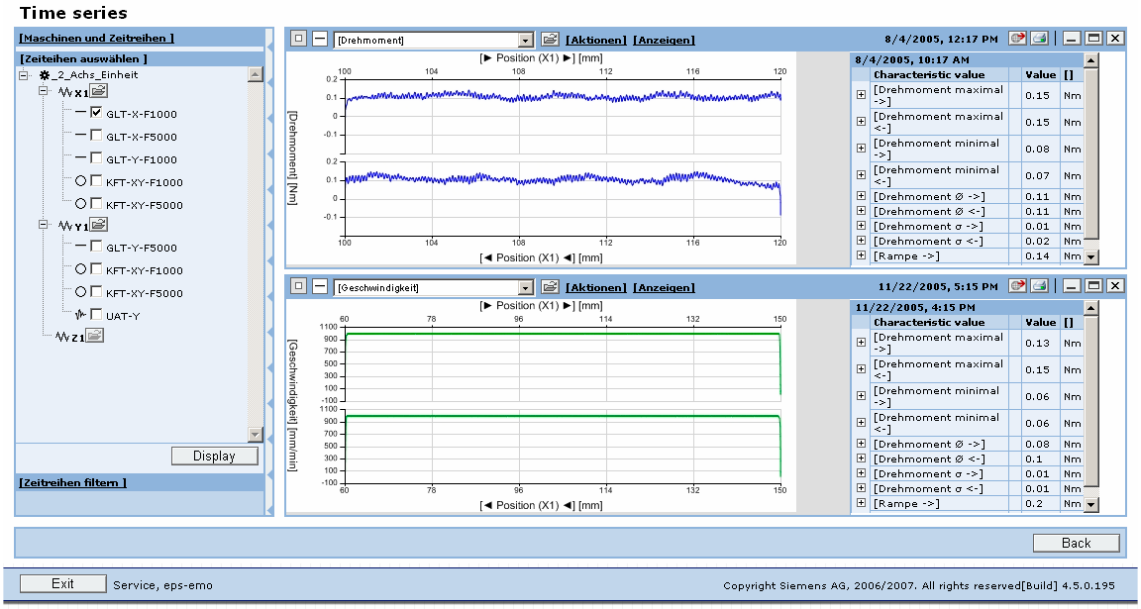


Fig. 2-28: Measurement results of a synchronous operation axis test

2.2.6 Universal axis test

Description of functions

For the universal axis test, characteristics are determined in order to define the friction, the moment of inertia and a torque offset:

- Residual torque (Res)
- Coulomb friction (Coul)
- Mixed friction (Mix)
- Viscous friction (Visc)
- Moment of inertia (Inr)
- Torque offset (Const)
- Coherence (K)
- Circular deviation (G)

The measurement type-relevant parameters are also specified.

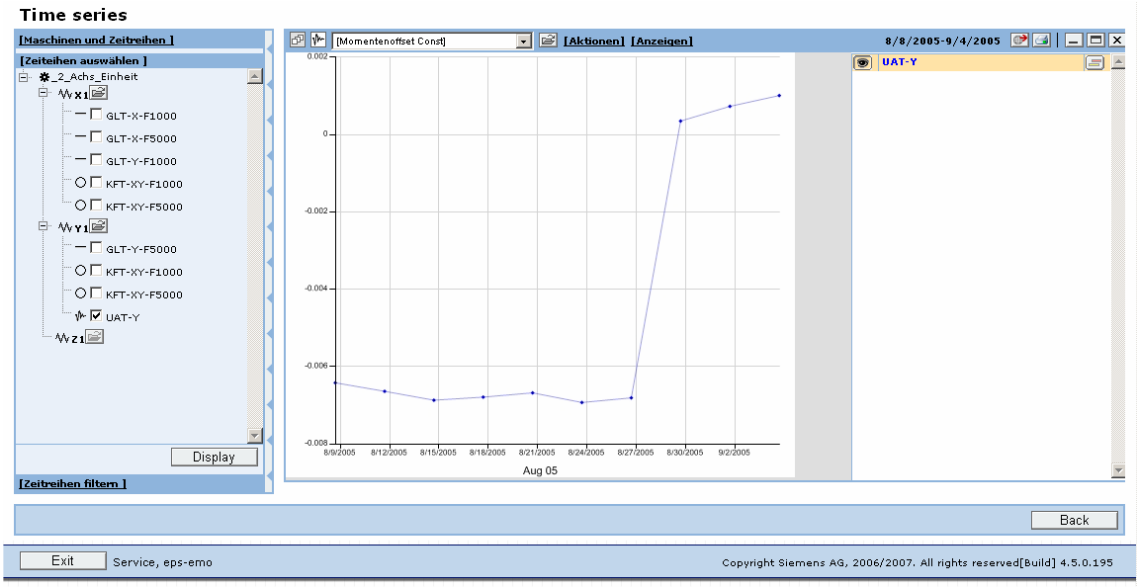


Fig. 2-29: Time series for a universal axis test

2.3 Test series on the machine

2.3.1 Performing measurement series

Perform measurement

The following alternatives are available for performing measurements on the machine:

- Performing a single measurement with manual entry of parameters before performing the actual test
- Performance of a single measurement as the repetition of an existing measurement without changing the parameters
- Performance of a further measurement as part of a series of measurements, based on the parameters predefined in the measurement series
- Performance of a measurement of a measurement series prescribed by a maintenance job
- Performance of measurements configured in a test series
- Performance of measurements in a test series by means of a maintenance job
- Performance of measurements in a test series without a machine operator, by means of a maintenance job under the control of the PLC.

Availability and privileges

Measurements, measurement series, and test series can only be performed on the operator panel. The authorization required to perform measurements, measurement series, and test series is described in detail in the Appendix.

Measurement sequence

The sequence is performed as follows independently of the different types of execution and type of test:

- Machine operator selects measurement, measurement series, or test series
- Confirmation of the parameters of the measurement and display of the measurement series contained in the test series
- A contour test to check collision can be performed before the actual measurement
- Check release by the PLC
- Machine operator sets AUTO mode and feedrate override to 100% on the control
- Machine operator presses NC START on the control
- Perform machine-specific prolog of the measurement movement
- Perform the measurement movement with data recording
- Perform machine-specific epilog of the measurement movement

- Result display
- Save the result

Notice

Please observe the information on the operator panel!

2.3.2 Requirements for performing the test

Requirements on the control

When making measurements, the machine axes must be moved with precisely the motion profile that is defined in the NC program. In addition, it must also be guaranteed that the motion is also executed in the machine coordinates.
The following functions in the NCK could be problematical when carrying out measurements (sample selection):

- Asynchronous subroutines
- Static synchronized actions
- Axis couplings
- Kinematic transformations
- Superimposed (overlaid) motion, such as DRF, external work offset
- Tool Length Compensation
- Functions, that influence the velocity, such as G95
- Functions that change the position, such as DIAMON
- Axis replacement
- Axis is passed over to the PLC (PLC axis)

The NC program for performing the measurement does not affect the functions listed above. Only the zero offsets are disabled and the offset produced by DRF and external zero point offset is compensated statically, i.e. the value is corrected by the value that applies at the beginning of the measurement.

Orientation transformations are a special case. It is possible to execute measurements with the geometry axes when transformation is active. However, the offset of the geometry axis coordinates produced by the orientation axes is not compensated for. It is therefore advisable to deactivate transformation.

Couplings between axes should be separated before the measurement movement (e.g. in the prolog program). The NC program of the ePS system does not separate couplings. The ePS system assumes that it is possible to load, select, and start an NC program (with subroutines) downloaded from the ePS system on the machine in a particular channel. For machines where the PLC prevents the machine operator from selecting or starting any NC program, the PLC can communicate with the ePS system via DB10.DBB90 or DBB91.

Machine data must be set in the control to acquire data for the condition monitoring measurements. Not only Trace Server machine data but also MD 36730: DRIVE_SIGNAL_TRACKING must be set.

Drives that are linked via Profibus must be handled differently. Here the Profibus configuration must be changed so that the torque values can be transmitted to the control cyclically.

Prerequisites of the machine

The measurements for condition monitoring assume that the machine axes can be traversed separately with precisely the motion profile that is defined by the NC program for performing the measurements.
Machine designs with parallel kinematics, for example, that do not allow this are not suitable for condition monitoring by ePS Network Services.

2.3.3 Prolog and epilog program for a measurement

Description of functions

To prepare the control making it suitable for the test, an NC program that has been specially adapted to the machine by the machine manufacturer or end user is executed at the beginning of the test. This means that machine settings can be specifically changed so that the test can be performed (example: Disabling transformations and couplings, resetting pre-set G codes).

The prolog and epilog program is reloaded into the control with name "N_EPS_PROLOGEPILOG_SPF" every time a test is run. The NC program editor of the operator panel (=HMI-Advanced) can be used to modify this program.

After the test has been performed, the ePS system automatically checks whether the prolog/epilog program has been changed and, if required by the machine operator, stores it permanently.

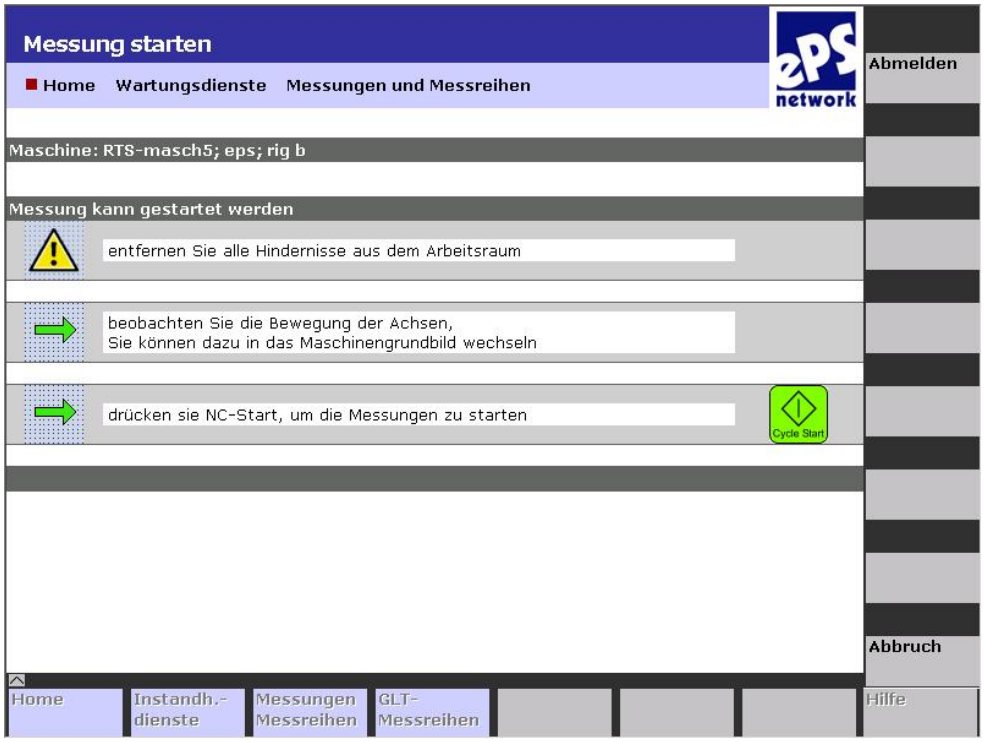


Fig. 2-30: Prompt for NC-START

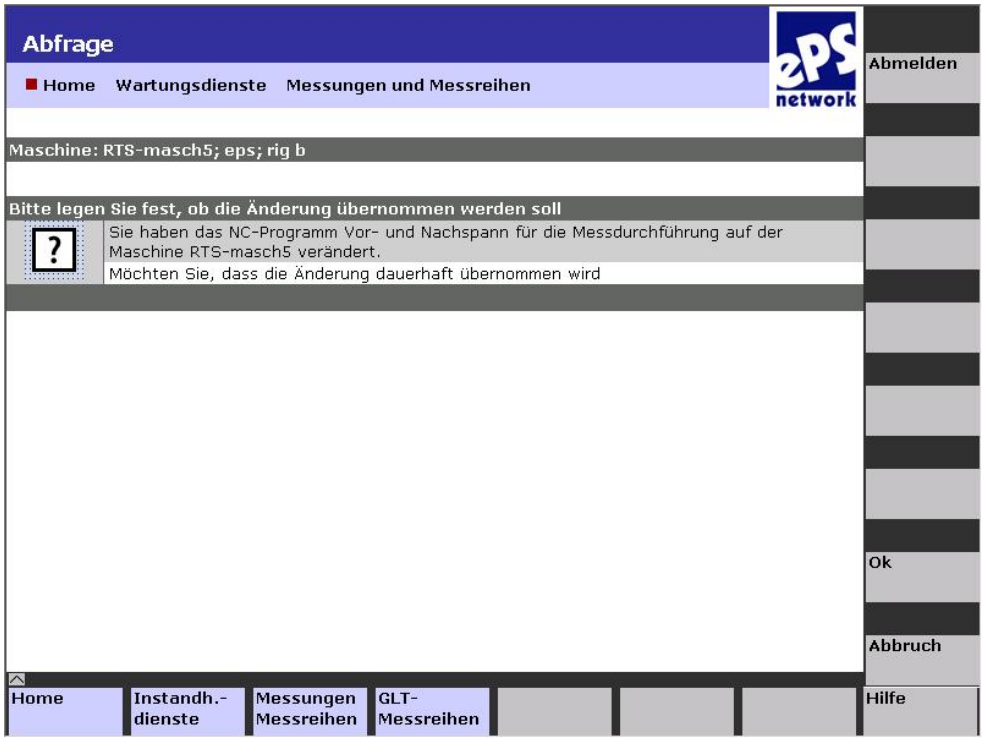


Fig. 2-31: Saving the prolog/epilog program permanently

Call sequence of the NC programs

The prolog and epilog program is executed before and after each measurement movement. The program is also called at the start of a test series and at the end of a test series.

Example of a call sequence:

```
Prolog for test series (testType == "FRAME")

Prolog for measurement series1 (testType == "CIRCULARITY")
Measurement1
Epilog for measurement series1 (testType == "CIRCULARITY")

Prolog for measurement series2 (testType == "EQUABILITY")
Measurement2
Epilog for measurement series2 (testType == "EQUABILITY")

Prolog for measurement series3 (testType == "UNIVERSAL")
Measurement3
Epilog for measurement series3 (testType == "UNIVERSAL")

Prolog for measurement series4 (testType == "CIRCULARITY")
Measurement4
Epilog for measurement series4 (testType == "CIRCULARITY")

...

Epilog for test series (testType == "FRAME")
```

testType == "FRAME" marks the call to start and end of the test series. The other parameters with this call are irrelevant. testType == "CIRCULARITY" identifies a circularity test measurement. "EQUABILITY" stands for the synchronous operation axis test and "UNIVERSAL" for the universal axis test.

In the calls placed before and after a measurement, the further call parameters of the program contain the specific information about the measurement in accordance with the table.

Description of the call parameters

All position values refer to the machine coordinate system (MCS).

	Synchronous operation axis test	Circularity test	Universal axis test
doProlog	TRUE = Call as prolog FALSE = Call as epilog		
testType	FRAME = Prolog/epilog of the test series (The following parameters are irrelevant.)		
testType	EQUABILITY	CIRCULARITY	UNIVERSAL
measSeriesName	Name of the measurement series (in UPPER CASE)		
intParam1	Channel axis number of the traverse axis	Plane selection (1 = G17, 2 = G18, 3 = G19)	Channel axis number of the traverse axis
intParam2	Channel axis number of the measurement axis	Spare	Spare
intParam3	Spare	Spare	Spare
intParam4	Spare	Spare	Spare
intParam5	Spare	Spare	Spare
intParam6	Spare	Spare	Spare
realParam1	Start position	1st center point coordinate of the circle	Start position
realParam2	End position	2nd center point coordinate of the circle	Maximum position
realParam3	Spare	Circle diameter	Spare
realParam4	Feed	Feed	Spare
realParam5	Spare	Spare	Spare
realParam6	Spare	Spare	Spare
axParam1	Channel axis (traverse axis)	Channel axis 1 (traverse axis)	Channel axis (traverse axis)
axParam2	Machine axis (measurement axis)	Channel axis 2 (traverse axis)	Spare
axParam3	Machine axis (traverse axis)	Spare	Spare
axParam4	Spare	Spare	Spare
axParam5	Spare	Spare	Spare
axParam6	Spare	Spare	Spare

2.3.4 Program example

Description

Here is a commented example program to illustrate how the prolog and epilog program can be used to prepare the machine specifically for a certain test. The structure of the program is as follows:

Prolog for the test series:

This section of the program is only executed once at the beginning of a test series and also on each single measurement outside a test series. This block contains everything that has to be executed irrespective of the type of test or the axis that is to be measured. For example, in this case G codes that are preset on the machine via machine data (G95, DIAMON, etc.) could be deactivated, the tool could be unloaded, the workpiece removed, and all axes moved to a safe initial position.

Prolog for each measurement:

This section of the program is executed before each measurement, irrespective of whether the measurement is part of a test series or is performed individually. This block can be used with call parameters to check which axis is to be tested, which test type is to be conducted, and with which parameters the measurement will be performed. For example, when testing certain axes, it may be necessary to move other axes to another position than the basic position, or the starting point for the measurement cannot be approached directly (circularity test). Certain actions could also be performed depending on the position range in which the measurement is performed.

When programming axis movements, it is important to ensure that the parameters of a measurement always refer to the machine coordinate system if they represent positions. The example program shows how the axis movement can be offset into the machine coordinate system using the command SUPA.

It is possible to test the name of the measurement series in the program and to execute special functions for a certain measurement series. However, that should be limited to special cases because the parameters of a measurement series can be changed at any time without its name having to be changed.

Epilog for the test series:

This section of the program is only executed once at the end of a test series and also after each single measurement made outside a test series. The actions that are necessary for minimizing the work the machine operator must do in order to resume the machining process after performing measurements should be executed in this block.

Epilog for each measurement:

This section of the program is executed after each measurement, irrespective of whether the measurement is part of a test series or has been performed individually. It is useful for undoing actions performed before the measurement. It may be necessary to move all axes back to their safe initial position.

```
PROC EPS_PROLOGEPILOG(BOOL doProlog, STRING[32]          ; user DEF area
testType, STRING[32] measSeriesName, INT intParam1,
INT intParam2, INT intParam3, INT intParam4, INT
intParam5, INT intParam6, REAL realParam1, REAL
realParam2, REAL realParam3, REAL realParam4, REAL
realParam5, REAL realParam6, AXIS axParam1, AXIS
axParam2, AXIS axParam3, AXIS axParam4, AXIS
axParam5, AXIS axParam6)
IF (doProlog == TRUE)
MSG("Start of Prolog ... ")                          ;     start of Prolog - user section start
IF ( testType == "FRAME")
MSG("Frame Prolog ...")                              ;     Frame Prolog user section actions at
                                                     start of a test series
    T0 M6                                            ; Unload tool
    BASIC POSITION                                   ; all axes to safe position
TRAFOOF                                              ; Deactivate transformation
G94                                                  ; for lathes, G95 is often placed in front
    DIAMOF
G90
  ELSE
MSG(testType << " Prolog ...")                       ; prolog for a specific series of measure-
                                                     ments
                                                     ; handling irrespective of type of measure-
                                                     ment
                                                     ;     handling for measurement of certain
                                                     axes:
    IF (axParam1 == C) OR                            ;     if axis A or C is to be measured, Q
       (axParam1 == A)                               must be 0
IF ($AA_IW[Q]!=0)                                    ; M code for rotation of Q
ENDIF
ENDIF
    IF (axParam1 == U) OR                            ;     if axis U or W is to be measured, Q
       (axParam1 == W)                               must be 180
IF ($AA_IW[Q]!=180)                                  ; M code for rotation of Q
ENDIF
ENDIF
IF (testType == "CIRCULARITY")                       ;     specific handling for circularity test
                                                     ; actions for all circularity tests: to avoid
                                                     collision, the two axes are moved to the
                                                     circle center one after the other. A particular
                                                     sequence may be required.
      G1 F1000 SUPA AX[axParam1]=realParam1          ; SUPA, therefore target position in the
                                                     machine coordinates
G1 F1000 SUPA AX[axParam2]=realParam2
IF (measSeriesName == "KFT_FFWON")
FFWON                                                ; specifically this series of measurements
                                                     should be performed using the pre-control
                                                     FFWON
ENDIF
ENDIF
IF (testType == "EQUABILITY")                        ; actions for all synchronous operation axis
```

```
                                                    tests, e.g. approaching the start position
IF (measSeriesName == "")                           ; specific actions for single series of measurements
ENDIF
ENDIF
IF (testType == "UNIVERSAL")                        ; actions for all universal axis tests, e.g. approaching the start position
IF (measSeriesName == "")                           ; specific actions for single series of measurements
ENDIF
ENDIF
MSG(" ... finished Prolog.")                        ; end of Prolog - user section end
GOTOF PROG_END
  ELSE
MSG("Start of Epilog ... ")                         ;     start of Epilog - user section start
IF ( testType == "FRAME")                           ;     Epilog of the test series
MSG("Frame Epilog ...")                             ;     Frame Epilog user section
  ELSE
MSG(testType << " Epilog ...")                      ; Epilog specifically for the last meas. series conducted
G90
    BASIC POSITION                                  ; all axes back to safe position after measurement
MSG(" ... finished Epilog.")                        ;     end of Epilog - user section end
ENDIF
ENDIF

PROG_END:
G4 F1                                               ; is required for synchronization
M17
```

2.3.5 Commissioning measurements

Description of functions

The prolog and epilog program must be edited in order to perform measurements. If measurements are performed on a machine for the first time, or if the prolog and epilog program has been deleted, then a preconfigured prolog and epilog program takes effect, which prevents the further execution of the NC programs as the NC program code runs in an endless loop. This part of the preconfigured prolog and epilog program must be deleted. A program code adapted to the requirements of the machine must be used for the prolog or epilog.

Fig. 2-32: Prolog and epilog program

2.3.6 Release protocol between PLC and ePS system

Description of functions

Communication is performed between the ePS system and the PLC for the execution of a test. The ePS system signals that a test will be executed with axis movements. The PLC can then put the machine in a suitable state and signals to the ePS system that the test can begin.

The protocol allows test series that are to be carried out with a maintenance schedule to be executed in a fully automatic manner while being monitored by the PLC.

More details are given in /R1/.

2.3.7 Contour test

Description of functions

A dry run is possible to ensure measurements can safely be performed on the machine. The machine operator has the option of executing a dry run with reduced velocity before beginning the test run configured to a specific type. This allows the operator to test for safety path motions (contour monitoring) of the machine axes to avoid collisions, etc.

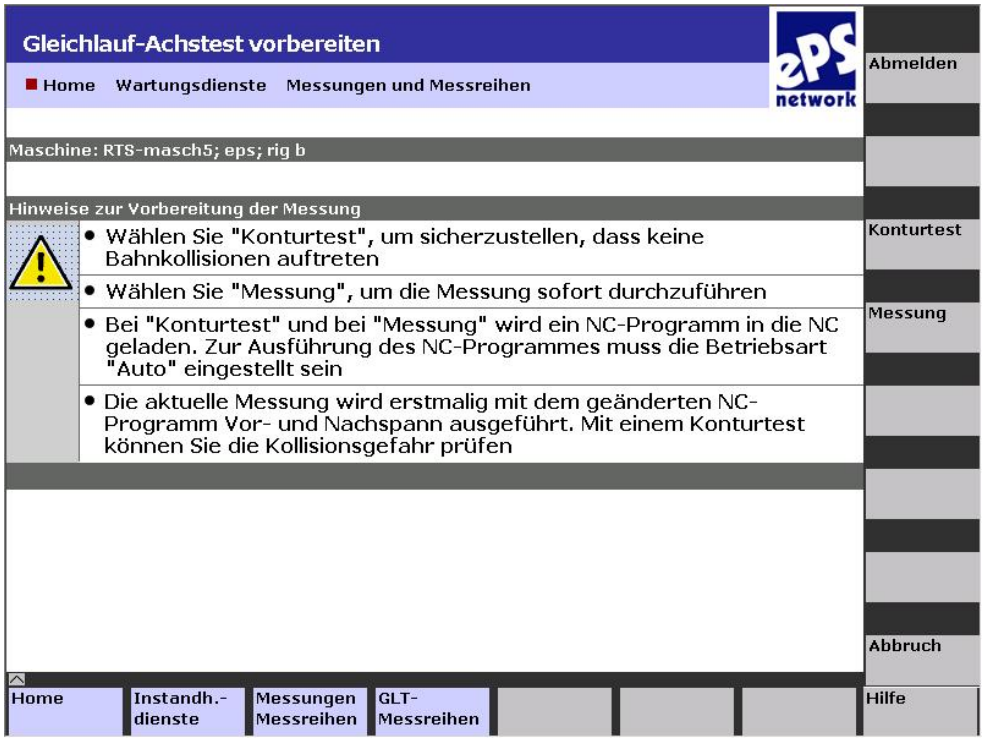


Fig. 2-33: Selecting the contour test

Field array	Description	Type
Contour test	A contour test can be run to check that the measurement part program is collision-free before actual measurement.	ACTION
Measurement	Selection of the "Measurement type" tab. The measurement can be performed once the notes have been read and understood.	ACTION

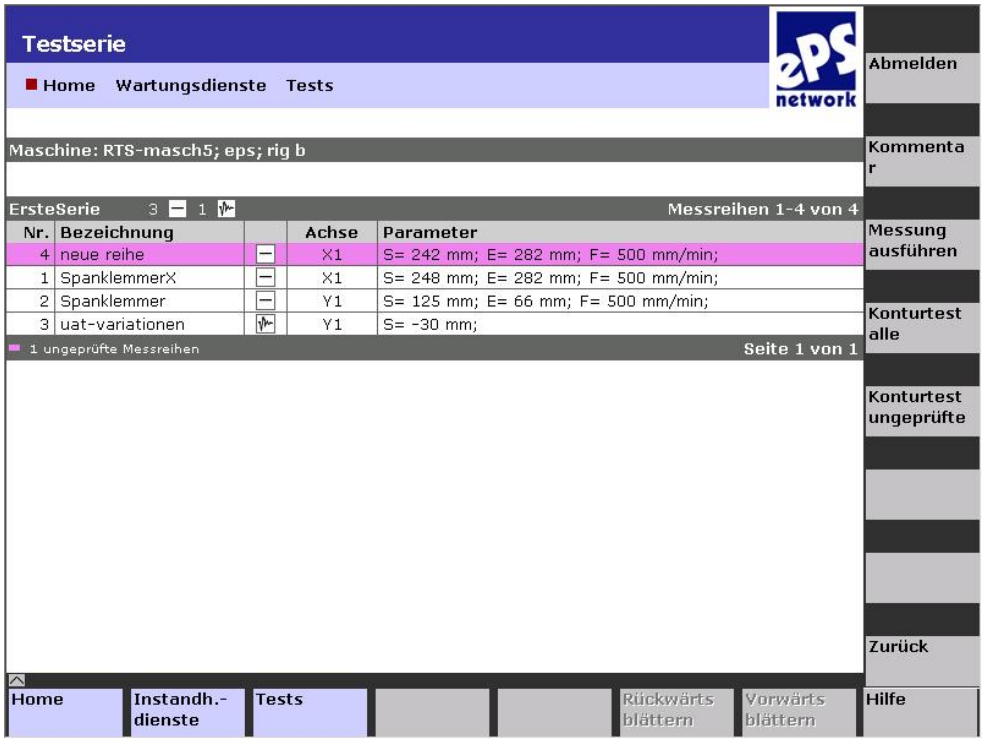


Fig. 2-34: Measurement series of a test series

2.4 Maintenance

Description of functions

Entering via "Machine information" → "Maintenance jobs" provides an overview of the jobs that are pending or complete **for the single machine that is currently selected**.

The overview of the maintenance jobs on the PC (see Section 4.1.1) is used for the following purposes:

- Obtaining an overview: Of the jobs that are pending and already complete; progress monitoring, planning service applications.
- Editing jobs: Automatic editing of controlled maintenance jobs on an individual basis, via control monitors and maintenance schedules

  Changes made to the job here are on a one-off basis and do not affect the original maintenance schedules.
- Changing work instructions: If other tasks that were not known at the time of planning must be completed along with those specified in the maintenance schedule

  If you change the work instruction, please note that this is only valid for the selected maintenance job. Any necessary modifications to the underlying maintenance schedule must be made via the "Set up function" menu → "Maintenance schedules".
- Changing execution time:

  E.g. scheduling tasks that can or should be performed together for the same day
- Editing comments: Adding comments for the tasks that have been performed or have not been performed; attaching detailed service report files to the job
- Acknowledging jobs: The maintenance procedures carried out are acknowledged as OK or Not OK.
- Deleting jobs: Jobs can be deleted in their entirety.

  This does not affect the underlying maintenance schedules and control mechanisms.

2.5 Remote access

2.5.1 Remote access functions

Overview

Remote access is an efficient and low-cost way of providing support for machine tools and production equipment via the Internet.

In the event of a fault, the service organization of the machine manufacturer has fast access to important control data and diagnostic functions. In that way, the machine manufacturer or maintenance department of the end user can immediately analyze the current condition of the machine in which a fault occurred.

Remote access avoids time-consuming in-situ service assignments or at least helps prepare for them better. Machine manufacturers can therefore reduce their warranty costs while providing more efficient servicing support for their end users.

Summary of the most important functions

The following functions are available during a link with the machine control. These functions enable diagnostics and fault rectification via the machine control. It is usually up to the service technician to execute the function. The technician can work on all problems via remote access on a PC with a mouse and keyboard.

Function	Feature
Chat	Permits the exchange of text messages with a participant in the service session.
Desktop sharing	Permits the display and remote control of machine control. For security reasons, however, it is not possible to initiate machine movements or to start NC programs. Within the function, areas of the screen can be marked with the Annotate function, which is similar to text marker.
Transfer file	Permits the transfer of single or multiple files or directories. Transfer can be from the service PC to the machine control or vice versa. This enables the import of patches to correct errors, for example. The machine control can also be updated quickly. Even complex NC programs can be transferred to the service employee for offline testing or to the service technician for modification via file transfer.
Video	Permits the transmission of video images of a webcam to the machine control
Recording and playback	Enable storage of the entire service session or parts of the service session for training or archiving purposes.

Function	Feature
Remote printing	Permits the printing on a local printer of the service PC of documents or graphics that are displayed on the control. This also installs the printer driver "Active Touch Document Loader" on the machine control.

2.5.2 Functions of a service session

Description of functions

The following functions are available during a link with the machine control. These functions enable diagnostics and fault rectification via the machine control. It is usually up to the service technician to execute the function. The technician can work on all problems via remote access on a PC with a mouse and keyboard.
Several service employees and specialists can work together in a service session to solve a problem. The service technician who establishes the service session first keeps control of all functions throughout the service session. All other service technicians can only observe what is going on. If necessary, the first service technician can pass on and take back control to or from another service technician within a desktop control session.
The entire session can also be passed on to a second service employee.

Function	Feature
Dialog via text window (Chat)	You can exchange text messages with the machine operator online via a chat window. The "Chat" function can be started without the need to obtain the machine operator's agreement.
Remote display of the operator interface HMI (Desktop view)	The "Desktop view" function is used to observe all operating steps at the operator interface of the machine HMI. That enables you to detect remotely on the service PC which functions are triggered on the control. You can provide the machine operator with instructions using the annotation function.
Remote control of all operating functions (Desktop control)	You can use the "Desktop control" function to execute all operating functions of the machine control via remote access. For safety reasons, however, it is not possible to initiate machine movements or to start NC programs.
Data transfer (Transfer file)	You can use the "Transfer file" function to transfer data between the machine control and your service PC. Data transfer is possible in both directions. Which functions and views of drives are used within data transfer depends on the type of session set.
Conference link (Transfer session)	You can use the "Assist online support" function to invite other specialists to join the teleservice session. The person you invite to join a teleservice session that is currently underway has the option of either providing active support or simply participating in the teleservice as an observer.

Function	Feature
Remarks (Annotate)	The "Annotate" function provides a kind of marker pen function. You can use this marker pen to give the machine operator instructions within the following functions: • Remote display - application view and desktop view • Remote control - application control and desktop control
Video transmission from the PC of the service engineer (video session)	You can use the "Show video" function to transfer a video image from your workstation to the machine operator. This can be used to show a drawing, for example.
Remote printing (Remote print)	A special printer can be activated on the control. If data is output to this printer, it is redirected to your service PC during an online link. This enables a printout of important information to be forwarded to you. The printout is then output on the printer of the service PC.

2.5.3 Starting a service session

Overview

To open a teleservice session, select main menu item "Machine information" and then menu item "Run teleservice". Go to the "Remote access" section and click on the "Run teleservice" link.

The session ID shown is transferred to the machine operator:

Fig. 2-35: Transfer session ID

Description of functions

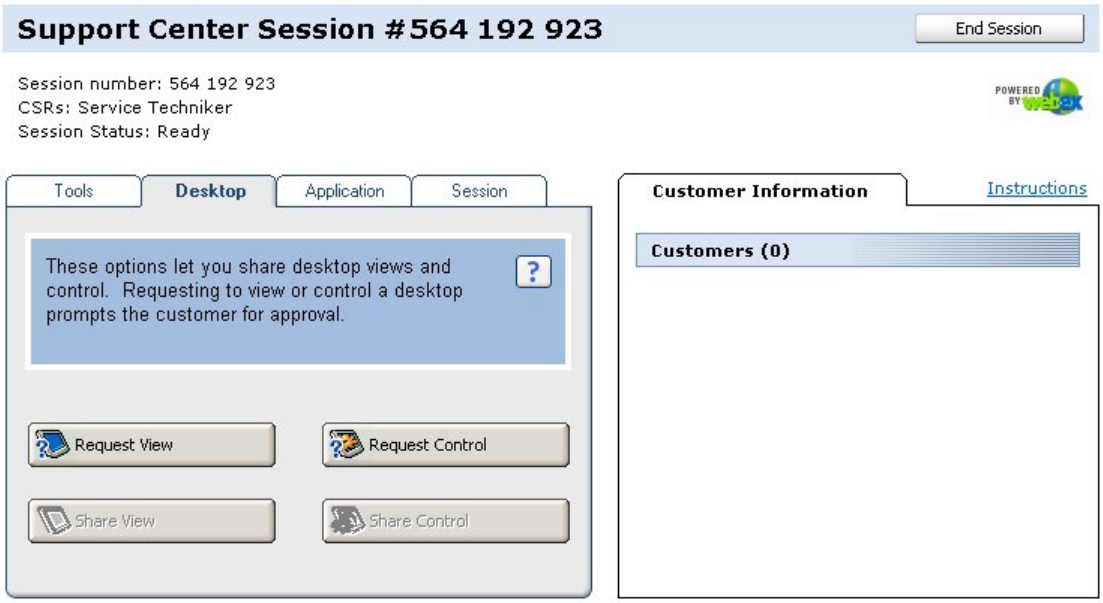


Fig. 2-36: Main menu of a support center session

Tab	Contents
Tools	Selection of functions: chat, video, or file transfer
Desktop	Selection of functions: desktop control or desktop view
Application	No longer used starting with ePS Network Services V4.0
Session	Selection of functions: transfer session, session options, or end session

Functions on "Tools"

Function	Description
Video	This permits the transmission of video images of a webcam from the service PC to the machine control.
Transfer file	Permits the transfer of single or multiple files or directories. Transfer can be from the service PC to the machine control or vice versa. This enables the import of patches to correct errors, for example. The machine control can also be updated quickly. Even complex NC programs can be transferred to the service employee for offline testing or for modification via file transfer. Which functions (advance or basis file transfer) and views of drives are used within data transfer depends on the type of session set for an organization.
Chat	Once initiated, the chat function allows each participant to send text messages. The participant can choose another participant to whom he/she wishes to send a message; alternatively, he/she can broadcast the message to all service employees who are logged on. The chat function can be started within the menu at any time. For communication with the machine operator, it is advisable

Function	Description
	to start the chat function before executing the "Desktop control" function or transferring a file.

Note

It is not easy for the machine operator to operate the chat window without a mouse. The machine operator can place the chat window in the background or foreground via softkeys during a desktop control session. The chat window on the machine control is automatically placed in the foreground if a text message is received.

If the machine operator wants to send a text message on his or her own initiative and the chat window is minimized, the operator can place the chat window in the foreground via a softkey.

Functions under the "Desktop" tab

Function	Description
Request View	Permits display of a machine control: Within the function, areas of the screen can be selected with the Annotate function, which is similar to a text marker. For safety reasons, however, it is not possible to initiate machine movements or to start NC programs.
Request Control	Permits control of a machine control: Within the function, areas of the screen can be selected with the Annotate function, which is similar to a text marker. For safety reasons, however, it is not possible to initiate machine movements or to start NC programs.

Functions under the "Session" tab

Function	Description
Transfer session	Transfer session control to another service technician
Session options	Optimize display of complex graphics
End session	Ending a service session

2.5.4 Example of a session via remote access

Requirement

The service session has already been established. You want to open a chat session with the machine operator, then control the machine control via the desktop control, transfer data, and record the entire service session.

Starting a chat session

The chat function allows each participant to send text messages once it has been started. The participant can choose the participant to which he or she wants to send a message or broadcast the message to all service technicians who are logged onto the system.
The chat function can be started within the menu at any time. For communication with the machine operator, it is advisable to start the chat function before executing the desktop control function or a file transfer.

What to do

1. To start chatting, click the "Chat" button.
2. Select the recipient. The default setting is "All Participants".
3. Click the "Send" button to send the text message to the participant. You can optionally use the enter key.

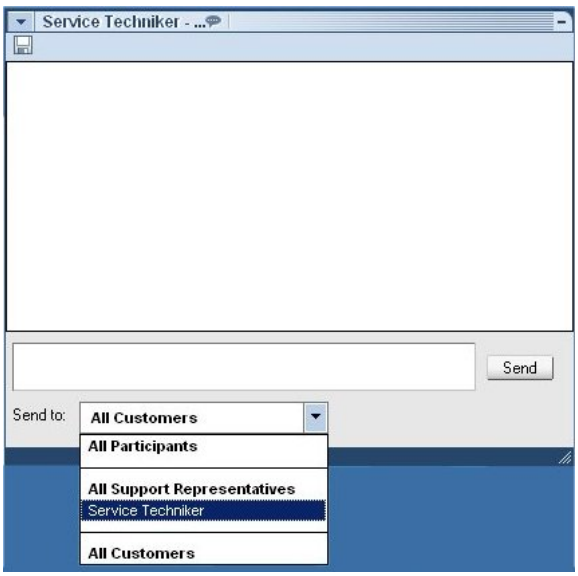


Fig. 2-37: Select recipient

Click the "–" button at the top right of the chat window to close the chat. If a participant closes the chat window, the initiator receives a message. The person who closed the Chat window cannot open it again. The initiator must end the chat and restart it to give all participants a chat window again.

Note

It is not easy for the machine operator to operate the chat window without a mouse. The service technician should therefore minimize the chat window during a desktop control session. The chat window on the machine control is automatically placed in the foreground if a text message is received.

If the machine operator wants to send a text message on his or her own initiative and the chat window is minimized, the operator can place the chat window in the foreground via a softkey.

2.5.5 Granting permission to execute functions

Requirement

If you want to take control of the machine control, the machine operator has to grant you permission. The machine operator can grant you permission for the requested "Desktop control" function alone, or for all functions that you may still want to use during the service session.
Indicate to the machine operator that it is simpler for both to grant permission for the entire session.

Desktop control

1. Go to the "Desktop" tab and click "Request Desktop Control ..."
   The following display appears for your information. You can acknowledge it with "OK".

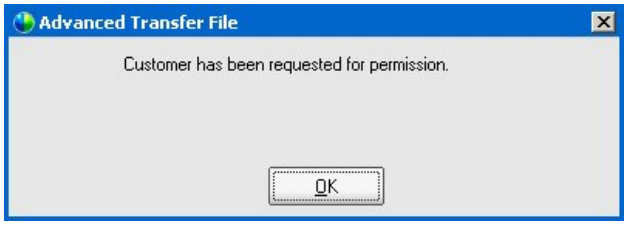


Fig. 2-38: Requesting permission

2. As soon as permission has been granted at the machine end, the window is acknowledged automatically.
   In this dialog box, the machine operator permits monitoring of the machine control, as well as general execution of all functions without prior confirmation by the machine operator via "Grant Permissions for all actions …".

The following dialog box is displayed to the machine operator:

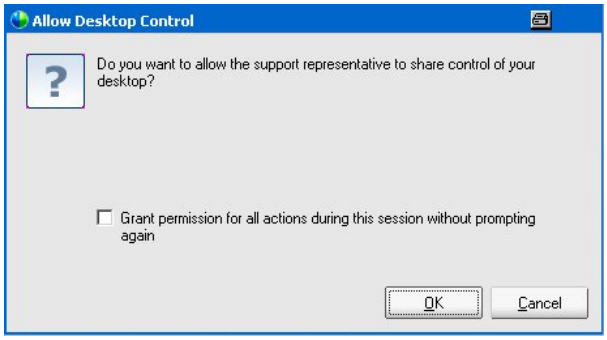


Fig. 2-39: Granting permission

Data transfer/"Advanced" transfer file:

3. Go to the "Tools" tab and click "Transfer files" in the menu.
   The machine operator must agree to this file transfer. Unless the machine operator has granted general permission to execute all functions, he or she must agree to each individual transfer.

   This transfer may contain one or more files or a whole directory. Alternatively, you can select the file transfer within the desktop control by clicking on the "Sharing" button top right, upon which the following dialog box opens.

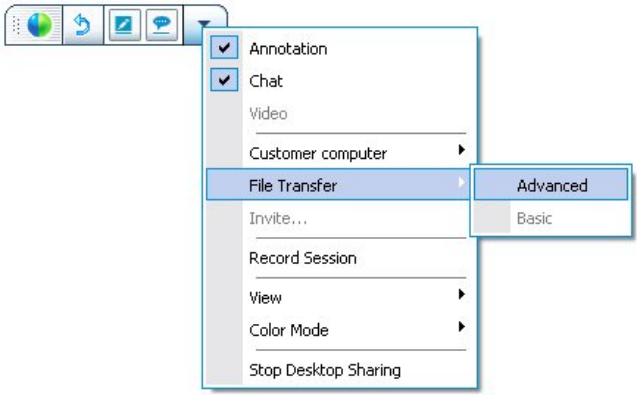


Fig. 2-40: Starting file transfer

Note

It is advisable to perform data transfer at the ePS Network Services display level because there are no HMI headers that reduce the screen content at this point. In the case of file transfer within a desktop control session, both parties can view and operate the file transfer window. If this is not desired or is not permitted, the file transfer should only be started from the menu of the service technician. In this "stand-alone" file transfer, only the service employee has control of the files to be transferred.

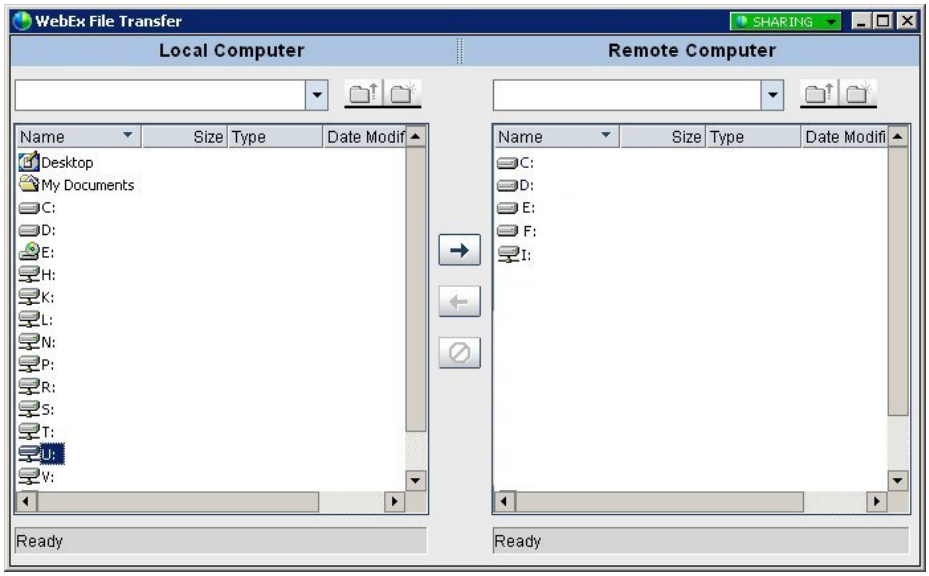


Fig. 2-41: Directory structure

4. Open a directory with a double-click. Click the back arrow to go to the next level up.
   To select several files, hold the <CTRL> key down during selection.

<-- --> 5. Data transfer is started by clicking the arrow buttons.
   When data transfer has been started, the progress of transfer is indicated, allowing you to estimate the remaining transfer time.

6. You can end the file transfer with the "X" button.

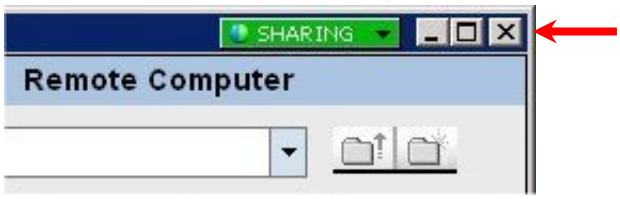


Fig. 2-42: End file transfer

Recording a service session

7. Select the "Record Session" button. The "Record Session" dialog box opens. Select the storage location and a file name for the Record File and confirm this name with "Save".

Fig. 2-43: Recorder panel

8. The recorder panel is used to you select the various options and execute actions.

Start recording by clicking the "Record" button.

You can pause recording at any time and then resume it by clicking "Pause".

To end recording, click the "Stop" button.

Ending desktop sharing

9. To cancel or end desktop sharing, click the "Sharing" button at the top right-hand side of the desktop sharing window and select "Stop Desktop Sharing".

Fig. 2-44: "Stop Desktop Sharing"

Selecting screen contents during desktop control

1. To apply annotations or markings to the desktop, click the **Sharing** button at the top right-hand corner of the Desktop Sharing window and select "Annotation".

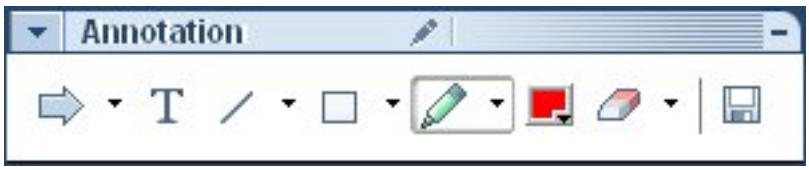


Fig. 2-45: "Annotation" toolbar

On the "Annotation" toolbar, the cursor changes shape to a marker pen with which you can select areas of the machine control.

2. To end the "Annotation" function, click the "–" button at the top right-hand corner of the toolbar.
3. You must then click on the desktop of the machine control with the mouse to get back mouse control.

Ending a service session

4. To end the service session, click the "Leave session" button. Confirm the end of the session by clicking Yes.

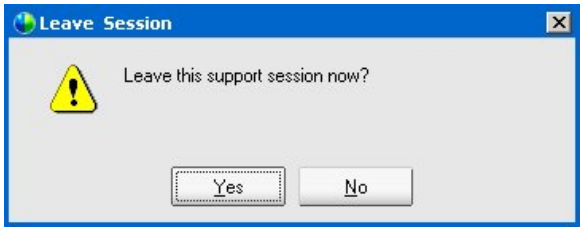


Fig. 2-46: Leave session

2.5.6 Setting up a service conference call

Description of functions

Several service employees and specialists can work together in a service session to solve a problem. The service technician who establishes the service session first keeps control of all functions throughout the service session. All other service technicians can only observe what is going on. If necessary, the first service technician can pass on and take back control to or from another service technician within a desktop control session.

The entire session can also be passed on to a second service employee. After that, all functions must be confirmed again by the machine operator.

Example

Participants:

- "Service technician 1"

  "Service technician 1" opens a "desktop control session" and can execute all functions of the control.
- "Service technician 2"

  "Service technician 2" is logged on with the name "Support Assist".

  "Service technicians 2" sees the same content, but cannot execute functions. (Exception: participating in the chat)

Transferring desktop control to "service technician 2" (Support Assist)

To transfer control, click the "Sharing" button in the top right-hand corner of the Desktop Sharing window and select "Allow to Control Remotely".
Click on the participant "Support Assist" (example):

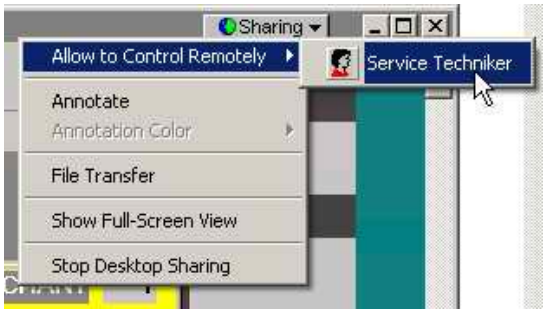


Fig. 2-47:

Control is transferred to "Service employee 2" for the current desktop control function. He or she can now take over control by clicking on the desktop of the machine control with the mouse.
"Service employee 2" can execute the following functions:

- Operate the machine control
- End desktop control
- Exit a service session

Transferring desktop control back from "service technician 2" (Support Assist)

"Service technician 1" can regain control. To transfer control, click the "Sharing" button in the top right-hand corner of the Desktop Sharing window and select "Allow to Control Remotely".
Click on the "Support Assist" participant and control is passed back to you.

Fig. 2-48:

Transfer of the entire service session

If "service employee 1" transfers the entire service session to "service employee 2", "service employee 1" can continue to observe the session or leave the session without closing the entire service session.
"Service employee 1" clicks the "Transfer Session" button.

Fig. 2-49:

A selection menu with the name of the other service technicians who are logged onto this session is displayed. "Service technician 1" selects "service technician 2" (example: Support Assist) and acknowledges with OK.
From this point on, "service employee 1" can only participate as an observer. All functions are deactivated in his/her menu.
"Service employee 2" has taken over the service session completely and can now let "service employees 3, 4, 5", etc., take part in the session. The service session can be transferred any number of times.

Note

Transferring the service session within the desktop view or desktop control terminates the desktop view or desktop control function.

2.5.7 Remote control via the keyboard

Description of functions

In a service session the special function keys on the operator keyboard can also be operated using the keyboard of the service PC via remote access. The following table shows the keys on the PC to which the horizontal and vertical softkeys and the special keys for the SINUMERIK keyboard are mapped.

Voll-tastatur	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
mit SHIFT	vertik Soft. 1	vertik Soft. 2	vertik Soft. 3	vertik Soft. 4	vertik Soft. 5	vertik Soft. 6	vertik Soft. 7	vertik Soft. 8	>	M		
ohne SHIFT	horiz Soft. 1	horiz Soft. 2	horiz Soft. 3	horiz Soft. 4	horiz Soft. 5	horiz Soft. 6	horiz Soft. 7	horiz Soft. 8	^		W1..n	Y
Voll-tastatur	5	Esc	Insert	Home	Page Up	Page Down	Enter	Tab				
ohne SHIFT								End				

Fig. 2-50: Special keys

Key	Description
MENU SELECT	Area switchover key You can call the main menu from any operating area by pressing this key. Pressing the key twice in succession changes from the current operating area to the previous one and back again.
>	Etc. key Expansion of the horizontal softkey bar in the same menu.
^	<Recall> key The <Recall> key goes to the next highest menu. It also closes a window.
M MACHINE	Machine area key Direct jump to the "Machine" operating area.

■

Notes

3

3 Setting up functions

Displaying overview

The functions below are set up, defined and executed in the "Set up functions" area for **a selected machine** and its corresponding maintenance and monitoring:

- Corrective maintenance
- Monitoring PLC and NC sizes
- General function settings for user configurations
- Function settings for communication
- Copying user configurations

Setting up functions

Corrective maintenance		**[Display overview]** Display an overview of all functions set up
▶	Maintenance schedules	
▶	NC monitors	
▶	PLC monitors	
▶	Measuring series	
▶	Test series	
▶	Prolog and epilog for measurement	
Fault services		
▶	Control monitors	
Global settings		
▶	PLC settings	
▶	Notification limitation	
Copying function settings		
▶	Copying function settings	
Client/server communication		
▶	Synchronization times	
▶	Offline synchronization	
▶	Monitoring ePS services	

As soon as a machine is selected, the function for displaying a group-based overview of all the configurations that the user has created for the machine becomes available. If required, the selection for display can be set up in the main functions menu.

All functions and user configurations set up

In the overview of configurations, the first column displays the type of configuration; the "Name" column displays the configuration names (arranged alphabetically); the "Required for" column displays other configurations where this subconfiguration is used; and the "Dependent on" column shows which other configurations are used as subconfigurations in this configuration.

A gradual fading is used for configuration names that cannot be displayed in full. The overview can be completely printed out for documentation purposes (printer icon ①).

The overview can be exported for the purpose of comparing the configurations and names, and can be compared with overview exports of other machines in a spreadsheet program, for example (② icon).

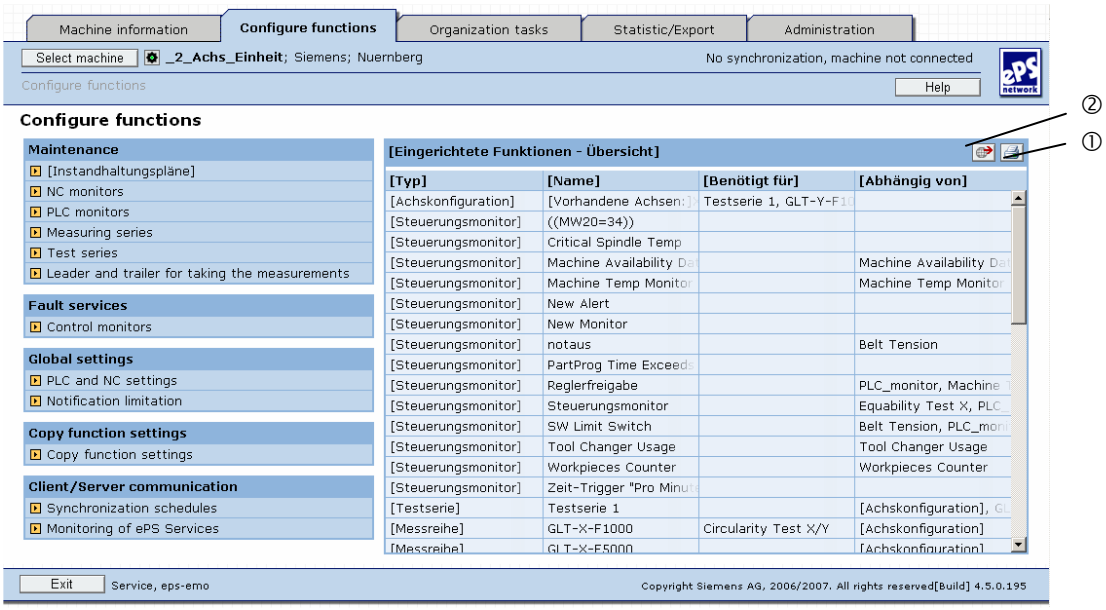


Fig. 3-1: Displaying overview

3.1 Maintenance

3.1.1 Creating maintenance schedules

Description of functions

The maintenance schedules contain the maintenance-related tasks to be performed on the machine (maintenance, inspection, and servicing).

Maintenance procedures may be logged in the schedule in a purely text-based format; alternatively, "intelligent" maintenance procedures, which automatically determine data via axis tests in order to performing purposeful status-oriented maintenance, may also be logged.

- The maintenance jobs for the organization responsible are automatically generated on their due date from a schedule or control monitor. A schedule always applies to just one machine.
- The maintenance jobs are produced on a time-controlled basis, in time intervals, on an event-triggered basis, or in event-triggered intervals. This is either performed by the universal triggers of a control monitor, or is set in the maintenance schedule.
- A maintenance job set in the maintenance schedule becomes pending immediately, but is only due once the scheduled date is reached.
  A maintenance job via a control monitor only becomes pending when the control monitor is initiated, and is then due immediately.
- Maintenance schedules can be updated at any time: This only affects maintenance schedules that will be output after the changes have been made, and not those that have already been output. This also applies if a schedule is deleted.

Note

If users are logged on to the control as machine operator, they can process the pending jobs. For machines with version V3, they do not have to be a member of the target organization; for machines of version V4, they require authorization to act as machine operator (MO) for this machine.

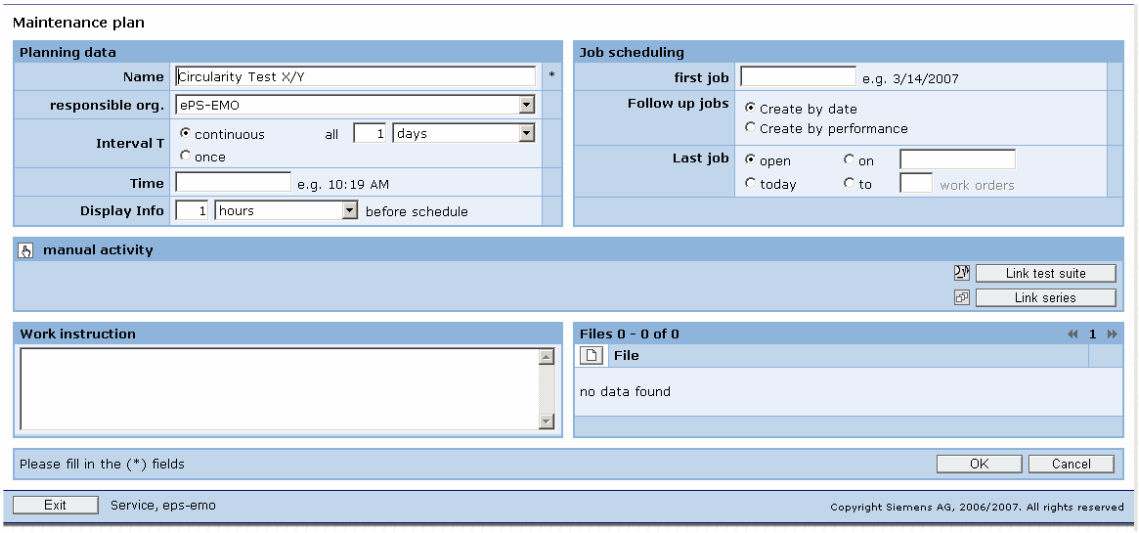


Fig. 3-2: Editing a maintenance schedule

Field array	Contents	Type
Designation	Short name for the maintenance procedure. This is also located in the overview of maintenance jobs on the ePS Network Services PC and the machine HMI.	DISPLAY INPUT (Max. 40 characters; any character permissible)
Interval	Both non-recurring and recurring tasks can be defined. The interval specifies how often the jobs will be generated. **Note:** If a job has been created automatically from a schedule, this job must be acknowledged and closed before the system will generate a new job. Changes to a schedule do not affect existing jobs: They are only accounted for in subsequent jobs.	DISPLAY SELECTION INPUT
Info display	Tasks are highlighted in the maintenance schedules n hours/days/weeks before their due date. ("yellow point"). **Note:** This identification can be used, for example, when a task needs certain preparation, a special tool is required, etc.	DISPLAY INPUT (Max. 10 characters, selection)
Time	Time when the maintenance job is due and is to be executed.	DISPLAY INPUT
Responsible org.	Organization allocated to carry out the job in this schedule. **Note:** This information is added to the jobs	DISPLAY SELECTION

Field array	Contents	Type
	from this schedule. However, any organization with access to this machine can change or delete the jobs in this schedule.	
Work instruction	Explanatory description of the maintenance task	DISPLAY INPUT
Link test series	Selection of a test series to be carried out in the framework of the maintenance job.	SELECTION
Automatically executing a test series	Time when the maintenance job is to be performed	SELECTION
Link measurement series	Selection of the "series of measurements" condition monitor in which the result of the measurement is updated as part of a maintenance job. **Note:** Only one series of measurements can be selected from the series of measurements available on the machine.	SELECTION
First job or Next job	The first order will be automatically generated from the schedule on this date. The deadline can only be specified once and cannot be updated at any time (it can only be specified again if the entire schedule is deleted and a new one created). **Note:** The earliest date you can enter is the current date. A maintenance schedule can also be stored without an entry in this field. However, in this case, no job will be created/the schedule is inactive. Within an active schedule (schedule generating jobs), this field is flagged with "Next job" and shows the next date on which the assigned pending job will be ready for processing.	DISPLAY INPUT Update of ePS Network Services for subsequentjobs

Field array	Contents	Type
Last job	Limits automatic generation of jobs The "today" option can be used to immediately stop the execution of a schedule. **Note:** A maintenance schedule for which no more pending jobs exist can be rescheduled, i.e. assigned a start date.	DISPLAY SELECTION INPUT
Subsequent jobs	The "After execution" option must be selected if the next job is to be created once the current job has actually been closed. Example: If the job that is currently open is processed two days after its scheduled time, the next job will be postponed by two days.) New jobs are created according to date regardless of whether jobs have been acknowledged.	DISPLAY SELECTION
Add file	To provide more details about the task, documents with more information can be appended. **Note:** The machine operator at the operator panel can only view documents in PDF format.	DISPLAY ACTION

Security note on displaying PDF documents

Notice

PDF documents to be displayed on the control operator panel must not contain any active contents (JavaScript, e-mail fields, etc.) nor have any HTML Links!!!

Otherwise there is a danger that it may be possible to navigate from the ePS system to other Web pages.

On the control operator panel, ePS Network Services only supports the display of PDF documents that are compatible with Acrobat 1.3 (Reader Version 4.x).

For optimum display, please create your PDF documents with the option "Initial View: Page Only/ Magnification Fit Width".

3.1.2 Configuring PLC monitors

Overview

You configure a PLC monitor in the following steps:

1. Select a PLC monitor or create a new PLC monitor.
2. Name the PLC monitor; comments and icons can be added as an option.
3. Define the PLC variables.
4. Use a control monitor to execute the PLC monitor.

Selecting or creating a PLC monitor

Since it is possible for each machine to have several PLC monitors, there is the option of sorting them in the overview display either by their names or by the two classification fields. In addition, it is possible to filter them by searching for specific parts of text that appear in the Name and Variables columns using the "Search text" box.

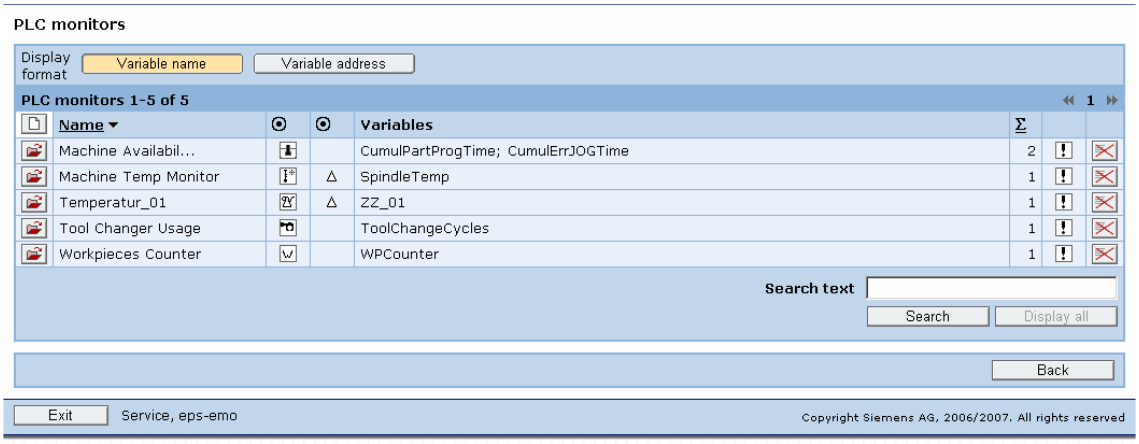


Fig. 3-3: Select PLC monitor

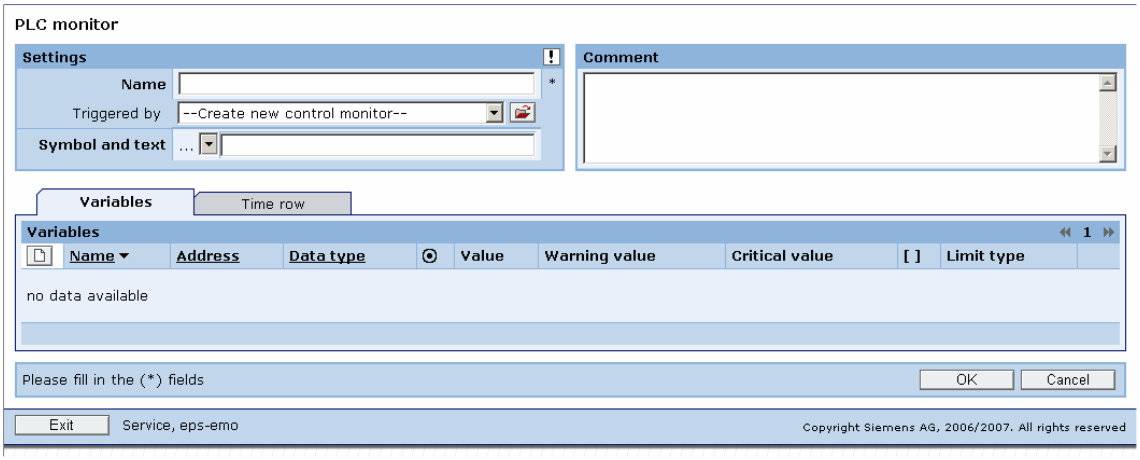


Fig. 3-4: Configure PLC monitor

Make the following entries to configure a PLC monitor:

Field array	Contents	Type
Designation	Name of the PLC monitor.	DISPLAY INPUT (Max. 40 characters; any character permissible)
Triggered by	Selection of a control monitor that is to trigger the PLC monitor. Creation of a new control monitor that is to trigger the PLC monitor.	DISPLAY SELECTION MENU
Icon and text	Selection of an icon stored in the system and naming the icon selected. **Notice:** The text entered applies to the entire machine and overwrites any existing text.	DISPLAY SELECTION INPUT (Max. 40 characters; any character permissible)
Comment	Individual text for the PLC monitor.	DISPLAY INPUT (Max. 2000 characters; any character permissible)
Variables	Selection of the menu for the variables.	Not selectable
Time series	Selection of the menu for the display of the already recorded values of the variables. Only available in the Machine information menu if recorded values of the variables are already present.	Not available
Variable selection	Selection to create a new variable in the PLC monitor. Selection to edit a created variable.	SELECTION
Cancel	Switch to the higher-level menu without saving.	SELECTION

Configuring PLC variables

The following must be specified for each of the variables in the PLC monitor:

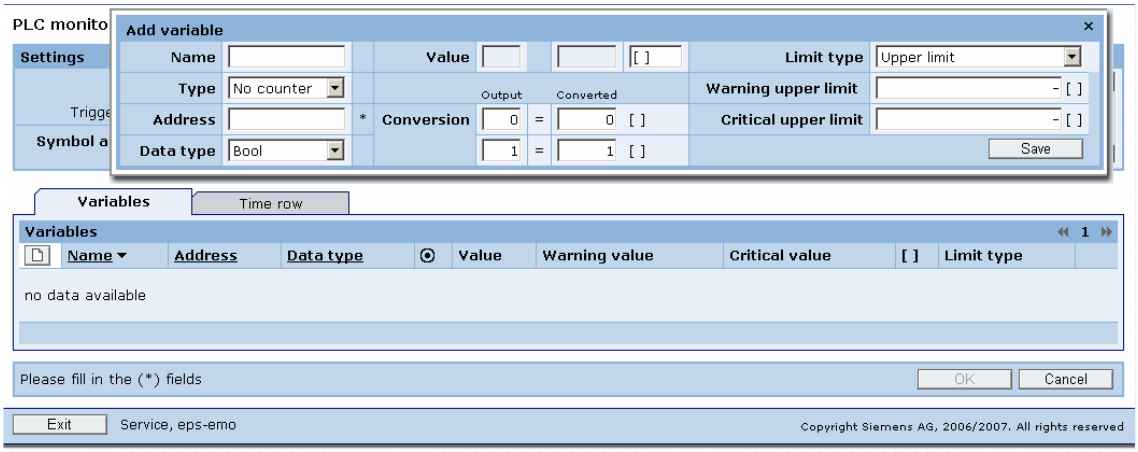


Fig. 3-5: PLC monitor - select variable

Field array	Contents	Type
Designation	Name of the variable	DISPLAY INPUT (Max. 40 characters; any character permissible)
Type	No counter: the variable is always processed with the current variable value. Up counter: the variable is used by the system as an endless difference totalizer. **Notice:** Only the up counter is intended for evaluating intervals. **Note:** The type can only be assigned once when the variables are created and cannot be changed at any point (can only be assigned again if variables are deleted in their entirety and created again).	DISPLAY SELECTION
Address	Absolute address in S7 syntax	DISPLAY INPUT
Data Type	Interpretation of the variable value in permissible S7 syntax. **Note:** The type can only be assigned once when the variables are created and cannot be changed at any point (can	DISPLAY SELECTION

Field array	Contents	Type
	only be assigned again if variables are deleted in their entirety and created again).	
Value	Display of the current variable value and converted variable value. Input and display of the dimension in a unit for the converted value.	DISPLAY INPUT (Max. 5 characters; any character permissible)
Conversion	Output: Input of 2 values for the real variable value. Converted: Specification for the associated dimensioned values.	DISPLAY INPUT (Max. 32 digits)
Limit type	Selection from the types of limit value: Lower limit; upper limit; tunnel	DISPLAY SELECTION
Warning limit	Value (or value range) of the warning limit	DISPLAY INPUT (Max. 32 digits)
Critical limit	Value (or value range) of the critical limit	DISPLAY INPUT (Max. 32 digits)

Changes to the configuration are not effective until the machine is synchronized.

Using (a) control monitor(s) to execute the PLC monitor

The "Trigger PLC monitor(s)" diagnostic action is used to detect the PLC variable values promptly and store them on the ePS server. It is only possible to access the data manually via the machine events or PLC monitor data series. Triggers can be used to react automatically to the variable values via control monitors.

See also:

- 3.3.1 Control monitors - List view
- 3.3.14 Diagnostic actions

3.1.3 Configuring NC monitors

Configuration at the PC

Make the following entries to configure an NC monitor:

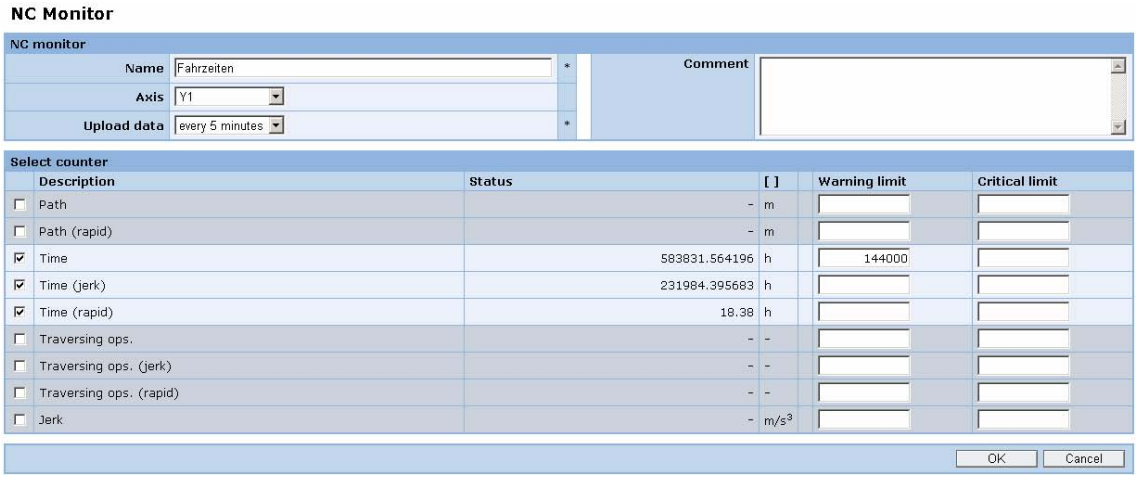


Fig. 3-6: Configuring an NC monitor on the PC

Field array	Contents	Type
Designation	Name of the monitor for easy identification	INPUT
Axis	Axis identifier, machine	SELECTION
Upload data	Cycles in which the data is acquired and stored	SELECTION
Comment	Detailed description of the monitor	INPUT
Select counter	The selected counter variables are acquired with the NC monitor	ACTION
Warning limit	Entry of the value for the warning limit	INPUT
Critical limit	Entry of the value for the critical limit	INPUT

Availability and privileges

The NC monitors can be configured on the PC and on the operator panel. The authorization required for configuring the NC monitors is described in detail in the Appendix.

3.2 Configuring measurements and measurement series

Description of functions

Configuration of measurements and measurement series it when you define the parameters required for measurement. The configurations created are always stored with the measurements and can be used again to repeat the measurements. That especially applies to measurement series. The configuration of a measurement series ensures that measurements are made with the same settings every time. This permits evaluation of the progression of characteristics over time.

In addition to parameters for performing a measurement, the limit values of the characteristics are also configured. On the operator panel, that is done exclusively as part of the procedure for conducting a measurement. On the PC that is done as part of configuring a series of measurements.

Availability and privileges

On the operator panel, a measurement is configured or a measurement series configuration changed only during the measurement procedure. On the operator panel, it is only possible to create a measurement series based on a measurement being performed.

On the PC, it is possible to configure measurement series. The authorization required to configure measurements and measurement series is described in detail in the Appendix.

3.2.1 Circularity test

Parameter description

Parameters for conducting a circularity test:

Field array	Contents	Type
Designation	Name of the measurement series (measurements do not have a name).	INPUT
Channel	Selection of the required channel: The channel defines the possible axis pairs in the "Axes" selection list.	SELECTION
Axes	Selection of possible pairs of geometric axes	SELECTION
Center point X1	Specification of the center coordinates of the circle for the first axis	INPUT
Center point Y2	Specification of the center coordinates of the circle for the second axis	INPUT
Diameter	Diameter of circle	INPUT
Feed	Path velocity of the circular movement	INPUT

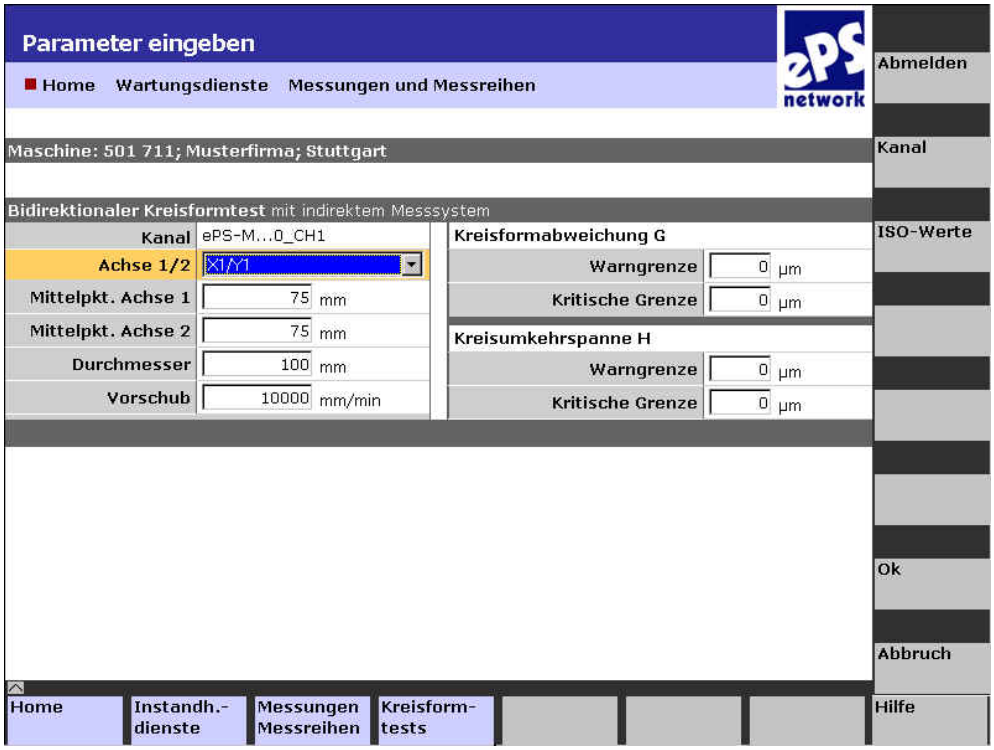


Fig. 3-7: Circularity test on the operator panel

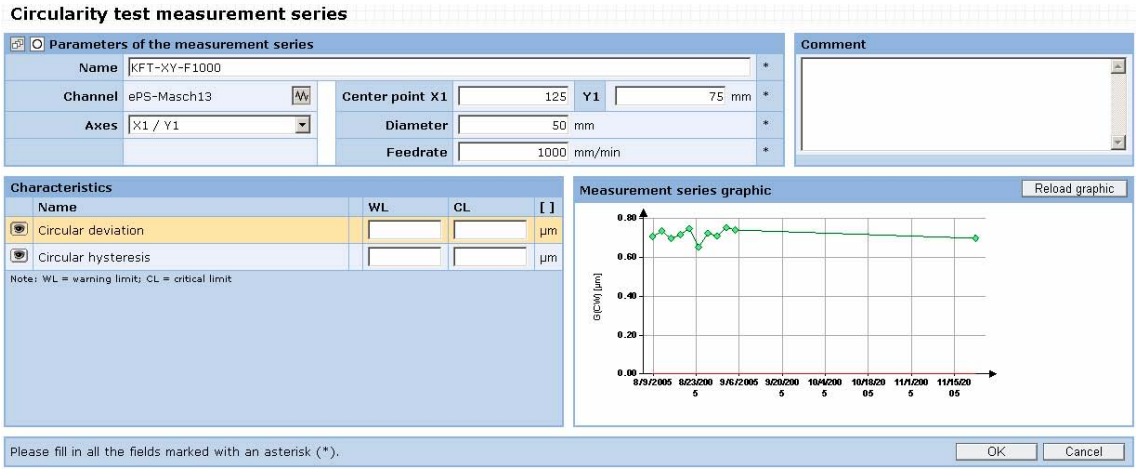


Fig. 3-8: Measurement series of a circularity test on the PC

3.2.2 Synchronous operation axis test

Parameter description

Parameters for conducting a synchronous operation axis test:

Field array	Contents	Type
Designation	Name of the measurement series (measurements do not have a name).	INPUT
Channel	Selection of the required channel. The channel defines the possible machine axes in the "Axis" selection list.	SELECTION
Axis	Selection of the possible machine axes that can be programmed in the selected channel.	SELECTION
Starting point	The axis position at which the first partial movement of the measurement begins.	INPUT
Endpoint	The axis position at which the first partial movement of the measurement ends.	INPUT
Feed	Velocity at which the axis is moved.	INPUT

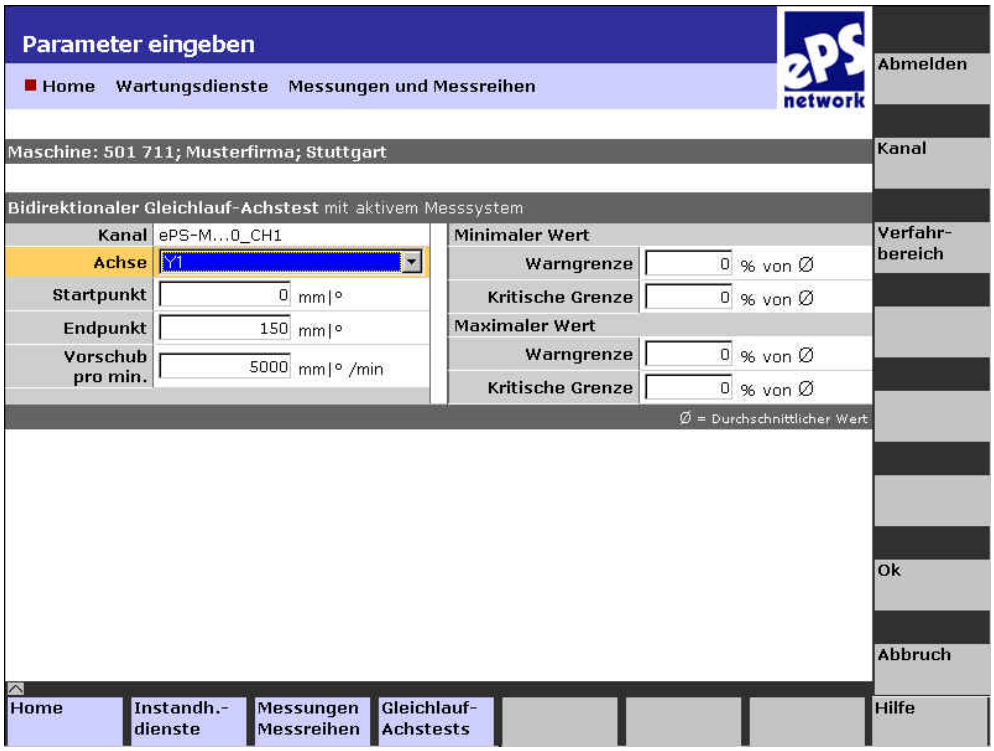


Fig. 3-9: Synchronous operation axis test on the operator panel

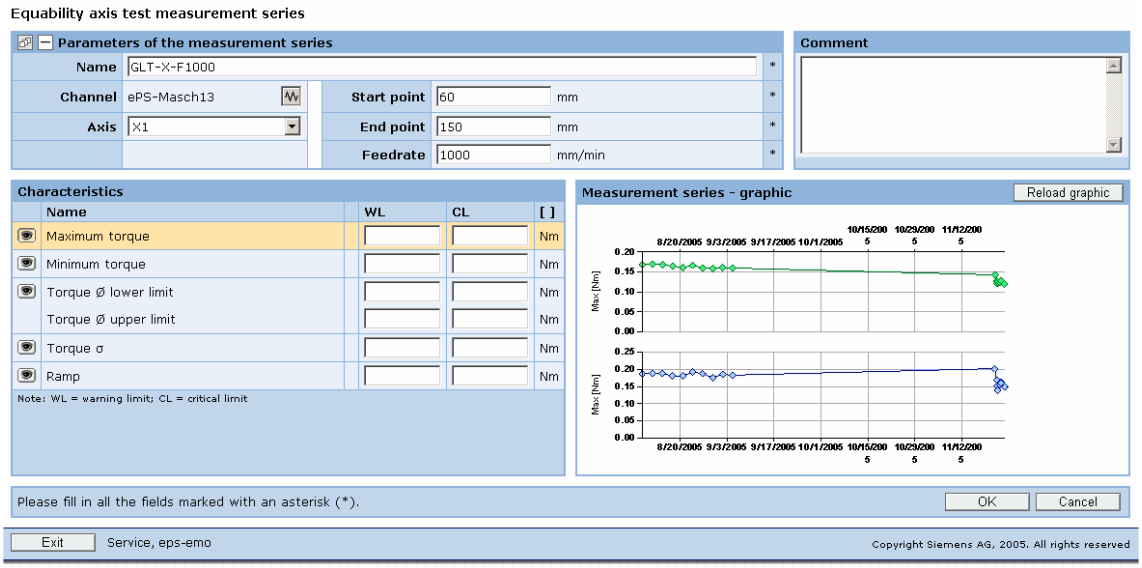


Fig. 3-10: Measurement series of a synchronous operation axis test on the PC

3.2.3 Universal axis test

Parameter description

Parameters for conducting a universal axis test:

Field array	Contents	Type
Designation	Name of the measurement series (measurements do not have a name)	INPUT
Channel	Selection of the required channel: The channel defines the possible machine axes in the "Axis" selection list.	SELECTION
Axis	Selection from the possible machine axes that can be programmed in the selected channel	SELECTION
Starting point	The axis position at which the various movements of the measurement begin. The position value is never lower than this value during measurement.	INPUT

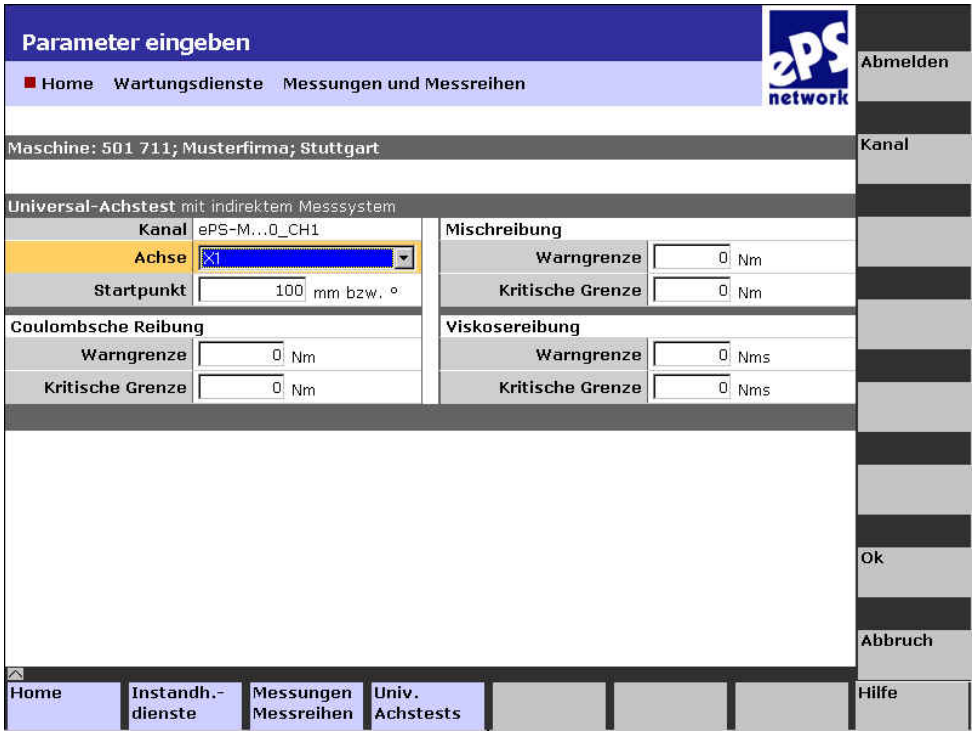


Fig. 3-11: Universal axis test on the operator panel

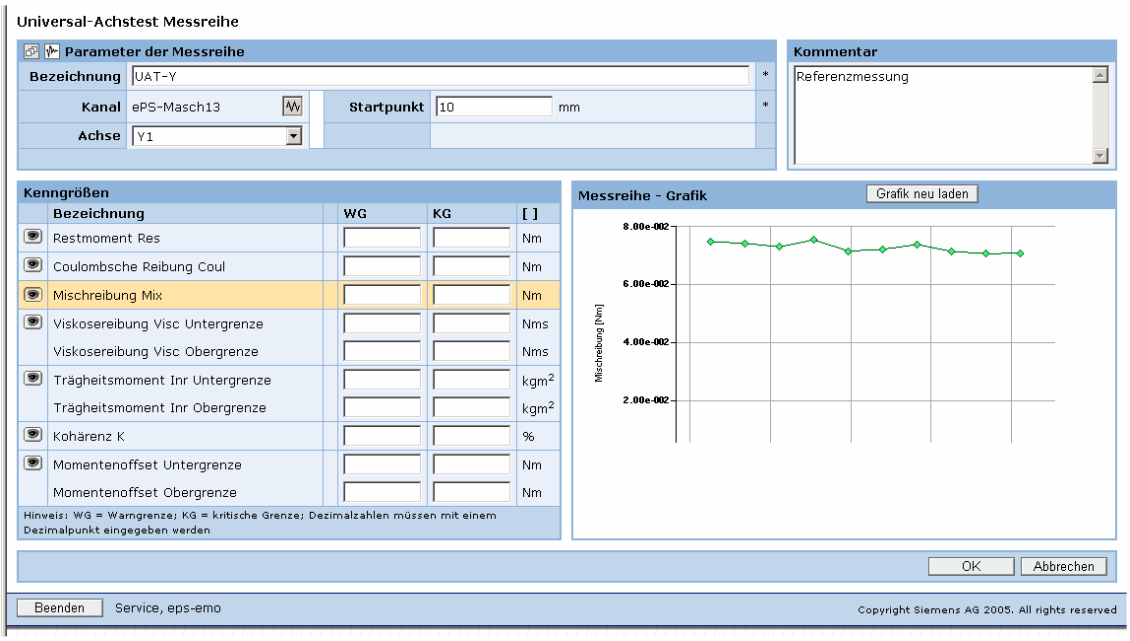


Fig. 3-12: Measurement series for a universal axis test at the PC

3.2.4 Performing test series

Overview

Test series are used to automate measurements for condition monitoring to a great extent. A test series can contain any number of measurement series. These measurement series are performed one after the other in the defined order when a test series is run. An machine operator is only required at the machine for the purpose of starting the test series. The measurements are made and measurement results stored without any further operator actions.

Description of functions

The following entries have to be made to configure a test series:

Field array	Contents	Type
Designation	Name of the test series. The system suggests an automatically generated name, which you can change. The names of test series must be unique within the context of the machine. The system adds another element to the name automatically if the name entered by the machine operator has already been assigned to another test series.	INPUT
Channel	Selects the required channel.	SELECTION
Comment	Any text entered to provide a detailed description of the test series	INPUT

To add, remove, or change the sequence of measurement series, these are selected in the overview displayed and moved by dragging and dropping or using the arrow buttons on the form.

A test series can only contain measurement series in one channel. It is not possible to change the channel of a test series.

Availability and privileges

Test series can only be configured on the PC. The authorization required for configuring the test series is described in detail in the Appendix.

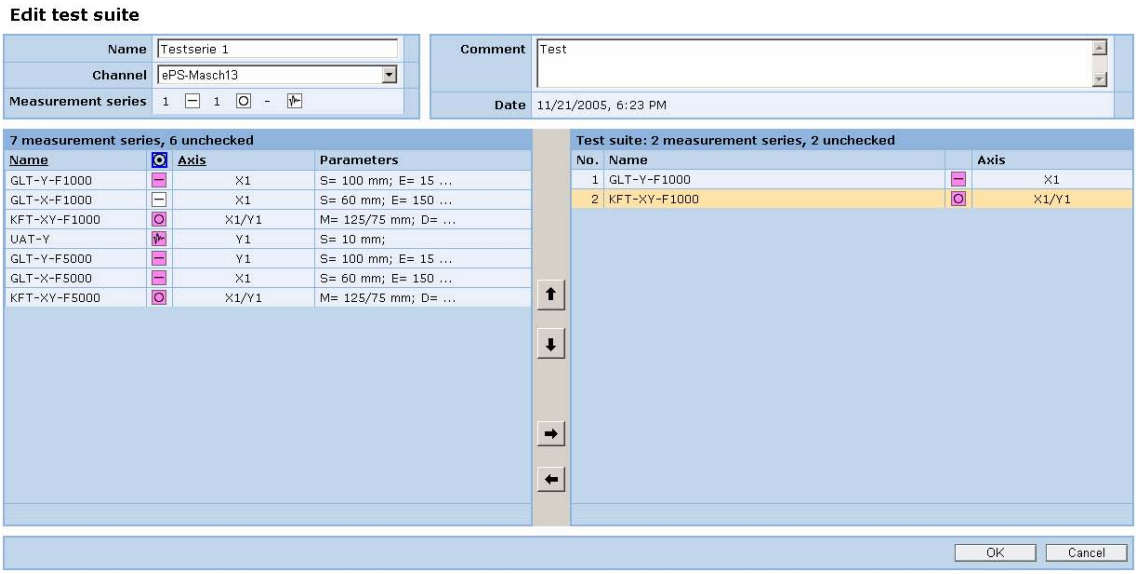


Fig. 3-13: Changing the configuration of a test series

3.3 Fault services

3.3.1 Control monitors - List view

Description of functions

Events occurring directly in the control, or even as a result of evaluations of control values or a machine operator's activities, can be evaluated by control monitors.

As a result, machine statuses can be acquired in order to draw general conclusions about errors (e.g. alarms), current machine states (e.g. about accuracy determined by circularity test), or use of resources; to collect production data (e.g. workpiece counters); to obtain statistical data; and to analyze individual events on a temporary basis.

The machine operator can use a control monitor to determine which signals he/she is interested in and, therefore, which automatic tasks he/she wishes to trigger. When the ePS system detects such an event, it can automatically trigger actions which, in turn, trigger specific operating sequences or provide diagnostics data for further analysis.

Note

By creating one or more control monitors, the machine operator defines the signal or combination of signals from a machine, and predefined states on the ePS server, that cause particular data to be generated or actions to be triggered.

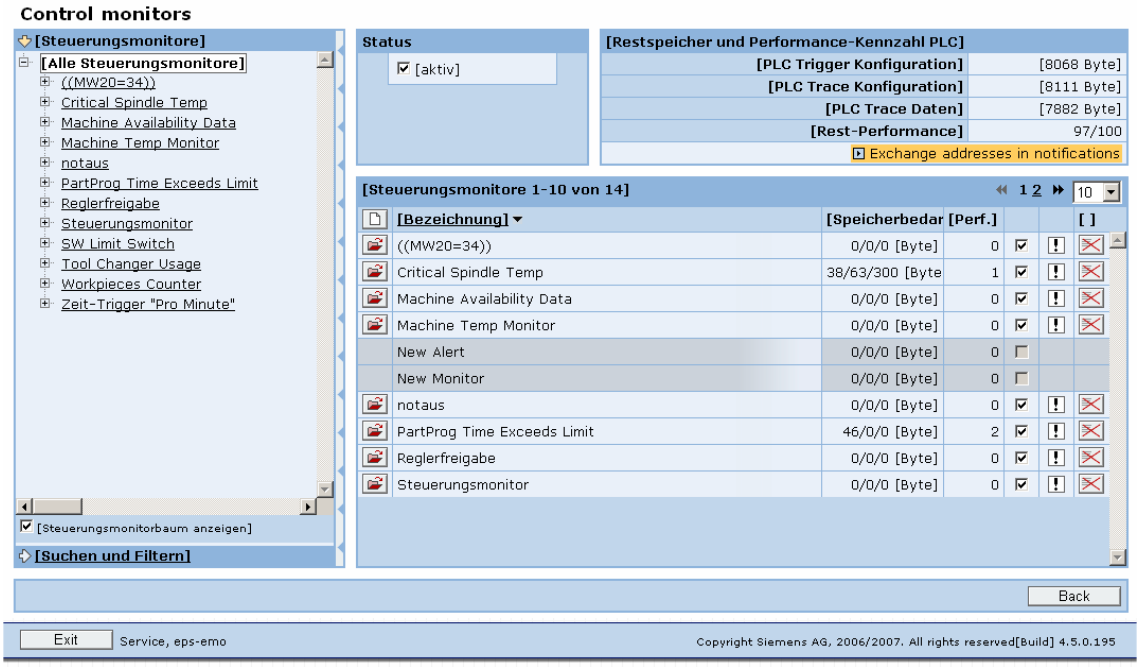


Fig. 3-14: Control monitors - List view

Field array	Contents	Type
Control monitors	Tree for selecting the control monitor to be processed. It can be expanded to show the triggers defined in it, which can be jumped to directly.	TREE
Status (overall)	Switches the control monitors currently active on or off on the next synchronization. **Note:** Does not change the activation state of each monitor.	DISPLAY SELECTION
Common starting date	The common start date defines the point at which all triggers will begin to execute the control monitor. Each trigger can be set so that it responds to the starting date. If a starting date has not been specified, all of the triggers react to the common starting date with the reaction identification. Specifying dates in the past is not permitted. Dates that are no more than 2 years in the future can be specified.	DISPLAY SELECTION
New triggers participation	Default setting for the function setting for triggers: If an individual trigger setting has not been made for participation at the starting date, the triggers will respond at the starting date.	DISPLAY SELECTION

Field array	Contents	Type
PLC remaining memory and performance index	Overview of the remaining memory of the individual PLC blocks and overview of the PLC performance index currently in use and maximum PLC performance index: • PLC trigger configurations • PLC trace configurations • PLC data	DISPLAY
Exchanging addresses in notifications	An address that is configured in one or more notifications of a control monitor can be replaced by another address from the organization's address book.	ACTION
Next synchronization in	Shows the time remaining until the next synchronization: If synchronization is overdue, negative values are displayed.	DISPLAY
Designation	Names of the control monitors	DISPLAY
Memory requirements (single monitor)	Used memory requirement of monitor for: • PLC trigger configurations • PLC trace configurations • PLC data	DISPLAY
Performance (single monitor)	Currently used PLC performance.	DISPLAY
Clock icon (single monitor)	Display indicating whether the control monitor has triggers that are independent of the common starting date: No display: No Faded display: Yes, at least one Normal display: Yes, all	DISPLAY
Single monitor status (activation state)	Monitor runs on the machine or is inactive.	DISPLAY
Synchronization status (single monitor)	An exclamation point indicates that the configuration currently stored is not yet effective on the machine.	DISPLAY

Note

The PLC performance index allows you to define how much performance may be used for the ePS PLC trigger. Each ePS PLC trigger uses a certain number of performance points. In this way you can control to what extent the PLC may be occupied by the ePS PLC trigger.

The PLC performance index can be defined on an individual basis, since the amount of memory and the cycle time guaranteed for ePS Network Services may vary depending on the performance of the control and the processes executed on it.

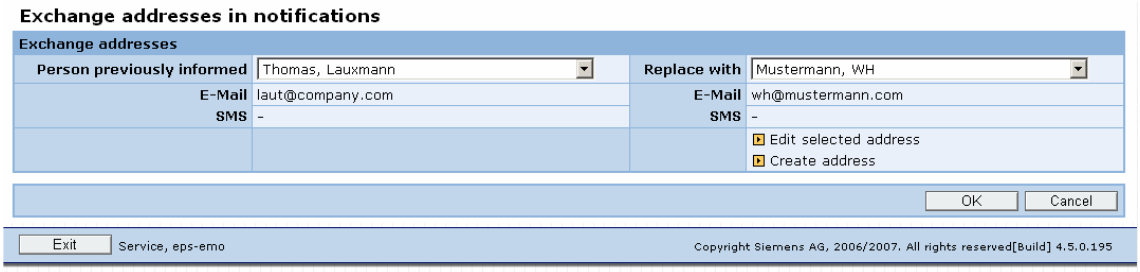


Fig. 3-15: Exchanging addresses in notifications

Field array	Contents	Type
Person previously notified	Opens the list of all addresses configured in notifications of the control monitors for this machine	SELECTION DISPLAY
• E-mail	Displays the e-mail address corresponding to the address selected, if one exists	DISPLAY
• SMS	Displays the telephone number corresponding to the address selected, if one exists	DISPLAY
Replace with	Opens the organization's address book so that a replacement address can be selected	SELECTION DISPLAY
• E-mail	Displays the e-mail address corresponding to the address selected, if one exists	DISPLAY
• SMS	Displays the telephone number corresponding to the address selected, if one exists	DISPLAY
Edit selected address	Corrections to the replacement address can be made, or it can be edited for completeness. The menu described in the section dealing with creating addresses is used for this purpose.	ACTION

Field array	Contents	Type
	It should be noted that any changes made to a name affect all configurations within the entire organization, and that changes are accepted automatically in all configurations without a request being made to do so.	
Create address	If the replacement address does not yet exist in the address book, a new entry for it can be created. The menu described in the section dealing with creating addresses is used for this purpose.	ACTION
OK	The address is replaced.	ACTION
Cancel	The address is not replaced.	ACTION

3.3.2 Control monitors - Detailed view

Description of functions

Control monitors are divided into three modules:

1. Trigger module
2. Action module
3. Workflow module

Generally speaking, function settings are made on a control monitor.

- The triggers are used to configure the logic which links information queries from the NC, PLC or database; in order to initiate actions and/or workflows.
- Workflows are notifications via e-mail or SMS and maintenance schedules.
- Diagnostic actions are data acquired from the control (NCK, PLC, PC).

Actions

After you have created a new control monitor or opened a control monitor for editing, you can perform the following actions:

- Select or change the trigger signals that will cause the monitor to run.
- Define or change the actions to be executed when a trigger is detected.

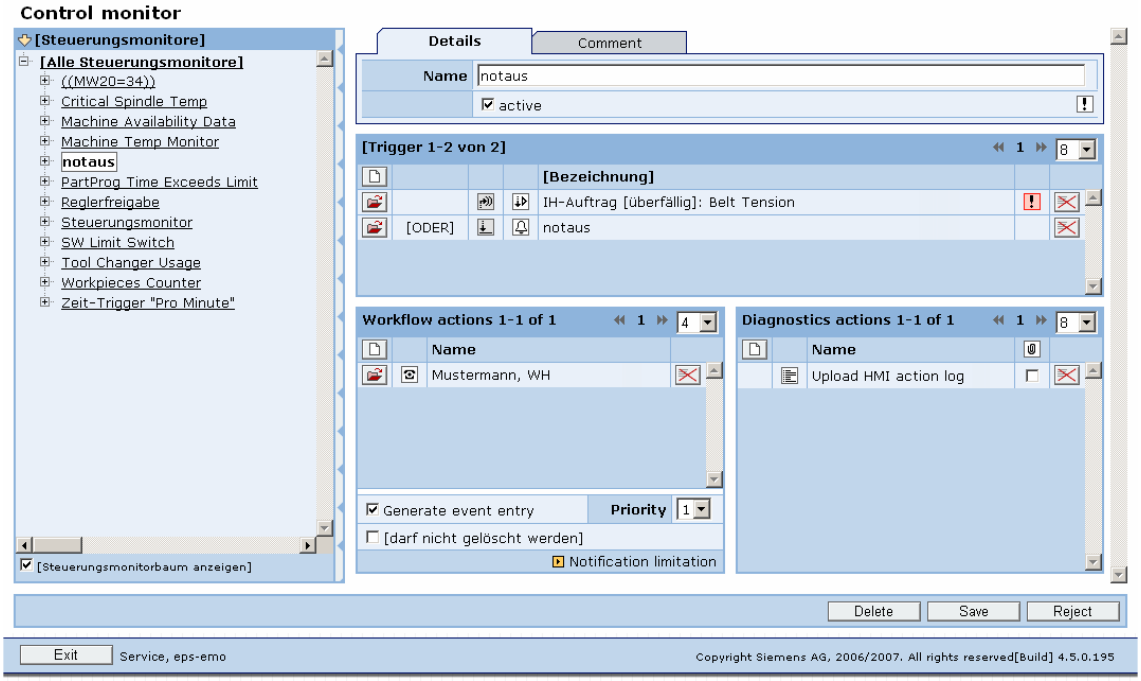


Fig. 3-16: Control monitor - Detailed view

Fields in the function settings	Contents	Type
Details	Displays function settings on the control monitor, which can be edited.	TAB SELECTION
Comment	Displays an editable comments field	DISPLAY INPUT (Max. 2000 characters; any character permissible)
Designation	Name of the control monitor: Names of control monitors must be unique. If a name has not been entered, the system will generate it automatically (control monitor (n), where n is the automatic serialization).	DISPLAY INPUT (Max. 40 characters; any character permissible)
Priority	Definition of a class used to enter events in the machine event list, so that they can be specifically filtered.	SELECTION DISPLAY (Digits from 1 to 5)
Must not be deleted	If this option is selected, events cannot be deleted from the event history.	SELECTION DISPLAY
Generate event entry	An entry in the machine events is not required for every control monitor. For notifications, maintenance or acquisition of value series from the	SELECTION DISPLAY

Fields in the function settings	Contents	Type
	NC or PLC, there is no need for an entry in the history, since these actions are events in and of themselves.	
Delete	Deletes the selected control monitor following a query	ACTION
Save	Saves the changes made on the monitor.	ACTION
Reject	Any changes that have been made will not be applied. The control monitor in place prior to opening remains unchanged.	ACTION

Field array	Contents	Type
Create trigger	Opens the submenu for adding a trigger	ACTION
Changing a trigger	Opens the submenu for changing a selected trigger	ACTION
Deleting a trigger	Deletes a trigger from the monitor configuration	ACTION
Create workflow actions	Opens the submenu for configuring notifications and maintenance schedules	ACTION
Change workflow actions	Opens the submenu for changing workflow actions	ACTION
Delete workflow actions	Deletes a workflow action from the monitor configuration	ACTION
Create diagnostic actions	Opens the submenu for adding actions.	ACTION
Change diagnostic actions	Opens the submenu for changing actions	ACTION
Delete diagnostic actions	Deletes an action from the monitor configuration	ACTION
Notification limitation	Opens the submenu for setting the notification limit for SMS/e-mail messages	ACTION
Send data as attachment	If data from the control is configured as an action in the control monitor for uploading purposes, it can be sent as an attachment to an e-mail. The uploaded data can also be selected for sending on an individual basis.	SELECTION

3.3.3 Machine triggers and server triggers

Description of functions

In terms of triggers, a distinction can be drawn between machine triggers and server triggers:

- Machine triggers respond in the form of queries for signals from the control.
- Server triggers are queries for values that have already been detected on the server.

Any action can be executed with any trigger, regardless of whether it is of a machine or server type. Fault help requests submitted to the ePS Network Services Internet PC and maintenance jobs that are due to be executed constitute an exception in this respect: These are monitored on the ePS server rather than being machine-triggered.

Initiating the trigger

A trigger can be assigned a label, which determines its behavior at the central starting date for maintenance (see Sub-section 6.1.3 "Machines" → Master data). If a label has been set and a starting date, which has not yet been reached, has been configured in the master data of the machine, the trigger will not be initiated. If the date has been reached or is in the past, the trigger will be initiated according to the conditions set for it. If a starting date has not been configured, or the label has not been set, the trigger will be initiated according to the conditions set for it.

The label for an entire trigger relates to each individual condition linked in the trigger. As a result, "OFF" indicates that no trigger conditions have been linked to the starting date, while "ON" indicates that all trigger conditions have been linked to the starting date. A "faded ON" indicates that at least one trigger condition is linked to the starting date.

Machine trigger

All actions that are available in the control monitor are initiated with a machine trigger. Machine triggers are initiated on the basis of either control variables or events that take place on the control PC.

Please select the required trigger type.

Machine trigger	
►	Alarm group
►	PLC trigger
►	Combined machine trigger: Alarm group and PLC trigger
►	Fault message to HMI
►	Time trigger

Server trigger	
►	A measurement of a series of measurements reaches a limit value
►	Trigger when maintenance jobs are (over)due
►	PLC monitor reaches a limit value
►	Cyclic trigger on NC monitor
►	Cyclic trigger on PLC monitor
►	Fault message on PC

3.3.4 Machine trigger on "alarm group"

Description of functions

The "alarm group" trigger can be used to respond to all alarms programmed in the control. These alarms also include the user area for alarm numbers that are used to program the machine functions for machine diagnostics purposes. If machine diagnostics are not performed on the basis of alarm numbers, there is no option of linking these error messages here. The alarm numbers that initiate triggers can be entered individually, in groups or in series.

It is also possible to remove individual alarms or groups from a selection. In addition to this, conditions that are not meant to initiate a trigger on their own can be linked (e.g. if a particular alarm is only meant to initiate a trigger in Automatic mode).

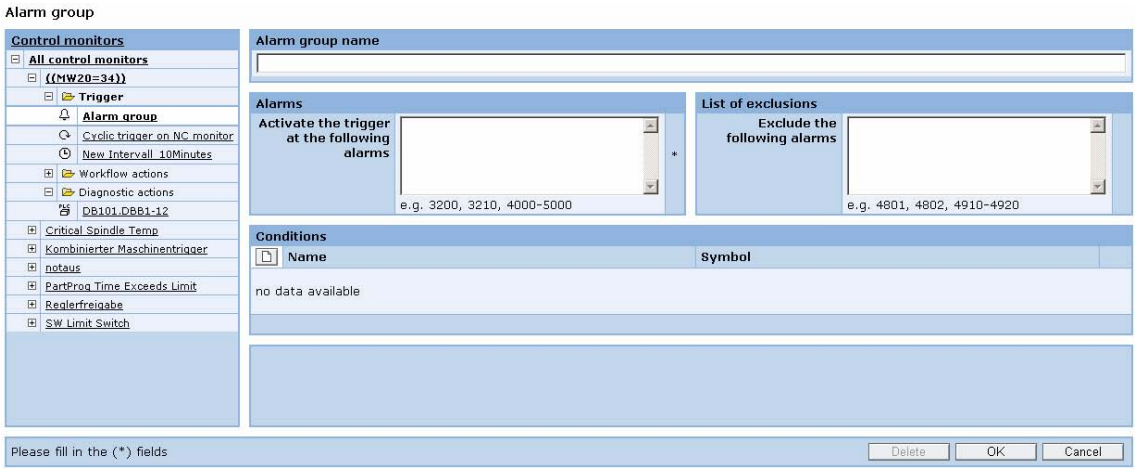


Fig. 3-17: "Alarm group" trigger

Field array	Contents	Type
Alarm group name	Name of the trigger; can be entered by the user. If the field remains empty or is deleted, the system generates a name from the parameters of the trigger. The name varies according to the screen resolution. If the name already exists, a consecutive number is automatically added in	DISPLAY INPUT (Max. 40 characters; any character permissible)

Field array	Contents	Type
	parentheses. If the name is too long, the number added can only be seen in a tooltip.	
Initiate the trigger at the following alarms	Enter the alarms to be initiated: List of individual alarms separated by commas or alarm number areas separated by "**–**".	DISPLAY INPUT (Max. 2,000 characters; any digit permissible: , and – are permissible special characters)
Exclude alarms	Enters the alarms that must not result in initiating: List of individual alarms separated by commas or alarm number areas separated by "**–**".	INPUT
Add / edit conditions	Opens the submenu for entering a PLC condition. **Note:** If an alarm occurs, an action is only initiated if the PLC condition described here occurs at the same time. If an alarm is pending and the condition is met after this, the action will not be initiated. (See also: 3.3.5 Machine trigger on "PLC variable")	ACTION

3.3.5 Machine trigger on "PLC variable"

Description of functions

Complex logic operations and value comparisons for PLC variables can be set up using machine triggers for "PLC variable". PLC conditions for "alarm group" triggers are configured in the same way as triggers for "PLC variable".

Note

In order to be able to use "PLC variable" triggers, PLC conditions (for conditional alarms) and PLC traces in monitors, the control must be set up accordingly (see /R1/). If it has not been set up correctly, you can set these functions in the monitors but you cannot activate them on the control.

You must also enter the settings for the data blocks used for the machine (see Section 3.4 "Global settings").

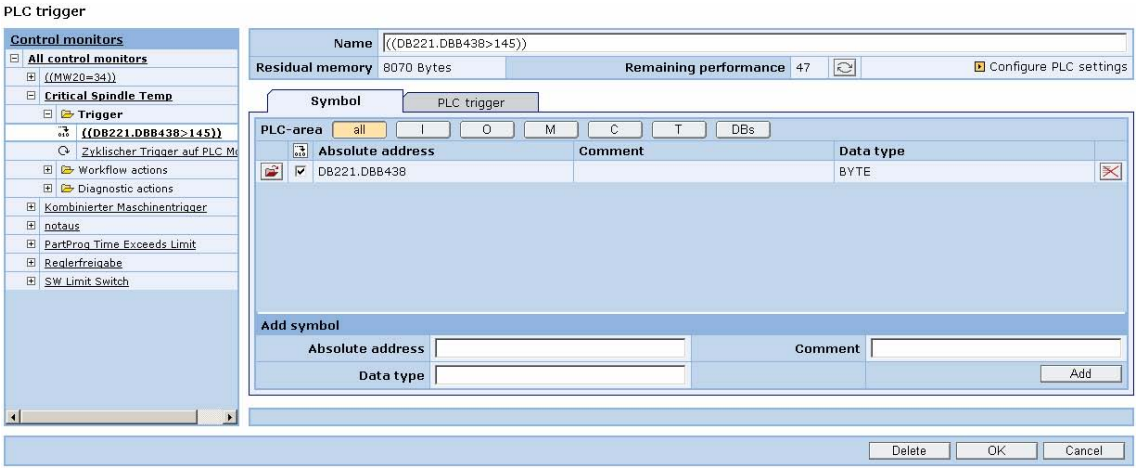


Fig. 3-18: Trigger on "PLC variable" - Adding addresses

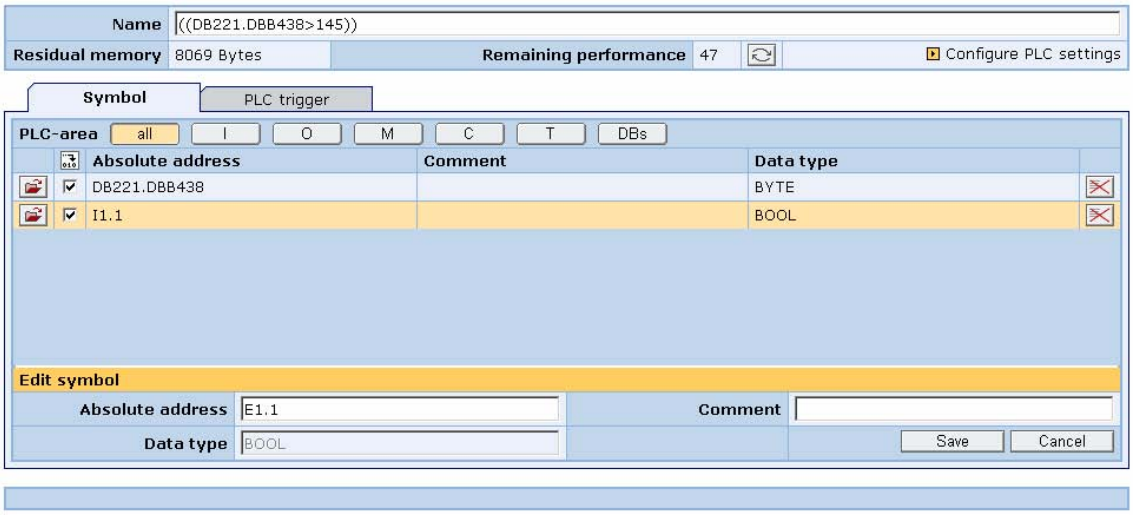


Fig. 3-19: Trigger on "PLC variable" - Editing printouts

Field array	Contents	Type
Designation	Name of the trigger; can be entered by the user. If the field remains empty or is deleted, the system generates a name from the parameters of the trigger. The name varies according to the screen resolution. If the name already exists, a consecutive number is automatically added in parentheses. If the name is too long, the number added can only be seen in a tooltip.	INPUT
Remaining memory	Indicates how much memory (in bytes) is left in the PLC data block for the "PLC variable" triggers and PLC conditions.	DISPLAY
Remaining performance	Shows the number (only in the case of bytes) of PLC variables that can still be used in triggers and as a condition. Depending on the size of the variable, it may be that 2 counts for one variable.	DISPLAY
Configure PLC settings	Since the PLC data blocks are required for the "PLC variable" trigger, it is possible to branch directly to the "PLC settings" menu from here.	ACTION

Each trigger can be assigned a label, which determines its behavior at the central starting date for maintenance (see also: Sub-section 6.1.3 "Machines" → Master data, and general description of triggers):

- If a label has been set and a starting date, which has not yet been reached, has been configured in the master data, the trigger will not be initiated.
- If the date has been reached or is in the past, the trigger will be initiated according to the conditions set for it.
- If a starting date has not been configured, or the label has not been set, the trigger will be initiated according to the conditions set for it.

"Icons" tab

The absolute address can be edited under "Icons".

Field array	Contents	Type
Icons	Displays the list of ANDed comparison operations in the trigger (in relation to the absolute addresses). These can be selected individually for editing purposes.	TAB
Edit absolute address Data Type	The system does not support plausibility for the absolute addresses, their data types, or the possible comparison operations. **Notice:** Subsequent correction of the absolute address data type is not possible. The variable must be deleted in its entirety, along with its comparison operation, and a new variable created.	INPUT DISPLAY
Force absolute address	To make it necessary for the trigger logic operations and comparison operations to be manipulated by deleting entries that have already been made (for testing purposes) each individual address can be forced, i.e. the address does not participate in the AND logic operation of the trigger.	SELECTION
Delete icon	Deletes an absolute address and the associated comparison operation	SELECTION
Add icon		
Absolute address Data Type	Enters the address of a PLC variable via STEP 7 syntax: All simple data types are supported. **Note:** The addresses can be entered in German and English notation (example: E1.1 or I1.1).	INPUT DISPLAY
Comment	Enters a comment for the absolute address	INPUT
Add	Adds the edited address to the AND logic operation of the trigger conditions. **Notice:** The comparison operation must be entered separately. ePS Network Services permits saving without a comparison operation; this renders the trigger ineffective.	ACTION

"PLC Trigger" tab

The comparison operation can be edited under "PLC Trigger".

Field array	Contents	Type
PLC trigger	Shows the comparison operations for the AND logic operations in the trigger, which can also be edited	TAB DISPLAY INPUT
Trigger 1 Trigger 2 ... Trigger n	The comparison operations for Trigger 1 and Trigger 2 are logic OR. The comparison operation consists of the comparison operation (>, <, =, <>) and the fixed comparison value (digit). **Notice:** ePS Network Services will not check the plausibility of the variable address for the potential comparison operation and actual comparison value. It is possible, but not advisable, to compare a binary address M1.1 to a value that is greater than 9,999.	INPUT DISPLAY
±	Entry for a comparison value tolerance, in which the trigger condition is still fulfilled. **Note:** ePS Network Services will not check the specified tolerance for plausibility. The tolerance is only advisable in = operations with values (no binary signals). With >, < operations, the comparison value can be specified correctly instead of the tolerance, as a tolerance direction has no effect.	INPUT DISPLAY
Delete	Deleting a comparison operation in the PLC trigger does not result in the PLC variable being deleted along with it, but instead forces the variable to renounce its participation at the trigger and hides the logic operation. If the forcing operation is undone by selecting the variable again, the comparison operation reappears as well.	SELECTION

3.3.6 Combined machine trigger on "alarm group" AND "PLC variable"

Description of functions

The combined machine trigger contains the alarm group trigger and PLC variable trigger, which are automatically linked by means of a logic "AND".

Its special feature is a configurable temporal indeterminacy between the alarm group trigger and the trigger for the PLC variable, in which the trigger is yet to be initiated.

The individual trigger functions are described in the same way as each of the triggers.

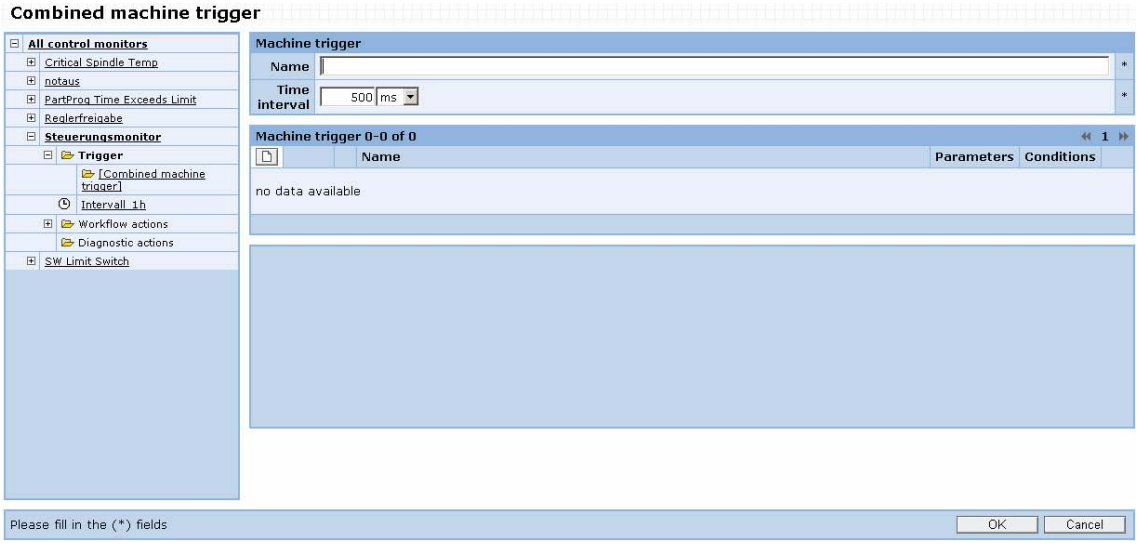


Fig. 3-20: Combined machine trigger

Field array	Contents	Type
Designation	Name of the trigger; can be entered by the user. If the field remains empty or is deleted, the system generates a name from the parameters of the trigger. The name varies according to the screen resolution. If the name already exists, a consecutive number is automatically added in parentheses. If the name is too long, the number added can only be seen in a tooltip.	DISPLAY INPUT (Max. 40 characters; any character permissible)

Field array	Contents	Type
Trigger event tolerance	Time to be bridged between successive initiation of individual triggers and initiation of a total trigger.	DISPLAY INPUT SELECTION (Time values between 500 ms and 24 hours are possible.)
Add / change trigger	Adding or changing any number of triggers until the limitation by the PLC data block can be ANDed. (See also: PLC performance index)	DISPLAY ACTION

3.3.7 Machine trigger for "Time-based trigger"

Description of functions

The time-based trigger permits trigger cycles between 1 minute and 99,999 days. A time can be entered in order to determine when daily triggers are initiated; this point represents the beginning of the cycle clocks for triggering.

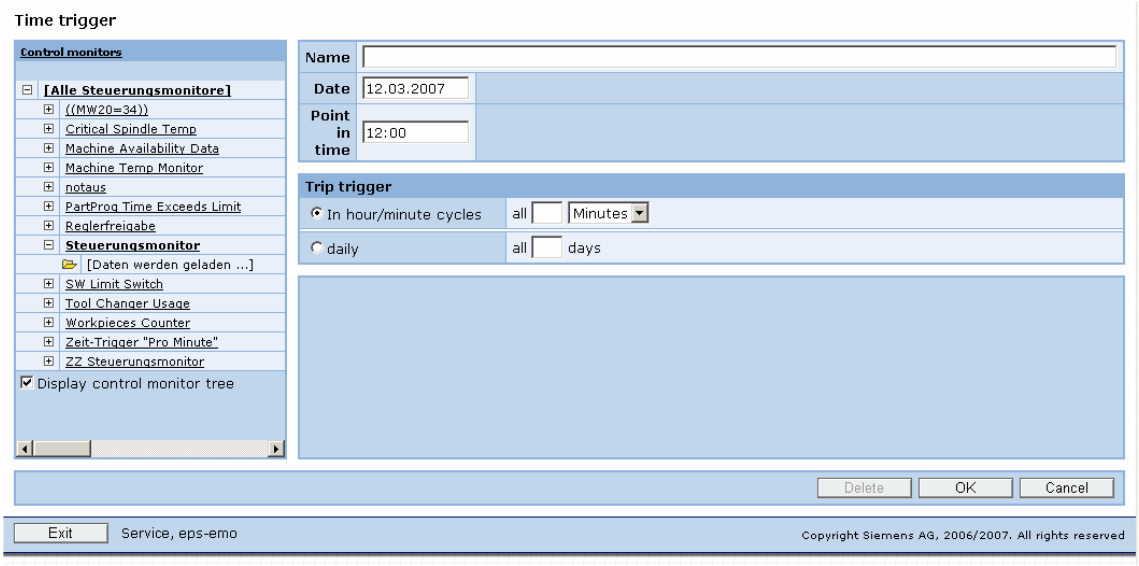


Fig. 3-21: Time trigger•

Field array	Contents	Type
Designation	Name of the trigger; can be entered by the user. If the field remains empty or is deleted, the system generates a name from the parameters of the trigger. The name varies according to the screen resolution. If the name already exists, a consecutive number is automatically added in parentheses.	DISPLAY INPUT (Max. 40 characters; any character permissible)

Field array	Contents	Type
	If the name is too long, the number added can only be seen in a tooltip.	
Date	To synchronize the cycle clocks, a start date can be entered on an individual basis.	DISPLAY INPUT (Date format with leading zeros)
Point in time	For the purpose of synchronizing the cycle clocks, a starting point in time can be specified on an individual basis, or, in the case of day clocks, the point during the day for initiation can be specified.	DISPLAY INPUT (Time format with leading zeros)
by hour / minute	Entry for a cycle clock in hours or minutes.	DISPLAY INPUT SELECTION (1 to 99,999 minutes or hours)
by day	Entry of a cycle clock in days	DISPLAY INPUT (1 to 99,999 days)
Dependent on starting date	This label specifies the dependency of the starting date for maintenance.	DISPLAY SELECTION (Toggle)

Each trigger can be assigned a label, which determines its behavior at the central starting date for maintenance (see also: Sub-section 6.1.3 "Machines" → Master data, and general description of triggers):

- If a label has been set and a starting date, which has not yet been reached, has been configured in the master data, the trigger will not be initiated.
- If the date has been reached or is in the past, the trigger will be initiated according to the conditions set for it.
- If a starting date has not been configured, or the label has not been set, the trigger will be initiated according to the conditions set for it.

3.3.8 Trigger on "Fault message at HMI/PC"

Description of functions

It is possible to process service cases via ePS Network Services. For this purpose, a fault help request can be output at the machine via the HMI (machine trigger). However, it is also possible to do this from any ePS Network Services Internet PC (server trigger).

To ensure that the fault help request reaches the correct contact person as quickly as possible, a control monitor can be used in order to set a trigger when fault help is requested. The control monitor should then inform the person responsible with an appropriate notification. An e-mail notification containing a description of the fault is sent automatically.

A special feature is the option of requesting any necessary remote access along with the fault help request from the machine HMI. The helper can then switch to the machine without any further assistance.

Notice

The time between the request and access is restricted.
(See also: Section 2.5 "Remote access")

The trigger on "Fault message at PC" cannot initiate any diagnostic actions at the machine.

Request teleservice session

Anyone searching for help on the machine can request a teleservice session at the same time as he/she is requesting help for a fault. The session ID required to start teleservice is transferred directly by the PC of the remote service engineer and, provided that the menu on the HMI is not exited, does not need to be entered manually at the machine. This function is especially useful if no phone connection is available to ask about the session ID or if other circumstances prevent communication of the session ID.

3.3.9 Server trigger on "Measurement series reaches limit value"

Description of functions

Any actions can be initiated if at least one of them has exceeded the limit value in one of the measurement series configured in the trigger.

The trigger is only initiated if a limit value is violated at the point of the axis test. Subsequent modification of the limit values to below the violation limit does not trigger any actions.

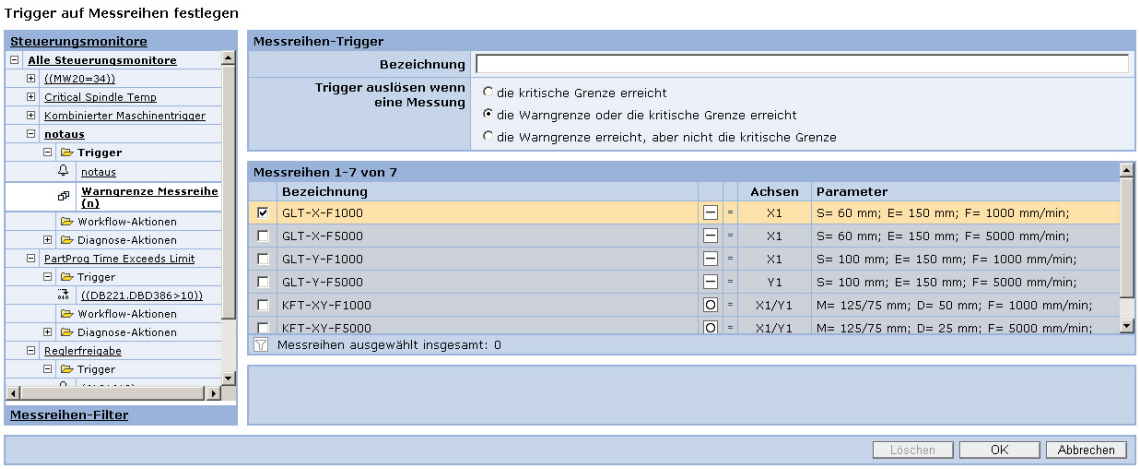


Fig. 3-22: Trigger on measurement series reaches limit value

Field array	Contents	Type
Designation	Designation for the trigger; can be entered by the user. If the field remains empty, or the designation is deleted, ePS Network Services will generate a designation from the selected measurement ranges. A consecutive number (n) can be added to this.	DISPLAY INPUT (Max. 40 characters; any character permissible)
Initiate trigger…	Select type of limit value • If at least one critical limit has been exceeded • If at least one warning limit has been exceeded (in which case the critical limit may also have been exceeded) • If only the warning limit has been exceeded and the critical limit has not yet been reached	SELECTION 1 of 3
Measurement series 1-n of n	Display and selection of the existing measurement series for the trigger	DISPLAY SELECTION

3.3.10 Server trigger on "Maintenance jobs due"

Description of functions

In order to monitor the execution of maintenance procedures by acknowledging maintenance jobs, this trigger can be used to respond on a specific basis to one or several jobs with time delays that can be configured differently. A notification is available as a response.

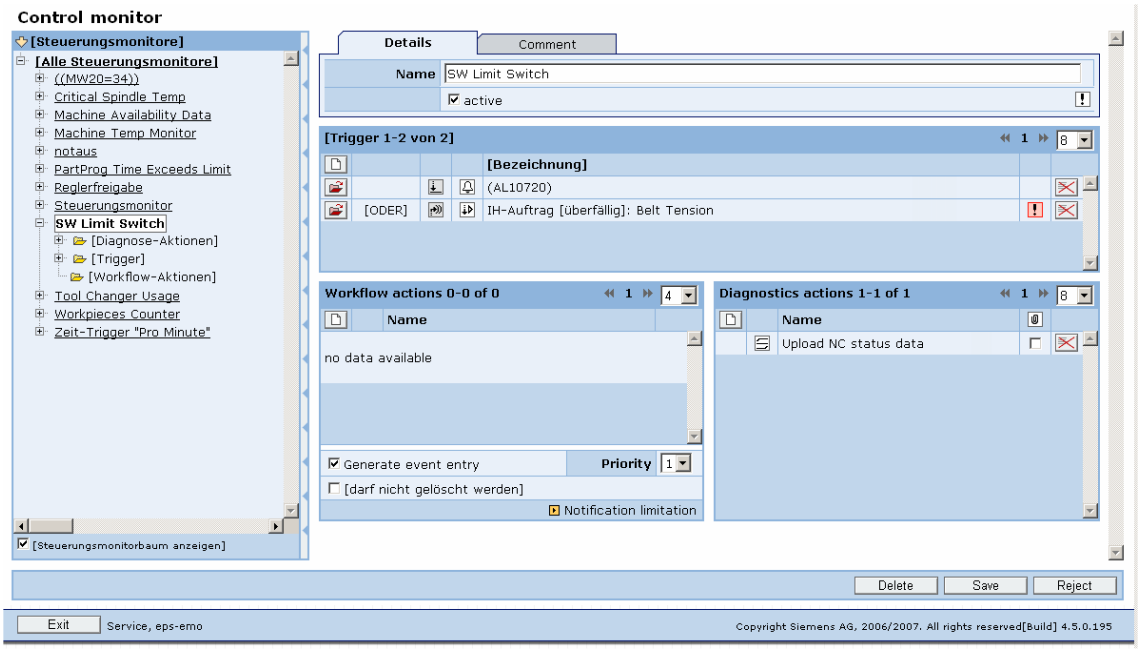


Fig. 3-23: Server trigger on "Maintenance job due"

Field array	Contents	Type
Designation	Name of the trigger: If this is not entered, the maintenance job (overdue) trigger is assigned the name of the maintenance schedule. If the automatic name has already been assigned, it does not change, even if a different maintenance job is being monitored. The automatic name of the maintenance schedule is updated if a name is entered and then deleted manually.	DISPLAY INPUT (Max. 40 characters; any character permissible)
Initiate trigger if a maintenance job is due.	If maintenance jobs are due, an individual notification for a freely configurable group of maintenance procedures can be sent. This does not necessarily have to be identical to the notification in the control monitor that triggers maintenance. For maintenance procedures that are directly controlled by the maintenance schedule, this is the only option for sending a notification indicating when maintenance procedures are due.	DISPLAY SELECTION (Toggle)
Initiate trigger if a maintenance job is	With a delay of 0 to 999 days, this trigger can be used to send notifi-	DISPLAY SELECTION

Field array	Contents	Type
overdue.	cations that are initiated when at least one of the selected jobs is overdue.	(Toggle) INPUT (Digits from 0 to 999)
Initiate trigger if a maintenance job is repeatedly overdue.	To serve as a reminder, notifications will repeatedly indicate if a job is overdue. The intervals between repeat notifications can be specified in days (between 0 and 999).	DISPLAY SELECTION (Toggle) INPUT (Digits from 0 to 999)
Maintenance schedules	The list of maintenance schedules can be used to select maintenance jobs to be triggered when they are due. The trigger will respond when at least one job on the list is due.	DISPLAY SELECTION (Toggle)

3.3.11 Server trigger on "PLC monitor reaches limit value"

Description of functions

Any reaching or exceeding of the limit values defined in the PLC monitor can be configured here as a trigger in the control monitor.

In contrast to the interval-based evaluations, an ePS Network Services endless counter should not be used here; otherwise, it will only possible for a trigger to be initiated once over the course of the entire life cycle of the monitor. In this case, it is advisable to use the normal PLC variable, which can fluctuate around a limit value so that this monitor can become active each time a limit value is violated.

Since the PLC monitor cannot generate an entry in the event history, this is done via the control monitor to ensure that any limit value violations can be documented.

The further functions of the control monitor, with workflow actions and diagnostics actions, are fully available, in order to be able to interactively initiate actions in response of limit value violations.

Since the processed data is not updated cyclically, the evaluation is done by reaching or exceeding the limit. In order not to trigger an action at every triggering, edge evaluation can be selected. An event will be generated only at the first trigger after the limit value violation.

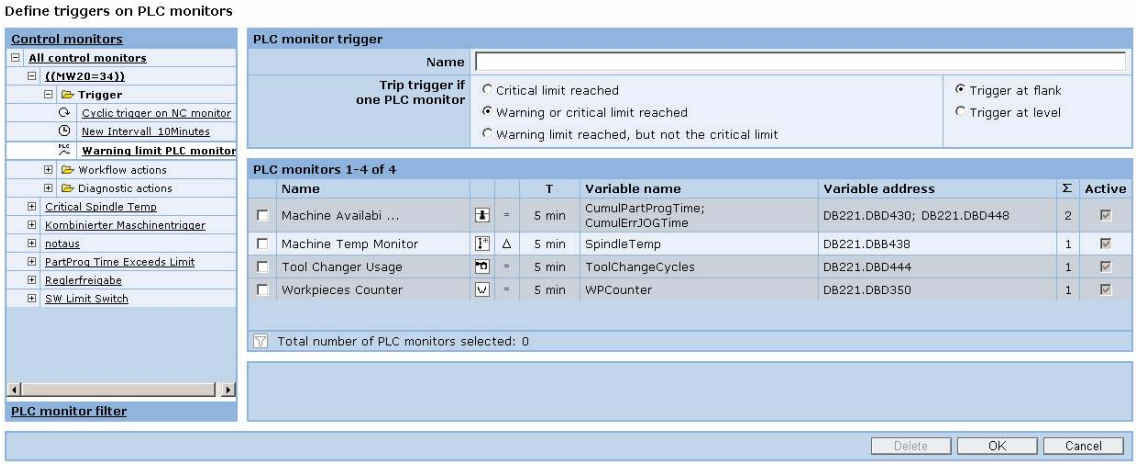


Fig. 3-24: Trigger on limit values for PLC monitor

Field array	Contents	Type
Designation	Name of the trigger	DISPLAY INPUT (Max. 40 characters; any character permissible)
Initiate trigger if at least one variable in the list of PLC monitors...	The following options are possible: • Critical limit reached • Warning limit or critical limit reached • Warning limit reached, but not critical limit Any number of PLC monitor variables can be integrated into the trigger.	SELECTION
Edge / level	Evaluate trigger: If "Edge" is selected, the trigger will only be initiated during the transition between the previous and current instance of variable acquisition, while simultaneously detecting the trigger initiation function. If "Level" is selected, the trigger will be initiated each time the variable content is recorded, once the initiating function has been detected. The initiating function is the limit value function that has been selected.	SELECTION

The limit values are permanently configured in the PLC monitor. Triggering for several limit values of a variable is only possible via several PLC monitors.

3.3.12 Cyclic server trigger for NC monitors and PLC monitors

Server trigger

A server trigger can be used to initiate all actions that are available (with the exception of fault help requests from an ePS Network Services Internet PC).

Server triggers initiate actions on the basis of limits or intervals that have been reached/exceeded (which can be configured for PLC and NC variables), when these have been read cyclically from the control defined as a ePS Network Services counter. (Endless counters in ePS Network Services cannot be reset, even if the variable has been reset.)

Cyclic trigger on NC monitor

Notice

Cyclic triggers for NC monitor data can only be created as a template if an axis configuration is available.

Since the NC variables are processed as "endless counters" in the NC, and are also accepted by ePS Network Services as this, the values read in a different control monitor action can be configured here in such a way that the trigger initiates when a configured interval value is reached or exceeded.

Notice

Since the endless counter function of the NC cannot be guaranteed when components are exchanged, when a smaller new value is read, ePS Network Services calculates this as an offset to the old value.

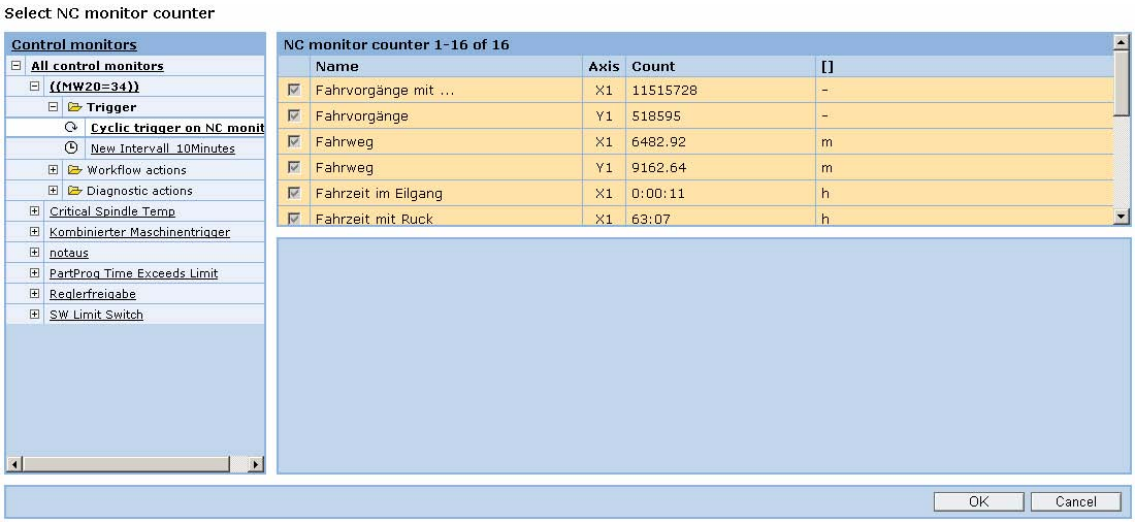


Fig. 3-25: Selection: NC monitor counter

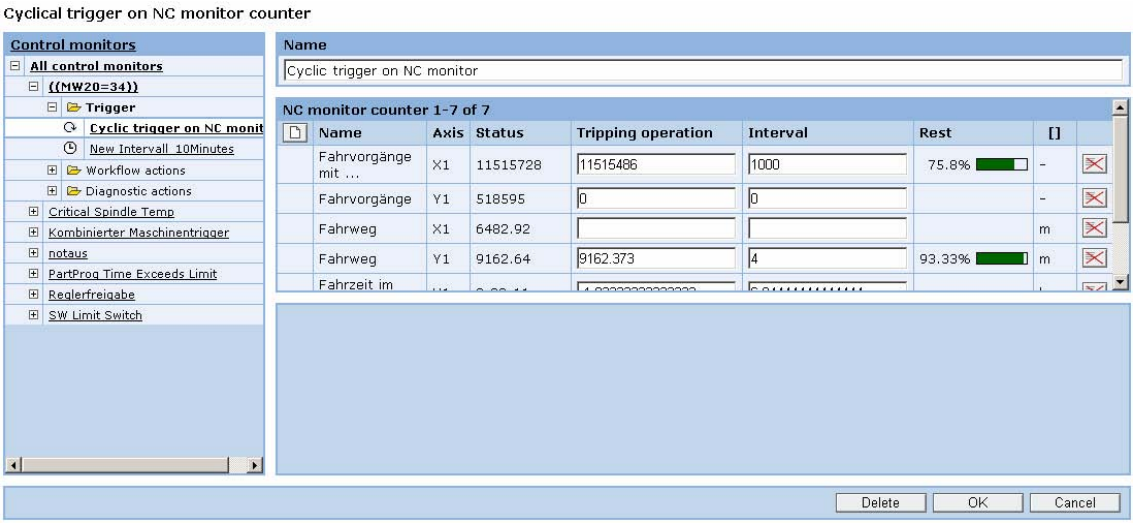


Fig. 3-26: Server trigger on NC monitor

An interval value can be specified for each NC variable provided. As soon as the variable value has exceeded the initiating value, the trigger is initiated and a new count interval begins. The trigger value is incremented by the configured interval value. If two or more counters are combined in one trigger, the first counter to exceed the interval limit triggers the trigger. A new count interval then starts for all counters that are combined in the trigger.

Field array	Contents	Type
View		
Designation	Name of the variable	DISPLAY INPUT (Max. 40 characters; any character permissible)
Axis	Axis identifier: NC axis name	DISPLAY
Status	Counter status, corrected by ePS, for current absolute variable content	DISPLAY
Trigger	Current status for the next initiation, either specified by an entry or automatically calculated and entered by ePS Network Services at interval change	DISPLAY INPUT (With ePS Network Services update)
Interval	Interval value	DISPLAY INPUT (Up to a max. of 9 digits)
Remainder	Numerical and graphic display of the remaining count units until next initiation	DISPLAY
[ ]	Unit of the counter	DISPLAY

Field array	Contents	Type
Delete	Deleting the counter from the server trigger	ACTION
Add	Adds a further NC monitor counter to the server trigger	ACTION
Dependent on starting date	This label specifies the dependency of the starting date for maintenance.	DISPLAY SELECTION (Toggle)

Each trigger can be assigned a label, which determines its behavior at the central starting date for maintenance (see also: Sub-section 6.1.3 "Machines" → Master data, and general description of triggers):

- If a label has been set and a starting date, which has not yet been reached, has been configured in the master data, the trigger will not be initiated.
- If the date has been reached or is in the past, the trigger will be initiated according to the conditions set for it.
- If a starting date has not been configured, or the label has not been set, the trigger will be initiated according to the conditions set for it.

Cyclic trigger on PLC monitor

ePS Network Services limits the use of PLC variables with this cyclic server trigger to the "endless counters" defined in ePS Network Services.

Notice

PLC counters cannot be used as ePS Network Services counters! It is not possible to correct this configuration (counters). Instead, the configuration must be deleted in its entirety and re-entered.

The values read in a different control monitor action (execute PLC monitor) can be prompted in such a way that the trigger is initiated when a configured interval value is reached or exceeded. The interval is then automatically projected onto the interval grid for the next prompt.

Notice

Since it is not possible to use the endless counter function of the PLC, when a smaller new value is read, ePS Network Services calculates this as an offset to the old value.

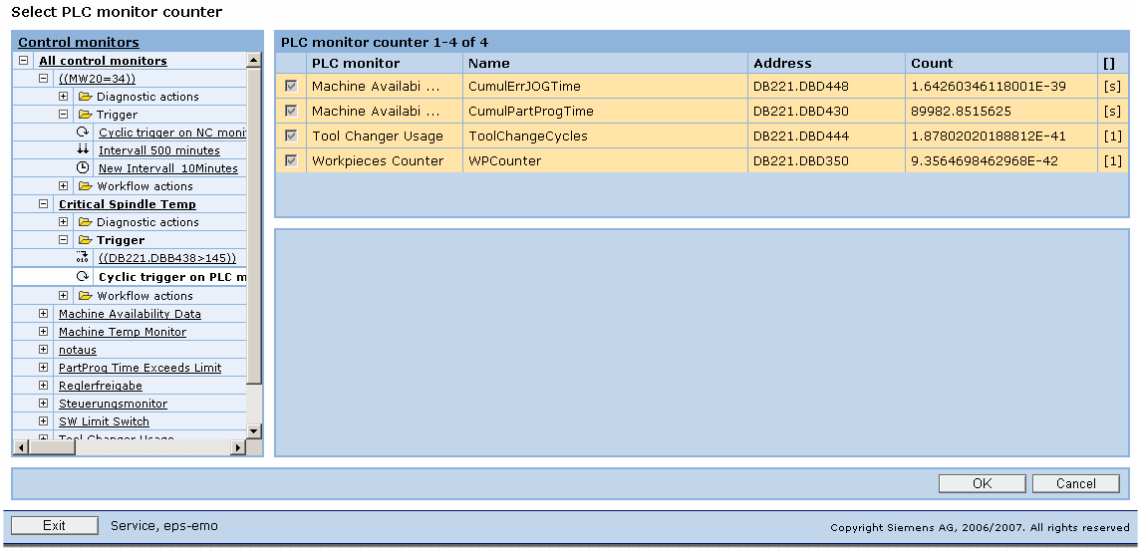


Fig. 3-27: Selection: PLC monitor counter

Field array	Contents	Type
Designation	Designation for the new trigger	DISPLAY INPUT (Max. 40 characters; any character permissible)
Add	Add the selection of all possible PLC monitor variables for which a trigger can be initiated.	ACTION
Selection	The variable can be marked for use once per trigger. Any number of variables can be selected.	SELECTION

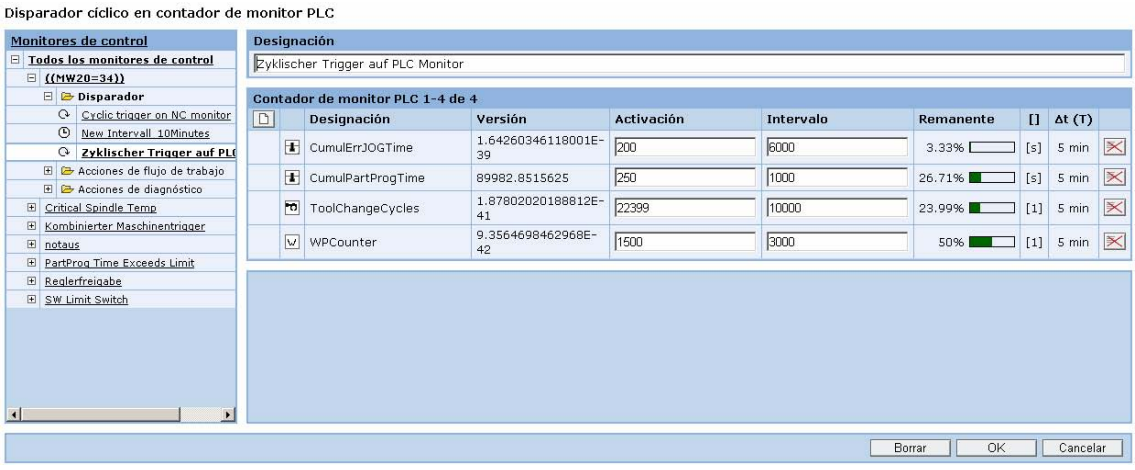


Fig. 3-28: Server trigger for PLC monitor

Field array	Contents	Type
View		
Designation	Name of the variable	DISPLAY INPUT (Max. 40 characters; any character permissible)
Status	Counter status, corrected by ePS Network Services, for current absolute variable content	DISPLAY
Interval	Interval value	DISPLAY INPUT (Up to a max. of 9 digits)
Remainder	Numeric and graphic display of the remaining count units (as a percentage) until next initiation	DISPLAY
[ ]	Unit of the counter	DISPLAY
Delete	Deleting the counter from the server trigger	ACTION
Add	Adds a further NC monitor counter to the server trigger	ACTION
Dependent on starting date	This label specifies the dependency of the starting date for maintenance.	DISPLAY SELECTION (Toggle)

Each trigger can be assigned a label, which determines its behavior at the central starting date for maintenance (see also: Sub-section 6.1.3 "Machines" → Master data, and general description of triggers):

- If a label has been set and a starting date, which has not yet been reached, has been configured in the master data, the trigger will not be initiated.
- If the date has been reached or is in the past, the trigger will be initiated according to the conditions set for it.
- If a starting date has not been configured, or the label has not been set, the trigger will be initiated according to the conditions set for it.

3.3.13 Workflow actions

Overview

The following workflow actions are available:

Please select the type of workflow action required

Add a workflow action	
►	Notifying persons via e-mail or SMS
►	Creating a maintenance job

Function description for "Notifying persons via e-mail or SMS"

You can use the workflow action "Notifying persons via e-mail or SMS", to notify persons of an event via SMS and/or e-mail. The recipient addresses must be stored in the address book.
(See also: Sub-section 6.1.1 "Addresses")

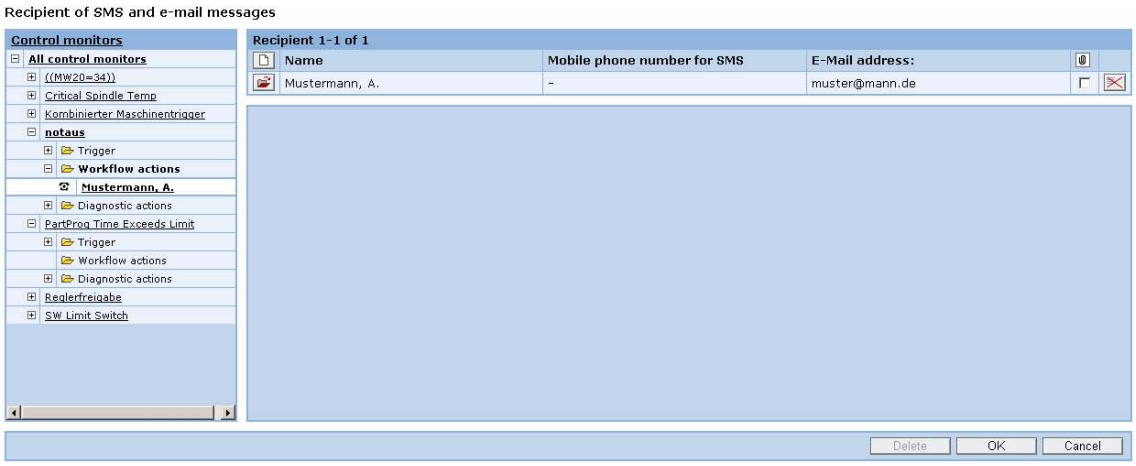


Fig. 3-29: Recipients - List view

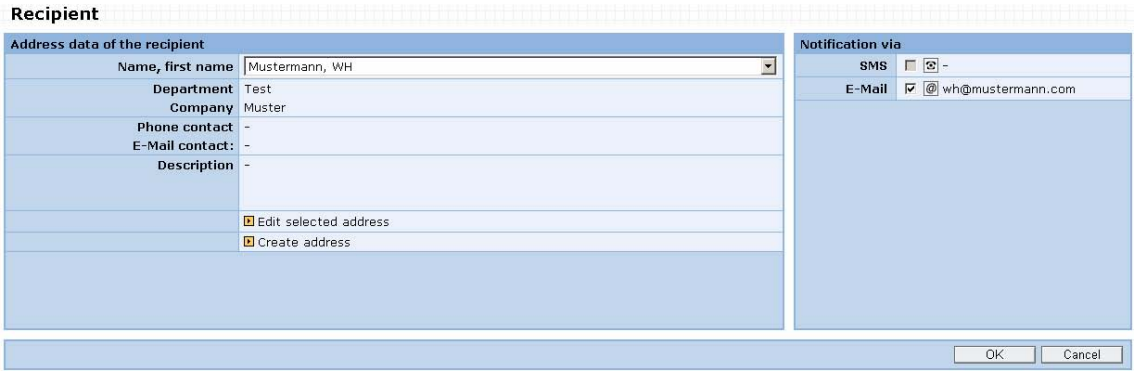


Fig. 3-30: Recipients - Detailed view

Field array	Contents	Type
Add recipient	Insertion of a new recipient into the recipient list of the control monitor	ACTION
Edit recipients	Editing of the notification type of the selected recipient (SMS/e-mail) or replacement of the selected recipient by another	ACTION
Delete recipient	Deletion of a recipient from the recipient list of the control monitor.	ACTION
	Note: This does not change or delete the address in the address book of the organization.	
Column with paper clip	Identifies a recipient: Forward the data acquired with the control monitor in file format.	SELECTION
Select recipient	Selection of a recipient from the address book of the organization	SELECTION
Notification via	Processing of the notification type of a recipient (SMS/e-mail)	SELECTION
Edit selected address	It is possible to switch directly to the address book for the purpose of correcting or editing a selected address. **Notice:** Changes to address data (name; telephone number; e-mail address) affect not only the data for the control monitor that has been edited, but also all of the control monitors in which the address has been programmed.	SELECTION
Create address	If a required addressee in the selection is missing, the information can be added directly to the address book from here.	SELECTION

Description of functions for "Creating a maintenance job"

The workflow action is used to create maintenance jobs on the basis of the control monitor trigger event. To create an order, a maintenance schedule is used as a template. (see Section 3.1 "Maintenance")

Note

If a maintenance job is created by a control monitor, it is always assigned the due date "immediately/today". The jobs created in this way do not affect the jobs scheduled directly in the maintenance scheduled.

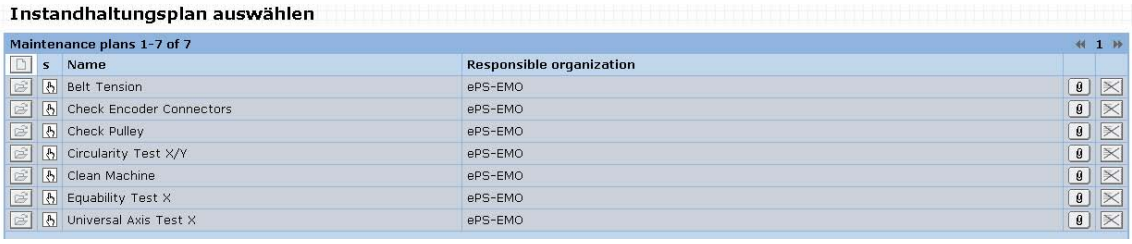


Fig. 3-31: Selecting a maintenance schedule for control monitor

Field array	Contents	Type
Create maintenance schedule	From here, it is possible to switch directly to the creation of a new maintenance schedule.	ACTION
Open maintenance schedule	Open and edit an existing maintenance schedule **Note:** Changes to the maintenance schedule only affect new jobs. Jobs that are already open and are, therefore, already being carried out, as well as jobs that are closed, remain documented in their original state. **Notice:** Renaming a maintenance schedule results in automatic reprogramming of all control monitors in the background where the schedule is configured. Consequently, it is not possible to create all of the required control monitors successively on the basis of a single plan.	ACTION
Paper clip	Use the maintenance schedule displayed in this line as a job, if the control monitor has been triggered. Any of the maintenance schedules can be selected. Those that have been selected are shown in yellow.	ACTION
Delete maintenance schedule	Deletes a maintenance schedule **Note:** Deletion is only possible if the schedule that is to be deleted is not used in any other control monitors, or controlled independently. However, if a maintenance schedule that creates a job in a control monitor is missing, this is documented and displayed in an entry in the event history. If the schedule becomes available again (i.e. a new version is created), it will also be created in the right format to act as a job.	ACTION

3.3.14 Diagnostic actions

Overview

The following actions are available:

Please select the type of diagnostic action required

Add a diagnostic action	
▶	Upload files
▶	Upload HMI action log
▶	Uploading machine data
▶	Upload NC status data
▶	Execute and upload PLC trace
▶	Upload PLC data
▶	Trigger PLC monitor(s)

Description of the "Upload files" function

The diagnostic action "Upload files" is used to upload any files from the file system of the SINUMERIK and the NC onto the ePS server on a trigger event.

In the column with the paper clip, the collection of uploaded files can be marked for sending as an attachment for a notification of the workflow for this control monitor.

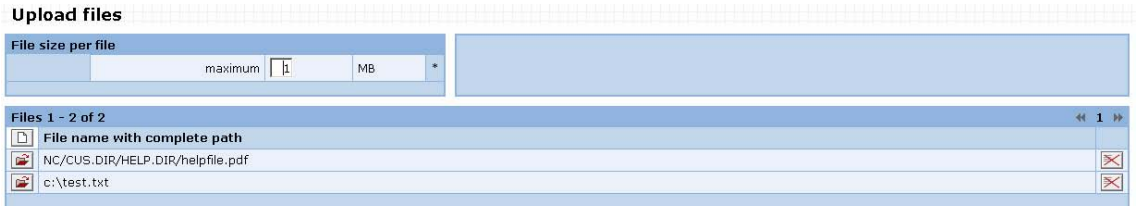


Fig. 3-32: Upload files

Field array	Contents	Type
File size per file	Determines the maximum size for each file to be uploaded: The file size must be specified between 1 MB and 10 MB. If a file does exceed the maximum value, it will not be loaded onto the ePS server.	DISPLAY INPUT (Digits from 1 to 10)
File name with complete path on the control	Shows the files entered with path details for uploading purposes Option: The list of specified files can be sorted in ascending or descending order (triangle).	DISPLAY INPUT
Delete	Deletes a file for uploading from the list.	ACTION

Field array	Contents	Type
Add / change	In the line for editing, the complete path, right up to the file to be uploaded with its file type identifier, must be entered in DOS syntax (but including special characters and with more than 8 characters). **Note:** The syntax shown below, which is different, can be used for the purpose of uploading files from the NC file system: `../NC/Verzeichnis.dir/Subverzeichnis.dir/ <Datei.Endung>` The system automatically determines the current storage location of the file (hard disk/NC SRAM) and the file is loaded from there.	DISPLAY INPUT

Description of "Upload HMI action log" function"

The current HMI action log file can be specifically uploaded to the ePS server with the trigger event.
This action type has no configurable parameters.

In the column with the paper clip, the HMI action log file can be marked for sending as an attachment for a notification of the workflow for this control monitor.

Description of the "Upload machine data" function

The diagnostic action "Upload machine data" enables uploading of the machine data to the ePS server on an event.
This action type has no configurable parameters.

In the column with the paper clip, the machine data can be marked for sending as an attachment for a notification of the workflow for this control monitor.

Note

The uploaded machine data do not contain any drive machine data.

Description of the "Upload NC state data" function

The diagnostic action "Upload NC status data" enables uploading of the NC status data to the ePS server on an event.
This action type has no configurable parameters.

In the column with the paper clip, the NC status data can be marked for sending as an attachment for a notification of the workflow for this control monitor.

Descriptions of the "Record and upload PLC trace" function

This action can be used to record the PLC variables status on a cycle-specific basis and display them synchronously via the ePS server for comparison purposes. Recording is started with the trigger event of the control monitor. Recording is

completed following the number of PLC cycles to be configured. A special feature is the option of specifying how many recording cycles from the period prior to the trigger event should remain recorded.

Note

The uploaded machine data do not contain any drive machine data.

Since the status can be recorded by means of any control monitor trigger, it is possible that this trigger may be initiated more frequently within the programmed recording time.

Within this context, ePS Network Services ensures that the recorded data is acquired from the first trigger until the end of recording and, provided that it is not overwritten in the DB interfaces of the PLC, until ePS Network Services has collected the data and stored it on the server.

If a trigger subsequently occurs within the recording time for the pre-trigger, recording is still carried out, but the pre-trigger status number is accordingly lower.

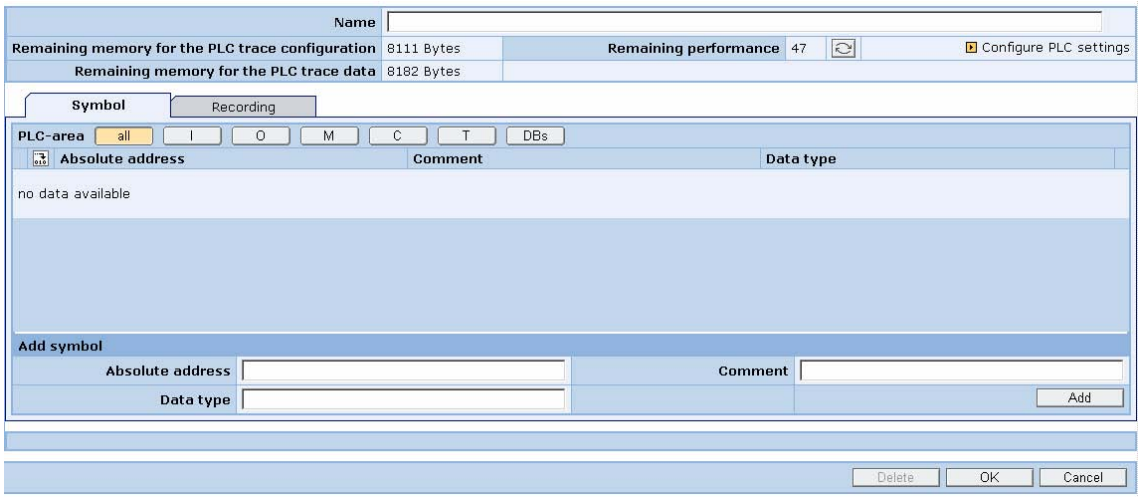


Fig. 3-33: PLC trace: Adding variables

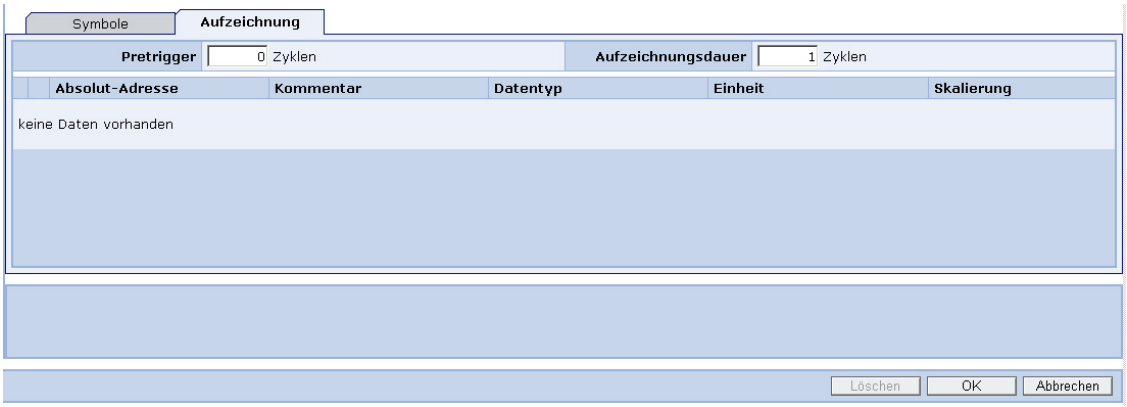


Fig. 3-34: PLC trace: Defining recording parameters

Field array	Contents	Type
Designation	Name of the PLC trace: Can be entered by the user. If the field remains empty, or the designation is deleted, ePS will enter the designation: Execute and upload PLC trace.	DISPLAY INPUT (Max. 40 characters; any character permissible)
Remaining memory for the PLC trace configuration	Displays the remaining memory in the DB for addressing variables in the PLC.	DISPLAY
Remaining memory for the PLC trace data	Shows the remaining memory in the DB of the PLC for **recording** the variables status. The memory requirement is directly related to the number of cycles to be recorded. **Note:** If the remaining memory is insufficient for the current definition of a trace, you can save the control monitor **inactively** in the system. To make it possible to activate it, you must free up memory by deactivating one or more of the control monitors.	DISPLAY
Icons	Shows the PLC variables with absolute addresses (not symbolic addresses), which are to be recorded in the trace, or for which additional programming can be carried out. **Note:** The PLC variables to be recorded are selected in the same way as PLC triggers/conditions. (See Sub-section 3.3.5 "Machine trigger on PLC variable").	TAB DISPLAY INPUT S7 syntax S7 formats (Max. 40 characters for naming; any character permissible)
Recording Recording time	Configured recording time, with the specified number of PLC cycles for the entire recording and the specified number of cycles from the time prior to the trigger event that are to remain recorded	TAB DISPLAY INPUT (Digits from 1 to 9999 for the total number of cycles,

Field array	Contents	Type
		0 also permissible for pre-trigger)
Recording Pretrigger	Entry for the number of cycles for the pre-trigger, used to determine the number of cycles before the trigger event to be recorded	TAB DISPLAY INPUT (Digits from 0 to 9999)
Remaining performance	Indicates how much of the remaining performance in the PLC cycle time is required for PLC triggers and PLC conditions (see function settings for performance).	DISPLAY
Configure PLC settings	Since data blocks must be used in the PLC for the configuration of PLC traces, these must be specified in the PLC settings for ePS Network Services. If this has not been done in the PLC settings or needs to be checked again, it is possible to branch directly from here for this purpose.	ACTION

Description of the "Upload PLC data" function

The diagnostic action "Upload PLC data" permits some or all of the PLC data blocks to be uploaded the ePS server on a trigger event, using a control monitor.

Notice

The PLC data blocks are available on the ePS server without a specific format. **Precisely one contiguous range of the same data block** can be selected for uploading for each control monitor.

For the purpose of displaying the DB content, the data from the ePS Network Services menu (machine events) must be exported and saved. A hexadecimal editor or byte-by-byte conversion in Excel is recommended for visualization purposes.

In the case of data block content that changes dynamically from the point directly after the trigger event up to the point when transfer to the ePS server is complete, due to the limited bandwidth of the communication channel to the PLC, it cannot be guaranteed that the statuses are from a single cycle.

Fig. 3-35: Adding PLC data blocks

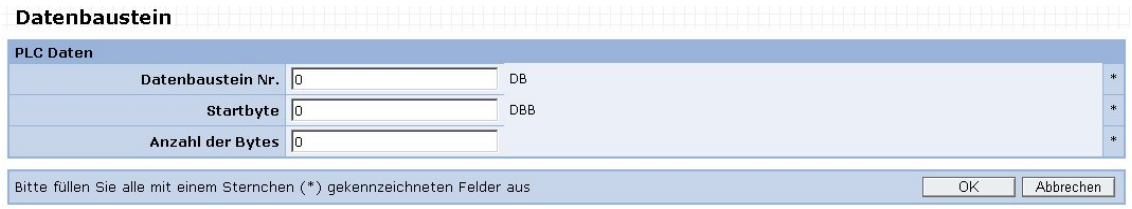


Fig. 3-36: PLC data block (details)

Field array	Contents	Type
Add/open	Switch to the menu for configuring the data to be uploaded. If a configuration is added, the entry fields will not contain any specifications. If an existing configuration is being changed, the configured entries will appear.	ACTION
Delete	Deletes a PLC data block to be uploaded from the list	ACTION
Data block No.	Number of the data block to be loaded to the ePS server	DISPLAY INPUT (Digits from 0 to 9999)
Start byte	Start byte from which the data of the	DISPLAY

Field array	Contents	Type
	data block will be loaded (inclusive)	INPUT (Digits from 0 to 99,999)
Number of bytes	Number of bytes to be loaded, starting from the start address.	DISPLAY INPUT (Digits from 0 to 999,999)

Description of functions: "Trigger PLC monitor(s)"

Using the "Initiate PLC monitor(s)" action, the variables configured in the selected PLC monitors are read from the PLC and uploaded. In order to execute PLC monitors as an action in a control monitor, they must have been configured beforehand. All configured PLC monitors are offered for selection here.

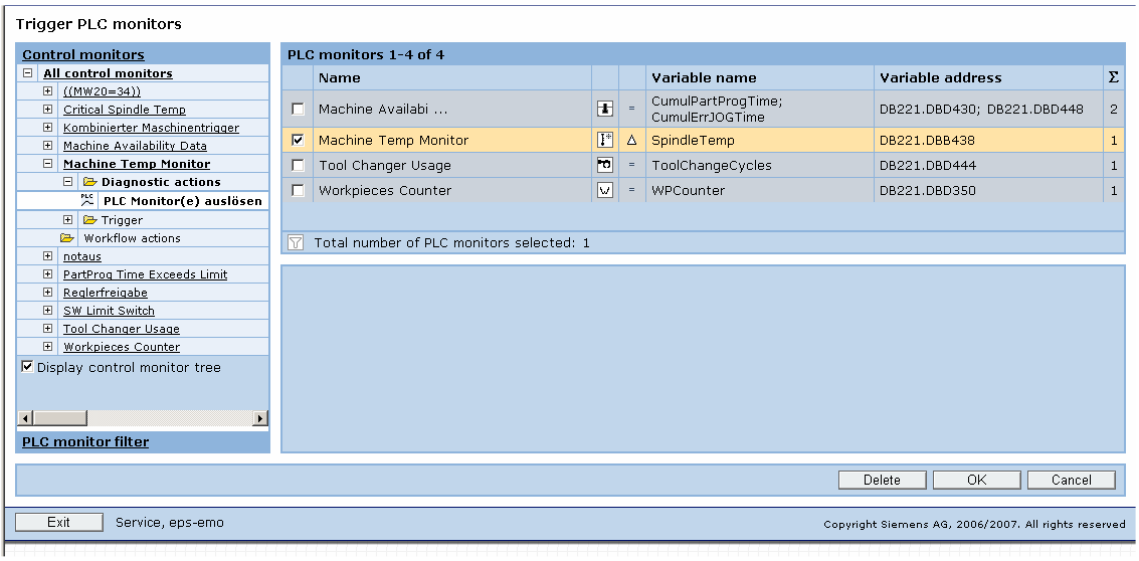


Fig. 3-37: PLC monitors - List view

Field array	Contents	Type
Triggering the PLC monitor	At the trigger event, the selected PLC monitor acquires the variables that are configured in the PLC monitor. In addition to a label indicating that they have been selected, the background of each PLC monitor is highlighted in yellow. Labels show detailed information for each PLC monitor that is described in the configuration of the PLC monitors.	SELECTION

The configuration of PLC monitors is described in Sub-section 3.1.2.

The triggers described previously for values that have been recorded using PLC monitors are based on the action of initiating PLC monitors.

The PLC monitors are programmed separately from the control monitor, as individual modular configurations. For the control monitor actions, all available PLC monitors are provided for the purpose of initiation via individual triggers. Any trigger that can be selected individually can be used for this purpose.

Note

There is the option of using a direct link between the PLC monitor and this control monitor configuration in order to enable rational configuration.

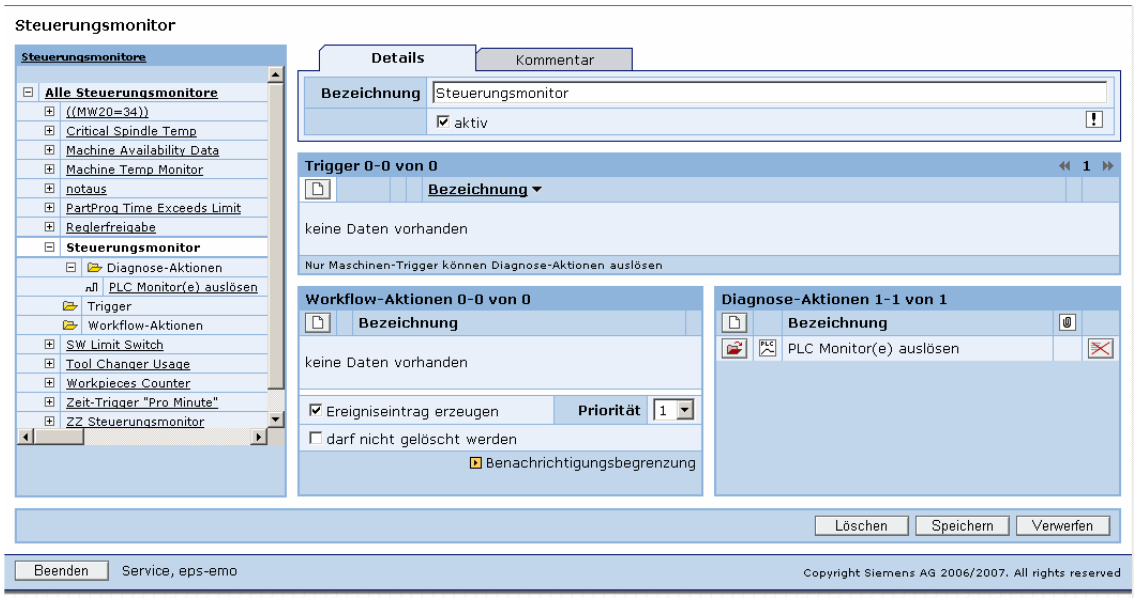


Fig. 3-38: PLC monitor - Detailed view

The machine tree filter functions are available for the purpose of selecting the PLC monitors:

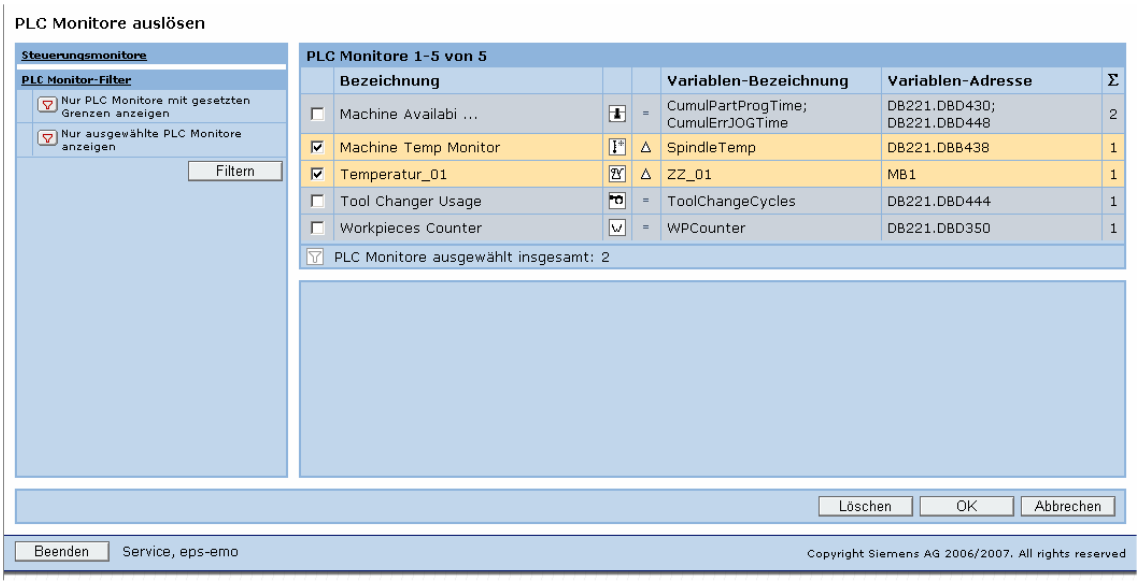


Fig. 3-39: PLC monitor filter

Field array	Contents	Type
Control monitors	Display of all control monitors of the machine.	VIEW NAVIGATION
PLC monitor filter	Limiting properties for the PLC monitor list The PLC monitors displayed can be reduced so that only those that are selected or have already been configured with limit values are shown. **Note:** By selecting limit values, it is possible to check whether the required monitor is also configured with limit values.	VIEW SELECTION
PLC monitors	Display of all configured PLC monitors of the machine	VIEW SELECTION

Availability and privileges

The PLC monitors can only be configured on the PC. The authorization required for configuring the PLC monitors is described in detail in the Appendix.

Description of the "Feedback to PLC" function

The function that provides feedback related to any given trigger event to the PLC writes individual pieces of information to the PLC.

4 bytes are available in DB 10, DBB118, DBB119, DBB120 and DBB121 of the SINUMERIK PLC for this purpose (this function is only available for SINUMERIK).

It is possible to select the way in which the data bytes are divided and formatted so that this is the same for all feedback messages.

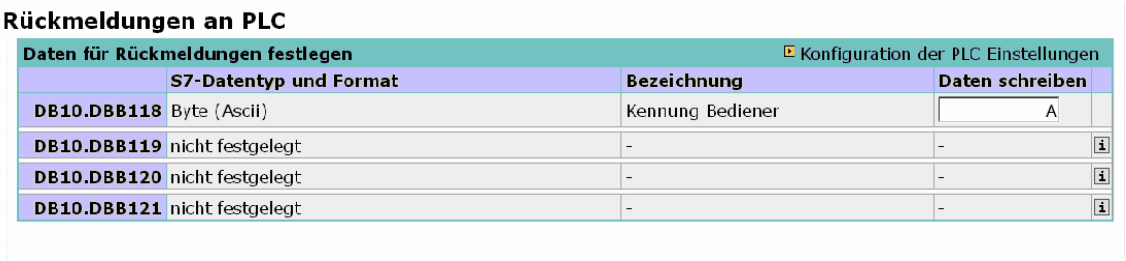


Fig. 3-40: Feedback messages to PLC

The feedback messages can be written to the PLC once for each control monitor. Variables are displayed for this purpose; these appear as they have been configured for the feedback messages, and with the names they have been given for the messages. ePS Network Services only allows variables to be written in a configured format.

It is possible to switch directly to the settings menu from here in order to adjust and configure the variable format.

Note

Variable format settings can only be changed if none of the control monitors are writing to the variable in the set format. Any feedback messages being written must be removed before the format can be changed.

The contents of the absolute variable addresses are completely overwritten with the information specified here. Individual bits are written selectively. Individual bits can only be written as bytes. For this purpose it is possible to determine whether a bit is to be set to 1 or 0, or is to remain without an entry as it currently appears in the PLC.

ePS Network Services ensures that in each case, a variable configured as an absolute address is always written as a complete entity (i.e. not byte-by-byte or bit-by-bit).

3.4 Global settings

3.4.1 Setting the notification limit

Description of functions

The notification limitation function enables a repeated delay to be set for the specifiable time span, during which no notifications are sent after the initial one. This prevents, for example, a glut of alarms being output in the event of a faulty configuration, or trigger signals.

Fig. 3-41: Setting the notification limit

Field array	Contents
Status	Switching the notification limit for the machine on/off. **Note:** This setting is activated immediately after storage of a change.
Do not send any messages for …	Time for notification limitation 1 to 1440 minutes 1 to 24 hours

Note

When the notification limit is active, all events are recorded in the event history. However, the first notification is sent within the set time window in order to prevent, if necessary, an overflow in the mailbox.

3.4.2 PLC and NC settings

Description of functions

To be able to use PLC triggers, PLC conditions, and PLC traces on a machine, the data blocks for the machine used in the control must be made known and performance enabled for the ePS Network Services functions.

Feedback messages must be configured (data format) in order for them to be sent to the PLC via data block 10 DBB118 to 121.

An AC marker must be configured in order to perform axis tests.

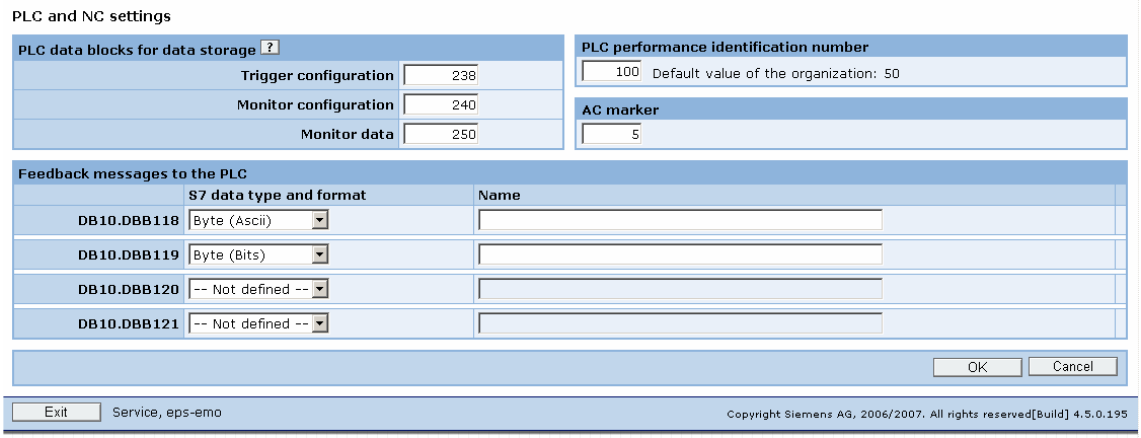


Fig. 3-42: Set up PLC for control monitors

Field array	Contents
Trigger configurations Display and input Digits from 0 to 9999	Number of the data block for PLC trigger configurations (number only; without DB)
Monitor configurations Display and input Digits from 0 to 9999	Number of the data block for PLC trace configurations (number only; without DB)
Monitor data Display and input Digits from 0 to 9999	Number of the data block for PLC trace data (number only; without DB)
PLC performance index Display and input Digits from 1 to 100	It is possible to use the PLC performance index in order to limit the number of PLC functions executed by ePS Network Services, to prevent ePS Network Services from overloading the control unnecessarily. The cycle time allocated to each ePS Network Services function is directly proportional to the number of ePS Network Services functions executed. Since there are different PLCs with different command execution times, a sensible quantity must be determined for this index.
AC marker Display and input Digits from 0 to 19999	An AC marker that is not being used by applications elsewhere must be enabled for the purpose of performing axis tests.

Note

The PLC performance index allows you to define how much performance may be used for the ePS Network Services PLC trigger. Each ePS Network Services PLC trigger uses a certain number of performance points.

In this way you can control the extent to which the PLC may be occupied by the ePS Network Services PLC trigger. The PLC performance index has to be defined individually by the machine manufacturer.

Feedback to the PLC

Field array	Contents
DB10.DBB118 Display and input Drop down list box	Determine the S7 data type and S7 format for the data type, with a label for the content of these variables.
DB10.DBB119 Display and input Drop down list box	Determine the S7 data type and S7 format for the data type, with a label for the content of these variables.
DB10.DBB120 Display and input Drop down list box	Determine the S7 data type and S7 format for the data type, with a label for the content of these variables.
DB10.DBB121 Display and input Drop down list box	Determine the S7 data type and S7 format for the data type, with a label for the content of these variables.

The S7 data types and formats should be taken from the manual titled "Programming with STEP 7 V5.4" (in the Appendix "Data and parameter types").ePS Network Services does not support times or real numbers here.

The S7 data type is also determined by means of the data width. If a word is defined, the following byte is, therefore, included automatically and blocked for a separate format. If a double word is defined, all 4 bytes are assigned as double words. ePS Network Services checks the plausibility of the potential formats and only permits correct configurations (e.g. data word 121 is not permitted).

3.5 Copying

3.5.1 Functions from other machines

Description of functions

This copy function fetches from a so-called source machine the configurations that the user has created previously and copies them to the current machine, the target machine.

Single or several user functions can be copied concurrently or successively. Any source machine for which the user has access can be selected for copying.

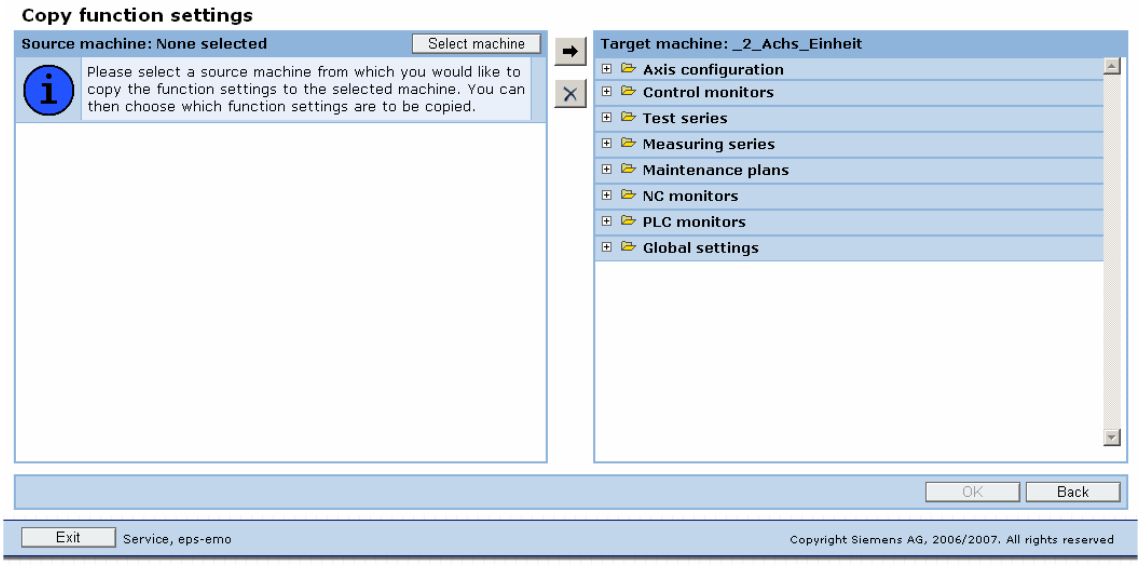


Fig. 3-43: Copy functions

Operating concept

The +/– fields can be used to list or hide individual user configurations that belong to the configuration group.

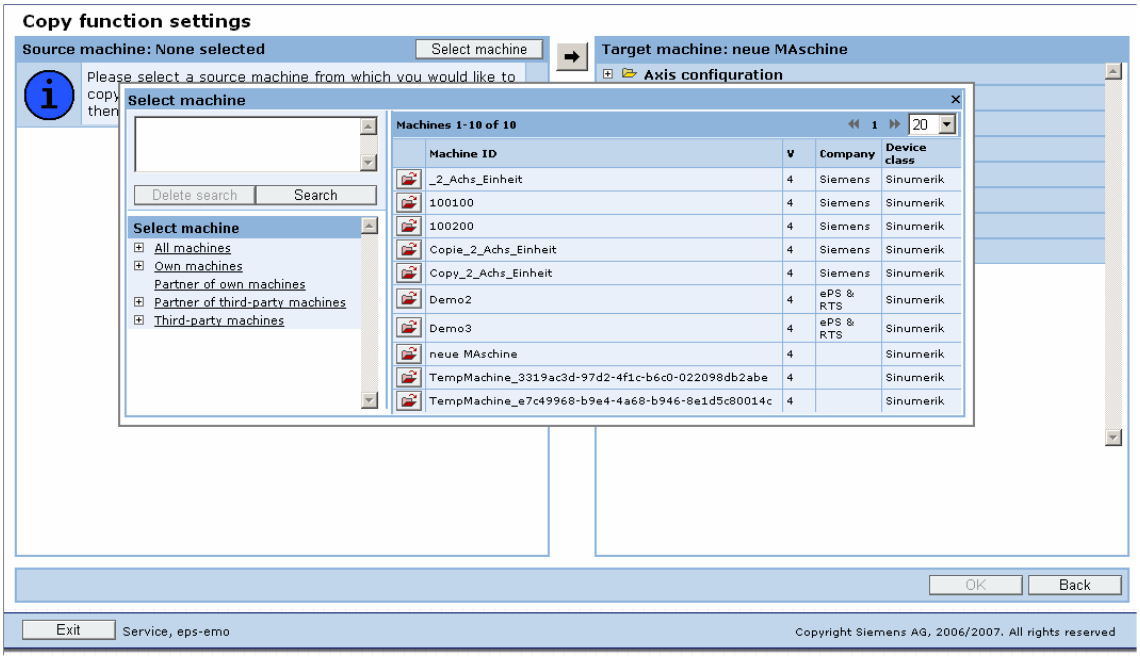


Fig. 3-44: Selecting a source machine

The machine selection functions correspond to those from the general description.

Color concept

The +/– fields can be used to list or hide individual user configurations that belong to the configuration group.

Color	Description
Light blue	Marked user configurations can be selected and so can be copied.
Gray	Marked rows cannot be selected and cannot, therefore, be copied.
Yellow	Marked user configurations are preselected for copying.
Light yellow	Marked rows are automatically also selected for copying as result of their dependency to a selected user configuration.
Dark blue	Marked rows are group headings with which the preselection of all user configurations of this group can be made.

The selection of the user configurations to be copied is made for the source machine. The selected user configuration is shown yellow.

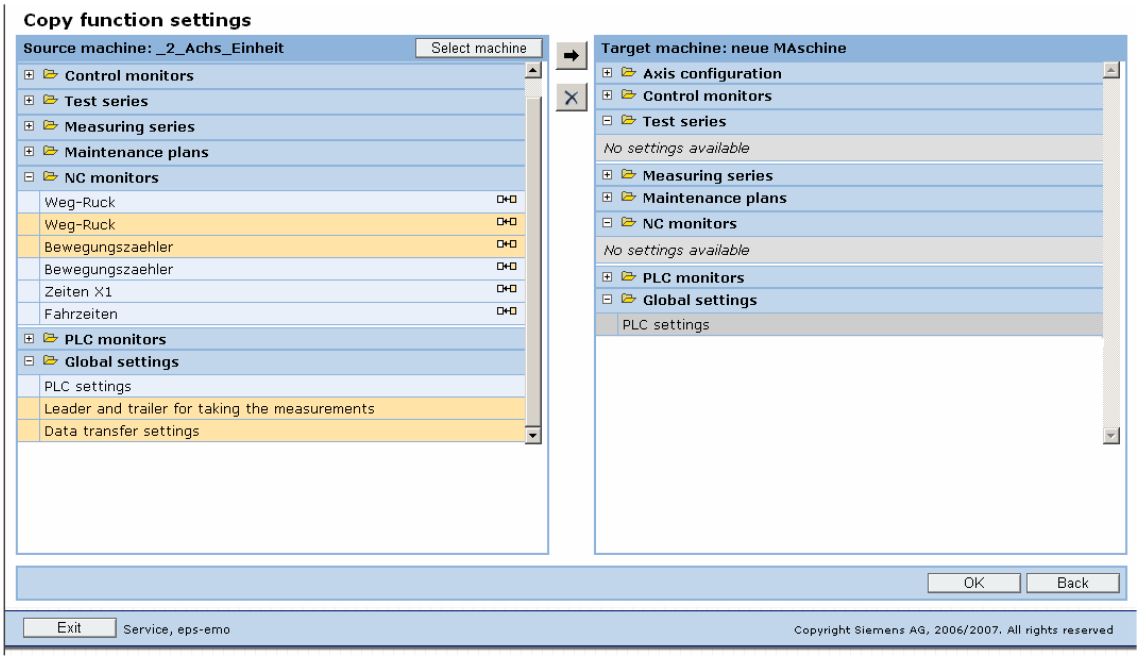


Fig. 3-45: Selecting functions on the source machine

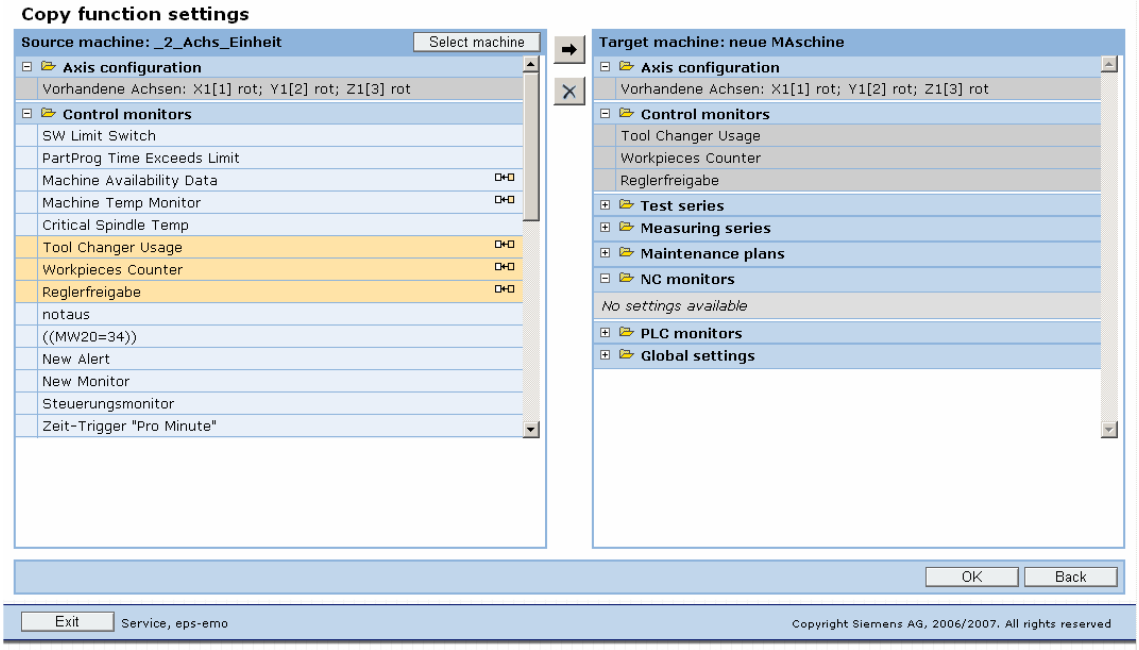


Fig. 3-46: Selection on the target machine

Copying from the source machine to the target machine:

Element	Action
	The arrow displays the preselected user configurations on the target machine.
	The "X" is used to discard the selected user configurations on the target machine preselected for copying to the target machine.
	This icon represents the copying to the target machine.
	This icon represents an overwrite of the user configuration on the target machine.
OK	"OK" confirms that the copying process is to be performed.
Previous	"Backward" cancels the copying process without performing any copy.

Result

The copying process is complete when the copy log is displayed.

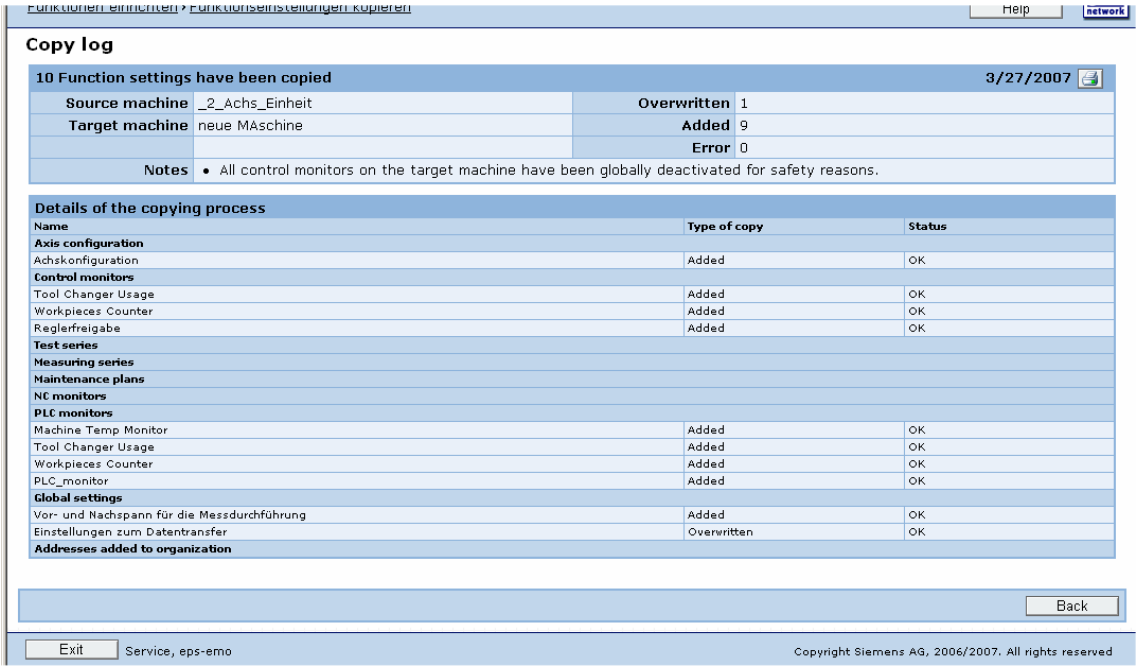


Fig. 3-47: Copy log

Field array	Contents	Type
 Print	The log can be printed for documenting the copying process. An Image Writer can also be used as printer. This allows the archiving of the log as file. Print settings can only be made by means of the settings for the selected printer.	SELECT ICON

Note

Copying user configurations is only possible in the current version of ePS Network Services if the device classes (SINUMERIK, S7, IPC) for the source and target machine are identical.

Copying user configurations with an axis reference is only possible in the current version of ePS Network Services if the axis indices, axis names and measuring system evaluation (translational or rotational) for the source and target machine are identical.

In the case of cross-organizational copying, addresses are extended in the target machine if this is required by the copied user configurations. This is shown in the log.

Notice

User configurations that are present on the target machine are overwritten by copying a configuration with the same name onto it.

User configurations can call other user configurations to act as configurations. ePS Network Services automatically selects these for copying since, without these, the user configuration to be copied would not be functional (unless this user configuration was already available on the target machine).

Example: The "Maintenance - oiling" control monitor has the task of outputting the "OILING" maintenance schedule. If the "OILING" maintenance schedule is not present on the target machine, it must be copied onto it so that the control monitor is able to function correctly. If the "OILING" maintenance schedule is present on the target machine, a copy can still placed on it (thus overwriting the schedule), but does not have to be, as the intention may be to use the existing one with the "Maintenance - oiling" control monitor.

3.6 Client/server communication

3.6.1 Synchronization times

Description of functions

During synchronization, the specified configurations (e.g. for control monitors) are transferred from the ePS Network Server to the control and become effective. You can configure an instant or interval when the machine will perform synchronization. You can also define the synchronization mode and time zone, in which the machine is located.

Fig. 3-48: Synchronization times - List view

Fig. 3-49: Add synchronization (detail)

Field array	Contents	Type
Next synchronization	Date of the next scheduled synchronization of the machine with the current configuration on the ePS server.	DISPLAY
Mode	on: All data is updated. off: The machine does not automatically synchronize with the settings on the ePS network server. standby: Only the synchronization data is updated.	SELECTION
Data Records	Several synchronization times can be configured simultaneously.	
Create data record	Creates a data record with new synchronization settings.	ACTION
Open data record	Edit a previously defined synchronization data record.	ACTION

3.6.2 Offline synchronization

Description of functions

The "Offline synchronization" function can be used to provide connected and active machines with new or changed configurations, when it is temporarily impossible to access the machine via the Internet. The configuration is not transferred to the relevant machine by means of the ePS system, but by the user instead. This can be carried out using, for instance, a USB flash drive, CD or e-mail.

As a result, the user can copy an ePS configuration on his/her PC to a local memory medium, and then import this ePS configuration to the relevant machine.

Configuration (PC)

Configuration takes place in the same way as with an "online" machine (as described in Chapter 3 "Setting up functions").

Note

The user does not receive any support regarding the issue of whether he/she has selected an appropriate configuration for a machine that does not send any data to the ePS server via the Internet.

Exporting the configuration (PC)

The user can export a configuration on the PC. He/she must select the "Offline synchronization" function for this purpose.

The system synchronizes and creates the configuration file on the server. A progress display will appear during this. Once the configuration file has been created on the server without any errors, a "Save as" dialog box will appear, and the file can be created on a local data carrier.

Note

The system will alert the user if the current ePS client version detected on the server does not fulfill the necessary requirements. The user will then be provided with the configuration for the enabled ePS client version.

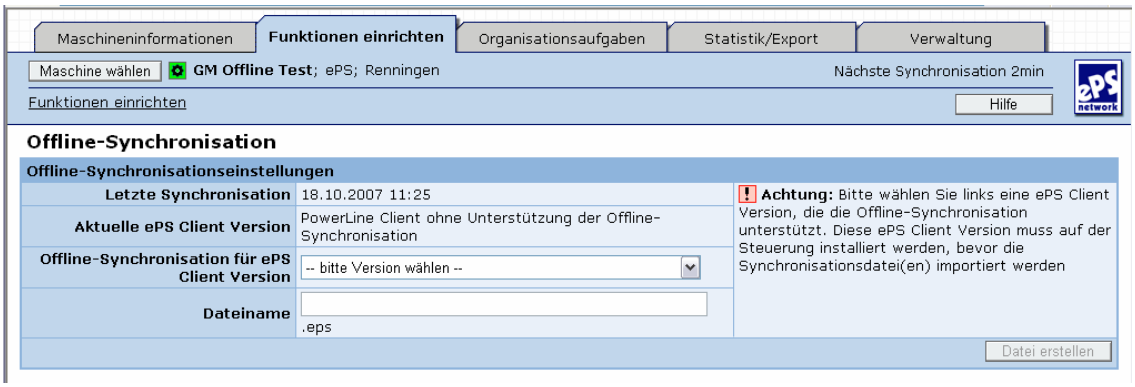


Fig. 3-50: Performing offline synchronization

Function	Description
last synchronization	Display of the date/time of the most recent synchronization with the machine **Note:** Synchronization can take place either online or offline. Therefore, it is not guaranteed that the configuration will already be on the machine.
Current ePS client version	Display of the ePS client version transferred during the most recent instance of online communication with the machine. If the ePS client version does not support offline synchronization, the following appears: "PowerLine client without offline synchronization support".
Offline synchronization for ePS client version	Selection of the required client version Please refer to the note.
File name	Entry/selection of the file name under which the configuration is stored on the data carrier.
Creating a new file	Creates a configuration file on the ePS server and then provides an option for saving locally.

Example of creating a configuration

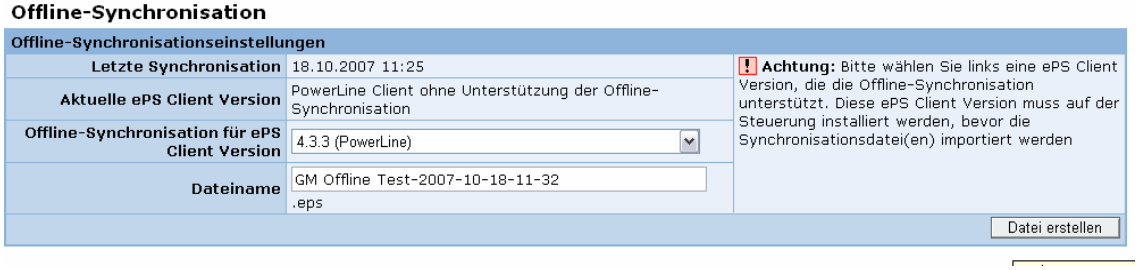


Fig. 3-51: Selecting a client version; file name suggested by the system

Fig. 3-52: Progress display when creating the configuration file

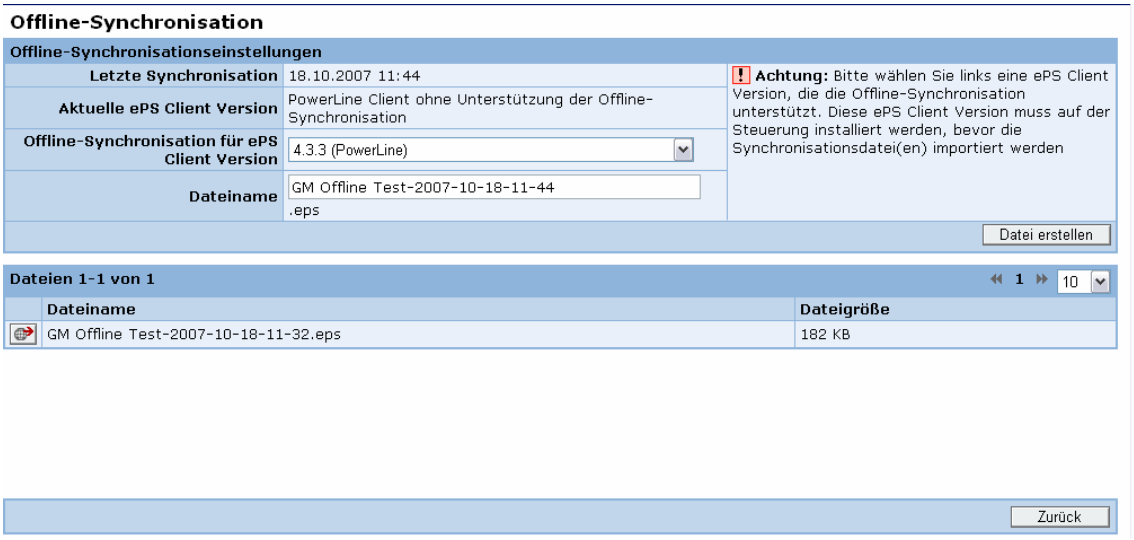


Fig. 3-53: Configuration file created

Function	Description
	Opens "Save as" box in Internet Explorer.
Previous	Ends offline synchronization and returns to "Set up functions"

3.6.3 Monitoring ePS services

Description of functions

With the monitoring function of the ePS services, you can configure the status monitoring of the ePS services on machines of your own organization.

You can activate or deactivate the status monitoring for a selected machine. The time interval for sign-of-life monitoring can be defined in the range 5 minutes to up to 24 hours.

Fig. 3-54: Setting monitoring

Field array	Contents	Type
Status	Activation or deactivation of monitoring of ePS services	SELECTION
Configure the monitoring of ePS services	Definition of the interval using predefined list values. In minute cycles: 5,10,15,20,30 In hour cycles: 1,2,3,4,6,8,12,24	SELECTION

■

4

4 Organizational tasks

4.1 Maintenance

Overview

The functions that ePS Network Services provides for maintenance purposes are divided into different sections:

- Maintenance jobs that are already in place and relate to an entire organization are available in the organizational tasks.
- It is possible to use the machine views in order to select individual maintenance jobs on a machine-specific basis.
- The "Set up functions" area in the maintenance schedules explains how maintenance procedures are set.
- A central scheduling function for maintenance procedures is located in the management, next to the machine master data for the machine function settings.

Organizational tasks

Organizational tasks	
►	Maintenance jobs
►	Service cases

Other options for linking maintenance procedures with control monitors and axis tests are described in the relevant sections.

Description of functions

The maintenance jobs describe the maintenance and servicing tasks to be performed on the machine. Maintenance jobs are always found in a maintenance schedule stored in the system.

The maintenance schedule contains the work instructions required for the procedures, in the form of text that has been entered directly, an attached file, or a reference to the maintenance manual and, if necessary, with functions that can be executed directly via the system (such as axis tests).

The maintenance job arises from either a specified point in the maintenance schedule or via a control monitor, which triggers the maintenance job.

See also Chapter 3: "Setting up functions".

Maintenance jobs may involve either activities (such as performing axis tests with the ePS system) or standard service and maintenance procedures on machines.

- The user can view maintenance jobs via the HMI on the machine operator panel, and can also acknowledge them here ("Machine operator at machine" application case); in other words, he/she can identify a job as "complete" by means of "OK" or "Not OK", and has the option of adding a comment.
- The user can view maintenance jobs on the ePS Network Services Internet PC and can edit them individually. For instance, the work description or the date can be edited individually for each job.

A change to the maintenance job itself does not change the underlying maintenance schedule!

This option is not available on the control operator panel.

Note

A user logged onto the machine at ePS Network Services can acknowledge the jobs that are pending here (change status and comment).

Jobs contain the target organization: This specifies which organization is responsible for processing the job. Jobs for a machine can be viewed, changed and deleted by any organization that has access to this machine.

Overview according to organization

Calling via "Organization tasks → Maintenance jobs" provides an overview of the jobs for all machines known in the organization. To be able to quickly find work that is still pending, jobs with the status "open" and "new" are highlighted in the list view.

The user can use the overview of the maintenance jobs on the ePS Network Services Internet PC for the following purposes:

- Creating an overview → of the jobs that are pending and have been acknowledged; progress monitoring; service application planning
- Editing jobs → individually changing automatically created jobs
- Changing a work instruction → if other tasks not anticipated at the time of planning must be completed along with the standard job
- Changing the execution time → for example, rescheduling tasks that can or should be completed together on the same day
- Editing comments → Adding comments for the tasks performed; appending detailed service reports to the job in file format
- Acknowledging jobs → Tasks to be performed can be entered in a user-friendly fashion (e.g. entering the same tasks on several machines)
- Deleting jobs

A hierarchical tree structure can be used to restrict the view of the jobs to the machines of a customer, a location and a production unit down to the level of the individual machine in the "Own machines" and "Third-party machines" views.

When working with machines released in a cooperation area, these machines can be further restricted according to partner organization in the "Partner of third-party machines" and "Partner of own machines" views.

Note

In all views of the tree structure, the respective designations from the machine master data (as specified in the user organization) are used.

Overview according to individual machine

Calling via "Machine information → Maintenance jobs" provides an overview of the jobs for the currently selected single machine. This is also the information that the user sees on the control operator panel (Maintenance services → Maintenance jobs).

Note

Frequently, the user logged on at ePS Network Services can only view open jobs at the control operator panel.

4.1.1 Selecting a maintenance job for a machine

Description of functions

The selection of a row in the machine tree limits the viewed jobs to just the machines at this level.

The top hierarchy level shows the organizational assignment of the machines and indicates the company from the machine master data. The hierarchy levels below this are the location, production unit and machine ID, from the machine master data.

Function	Description	
Filter (machine tree)	All	All machines that the user can access.
	native	Only those machines logged-on in the user's organization.
	External	External machines that have been released for your own organization.
	Partner for external machines	External machines that have been released for your own organization, but which are executed under a different machine ID within your own organization
	Partner for own machines	Your own machines, which have been released for other organizations, but which have each been assigned a different machine ID in each of the other organizations

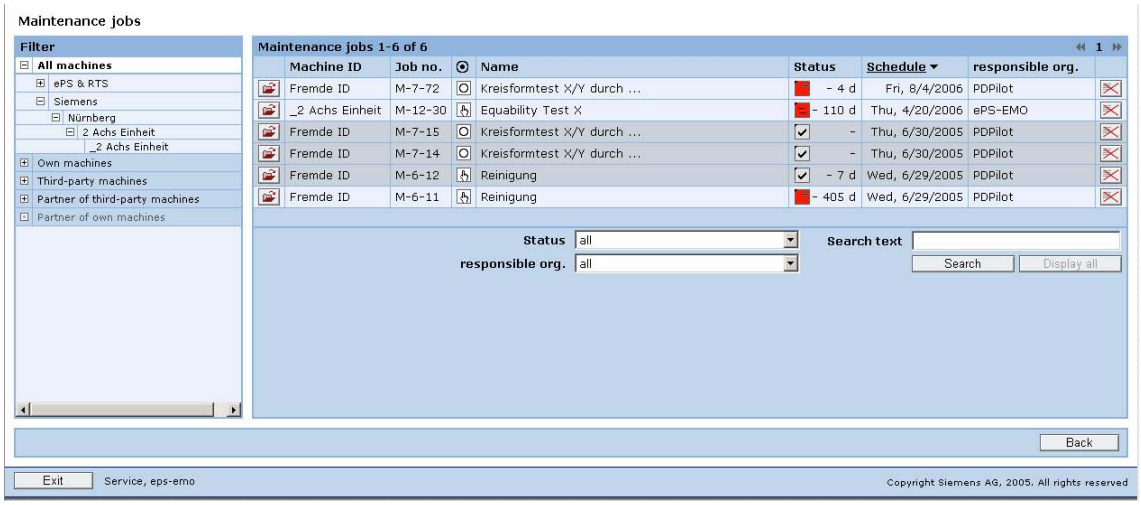


Fig. 4-1: Maintenance jobs - List view

Field array	Contents	Type
Machine ID	Display of the machine ID from the machine master data, which differs for the same job depending on whether the maintenance job list is viewed from the point of view of any given partner, or from your point of view	DISPLAY
Job number	Unique, consecutive numbers for maintenance jobs, which are automatically generated by the system in order to avoid misunderstandings in communication	DISPLAY
Icon (circle with dot)	Icon generated automatically by the system for the purpose of classifying the maintenance job. The icons are assigned as follows: Hand: All jobs without axis tests Circular: Circularity test with maintenance job Saw tooth: Synchronous operation axis test Dash: Universal axis test	DISPLAY
Designation	Designation of the maintenance schedule, which the user has allocated during configuration	DISPLAY
Status	Indicates the status of the job. The display is selected by the system automatically, depending on the acknowledgement to be made by the user. • Open folder icon = job open • Closed folder icon = Acknowledged job closed and OK • Closed folder icon with lightning flash = acknowledged job closed, not OK • A yellow icon indicates that the job has reached its deadline configured by the user for advance display of the job, but has not yet exceeded the due date from the configuration. • A red icon indicates that the deadline configured by the user for executing the job has been exceeded. Since only one position is available for all the displays, the order of priority is set by the system.	DISPLAY
Status [number d]	Shows the number of days until the execution time in the "Date" column.	DISPLAY
Time	Execution time for the maintenance job, calculated by the system according to the basic settings configured by the user As an option, this column can be sorted according to time, in ascending or descending order.	DISPLAY

Field array	Contents	Type
Responsible org.	Indicates the organization configured in the maintenance schedule as taking responsibility	DISPLAY
Info display		DISPLAY
(Filter) Status	The system only displays the jobs with the selected filter criterion.	DISPLAY
(Filter) Responsible organization	The system only displays the jobs with the selected filter criterion.	SELECTION
Search text	The system only displays the jobs with the partial text entered as a filter criterion.	SELECTION
Search	Activate filter functions	INPUT
Display all	Deactivate filter functions and display all	ACTION
Previous	Switch to the original menu	ACTION

4.1.2 Opening a maintenance job (PC)

Description of functions

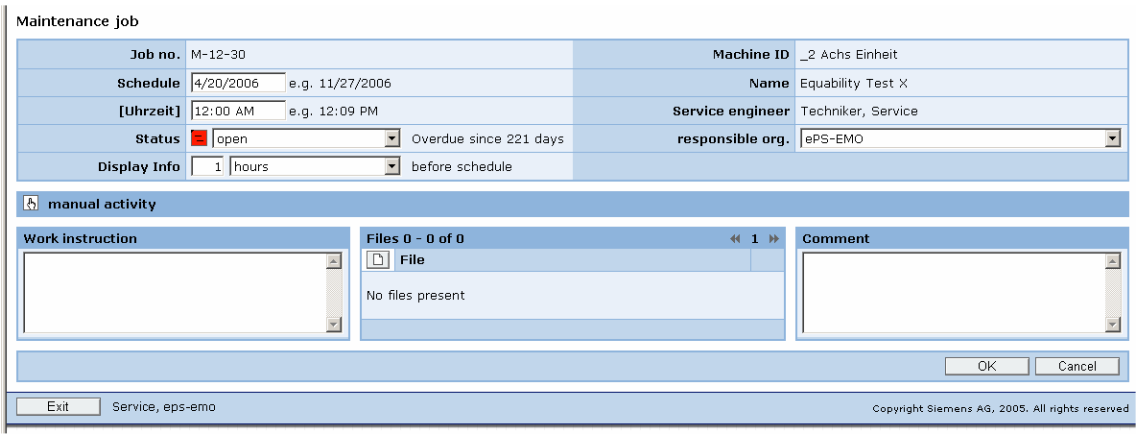


Fig. 4-2: Processing a maintenance job (detailed view)

Field array	Contents	Type
Job number	Unique, consecutive numbers for maintenance jobs, which are automatically generated by the system in order to avoid misunderstandings in communication	DISPLAY
Time	Execution time for the maintenance job, calculated by the system according to the basic settings configured by the user You have the option of changing the date for this job once.	INPUT (In date format with leading zeros)
Time	Time at which the maintenance job is to be due on the date configured (see above).	INPUT (In time for-

Field array	Contents	Type
		mat with leading zeros)
Status	Indicates the status of the job. The status can be changed by the user here. Opening the job should indicate that the maintenance procedures required in the job have already been carried out. Closing the maintenance job corresponds to acknowledging it; here it can be determined whether the maintenance procedures were performed successfully.	SELECTION
Display info before date	The info display is intended to provide advance notice of the next maintenance job due. Here, the user can also change this specification again, exclusively for this job. The number of hours, days, weeks, or months for advance notice to be given is freely specifiable.	INPUT (Numbers from 0 to 24) SELECTION
Machine ID	Display of the machine ID from the machine master data, which differs for the same job depending on whether the maintenance job list is viewed from the point of view of any given partner, or from your point of view	DISPLAY
Designation	Designation of the maintenance schedule, which the user has specified during configuration	DISPLAY
Author	Here, the system automatically enters the user logged onto ePS who has most recently opened the maintenance job on the machine operator panel.	DISPLAY
Responsible org.	Indicates the organization configured in the maintenance schedule as taking responsibility The user can select a different organization to be responsible for this particular maintenance job, from a drop down list box.	DISPLAY SELECTION EDIT (See master data of the machine)
Work instruction	Description of the maintenance procedures to be performed. This field displays the work instructions for the person performing maintenance.	DISPLAY EDIT (Max. 2,000 characters incl. blanks)
Files	In order to provide a more detailed description of the job, additional documents can be attached in PDF format by means of "Add file", or can be attached for this job on an individual basis. It is also possible to directly	DISPLAY SELECTION

Field array	Contents	Type
	view files that have already been attached.	
Comment	Description of the maintenance procedures to be performed. This field displays the maintenance report of the person performing maintenance.	DISPLAY EDIT (Max. 1,000 characters incl. blanks)

Restriction:

For reasons of data protection, the option of editing maintenance jobs described above is only available for maintenance jobs that have not yet been opened or acknowledged. Open maintenance jobs are protected against changes being made to their contents during the maintenance process. Acknowledged maintenance jobs are, therefore, saved in document format, containing the maintenance procedures carried out.

Options

Submenus are available as an option if axis tests are connected to the maintenance job.

The axis tests (axis test type and name) which have been connected to the maintenance job while the maintenance schedule was being created are displayed.

The details indicate:

- That an axis test has been performed, as well as whether this was successfully completed and interpretable results produced
- The date on which the axis test was performed. A date is not entered if the maintenance job has been acknowledged without an axis test having been performed.
- The (consecutive) number of each axis test counted (axis test type and name) A date is not entered if the maintenance job has been acknowledged without an axis test having been performed.
- The axis, along with its name (but not the axis index or channel axis index), and the parameters of the axis test in NC syntax format

Another optional view is available for combinations of axis tests (several axis tests compiled in a test procedure):

- Here, the number of axis tests is displayed, as well as whether the axis tests yielded interpretable results.
- The date on which the axis tests were performed. If the maintenance job has been acknowledged without the axis tests being performed, a date is not entered.
- The NC channel in which the axes are configured for the axis test
- The number of axis tests configured in this combination
- The types of axis test configured, as well as how many are included in this combined axis test

Once axis tests have been performed, their results can be viewed from this point in a submenu.

Field array	Contents	Type
Open (axis test)	Axis test data recorded for a maintenance job is displayed along with its test parameters, and can be viewed in the associated data series.	DISPLAY

Notice

In the case of maintenance procedures that include axis tests, it is highly recommended that the status of the maintenance job be set to "open" while the axis test is being performed. Otherwise, this may result in faulty axis tests if a third party accesses the configurations.

4.1.3 Executing a maintenance job (HMI)

Description of functions

Maintenance personnel can view jobs in the ePS Network Services menu (Maintenance services → Maintenance jobs) on the machine HMI, and can also open them from here.

To limit the length of execution for maintenance procedures, there is the option of protecting the maintenance job from entries and changes when it is opened. Third parties will see that the maintenance procedure is already taking place and will be acknowledged with the appropriate status (see Section 2.3 "Test series on the machine").

Function	Description
Execute maintenance job	The maintenance personnel can edit maintenance jobs that are due: • Open (block for third-party access) • Add and change comments • Acknowledge as correctly executed • Acknowledge as incorrectly executed, if this is not

Function	Description
	possible. It may be advisable to add a comment in such cases.
Condition monitor: Perform axis tests from the maintenance job	The maintenance personnel can perform the axis tests that are linked to the maintenance job via the maintenance schedule.
View maintenance job	The maintenance personnel can display the information stored in the maintenance schedule (from which the maintenance job was generated), such as work instructions and attached files (drawings, extracts from the machine documentation, etc.). These documents must have been stored as PDF documents during the planning in the maintenance schedule or in the job.

The same maintenance job information is shown on both the machine HMI and the PC. To this effect, menu operation is limited: The jobs cannot be edited; but only opened and acknowledged, and comments can be added.

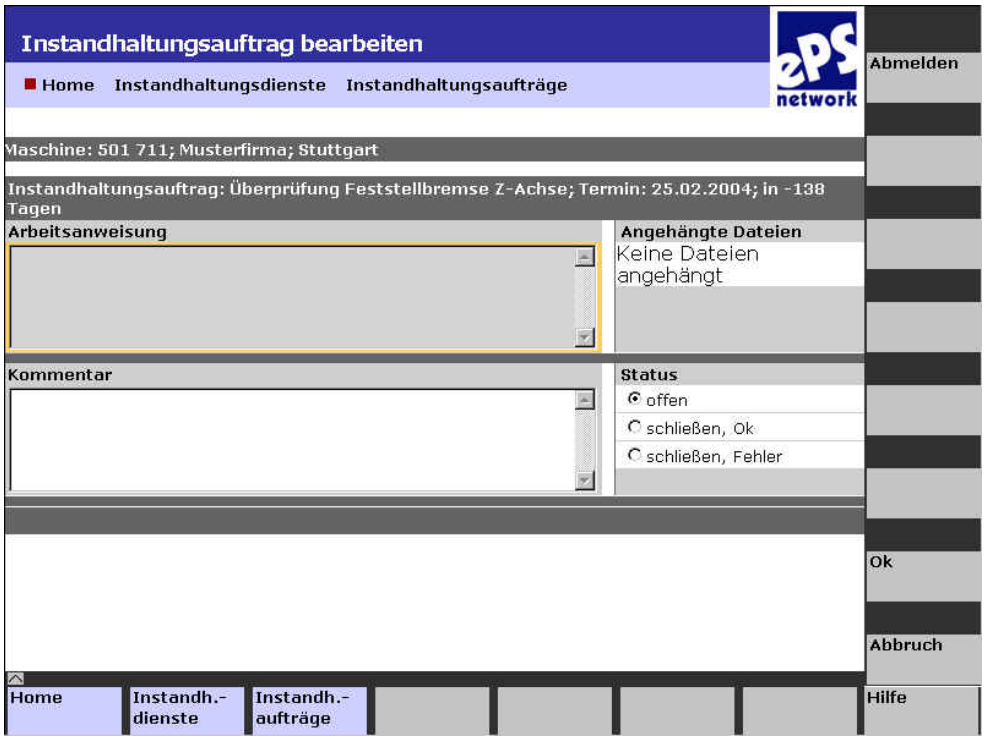


Fig. 4-3: Processing a maintenance job on the HMI

Field array	Contents	Type
Master data	Display your own data from the machine master data. Where a job is concerned, this may vary depending on the view used for visualization: i.e. whether it is viewed from the perspective of any given partner, or, in the case of the maintenance job list, your own point of view.	DISPLAY
Job no., job designation, date, due status	Unique, consecutive numbers for maintenance jobs, which are automatically generated by the system in order to avoid misunderstandings in communication Designation of the maintenance schedule, which the user has allocated during configuration Execution time for the maintenance job, calculated by the system according to the basic settings configured by the user	DISPLAY
Status	Indicates the status of the job. The status can be changed by the user at this point. Opening the job should indicate that the maintenance procedures required in the job have already been carried out. Closing the maintenance job corresponds to acknowledging it; here it can be determined whether the maintenance procedures were performed successfully. **Important**: Even when the display has a particular status, it is not actually set to this. In each case, the status must be confirmed with "OK" in order for it to take effect and for the display to be set to this. This can be monitored by calling the maintenance job again.	SELECTION
Author	Here, the system automatically enters the user logged onto ePS Network Services who has most recently opened the maintenance job on the machine operator panel.	*No display*
Responsible org.	Not displayed, since the responsible organization would never inadvertently look for the job on the machine	*No display*
Work instruction	Description of the maintenance procedures to be performed. This field displays the work instructions for the person performing maintenance.	DISPLAY

Field array	Contents	Type
Files	In order to provide a more detailed description of the job, additional documents can be attached in PDF format by means of "Add file", or can be attached for this job on an individual basis. It is also possible to directly view files that have already been attached. **Note:** The first document of the list has been preselected and can be directly opened with "View file". Other documents in the list can only be viewed if they have been selected with the cursor beforehand.	DISPLAY SELECTION
Comment	Description of the maintenance procedures to be performed. This field displays the maintenance report of the person performing maintenance.	DISPLAY EDIT (Max. 1,000 characters incl. blanks)
Axis tests	The axis tests included in the maintenance job can be performed directly from this point. The test results are saved as measurement series. (See also: Performing a CM measurement)	ACTION
Test results	The results of the axis tests can be viewed directly from this point. **Note:** The result can also originate from previous processing of the job, provided this was not completed with "closed" status.	ACTION

Security note on displaying PDF documents

Notice

PDF documents to be displayed on the control operator panel must not contain any active contents (Java script, e-mail fields, etc.) nor have any HTML Links!!!

Otherwise there is a danger that it may be possible to navigate from the ePS system to other Web pages.

ePS Network Services supports on the control operator panel only the display of PDF documents that are compatible with Acrobat 1.3 (Reader version 4.x).

For optimum display, please create your PDF documents with the option "Initial View: Page Only/ Magnification Fit Width".

4.2 Service cases

Description of functions

Service cases are automatically generated from fault help requests.

If the personnel at the machine or in the production line require support, a help request can be submitted via the HMI of a machine with ePS Network Services, or an ePS Network Services Internet PC.

Where service cases are concerned, all of the fault help requests submitted for an entire organization are displayed.

Fault help requests can also be submitted to an ePS Network Services Internet PC for single machines, with the machine information entered under fault services. It should be noted that fault services for the machine information should not be mistaken for fault services for setting up functions, as the control monitors are located in this menu.

Fault help requests entered can be linked via control monitors. All possible actions for control monitors, such as notifications, uploading data, etc., are available within this context. (Exception: With a fault help request from an ePS Network Services Internet PC, it is not possible to execute any actions that will affect access to current data from the control.)

Fault help requests are only advisable in conjunction with a specific notification, since, although the user seeking help is waiting for a quick response, monitoring personnel are seldom available exclusively for incoming service case notifications.

During servicing, the technician can see the description of the problem entered by the personnel and can document the procedures being carried out by making additional entries throughout the entire process. For support purposes, the service technician can see the fault help request files uploaded with a control monitor from the machine.

Overview of service cases

The overview of service cases is used to obtain a general view of all service cases assigned to an organization. That enables quick access to solutions that have already been worked out and documented for use in new service cases. Service cases can be assigned to people in your own organization by allocating employees. It is not possible to notify a technician automatically, but it is possible to clearly identify them in a separate column of the overview of service case help requests.

During searching and filtering, it should be noted that all non-visible parts of texts, from the entire contents of service cases, are also included in the overview, and thus it may be the case that more than expected is displayed.
The current status of the work (processing status) can also be made transparent for all employees for the purpose of planning and progress control.

Notice

Service cases are always related to a machine.

As a result, each user that has access to a machine via an ePS Network Services Internet PC can view its service cases. If access granted to an organization is removed, it will no longer be possible to access the service cases.

4.2.1 Service cases - List view

Description of functions

Function	Description
Opening service case	Opens an existing service case so it can be processed.
Create service case (manually)	Manual creation of a service case. The service case is created for the currently selected machine.

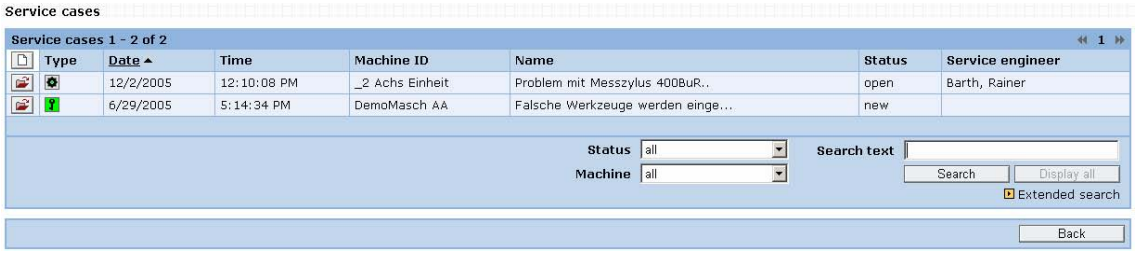


Fig. 4-4: List view of service cases

Field array	Contents	Type
Date / time	Date and time when the service case was created.	DISPLAY
Machine ID	Designation of the machine from which the service case originates or for which it was created.	DISPLAY
Designation	Description of the service case **Note:** If the service case has been entered at the machine HMI or the ePS Network Services Internet PC with the machine information, the first 40 characters of the fault description will be used for the designation. When a service case is entered directly into the organizational overview at this point, a specific name can be assigned.	DISPLAY
Status	Processing status of a service case.	DISPLAY
Author	Technician currently assigned to a service case (not the creator of the fault help request)	DISPLAY
Status of the service cases (filter)	Filtering of all service cases according to status: Filtering is performed by clicking "Search".	SELECTION

Field array	Contents	Type
Machine (filter)	Filtering of all service cases according to the machine that is currently selected: Filtering is performed by clicking "Search".	SELECTION
Search text / free search text (filter)	Permits filtering of all service cases according to a free text: Filtering is activated by clicking "Search". **Note:** The filter text is applied to the machine ID and the service case name. Technicians cannot be found in this way. The filter is only effective if the limitations are adhered to.	INPUT (Max. 40 characters; no differentiation between upper and lower case; any character permitted)
Extended search	Enhanced search for service cases according to the search term, date, status, and the current technician and initiator of the service case.	ACTION

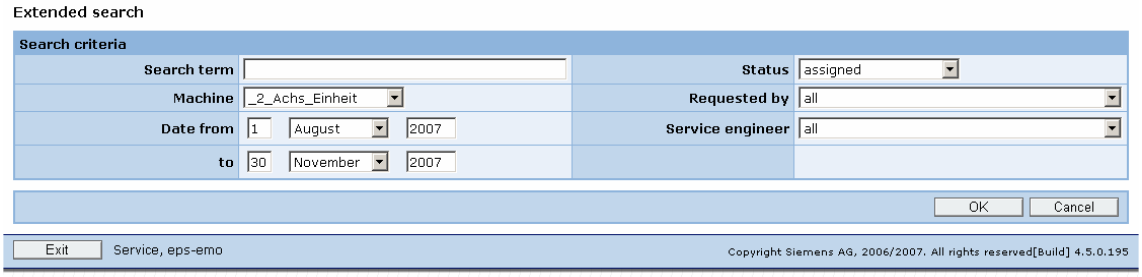


Fig. 4-5: Search criteria for service cases

Field array	Contents	Type
Requested by	Creator of fault help request	SELECTION
Author	Technician currently assigned to a service case (not the creator of the fault help request)	SELECTION
Status of the service cases (filter)	Filtering of all service cases according to status: Filtering is performed by clicking "Search".	SELECTION
Machine (filter)	Filtering of all service cases according to the machine that is currently selected: Filtering is performed by clicking "Search".	SELECTION
Search string	Permits filtering of all service cases according to a free text: Filtering is activated by clicking "Search". **Note:** The filter text is applied to the machine ID and the service case name. Technicians cannot be found in this way. The filter is only effective if the limitations are adhered to.	INPUT (Max. 40 characters; no differentiation between upper and lower case; any character permitted)
Date from/to	The service cases to be displayed can be limited to within a freely definable time win-	SELECTION (month)

Field array	Contents	Type
	dow. For this purpose, the time frame is limited by entering dates (inclusive) between which service cases should be displayed. In addition, other filters will take effect.	INPUT (Day: Between 1 and 31; year: Between 1994 and 20xx)

4.2.2 Service cases - Detailed view

Description of functions

A service case can be accessed by either opening one from the overview list of existing service cases, or creating a new one in the service cases menu in the organizational tasks.

It is not necessary for a machine to be selected for the purpose of opening an existing service case. In order to create a new service case, ePS Network Services asks the user to select a machine, and automatically opens the machine selection list for this purpose.

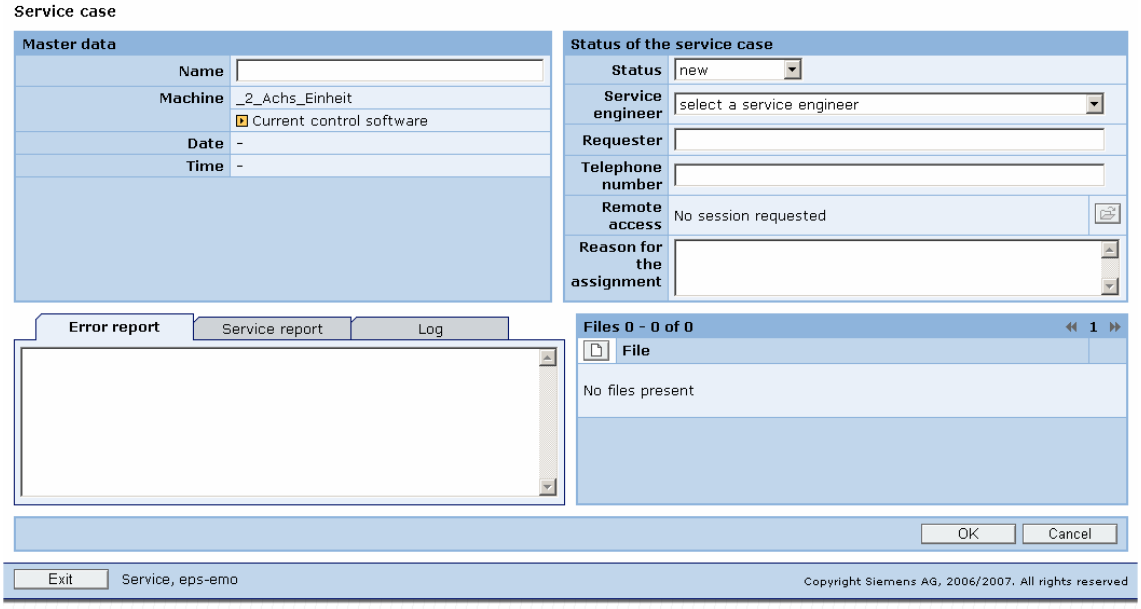


Fig. 4-6: Creating a new service case (detailed view)

Field array	Contents	Type
Edit designation	Assignment of a name for the service case. **Note:** If the service case was triggered by the event "Error processing requested (HMI/PC)", the first 40 characters of the error description entered there are used as the designation of the service case, since your own designation cannot be entered at the machine. If no designation is entered at the ePS Network Services PC, it is automatically created from the first 40 characters of the error text. **Notice:** You can rename a service case that has already been created as often as you wish.	DISPLAY ACTION (Max. 40 characters; any character permissible)
Status	A status can be assigned to the service case, so that it can have a varying status which reflects the stage of the process. The status can be changed as many times as is required. The status also has absolutely no effect in respect of changing other fields. Even service cases that have been closed can be changed at a later point. New: Created but not yet processed Assigned: The technician who is to provide fault help has been determined. Open: Additional procedures for fault help cannot be determined. Closed: The fault help is complete (whether in terms of fault elimination or diagnosis) and there is no additional fault help to be carried out.	DISPLAY SELECTION
Author	A technician can be assigned to the service case; this person must be a user from your own organization with ePS Network Services access rights. The technician can be changed as many times as is required.	DISPLAY SELECTION

Field array	Contents	Type
	Note: Changes to technicians and status are stored jointly with the optional reason for the change in the change history of the service case.	
Telephone number	For questions relating to clarifying the fault, the person who made original the request can leave his/her telephone number.	INPUT / DISPLAY (15 digits)
Remote access	If the person who made the fault help request requires teleservices and has indicated this on the machine HMI, a teleservice session can be established at this point.	ACTION
	Note: The session ID is automatically transferred to the operator panel of the control from which the request for a teleservice session was submitted. Manual entry at the panel is not necessary. If the request form for the teleservice session on the operator panel of the control is no longer open (e.g. canceled by the machine operator), a teleservice session will have to be initiated.	
Service report	Option for entering a service report: The existing report can be changed as many times as required by means of editing; this will not be logged.	DISPLAY INPUT (Max. 2000 characters; any character permissible)
Listing	Each change to the status and technician is logged here along with a time stamp and the change.	DISPLAY
Files	Display of the files connected with the service case for additional information. Use the browse function to locate and add files. Click the files once to open them in the applications corresponding to the type of file. **Note:** Additional files from the local file system can be linked to the service case manually using "Add file" and saved on the ePS network server (e.g. repair reports, pictures of the damage). Files can also be added and deleted as required at a later point; this will not be logged.	SELECTION DISPLAY ACTION

Field array	Contents	Type
Reason for assignment	Whenever the status is changed, the field indicating the reason for editing is enabled, and the text entered here is stored in the log history with the status change.	DISPLAY INPUT (Max. 2000 characters; any character permissible)
Date/time	When a service case help request is saved for the first time, the date and time are saved automatically and are always displayed with the service case (in a format that cannot be changed).	DISPLAY
Current control software	The user of this interface has permanent access to the current control software. The current control software is detected automatically by ePS Network Services and is available directly at this point.	ACTION

4.2.3 Requesting fault processing at the HMI

Description of functions

Fig. 4-7: Requesting fault processing on the HMI

Field array	Contents	Type
Report fault Error report	In the event of a fault, a report can be sent directly via the HMI on the machine, which immediately leads to a fault event on transferral. Since a name was not given to the fault help request at this point, the first 40 characters are automatically used as a name for the fault on the ePS Network Services Internet PC.	DISPLAY INPUT (Max. 2,000 characters; any character permissible)
Requesting remote access	A request for remote access can be directly linked with a fault help request. This eliminates the need to enter the session ID manually on the HMI. In order to transfer the session ID automatically and for remote access to be started by an employee at an ePS Network Services Internet PC once he/she has viewed the service case, the request form must remain open until remote access is up and running. If the request form for the remote access has been closed (e.g. canceled), a teleservice session will have to be set up manually. (See also the section titled "Functions of a service session") **Note:** This function is only available when fault processing is requested on the HMI.	DISPLAY SELECTION
Telephone number	The person who made the request can leave his/her telephone number for any other questions that may arise.	DISPLAY INPUT (Max. 15 digits)
Requested by	The person who made the request can enter his/her details directly here, independently of the user logged in at the machine with ePS Network Services, as these may be completely different.	DISPLAY INPUT

■

5

5 Statistics/export

Overview

The statistics and export area provides ePS Network Services functions used to evaluate the information contained on the ePS Network Server or display task-specific summaries (e.g. for the system administration). As statistics function, the multi-machine events can be viewed in the same way as the machine events of an individual machine.

Statistics/export

Multi-machine views	
▶	Machine events
▶	Measuring series
▶	Reports
Import	
▶	Active import procedures
▶	Importing a file
▶	Import directory (requires ActiveX)
Export	
▶	Export PLC data
Overviews	
▶	Synchronization overview
▶	Monitoring ePS services

5.1 Multi-machine views

5.1.1 Multi-machine events

Description of functions

Event history of several machines in one display:
In the Statistics/Export area under Multi-machine events, any machine can be entered on an individual basis, or machines can be selected as groups. The machine events are to be displayed in the form of a chronological list.

The navigation is performed in the machine tree where machines can be specifically selected or filters used.

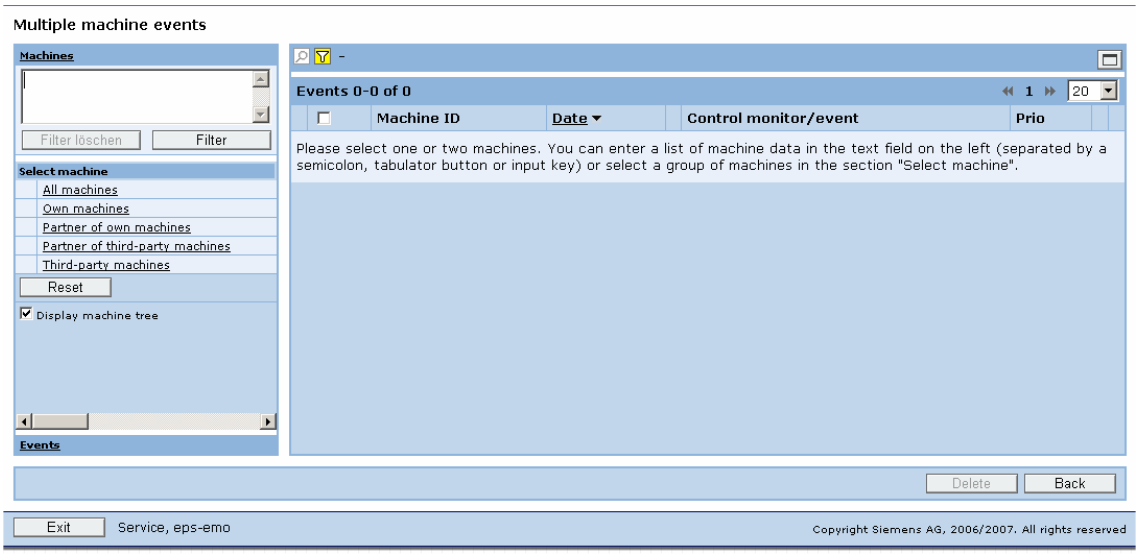


Fig. 5-1: Multi-machine views

Function	Description
Machines (window)	Input window for the manual selection of machines by entering their name. Several names can be specified when separated by a comma. Names, for which no machines are found, can be specified, but are not taken into account. Instead of a manual entry, the specification can also be copied from an arbitrary file in the window.
Select machines (machine tree window)	Selection of all machines or Selection of all machines in a node or Selection of one machine in a node.

Function	Description
Delete filter (button)	Delete selection in the machine tree: The entries are retained in the machine search window.
Search (button)	The machine event history is created and displayed for all the selected and specified machines.
Delete search (button)	Delete all selections in the machine window: Selections in the machine tree are retained.

Displaying result of the selection

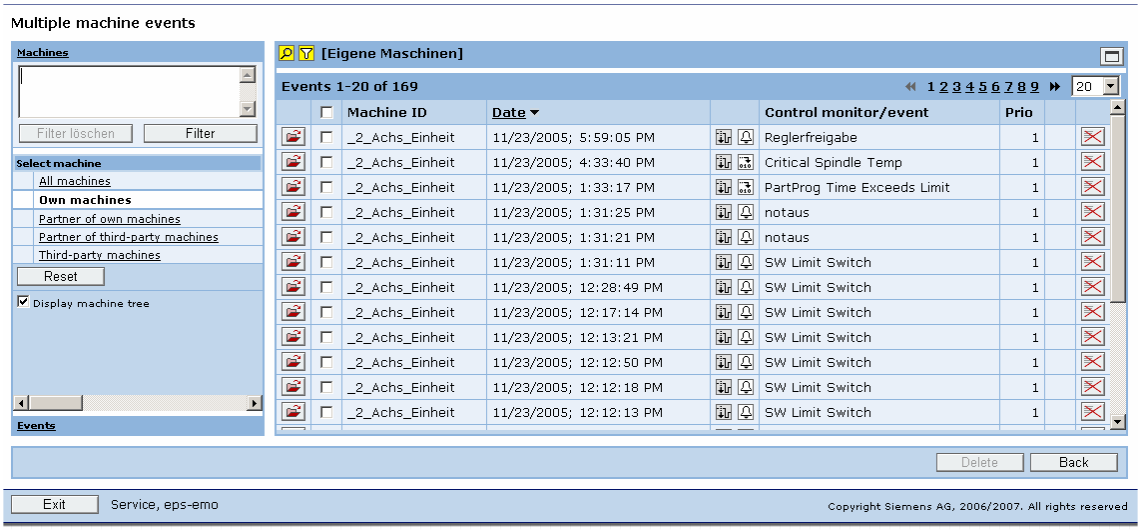


Fig. 5-2: Multi-machine events - machine type filter

Function	Description
Events (window)	Input window for the partial text filter. Instead of a manual entry, the specification can also be copied from an arbitrary file in the window.
Filtering	The machine event history is created and displayed for all the selected and specified filter properties.
Deleting a filter	Delete entire selection in the window. The selection in the event category tree remains unchanged.
Select event category	Switch selection of the node filter properties on/off as toggle function.
Select single event in a category	Selection/deselection of a single filter property in a category node as function.

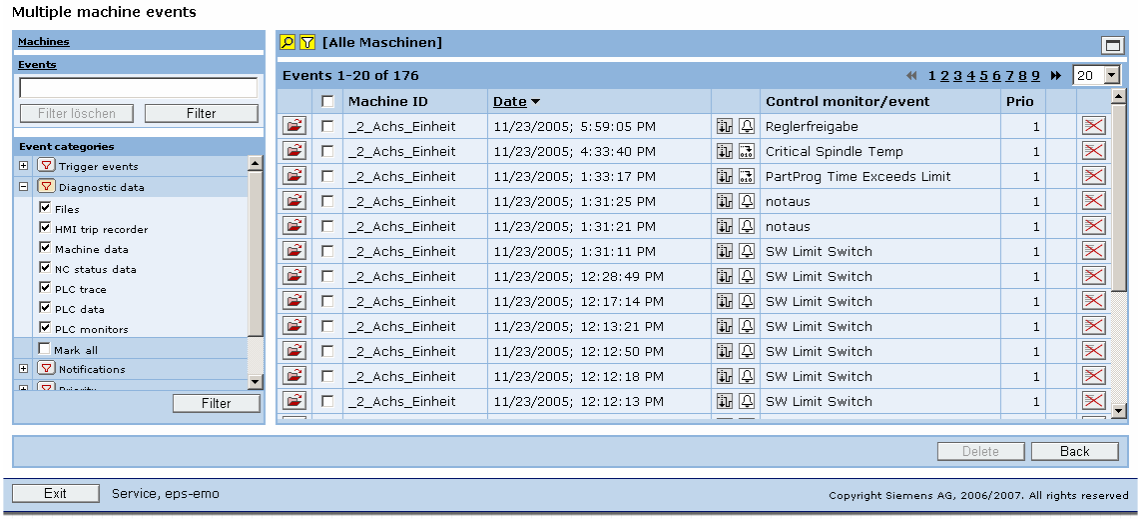


Fig. 5-3: Multi-machine events - event type filter

The display of the machine events is in strict chronological order for all the selected machines. The further functionalities in and with the data of the machine events are as described below in the event history of a machine.

5.1.2 Measurement series

Description of functions

On the basis of a measurement series of a machine to be examined, it is often not possible to decide whether the viewed machine is in good or bad condition. This applies in particular when only few measurement data is available for the inspected machine. By comparing the measurement data between machines of the same make, you might be able to assess even with few data records whether a machine is in acceptable condition.

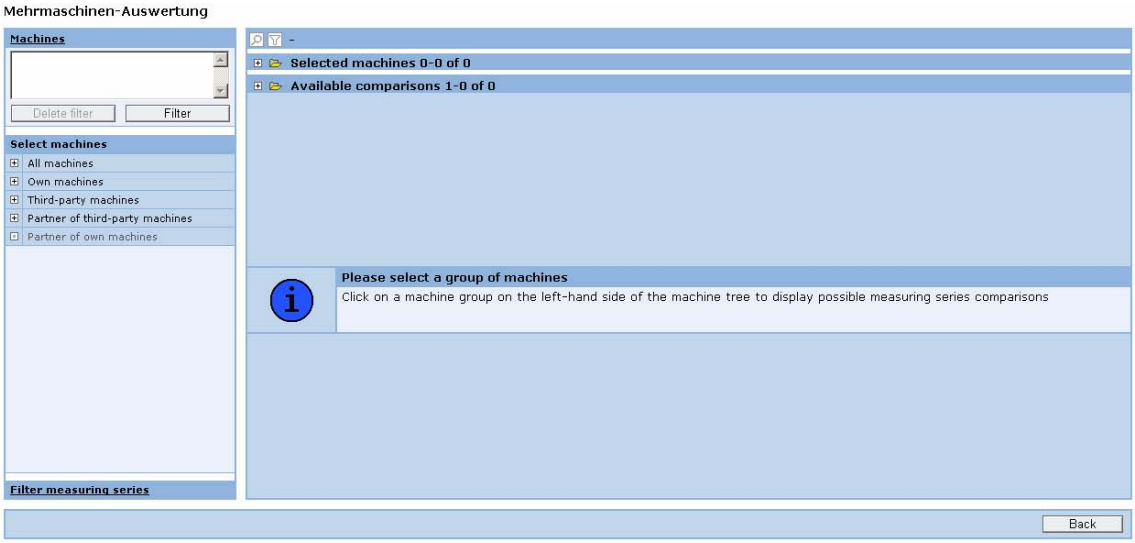


Fig. 5-4: Initial status of the multiple machine evaluation

Selecting machines

The selection of the machines to be considered for the comparative inspection of measurement series is done via the machine tree. The machine operator selects a node in this tree, which will include all machines located below this node.

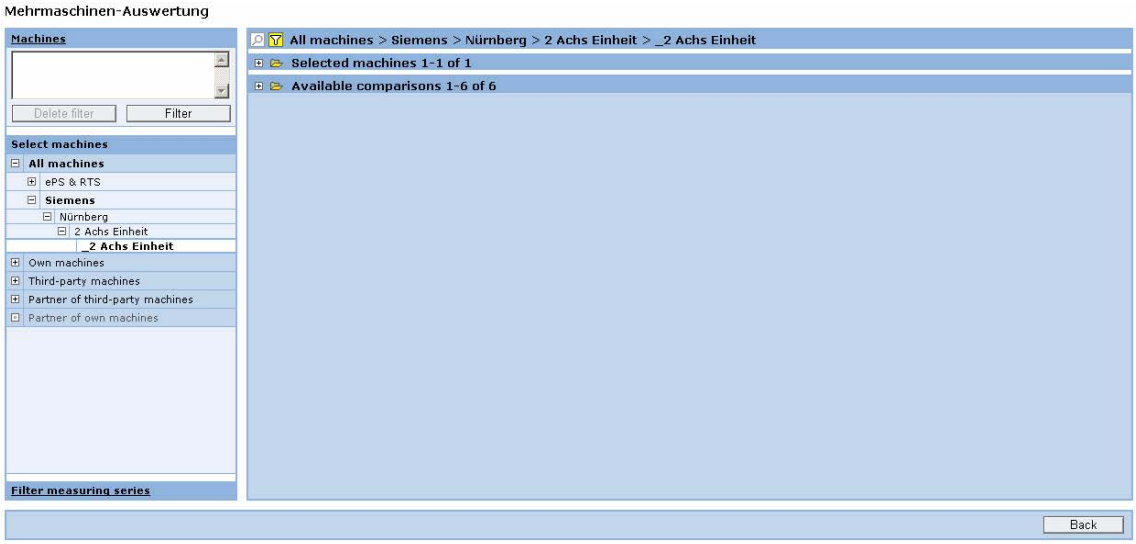


Fig. 5-5: Selecting the machines via the machine tree

The number of machines selected via the machine tree can be limited through a filter. The filter entry box allows the entry of one or several texts. The filter has the effect that from all the machines selected via the machine tree, only those will be considered for the comparison, whose machine name contains one of the filter texts.

Selection of measurement series

After having selected the machines to be considered, the system will create an overview over the comparable measurement series. This overview contains the following information:

- Type of measurement series
- Name of measured axis
- Values of the measurement series parameter relevant for the comparison
- Number of machines that have a comparable measurement series
- List of names of the measurement series (names of measurement series that have the same name for different machines will only be displayed once)

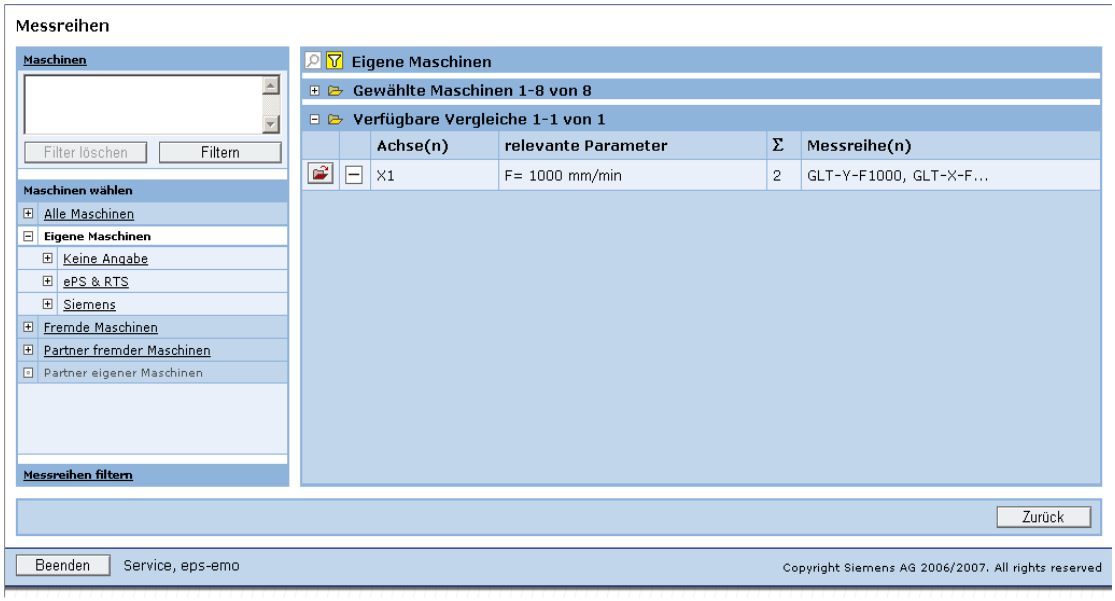


Fig. 5-6: Overview on the measurement series groups

The measurement series is selected by clicking the "Open" icon in the corresponding line.

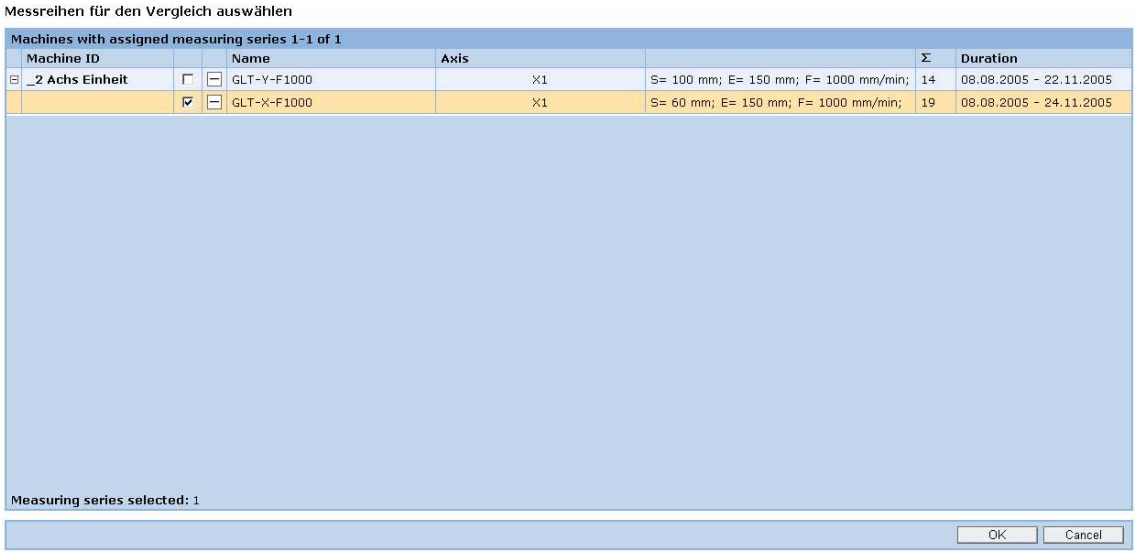


Fig. 5-7: Comparing measurement series in the selected measurement series group

In an overview, the system shows all measurement series examined in one comparison grouped by machines. In this overview, the selection of the measurement series to be examined in the comparison function can be changed. The system will make a preselection, to the effect that from each machine only one measurement series will be considered for displaying. The criteria for this preselection is the number of measurements contained in the measurement series. For each machine, the measurement series with the most measurements will be marked as selected. By selecting, this preselection can be overwritten at will.

Displaying measurement series

In order to display measurement series in a diagram, the machine operator must select the required characteristic from the table. The system will then generate a diagram showing the progress in time of the selected characteristic for each of the measurement series considered in the comparative display. There are various functions available for changing the diagram or displaying detailed information.

Function	Description
Machines	In the "Machines" table, all measurement series considered in the comparative function will be listed according to machine. Individual measurement series can be excluded from being displayed in the diagram or included again.
Characteristics	The table shows the characteristics that are calculated for the examined type of measurement series. For displaying in the diagram, a characteristic needs to be selected.
Parameter	The expandable "Parameters" table shows the parameters of the measurement being performed. Parameters that are not identical in all measurement series will be marked. Click the "Open" icon in the table to display a detailed view of the parameters for each individual measurement series.

Function	Description
Supplementary conditions	The expandable "Supplementary conditions" table shows the supplementary conditions of the measurement being performed. Supplementary conditions that are not identical in all measurement series will be marked. Click the "Open" icon in the table to display a detailed view of the supplementary conditions for each individual measurement series.
Time series	This function displays the progression over time of the selected characteristic within the defined period.
Machine series	This function displays the selected characteristic from the compared measurement series at a defined point in time. It is displayed as a bar chart. The ordinate at the left-hand side indicates the relative deviation from the average value of the examined characteristics values. The right-hand ordinate indicates the absolute value.
Time period	The time frame to be examined as a time series in the display can be adjusted. You can select certain defined periods or a period limited by two markings in the displayed diagram.
Markings	In the display as time series, two markings can be set by double-clicking. These markings indicate the individual characteristic values at this point in time and serve to define a time frame or a point in time.
Defining time	In the display as machine series, the reference point can be defined. You can enter the point in time explicitly or use one of the two markings.

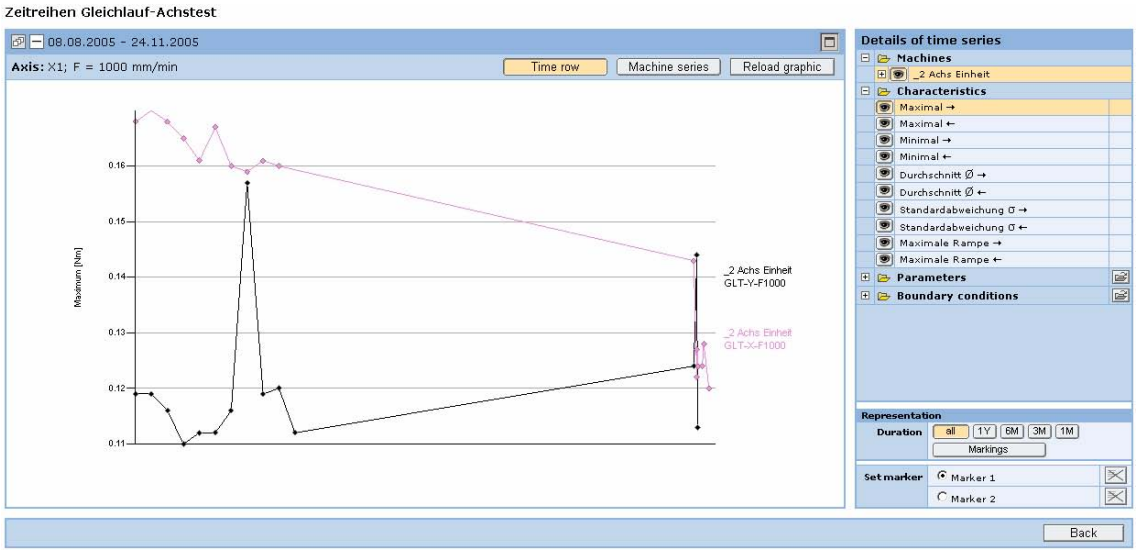


Fig. 5-8: Displaying the measurement series as time series

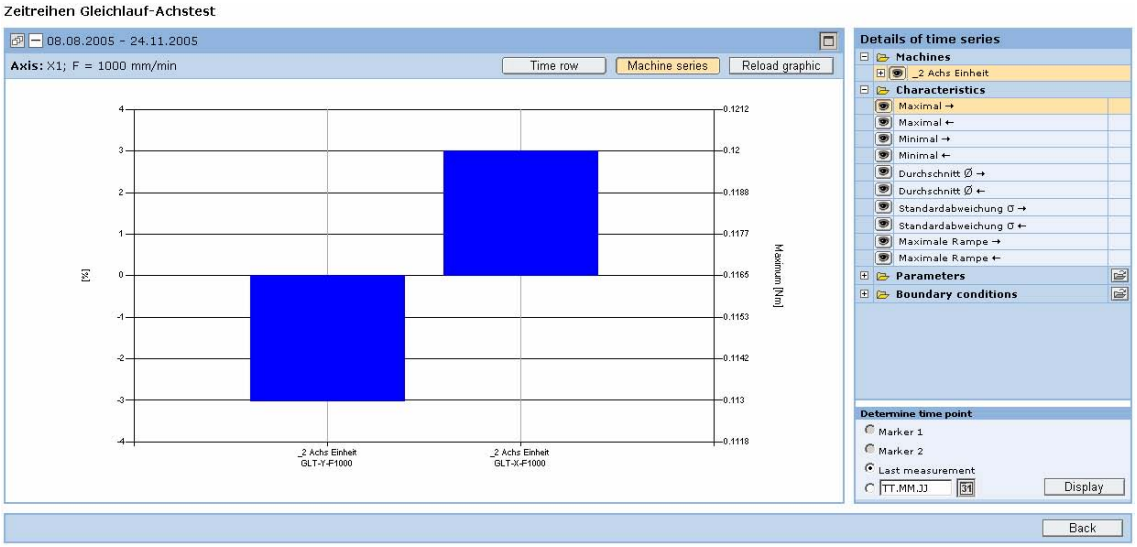


Fig. 5-9: Displaying the measurement series as machine series

5.1.3 Reports

Description of functions

"Reports" are available as an option in ePS Network Services. These provide an overview of all events on an organization's machines, within a fixed time frame of one week. Within an organization, it is possible to group machine master data by "Manufacturer" or "Location".

A report shows all of the events compiled by the machines over the course of a week in a summary report.

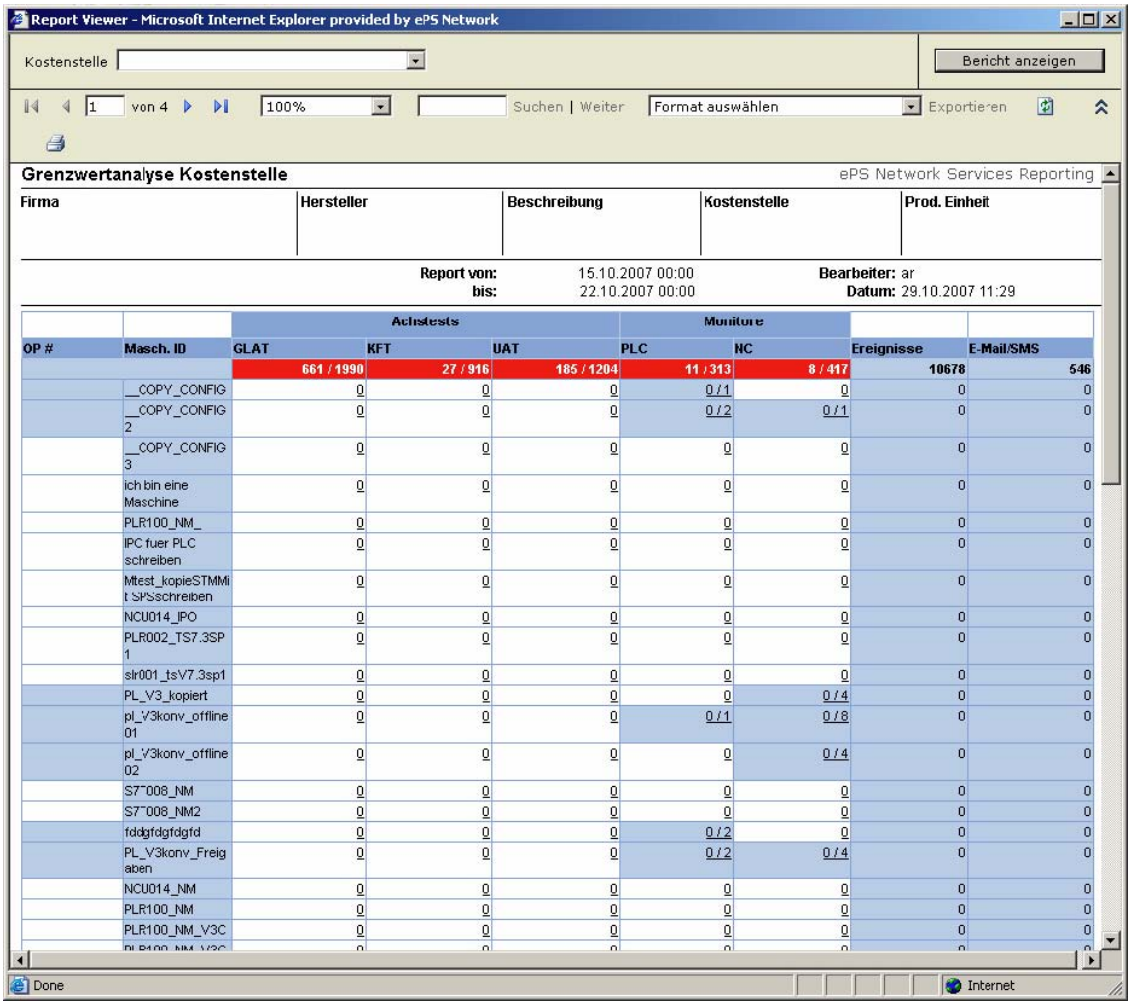
Other reports show totaled and extreme values for each machine and event type, and also use color coding.

ePS data report (cross-machine summary report)

This report contains individual information for all characteristics that are subject to limit values, with evaluations grouped and a total displayed with color coding.

- Axis text, 3 times, per axis test type (yellow/red; number of limit value violations)
- PLC monitor evaluations (yellow/red; number of limit value violations)
- NC monitor evaluations (yellow/red; number of limit value violations)
- Machine events (number only)
- Notifications (number only)

A machine is shown on each line of the selection. You can branch to the corresponding individual machine report via a link. The individual machine report can also be selected directly via the menu.



		Abnahmetests			Monitore			
OP #	Masch. ID	GLAT	KFT	UAT	PLC	NC	Ereignisse	E-Mail/SMS
		661 / 1990	27 / 916	185 / 1204	11 / 313	8 / 417	10678	546
	__COPY_CONFIG	0	0	0	0 / 1	0	0	0
	__COPY_CONFIG 2	0	0	0	0 / 2	0 / 1	0	0
	__COPY_CONFIG 3	0	0	0	0	0	0	0
	ich bin eine Maschine	0	0	0	0	0	0	0
	PLR100_NM_	0	0	0	0	0	0	0
	IPC fuer PLC schreiben	0	0	0	0	0	0	0
	Mtest_kopieSTMMi t SPSschreiben	0	0	0	0	0	0	0
	NCU014_IPO	0	0	0	0	0	0	0
	PLR002_TS7.3SP 1	0	0	0	0	0	0	0
	slr001_tsV7.3sp1	0	0	0	0	0	0	0
	PL_V3_kopiert	0	0	0	0	0 / 4	0	0
	pl_V3konv_offline 01	0	0	0	0 / 1	0 / 8	0	0
	pl_V3konv_offline 02	0	0	0	0	0 / 4	0	0
	S7^008_NM	0	0	0	0	0	0	0
	S7^008_NM2	0	0	0	0	0	0	0
	fddgfdgfdgfd	0	0	0	0 / 2	0	0	0
	PL_V3konv_Freig aben	0	0	0	0 / 2	0 / 4	0	0
	NCU014_NM	0	0	0	0	0	0	0
	PLR100_NM	0	0	0	0	0	0	0
	PLR100_NM_V3C	0	0	0	0	0	0	0

Fig. 5-10: Example of individual machine report

Individual machine reports

Individual machine reports contain detailed depictions of each axis test and monitor type. In addition, all of the monitors configured for a machine are displayed individually in alphabetical order.

The display also shows a "neutral" depiction, which indicates that the monitor has not detected or evaluated any data during the report interval.

The evaluated data is shown with color coding reflecting the associated limit values. Evaluations are performed on specific days for all events of the individual monitor. The highest priority is given to the worst result.

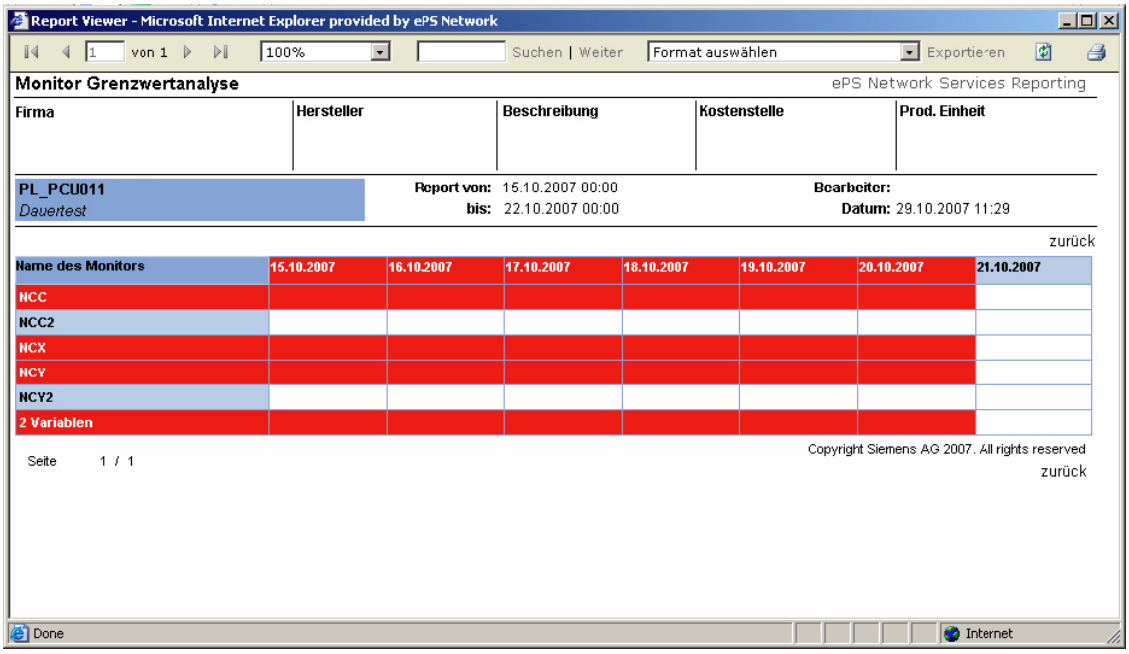


Fig. 5-11: Example of long-term test

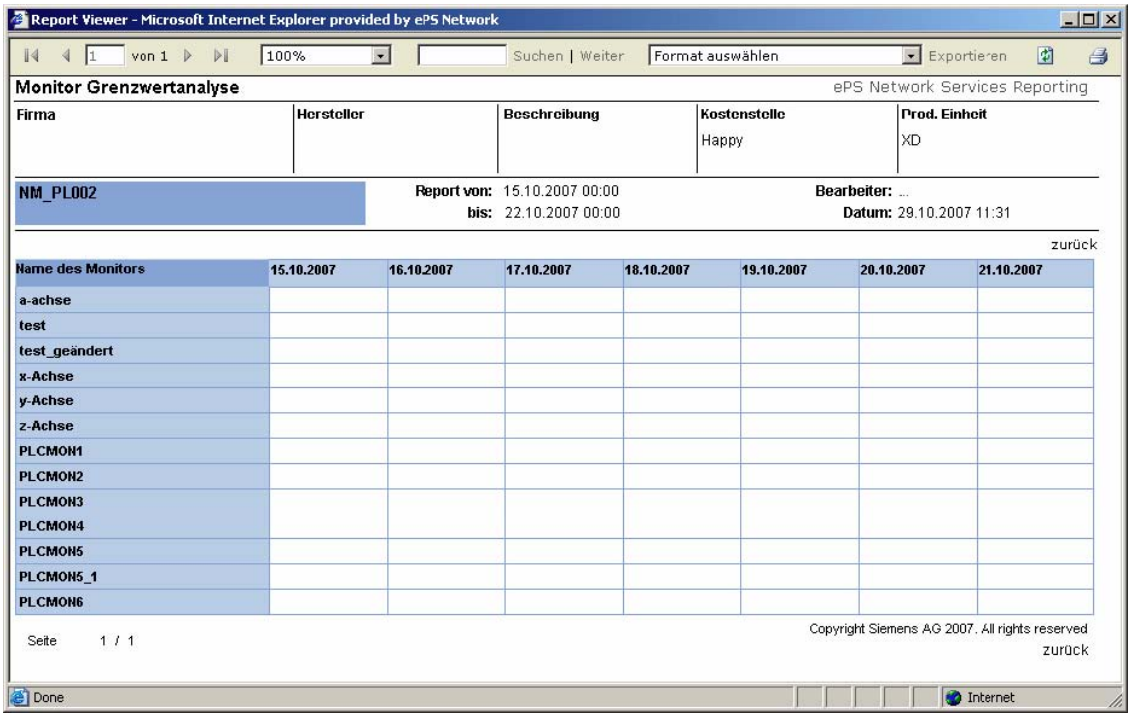


Fig. 5-12: Example of monitors

ePS management report

To ensure consistent documentation and change management, ePS Network Services provides a report detailing all of the changes made to configurations of a machine, along with the date and time, the technicians currently logged on, and the label for the configuration that was created or changed.

In this case, the following restrictions apply:

- It is not possible to log the deletion of a configuration or the name of a configuration that has been renamed.
- Once a report has been selected, all of the reports available for the organization are offered. The reports below relate to logging changes made to configurations.
- The total number of changes shows not only how many changes were made, but also whether changes were made and when, as well as when the most recent change was made (adjustment for updates).
- The individual machine log assumes that a machine for logging all changes has been selected, and that it has logged which user made the change, which configuration was changed, and when the change took place.

ePS management report for machine groups

Konfig Test Org1 **Created by:** rkp1
Date: 10.08.2007 06:24:13

Machine ID	Internal name	Location	Production unit	Organization responsible	Last change	Number of changes
101	endcustomer's name for 101	Location 1	production unit for 101	Konfig Test Org1	10.08.2007 06:24:13	0
102	endcustomer's name for 102	Location 1	production unit for 102	Konfig Test Org1	10.08.2007 06:24:14	39
103	endcustomer's name for 103	Location 1	production unit for 103	Konfig Test Org1	10.08.2007 06:24:14	39
104	endcustomer's name for 104	Location 2	production unit for 104	Konfig Test Org1	10.08.2007 06:24:14	52
105	endcustomer's name for 105	Location 1	production unit for 105	Konfig Test Org1	10.08.2007 06:24:14	26
106	endcustomer's name for 106	Location 3	production unit for 106	Konfig Test Org1	10.08.2007 06:24:14	91
107	endcustomer's name for 107	Location 2	production unit for 107	Konfig Test Org1	10.08.2007 06:24:14	26
108	endcustomer's name for 108	Location 3	production unit for 108	Konfig Test Org1	10.08.2007 06:24:14	91
109	endcustomer's name for 109	Location 2	production unit for 109	Konfig Test Org1	10.08.2007 06:24:14	78
1010	endcustomer's name for 1010	Location 3	production unit for 1010	Konfig Test Org1	10.08.2007 06:24:15	117
1011	endcustomer's name for 1011	Location 2	production unit for 1011	Konfig Test Org1	10.08.2007 06:48:36	0
1012	endcustomer's name for 1012	Location 2	production unit for 1012	Konfig Test Org1	10.08.2007 06:48:36	78
1013	endcustomer's name for 1013	Location 2	production unit for 1013	Konfig Test Org1	10.08.2007 06:48:37	65
1014	endcustomer's name for 1014	Location 1	production unit for 1014	Konfig Test Org1	10.08.2007 06:48:37	91
1015	endcustomer's name for 1015	Location 3	production unit for 1015	Konfig Test Org1	10.08.2007 06:48:37	104
1016	endcustomer's name for 1016	Location 2	production unit for 1016	Konfig Test Org1	10.08.2007 06:48:37	78
1017	endcustomer's name for 1017	Location 1	production unit for 1017	Konfig Test Org1	10.08.2007 06:48:37	39
1018	endcustomer's name for 1018	Location 3	production unit for 1018	Konfig Test Org1	10.08.2007 06:48:37	104
1019	endcustomer's name for 1019	Location 2	production unit for 1019	Konfig Test Org1	10.08.2007 06:48:37	78
1020	endcustomer's name for 1020	Location 1	production unit for 1020	Konfig Test Org1	10.08.2007 06:48:37	39

ePS management report for individual machines

Konfig Test Org1	Internal name endcustomer's name for 1015	Description description for 1015	Location Location 3	Production unit production unit for 1015

1015	Created by:	rkp1
	Date:	10.08.2007 06:24:13

Type of configuration	Designation	Time of change	Changed by
PLC monitor	PlcMonitor_Name_9	11.08.2007 08:36:11	LastName, FirstName
NC monitor	NcMonitor_Name_9	11.08.2007 08:36:11	LastName, FirstName
CondMonSettings	CondMonSettings_Name_9	11.08.2007 08:36:11	LastName, FirstName
CondMonitorSeries	CondMonitorSeries_Name_9	11.08.2007 08:36:11	LastName, FirstName
CondMonitorSuite	CondMonitorSuite_Name_9	11.08.2007 08:36:11	LastName, FirstName
ControlMonitor	ControlMonitor_Name_9	11.08.2007 08:36:11	LastName, FirstName
MaintTicketTemplate	MaintTicketTemplate_Name_9	11.08.2007 08:36:11	LastName, FirstName
NotificationAddress	NotificationAddress_Name_9	11.08.2007 08:36:11	LastName, FirstName
PlcModule	PlcModule_Name_9	11.08.2007 08:36:11	LastName, FirstName
PlcInterface	PlcInterface_Name_9	11.08.2007 08:36:11	LastName, FirstName
ProEpiLog	ProEpiLog_Name_9	11.08.2007 08:36:11	LastName, FirstName
<unknown Item: "HeartbeatSettings" >	HeartbeatSettings_Name_9	11.08.2007 08:36:11	LastName, FirstName
Machine master data	Machine_Name_9	11.08.2007 08:36:11	LastName, FirstName
PlcMonitor	PlcMonitor_Name_9	11.08.2007 08:36:11	LastName, FirstName
Nc Monitor	NcMonitor_Name_9	11.08.2007 08:36:11	LastName, FirstName
CondMonSettings	CondMonSettings_Name_9	11.08.2007 08:36:11	LastName, FirstName
CondMonitorSeries	CondMonitorSeries_Name_9	11.08.2007 08:36:11	LastName, FirstName
CondMonitorSuite	CondMonitorSuite_Name_9	11.08.2007 08:36:11	LastName, FirstName
ControlMonitor	ControlMonitor_Name_9	11.08.2007 08:36:11	LastName, FirstName
NotificationAddress	NotificationAddress_Name_9	11.08.2007 07:55:22	LastName, FirstName
PlcModule	PlcModule_Name_9	11.08.2007 07:55:22	LastName, FirstName
PlcInterface	PlcInterface_Name_9	11.08.2007 07:55:22	LastName, FirstName
ProEpiLog	ProEpiLog_Name_9	11.08.2007 07:55:22	LastName, FirstName
<unknown Item: "HeartbeatSettings" >	HeartbeatSettings_Name_9	11.08.2007 07:55:22	LastName, FirstName
Machine master data	Machine_Name_9	11.08.2007 07:55:22	LastName, FirstName
PlcMonitor	PlcMonitor_Name_9	11.08.2007 07:55:22	LastName, FirstName
Nc Monitor	NcMonitor_Name_9	11.08.2007 07:55:22	LastName, FirstName
CondMonSettings	CondMonSettings_Name_9	11.08.2007 07:55:22	LastName, FirstName
CondMonitorSeries	CondMonitorSeries_Name_9	11.08.2007 07:55:22	LastName, FirstName
CondMonitorSuite	CondMonitorSuite_Name_9	11.08.2007 07:55:22	LastName, FirstName
ControlMonitor	ControlMonitor_Name_9	11.08.2007 07:55:22	LastName, FirstName
MaintTicketTemplate	MaintTicketTemplate_Name_9	11.08.2007 07:55:22	LastName, FirstName
NotificationAddress	NotificationAddress_Name_9	11.08.2007 07:55:22	LastName, FirstName
PlcModule	PlcModule_Name_9	11.08.2007 07:55:22	LastName, FirstName
PlcInterface	PlcInterface_Name_9	11.08.2007 07:55:22	LastName, FirstName
ProEpiLog	ProEpiLog_Name_9	11.08.2007 07:55:22	LastName, FirstName
<unknown Item: "HeartbeatSettings" >	HeartbeatSettings_Name_9	11.08.2007 07:55:22	LastName, FirstName
Machine master data	Machine_Name_9	11.08.2007 07:55:22	LastName, FirstName
Machine master data	Machine_Name_8	11.08.2007 05:29:10	LastName, FirstName
PlcMonitor	PlcMonitor_Name_8	11.08.2007 05:29:10	LastName, FirstName
Nc Monitor	NcMonitor_Name_8	11.08.2007 05:29:10	LastName, FirstName
CondMonSettings	CondMonSettings_Name_8	11.08.2007 05:29:10	LastName, FirstName
CondMonitorSeries	CondMonitorSeries_Name_8	11.08.2007 05:29:10	LastName, FirstName
CondMonitorSuite	CondMonitorSuite_Name_8	11.08.2007 05:29:10	LastName, FirstName
ControlMonitor	ControlMonitor_Name_8	11.08.2007 05:29:10	LastName, FirstName
MaintTicketTemplate	MaintTicketTemplate_Name_8	11.08.2007 05:29:10	LastName, FirstName
NotificationAddress	NotificationAddress_Name_8	11.08.2007 05:29:10	LastName, FirstName
PlcModule	PlcModule_Name_8	11.08.2007 05:29:10	LastName, FirstName
PlcInterface	PlcInterface_Name_8	11.08.2007 05:29:10	LastName, FirstName

Konfig Test Org1	**Internal name** endcustomer's name for 1015	**Description** description for 1015	**Location** Location 3	**Production unit** production unit for 1015

1015 **Created by:** rkp1
Date: 10.08.2007 06:24:13

Type of configuration	Designation	Time of change	Changed by
ProEpiLog	ProEpiLog_Name_8	11.08.2007 05:29:10	LastName, FirstName
<unknown Item: "HeartbeatSettings" >	HeartbeatSettings_Name_8	11.08.2007 05:29:10	LastName, FirstName
Machine master data	Machine_Name_8	11.08.2007 05:29:10	LastName, FirstName
PlcMonitor	PlcMonitor_Name_8	11.08.2007 05:29:10	LastName, FirstName
Nc Monitor	NcMonitor_Name_8	11.08.2007 05:29:10	LastName, FirstName
<unknown Item: "HeartbeatSettings" >	HeartbeatSettings_Name_6	10.08.2007 22:30:06	LastName, FirstName
Machine master data	Machine_Name_6	10.08.2007 22:30:06	LastName, FirstName
PlcMonitor	PlcMonitor_Name_6	10.08.2007 22:30:06	LastName, FirstName
Nc Monitor	NcMonitor_Name_6	10.08.2007 22:30:06	LastName, FirstName
CondMonSettings	CondMonSettings_Name_6	10.08.2007 22:30:06	LastName, FirstName
CondMonitorSeries	CondMonitorSeries_Name_6	10.08.2007 22:30:06	LastName, FirstName
CondMonitorSuite	CondMonitorSuite_Name_6	10.08.2007 22:30:06	LastName, FirstName
ControlMonitor	ControlMonitor_Name_6	10.08.2007 22:30:06	LastName, FirstName
MaintTicketTemplate	MaintTicketTemplate_Name_6	10.08.2007 22:30:06	LastName, FirstName
NotificationAddress	NotificationAddress_Name_6	10.08.2007 22:30:06	LastName, FirstName
PlcModule	PlcModule_Name_6	10.08.2007 22:30:06	LastName, FirstName
PlcInterface	PlcInterface_Name_6	10.08.2007 22:30:06	LastName, FirstName
ProEpiLog	ProEpiLog_Name_6	10.08.2007 22:30:06	LastName, FirstName
<unknown Item: "HeartbeatSettings" >	HeartbeatSettings_Name_6	10.08.2007 22:30:06	LastName, FirstName
MaintTicketTemplate	MaintTicketTemplate_Name_5	10.08.2007 21:49:17	LastName, FirstName
NotificationAddress	NotificationAddress_Name_5	10.08.2007 21:49:17	LastName, FirstName
PlcModule	PlcModule_Name_5	10.08.2007 21:49:17	LastName, FirstName
PlcInterface	PlcInterface_Name_5	10.08.2007 21:49:17	LastName, FirstName
ProEpiLog	ProEpiLog_Name_5	10.08.2007 21:49:17	LastName, FirstName
<unknown Item: "HeartbeatSettings" >	HeartbeatSettings_Name_5	10.08.2007 21:49:17	LastName, FirstName
Machine master data	Machine_Name_5	10.08.2007 21:49:17	LastName, FirstName
PlcMonitor	PlcMonitor_Name_5	10.08.2007 21:49:17	LastName, FirstName
Nc Monitor	NcMonitor_Name_5	10.08.2007 21:49:17	LastName, FirstName
CondMonSettings	CondMonSettings_Name_5	10.08.2007 21:49:17	LastName, FirstName
CondMonitorSeries	CondMonitorSeries_Name_5	10.08.2007 21:49:17	LastName, FirstName
CondMonitorSuite	CondMonitorSuite_Name_5	10.08.2007 21:49:17	LastName, FirstName
ControlMonitor	ControlMonitor_Name_5	10.08.2007 21:49:17	LastName, FirstName
MaintTicketTemplate	MaintTicketTemplate_Name_5	10.08.2007 21:49:17	LastName, FirstName
NotificationAddress	NotificationAddress_Name_5	10.08.2007 21:49:17	LastName, FirstName
PlcModule	PlcModule_Name_5	10.08.2007 21:49:17	LastName, FirstName
PlcInterface	PlcInterface_Name_5	10.08.2007 21:49:17	LastName, FirstName
ProEpiLog	ProEpiLog_Name_5	10.08.2007 21:49:17	LastName, FirstName

5.2 Import

Description of functions

In the Import area, data accumulated in "Robust operation" can be transferred to ePS. "Robust operation" enables data that is accumulated as a result of a trigger event to be temporarily stored on the local hard disk of the control, if the Internet connection is faulty or temporarily unavailable. Temporarily storage of data is carried out, for example, when there is no Internet connection to the ePS server due to network problems or when the Internet connection has been deliberately deactivated for a long period of time.

Data that has resulted locally can be transferred to the ePS server as follows:

- When the Internet connection is active again, the data is automatically transferred to the ePS server.
- The user can copy the data to a network drive via a local "Backup" function. The backup application is called via the "Data backup" softkey.

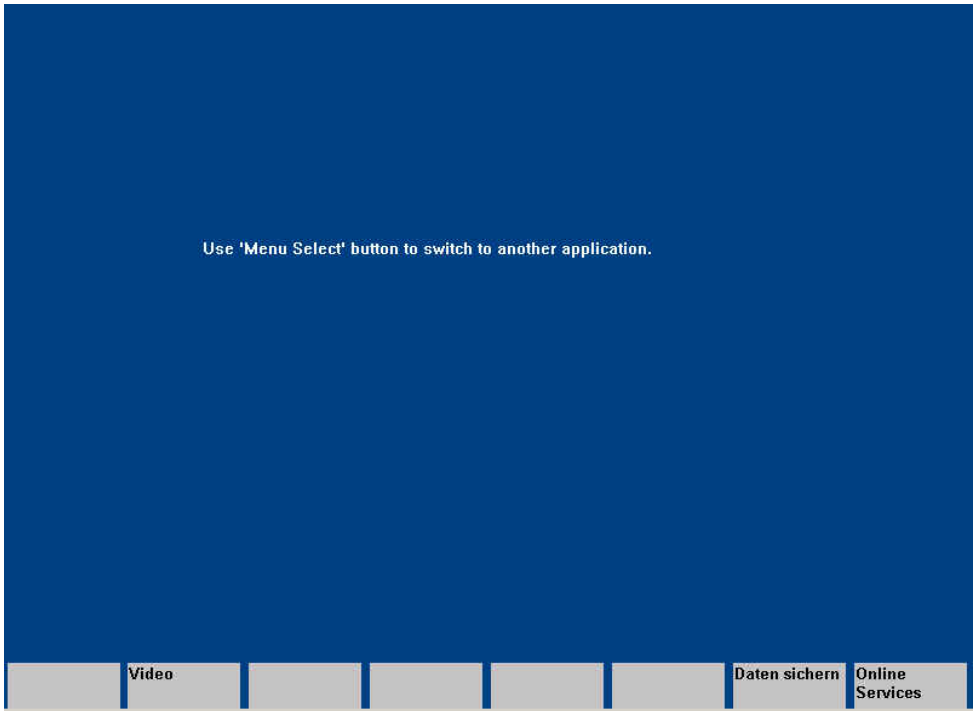


Fig. 5-13: Local selection menu

Local backup application

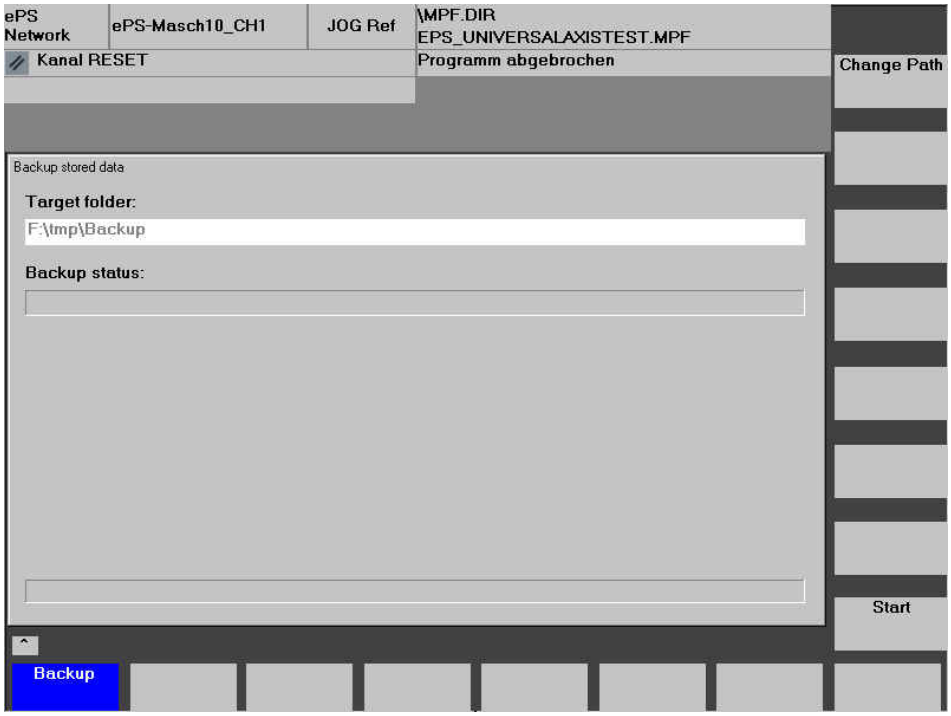


Fig. 5-14: Backup application

Functions

Function	Description
Change path	The user can select the target folder.
Start	The user can start the backup operation.

5.2.1 Active import processes

Description of functions

Here you can view all as yet incomplete file or directory import operations.

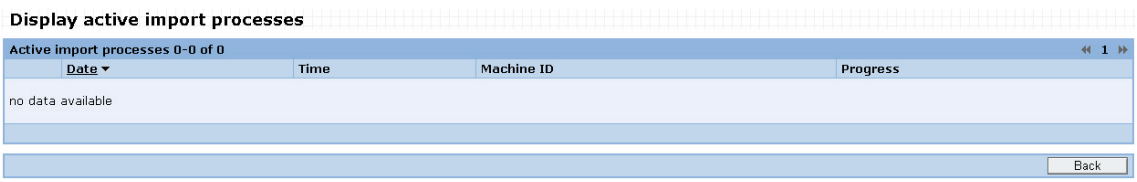


Fig. 5-15: Active import processes

5.2.2 Importing a file

Description of functions

The "Import file" function enables data files accumulated in "Robust operation" to be individually transferred to the ePS server. This data must first have been transferred to an external data medium (PC, notebook, PG, etc.) via the "Data backup" function described in the "Import" section. You can also change the suggested e-mail address if you want to receive notification after import.

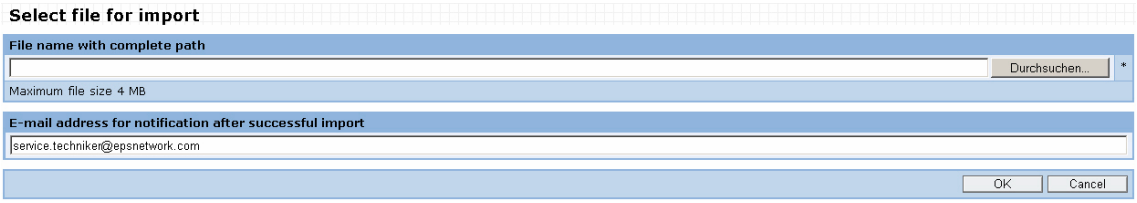


Fig. 5-16: Importing a file

Note

Before importing data files from "Robust operation", if necessary you should activate the notification limit (see Sub-section 3.4.1 "Setting the notification limit") to avoid an excessive number of notifications being generated. This is only necessary if you have used notifications within the control monitor function.

5.2.3 Importing a directory (requires ActiveX)

Description of functions

The Import directory function enables transfer of data resulting from "Robust operation" to the ePS server, even from several different machines. This data must have been transferred to an external data medium first (PC, notebook, PG, etc.) via the "Data backup" ePS function available on the HMI.

All data must be in one directory. You can also change the suggested e-mail address if you want to receive notification after import.

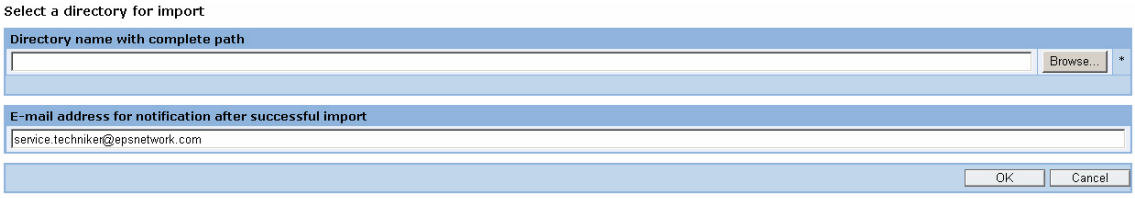


Fig. 5-17: Importing a directory

5.3 Export

Overview

In the export area, data that was downloaded from the machine to the ePS Network Server can be exported to external systems (e.g. local PC). This makes the data available for further processing.

Description of functions

The Export of PLC data blocks function can be used to export the uploaded contents of the PLC data blocks of a machine from the ePS Network Server to a file. The data that can be exported is present in binary format and can also be deleted from the ePS Network Server later.

Fig. 5-18: Exporting PLC data blocks

5.4 Overviews

Overview

Overviews provide a status overview of all or some of the machines. This overview helps in making a decision, for example, on which machine should be synchronized although it did not have any scheduled contact with the ePS Network server.

5.4.1 Synchronization overview

Description of functions

The Synchronization overview function can be used to display a summary of the synchronization data for one's own and external machines. The synchronization overview can also be used to show the activated and deactivated machines in a single display.

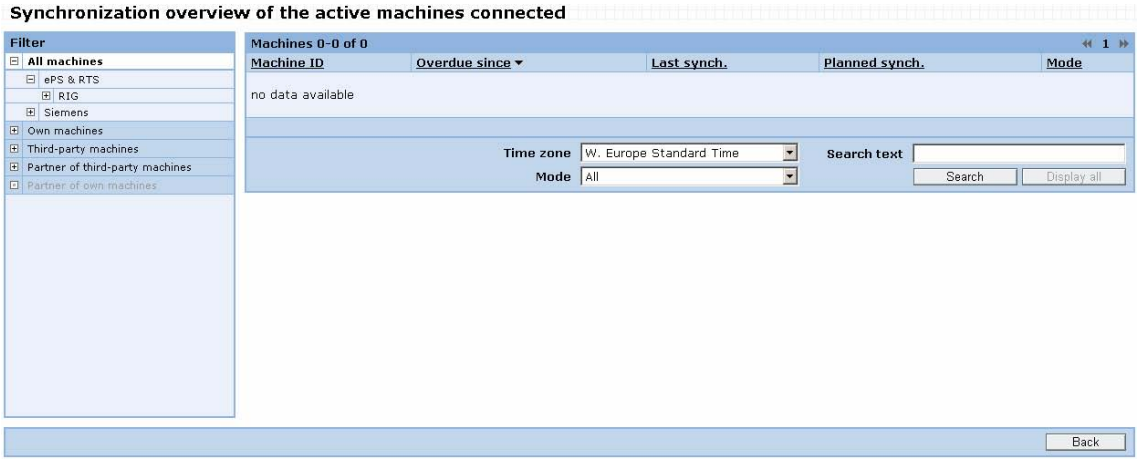


Fig. 5-19: Synchronization overview

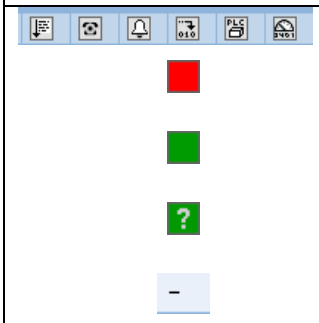
5.4.2 Monitoring ePS services

Description of functions

The monitoring function of the ePS services enable you to see how well the ePS services are functioning on the machine at a glance.

Malfunctions in the basic services or individual services such as alarm notification, alarm monitor, PLC monitor, etc. are displayed and the appropriate countermeasures can be taken.

Meaning of the listing

Field array	Contents	Type
Machine ID	Machine	DISPLAY
Condition monitoring	Red: The machine did not report after the specified interval. Green: The machine report for the specified interval.	DISPLAY
Interval	Value of the set machine time interval for condition monitoring	DISPLAY
Last signal on	Date and time of the last signal of condition monitoring	DISPLAY
	Details of ePS services: – ePS service not functioning at the time of reporting – ePS service functioning at the time of reporting – No information at the current time of reporting – This service is not available or no longer available, or not configured on the machine.	DISPLAY
Basic service	Information on "Basic services": Basic services are necessary ePS services without which no other services (such as alarm notifications or monitors) can function.	DISPLAY
Alarm notification	Information on the "Alarm notification" service	DISPLAY
Alarm monitor	Information on the "Alarm monitor" service	DISPLAY
PLC monitor	Information on the "PLC monitor" service	DISPLAY
Upload PLC data block	Information on the "Upload PLC data" service	DISPLAY
NC monitor	Information on the "NC monitor" service	DISPLAY

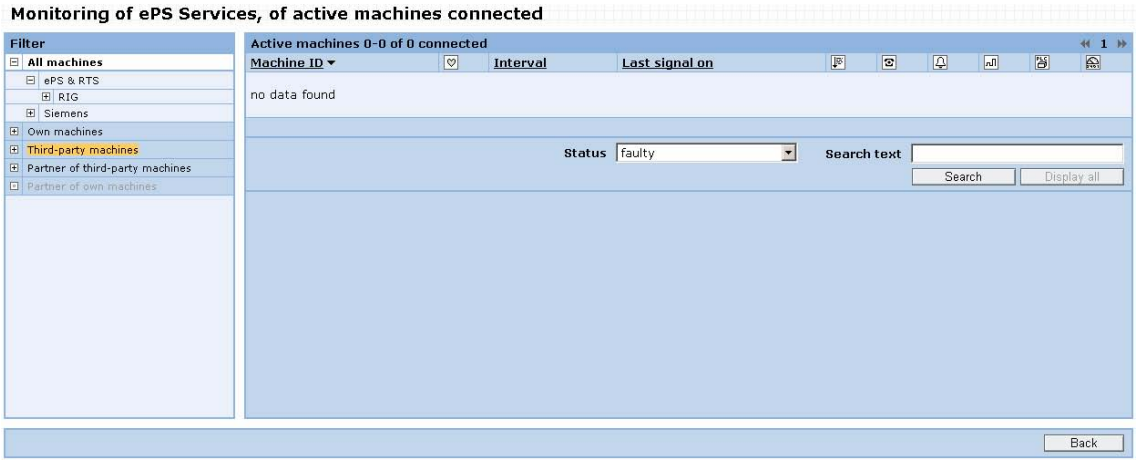


Fig. 5-20: Monitoring ePS services

Field array	Contents	Type
Status	Selection of the desired status information: The default setting is "Any fault" Other selection fields are: • Fault in condition monitoring • Fault in function • All states	SELECTION
Search text	Search field for a more detailed specification of the "Status of the services" selection.	SELECTION

■

Notes

6

6 Management

6.1 Organization management

Description of functions

Before the ePS Network Services can be used by the machine operators, service engineers and system startup engineers, the administrator must create

- Users,
- Their roles and
- Machines.

Management

Organization management	
▶	Addresses
▶	Users
▶	Machines
▶	Organizational data
Personal settings	
▶	Changing the password
▶	Data protection guidelines
▶	Resetting filter and search settings

If you want to work together with other organizations on machines, you must set up the machines for use in cooperation areas.
A machine can only by released by the administrator of the source organization. The target organization cannot make a further release. This means that the source organization always retains the control over which other organizations can access its data and settings.

Users in the target organization have almost the same rights to access the released external machine as they would for a machine within their own organization.

6.1.1 Addresses

Description of functions

The recipient addresses for SMS and e-mail notification are kept in the address book. This allows you to access existing recipients when creating messages or to create new recipients. Changes to addresses apply to all notifications for a recipient whose data is changed and are therefore always up to date.

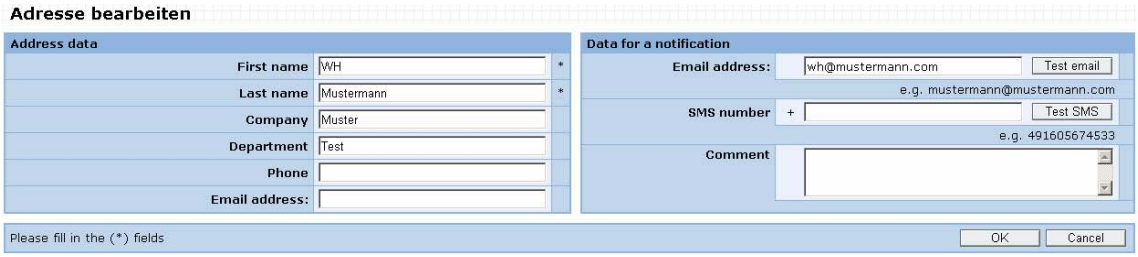


Fig. 6-1: Adding an address to the address book

Field array	Contents	Type
First name	First name of the notification recipient	INPUT
Last name	Last name of the notification recipient	INPUT
Company	Company of the notification recipient	INPUT
Dept.	Department of notification recipient	INPUT
Phone	Phone number of the notification recipient (for information only)	INPUT
E-mail address	E-mail address of the notification recipient (for information only)	DISPLAY
Test e-mail	The "Test e-mail" function is used to check that the e-mail address is correct. Check with the e-mail recipient that this test e-mail arrived at the correct recipient after it was sent.	ACTION
SMS number	SMS number of the notification recipient	INPUT
Test SMS	The "Test SMS" function is used to check that the SMS number is correct. Please check with the SMS recipient that this test SMS arrived at the correct recipient after it was sent.	ACTION
Comment	Comment on an address	INPUT

6.1.2 User

Description of functions

User administration involves:
- Creating users,
- Changing their names and
- Assigning new passwords to them.

You can also assign one of the following roles to each user:
- Administrator
- System startup engineer
- Service engineer
- Machine operator

This assignment gives users only the predefined program options for the user roles (for additional details, see Appendix)

The user with the user name "Administrator" is not displayed in the user lists and cannot, therefore, be deleted. This ensures that the "Administrator" user within an organization is always able to perform machine and user administration, even in the event that all other administrators of the organization have been inadvertently deleted.

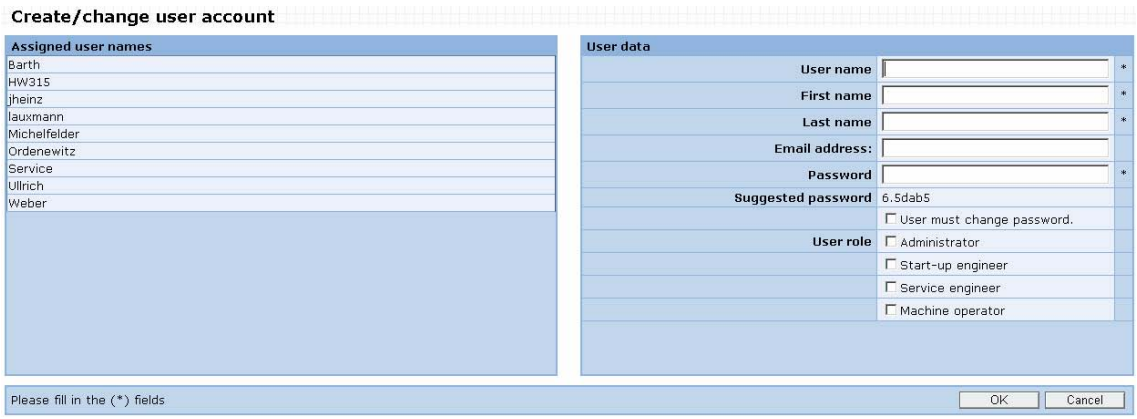


Fig. 6-2: Creating/editing a user

Field array	Contents	Type
User name	Logon name for the ePS Network Services **Notice:** The "user name" may only be present once within the organization.	INPUT
E-mail	E-mail address of the user: It is used for information and can be used to transmit the user data.	INPUT
Password	User password: You can enter the suggested password or define your own password for the user. Please observe the criteria for a valid password.	INPUT
User must change password	You can specify whether the user must change the password during the first logon.	SELECTION

Field array	Contents	Type
User role	You can assign one or more roles to each user.	SELECTION

Notice

You can use the "Add user" function to specify a new password or use the suggested password. You can also force the user to change the assigned password during the first logon. For security reasons, we recommend that you activate this option for password assignment.

For security reasons, the password to the ePS Network Services should be changed regularly. We recommend that you change the password in accordance with your company's guidelines. If this is not envisaged, we recommend that you change the password every four weeks at the latest.

6.1.3 Machines

Description of functions

The appropriate setup must be performed before the ePS Network Services can be used on a machine. Here you can:

- Save and edit both the machine name and other information about the machine.
- Deactivate, activate, separate, or delete the machines.
- Release a machine for use by another organization (cooperation area), revoke a previously granted release, and reject an external machine released to your organization.
- Select the server software version of the machine.
- Define whether it is always necessary to have authorization to use particular functions on this machine during a teleservice session.
- Duplicate a machine with its settings.

Function	Description
Create own machine	Create a new machine in the user organization.
Activate/deactivate machine	Activate the machine for the purpose of using the ePS Network Services. Deactivated machines cannot use ePS Network Services.
Duplicate machine	Create a new machine with same settings as an existing machine.
Delete machine	Deletes a machine permanently. Data is no longer available for this machine.

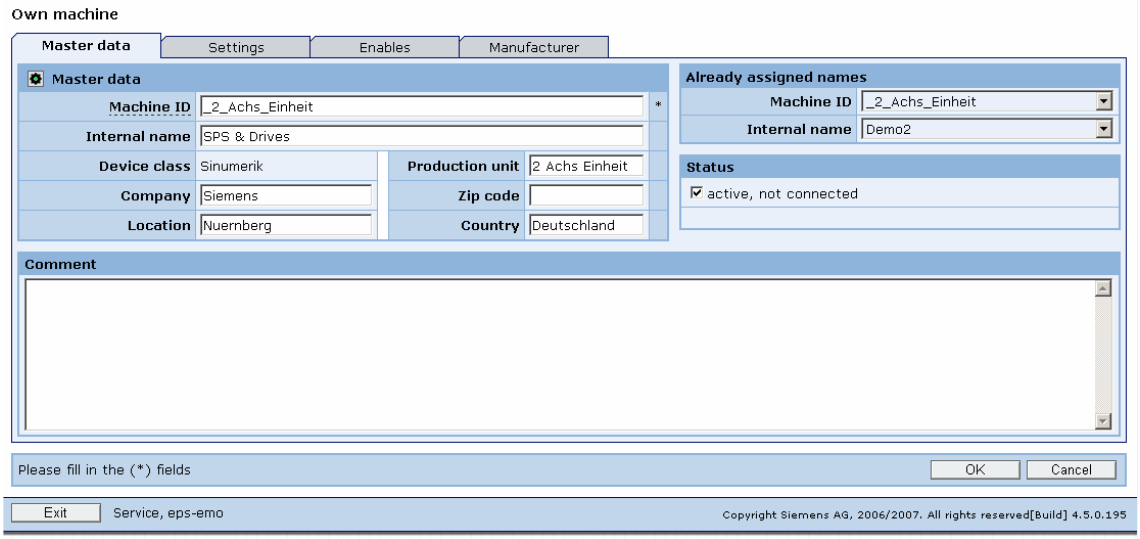


Fig. 6-3: Editing the master data of the machine

Master data

To make it easier to handle machines that have recently been created, the fields within the machine's "Master data" menu appear with their most recently entered contents. This prevents identical or similar entries from being reentered unnecessarily. Generally speaking, no distinction is made in these entries between upper- and lower-case letters.

Field array	Contents	Type
Machine ID (mandatory)	Designation of the machine within the organization of the user. This machine name must be unique within an organization.	DISPLAY INPUT (Max. 40 characters; return, backspace, °, $, §, \, ;, >, <, ß, ä, ö, ü, Ä, Ö, Ü, ´, € are not permitted)
Internal name	Freely selectable, additional name of the machine can be the name at the end user (inventory number) or type designation.	DISPLAY INPUT (Max. 40 characters; any character permissible)
Device class	The device class defines which ePS Network Services can always be used on a particular machine. Depending on the device class, some functions cannot be used (see Section 7.3 Client Diagnostics). SINUMERIK, S7 and IPC are available in the selection.	DISPLAY SELECTION

Field array	Contents	Type
	Notice: It is no longer possible to change the device class of a machine that has already been created and has been connected once.	
Company	Name of the end user: Machines can be selected in the machine tree according to the end user.	DISPLAY INPUT (Max. 40 characters, return, backspace, °, $, \, ;, >, <, are not permissible.)
Location	Specifies the location of the machine: Machines can be selected in the machine tree according to their location.	DISPLAY INPUT (Max. 40 characters, return, backspace, °, $, \, ;, >, <, are not permissible.)
Production unit	Specifies the production unit to which the machine belongs: Machines can be selected in the machine tree according to their production unit.	DISPLAY INPUT (Max. 40 characters, return, backspace, °, $, \, ;, >, <, are not permissible.)
Zip code	Entry for the zip code of the location	DISPLAY INPUT (Max. 40 characters; any character permissible.)
Country	Entering the country (location) of the machine	DISPLAY INPUT (Max. 40 characters; any character permissible.)
Comment	No comment	DISPLAY INPUT (Max. 2,000 characters; any character permissible)
Status	Active: Identical to the description in the machine selection menu. Connected: Register the machine for ePS Network Services use (only possible from the machine and referred to as connected from this point onwards), and disconnect it (requires re-registration from the machine). Display of the machine's registration status and the only possibility of eliminating the machine registra-	SELECTION / DISPLAY

Field array	Contents	Type
	tion (disconnect - database terminology).	
Names already assigned	Display of the machine designations already available in the organization of the user.	DISPLAY
To be omitted???		

Notice

Device classes can no longer be changed once the machine has been "registered (connected)".

Settings

Field array	Contents	Type
• **Operator panel front**		
Logon always required	Here you can specify whether a user always has to log in manually, or whether he/she can log into the machine automatically in one of the roles mentioned below (without having to enter the user name, password and organization manually).	DISPLAY SELECTION
Can be operated as	Here you can specify the role under which the user can log in "automatically" (system startup engineer, service engineer or machine operator).	DISPLAY SELECTION
Software version	Adapting the server software version of the machine **Notice:** It is only possible to upgrade to a higher software version. The upgrade is performed the next time the machine is booted after the change. After that it is no longer possible to undo the change!	DISPLAY SELECTION
• **Remote access**		
Always request approval	If the machine requests remote access (this is only possible from the machine), and the location to be accessed connects to the machine, access approval must be granted again on the machine. Where remote access is concerned, a distinction is still drawn between the different actions (visualization and operation; retrieving data; saving data; NC operation; PLC access) that must be acknowledged in a session as having approval.	DISPLAY SELECTION
• **Measurements**		

Field array	Contents	Type
Display rigidity	Here you can define whether the rigidity is also to be displayed for the axis test.	DISPLAY SELECTION

Enables

Field array	Contents	Type
Delete / modify release	Remove the release of a machine to another organization or modify the release rights.	ACTION
Add release	To ensure that users within other organizations do not require access to the whole of your organization, it is possible to release a machine on an individual basis in the master data for another organization. Organizational data are never released for partner access. The rights for machine-related functions are the same as those within your own organization for system startup engineers, service engineers or machine operators.	ACTION

Note

You can release a machine for several different organizations. The users at the target organization see only their own release not those made to the other organizations. For the release, the master data of external machines in the target organization is initialized with the currently valid machine information (machine ID, internal name, etc.). This initialization is not necessary if the machine has already been released to the same organization in the past.

If the organization to which you wish to release a machine does not yet appear in the list of known organizations ("release to"), you must request the organization designation and the release password from your partner organization (see the section titled "Cooperation areas").

Manufacturer

Field array	Contents	Type
Manufacturer number	Each manufacturer is obliged to assign a unique machine number (type plate).	DISPLAY INPUT (Max. 40 characters, return, backspace, °, $, \, ;, >, <, are not permissible.)
Manufacturer ID	The end customer and/or machine operator generally have a unique ID for the machine supplier.	DISPLAY INPUT (Max. 40 characters, return, backspace, °, $, \, ;, >, <, are not permissible.)
Manufacturer's name	Each manufacturer is obliged to provide their name on the type plate.	DISPLAY INPUT (Max. 40 characters, return, backspace, °, $, \, ;, >, <, are not permissible.)

6.1.4 Creating a machine in the form of a copy

Description of functions

Before ePS Network Services can be used on a machine, it must be set up on the ePS server. To make it easier to set up similar machines, a machine that has already been set up can be created as a copy. All of the configurations are adopted by the existing machine, with the exception of the machine master data, which must be edited as the machine ID will be the unique point of identification for the new machine.

In addition to copying, the following functions are also available in the "Machines" menu:

- Editing the master data of the machine
- Deactivating, activating or deleting a machine
- Copying a machine with its settings and user configurations to a new machine that is then created.

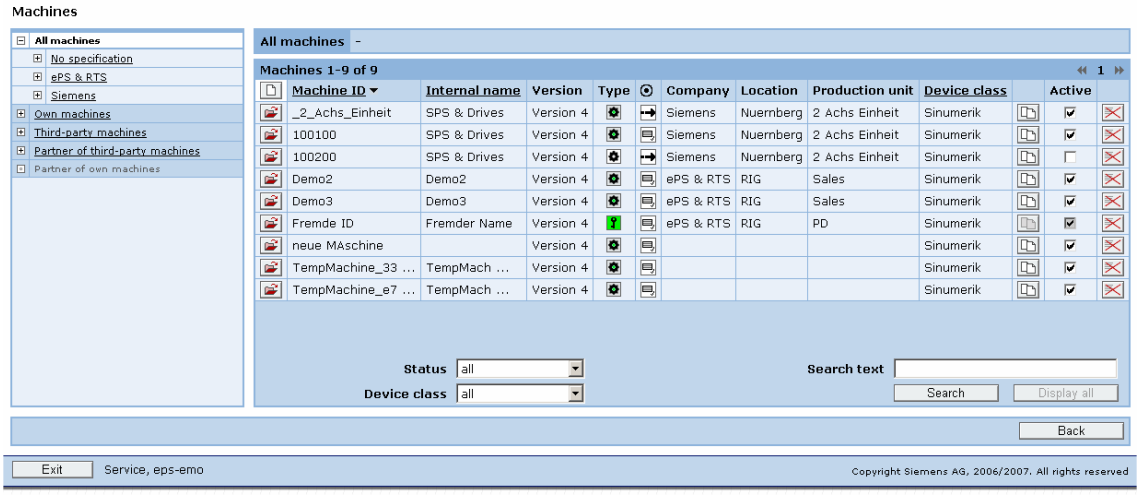


Fig. 6-4: Machine - list

Field array	Contents	Type
All machines	Machine tree	DISPLAY SELECTION
Create your own new machine	Switch to the menu for creating the master data for a new machine.	ACTION
Open machine	Open the master data menu with the line of the selected machine.	ACTION
Machine ID	Machine designation	DISPLAY
Internal name	Additional machine designation	DISPLAY
Version	ePS version information	DISPLAY
Type	Machine status: The gear wheel icon indicates that the machine is your own machine. The key wheel icon indicates that the machine is an external machine. Green: The machine is registered (connected). Gray indicates that the machine has been disconnected (must be re-registered by the machine). White indicates that the machine is not active.	DISPLAY
⊙	Logged onto the machine (see configuration in the machine master data) Rectangle - Access to the ePS Network Services menu is only possible by logging onto the machine HMI. Arrow - Access to the ePS Network Services menu on the machine is possible with the rights configured in the master data of	DISPLAY

Field array	Contents	Type
	the machine, without the need to log on.	
Company	Name of the end user: Machines can be selected in the machine tree according to customer (see configuration in the machine master data).	DISPLAY
Location	Specifies the location of the machine: Machines can be selected in the machine tree according to location (see configuration in the machine master data).	DISPLAY
Production unit	Specifies the production unit to which the machine belongs: Machines can be selected in the machine tree according to production unit (see configuration in the machine master data).	DISPLAY
Device class	Division of control types with different functional scopes (see configuration in the master data of the machine).	DISPLAY
 Copy	Copy function – create this machine in the form of a copy with all user configurations, settings and appendices, with the exception of the machine designation.	ACTION
 Active	Activate/deactivate system use: Following deactivation, the machine remains registered with ePS Network Services (not disconnected; this would require the machine to be connected). The ePS server does not accept or store any data sent by the machine, and the user configurations on the machine are not updated. Following activation, changes to user configurations in terms of manual synchronization or automatic synchronization are transferred to the machine again; in addition, data from the machine begins to be stored on the ePS server again.	ACTION
 Delete machine	Deletes a machine permanently. Data is no longer available for this machine.	ACTION
Current copying process	Change to the copying process menu when one is running parallel in background (see "Creating a machine in the form of a copy").	ACTION
Status	Filter function for the possible status: • All • Active and registered • Active but not registered • Not active	DISPLAY SELECTION
Device class	Filter function for the possible device clas-	DISPLAY

Field array	Contents	Type
	ses: • SINUMERIK • S7 • IPC • All	SELECTION
Search text	Filter function with a partial text from the designation of the machine ID.	DISPLAY INPUT (Max. 128 characters; any character permissible.)
Search	Start search with the set filter conditions.	ACTION
Display all	Start the display without filter conditions (no need to change the set filter conditions)	ACTION
Previous	Switch to the "Management" menu	ACTION

Copy function: Creating a new machine in the form of a copy

Click "Copy" to switch to the "Master data" menu of the machine:

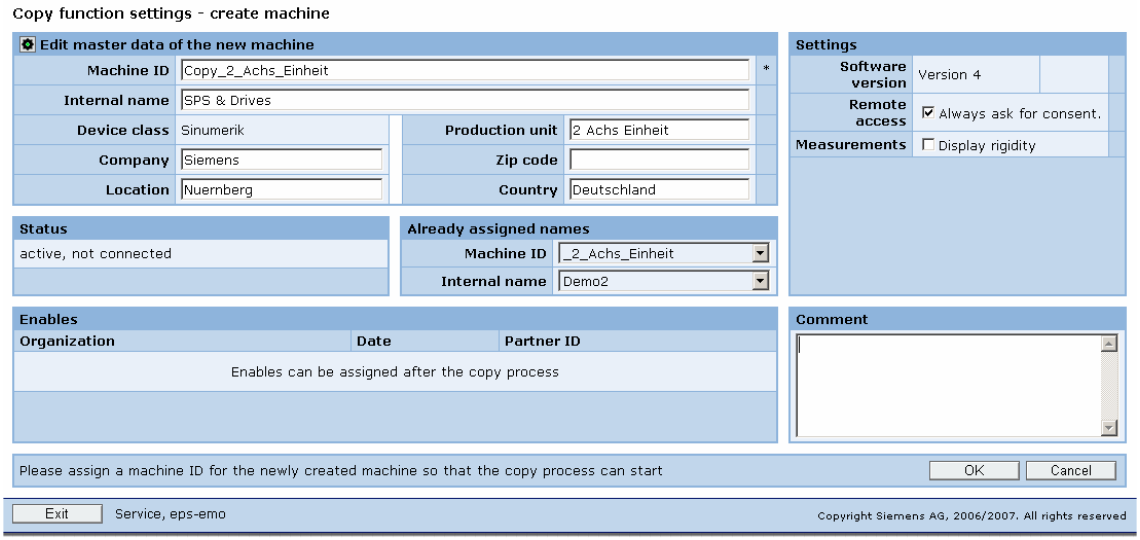


Fig. 6-5: Entering the master data of the copied machine

After the machine master data has been completed and confirmed with "OK", you will be switched to the copy menu.

Preselecting the user configuration to be copied

This function selects all user configurations for copying.

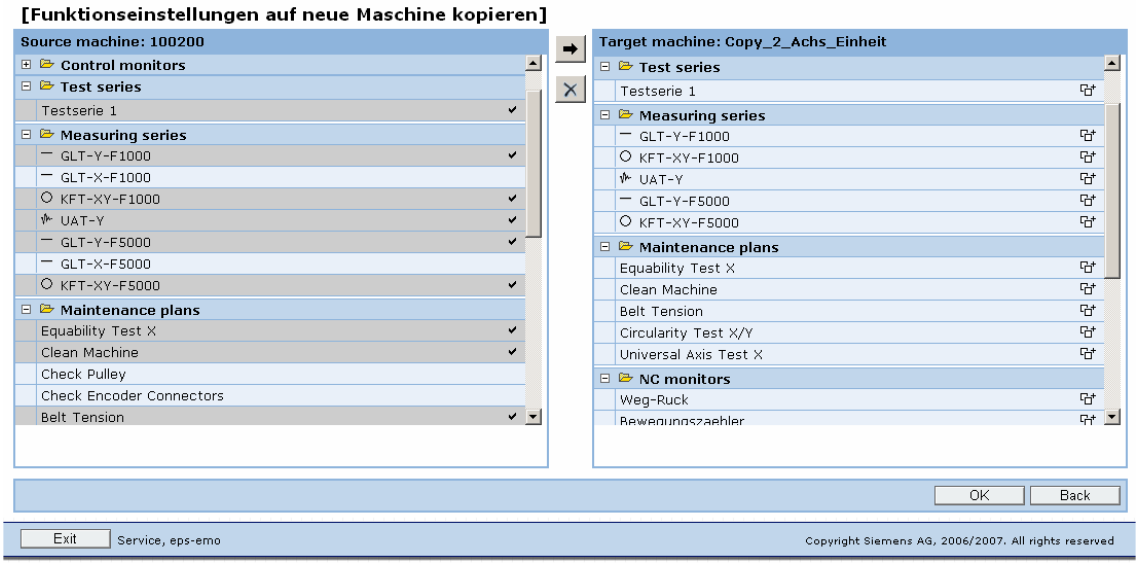


Fig. 6-6: Copying function settings to a new machine

As previously described for copying the user configuration, there is also the option of removing specific user configurations from the copy list and adding them again.

Field array	Contents	Type
	Add the selected user configurations to the copy list.	ACTION
	Remove the selected user configurations from the copy list.	ACTION
+	Open the user configuration group.	ACTION
–	Close the user configuration group.	ACTION
Text selection	Select a user configuration.	ACTION TOGGLE
Previous	Cancel: Return to the machine menu without copying.	ACTION MENU
OK	Start copying process	ACTION MENU

After confirming with "OK," the copy log will be output:

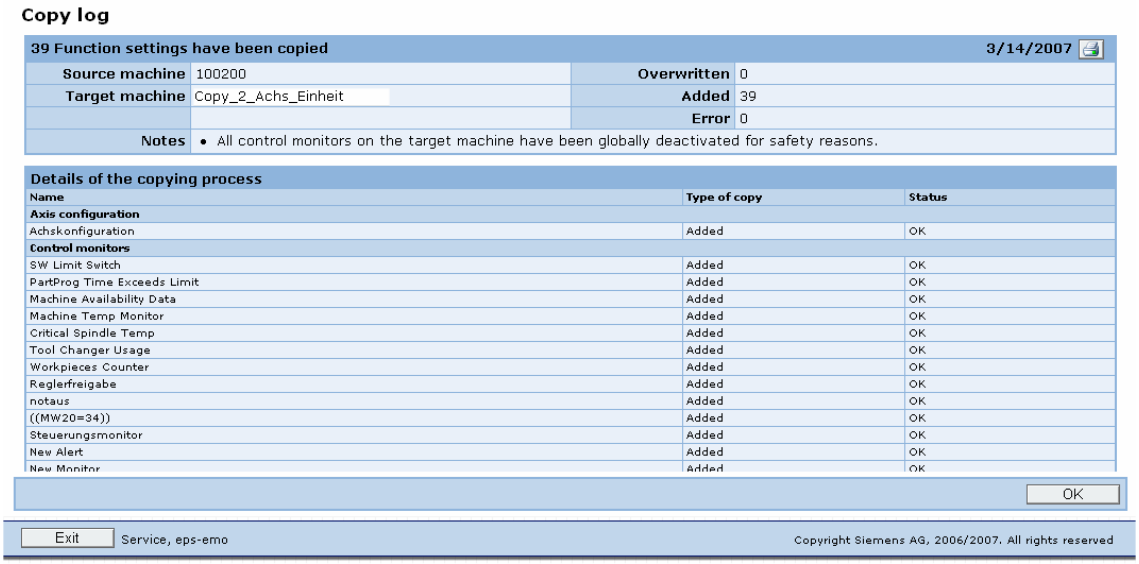


Fig. 6-7: Listing

There is the option of canceling the copying process:

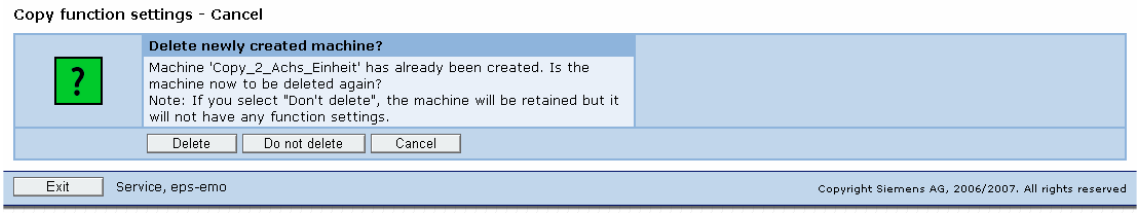


Fig. 6-8: Cancel copy

Field array	Contents	Type
Delete	Deletes the newly created machine. A switch is made to the machine menu.	ACTION MENU
Do not delete	The newly created machine is retained without user configurations. Change to the machine menu.	ACTION MENU
Cancel	Return to the copy menu to continue the copying process.	ACTION MENU

6.1.5 Organizational data

Overview

As the administrator, you can view the stored organizational data.

Here you define the following:

- The release password with which another organization can release a machine to be accessed by you
- The type of teleservice session, used as a basis for defining the functions within a session

This is also where you select the server software version and modify it centrally for the entire organization.

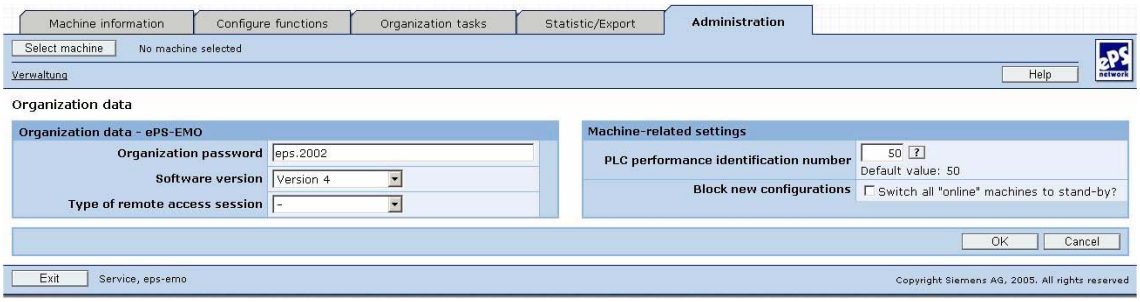


Fig. 6-9: Editing organizational data

Teleservice session type

By selecting a session type, the administrator can define the functions that can be used in a teleservice session for the entire organization.

To find out which functions are permitted in each session type, see the description in /R3/.

PLC performance index

The PLC performance index allows you to define how much performance may be used for the ePS PLC trigger. Each ePS PLC trigger uses a certain number of performance points. In this way you can control to what extent the PLC may be occupied by the ePS PLC trigger. The PLC performance index has to be defined individually by the machine manufacturer.

Block new configuration

This function serves to only release new ePS server versions for all machines after they have been tested on single machines. For this purpose, this function allows you to switch all machines from "ONLINE" to "STANDBY" synchronization mode, in order to temporarily prevent any changes at the ePS client scripts by means of new ePS server versions.

Note

"Standby" causes the machine to synchronize regularly and check whether there is an online request. No ePS client jobs will be started or completed, and also no restart of the job machine will be performed due to changed scripts.

Notice

When restarting the machine, it will in any case get the new boot script from the server, regardless of these settings. Thereafter, also the new scripts will be started.

6.1.6 Download areas

Description of functions

ePS Network Services allows you to access new download areas for the use statistics and security patches for Microsoft Windows NT.

The download areas can only be accessed by the user named "Administrator" (use statistics) or users assigned the role of administrator (security patches for Microsoft Windows NT) and can be reached by accessing the "Download areas" menu item of the "Management of organization" menu group within the "Management" tab.

Fig. 6-10: Download areas

Three tabs are available to you in the download area:

- Reports
- Security patches
- Services

You can return to ePS Network Services via the "Services" tab.

Download areas → Evaluations

On the "Evaluations" tab, you can modify the display of the use statistics activated, by filtering them according to criteria such as the number of and time period, or changing the order in which reports are displayed.

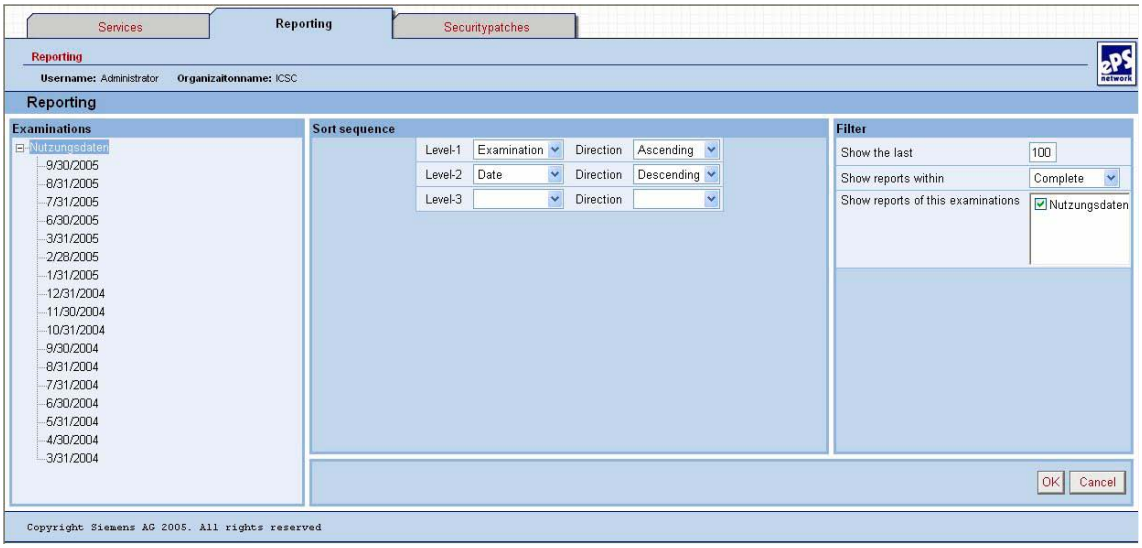


Fig. 6-11: Reports

Download areas → Security patches

On the "Security Patches" tab, you can download the security patches provided for Microsoft Windows NT after agreeing to the conditions of use.

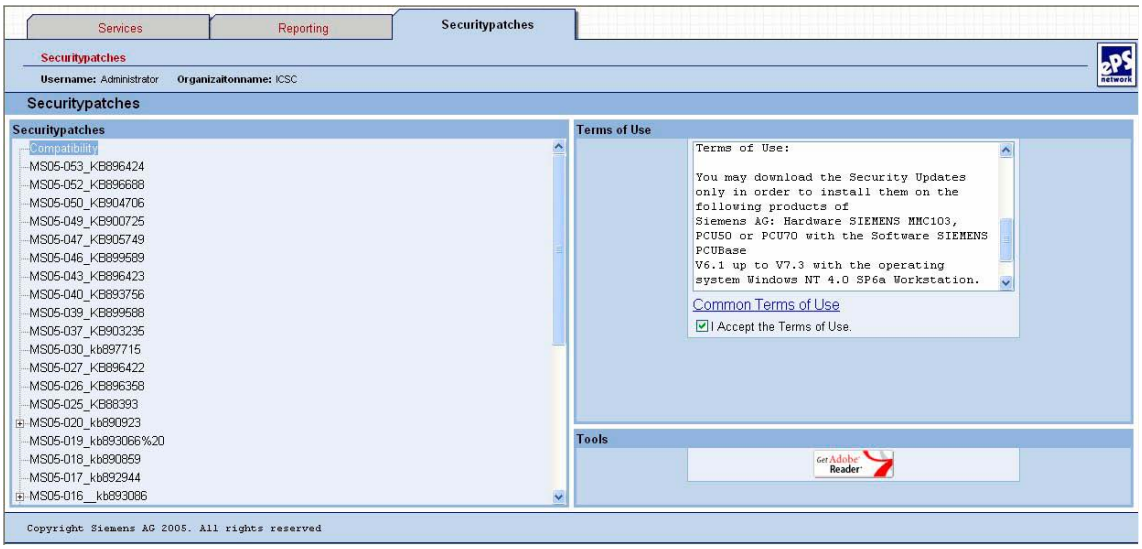


Fig. 6-12: Security patches - Conditions of use

6.2 Personal settings

Changing the password

Every user can change his or her own password according to the set rules using the "Change password" function.

Data protection guidelines

Each user must acknowledge the valid data protection guidelines using the “Data protection guidelines” function before using the system.

The user confirms that he or she will only enter personal data in the system after having first obtained the consent of the person concerned and will comply with the valid data protection guidelines. For more details, please read the document that the function itself provides.

Agreement to the data protection guidelines can be revoked at any time.
Note: A user cannot access the ePS Network Services without first agreeing to the current data protection guidelines.

Filter and search settings

Any user can reset the settings to the system default settings by means of the "Reset filter and search settings" function.

■

Notes

7

7 Establishing a connection and diagnostics

7.1 Connecting a machine to the HMI

Description

To use the ePS Network Services on a control, the following steps must be performed:

1. An administrator creates the machine with the associated master data on the ePS Network Server.
2. It is then necessary to register the machine. The machine is then given an identifier by the ePS Network Server that identifies it uniquely.
3. This machine will be connected with the ePS Network Server.
4. The alarm model can then be uploaded and the machine synchronized.

Operating sequence on the machine

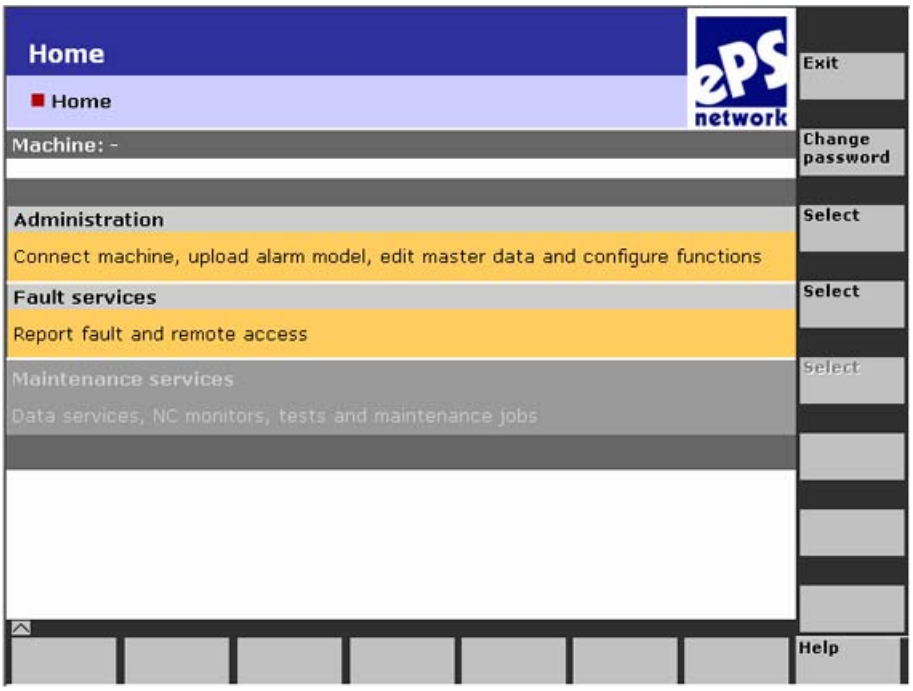


Fig. 7-1: After the login on the HMI

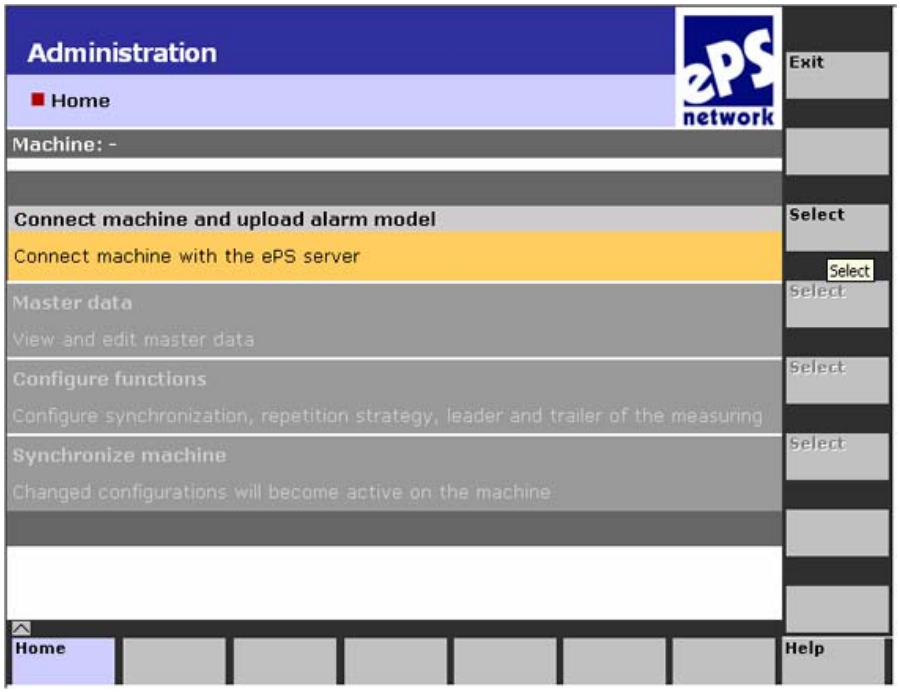


Fig. 7-2: Connecting to the ePS Server

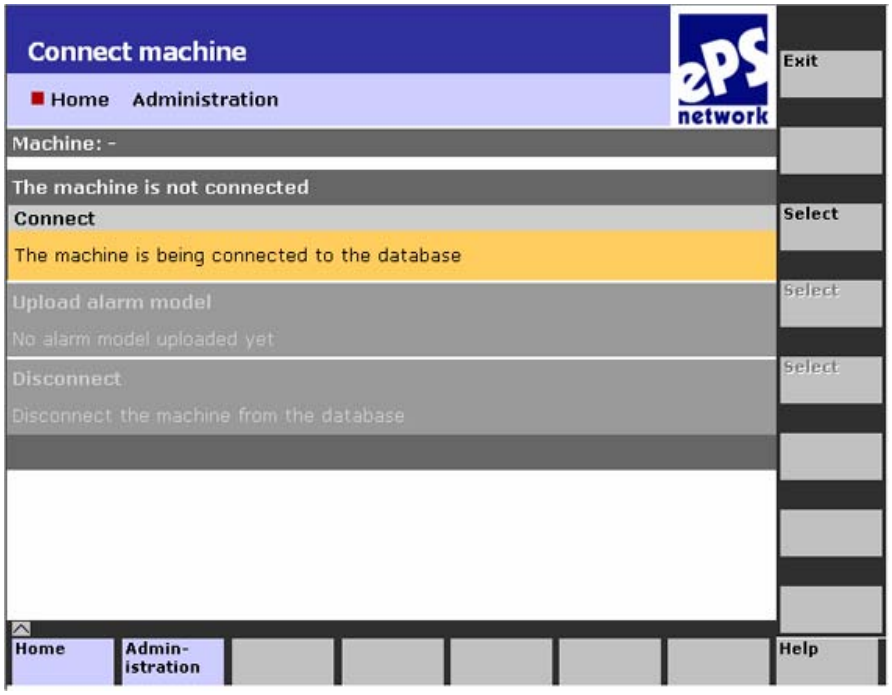


Fig. 7-3: Connecting a database

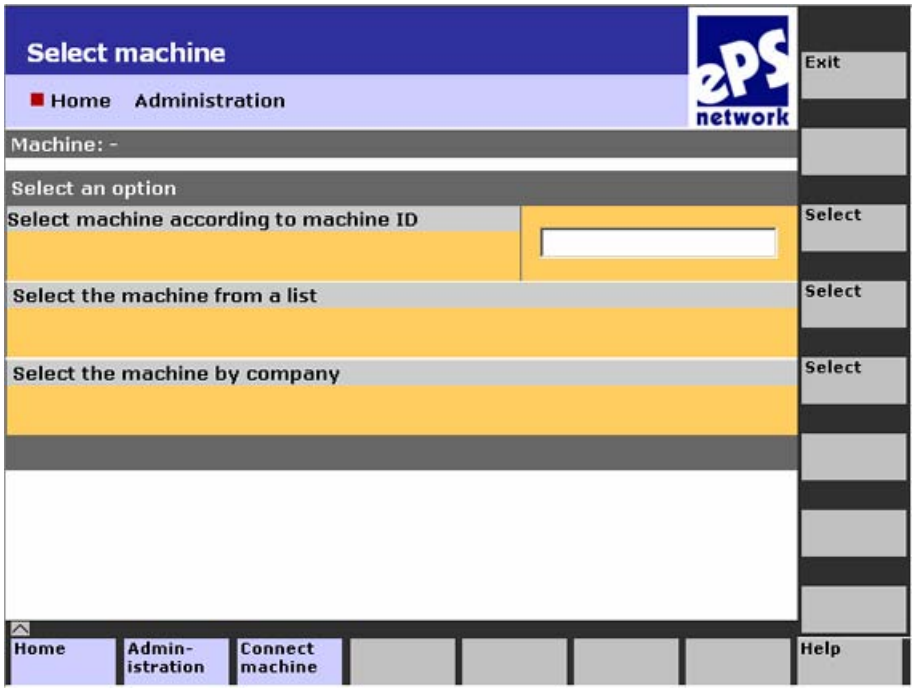


Fig. 7-4: Connecting a machine – Selecting a machine

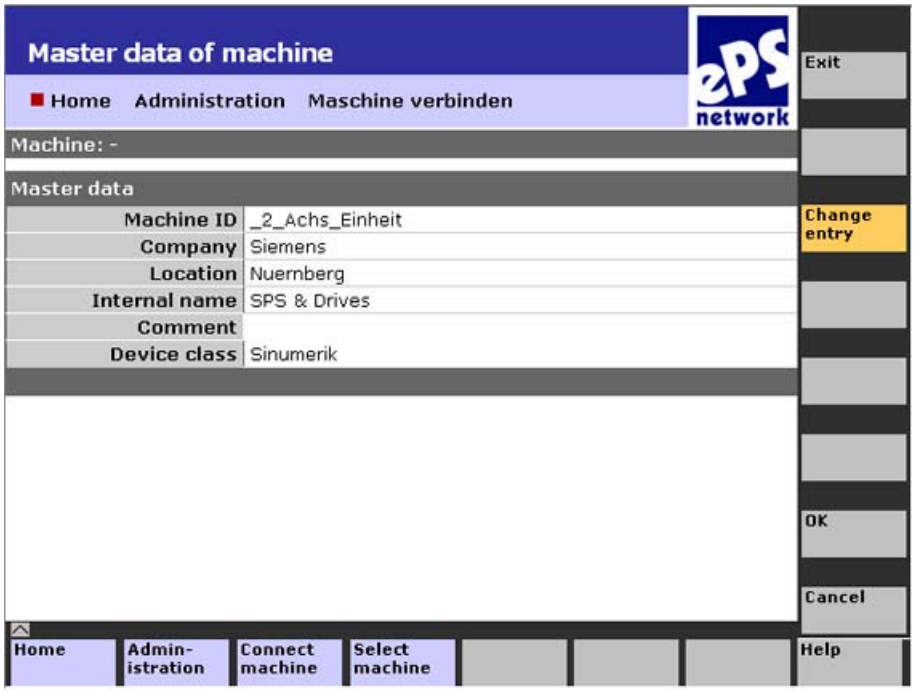


Fig. 7-5: Master data of the machine

7.1.1 Uploading an alarm model

Operating sequence on the machine

Language-specific alarm texts are made available on the ePS Server. This allows alarm messages to be displayed in the currently set browser language.

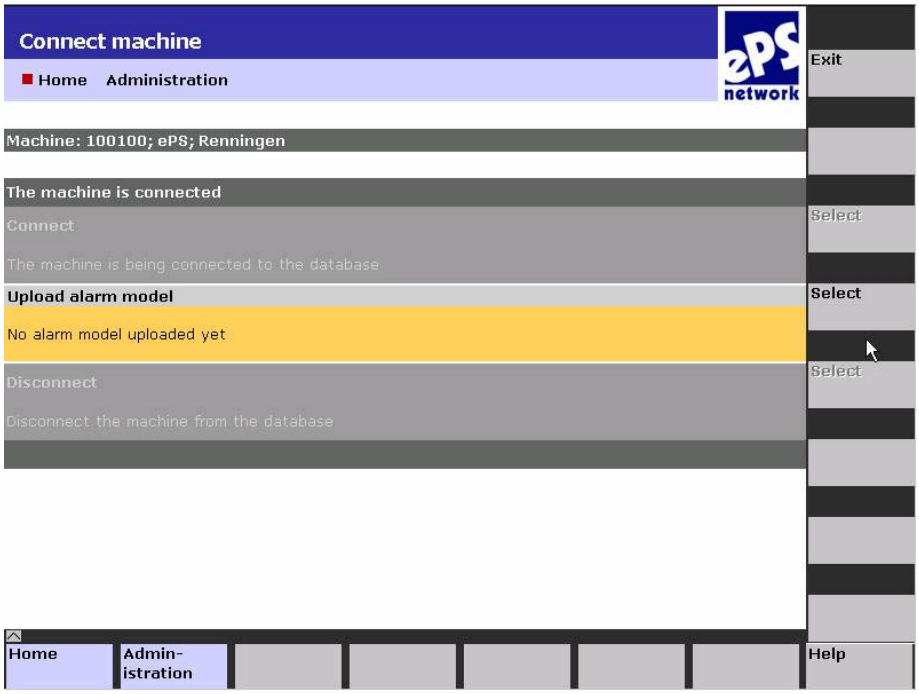


Fig. 7-6: Uploading an alarm model

7.1.2 Synchronizing the machine

Operating sequence on the machine

Synchronization takes over and activates the defined configurations, such as alarm notifications and trigger events, from the ePS Network Server to the control.

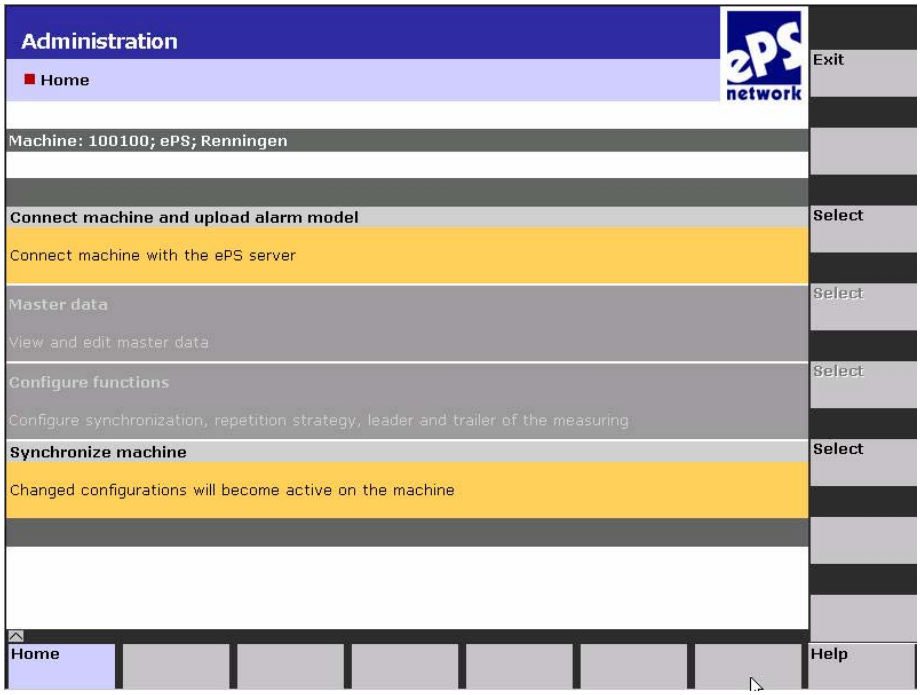


Fig. 7-7: Synchronizing the machine

Fig. 7-8: Initiating synchronization

Fig. 7-9: Synchronization completed

7.1.3 Disconnecting the machine (at HMI and PC)

Operating procedure on the HMI

A machine is disconnected from the database:

Fig. 7-10: Disconnecting a machine on the HMI

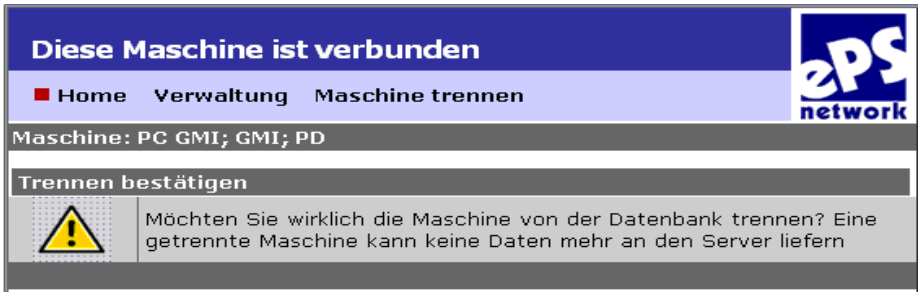


Fig. 7-11: Confirming disconnection on the HMI

After disconnection, all the information regarding the database has been removed from the local hard disk of the PCU.

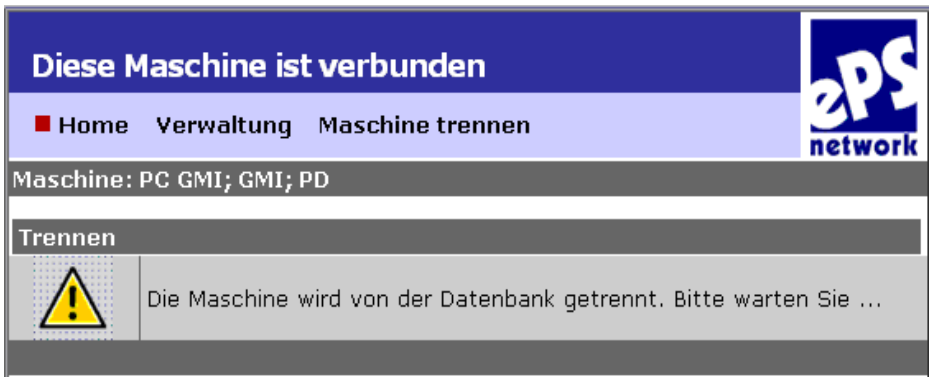


Fig. 7-12: Information about the disconnection

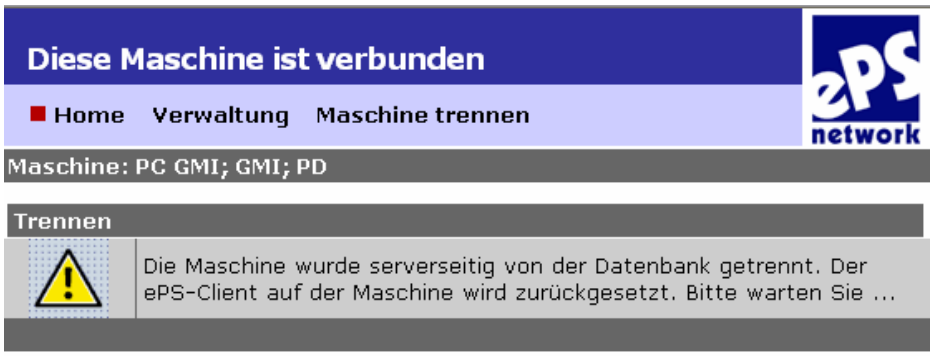


Fig. 7-13: Message on the HMI

Note

After the disconnection from the server:

As soon as a machine operator contacts ePS with a machine that has been disconnected from the database by the server, a message is displayed informing the user that this machine has been disconnected by the server. All actions of the ePS client are canceled and disconnection is started by the client.

Operating procedure on the PC

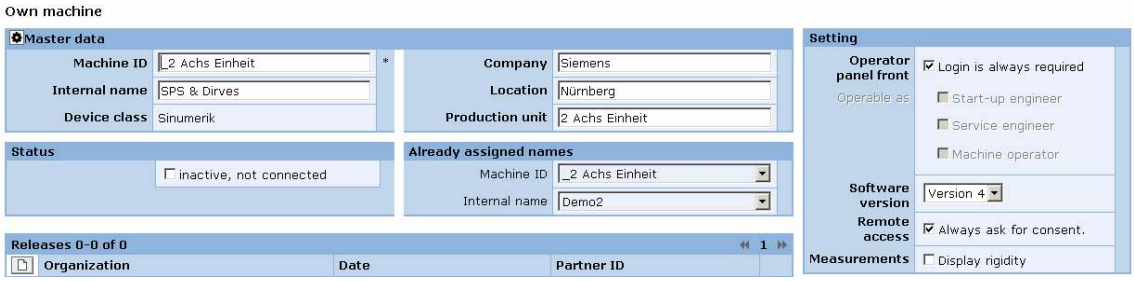


Fig. 7-14: Disconnecting a machine on the PC

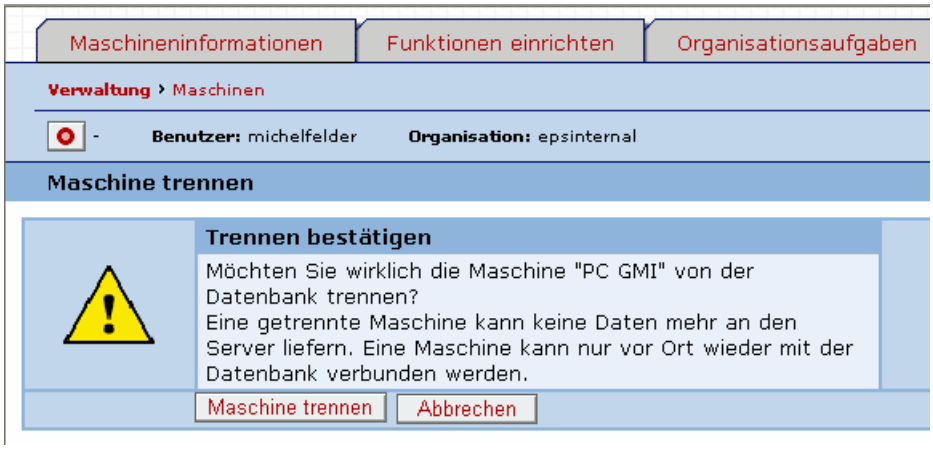


Fig. 7-15: Confirming disconnection on the PC

Field array	Contents
Disconnect machines	A machine is disconnected from a connected database machine
Cancel	The disconnection operation is canceled

7.1.4 Repetition strategy

Description of functions

The repetition strategy allows you to define how the ePS client will respond if communication via the Internet or the ePS Network Server fails. You can activate and deactivate the repetition strategy and define when the repetition strategy will be started.

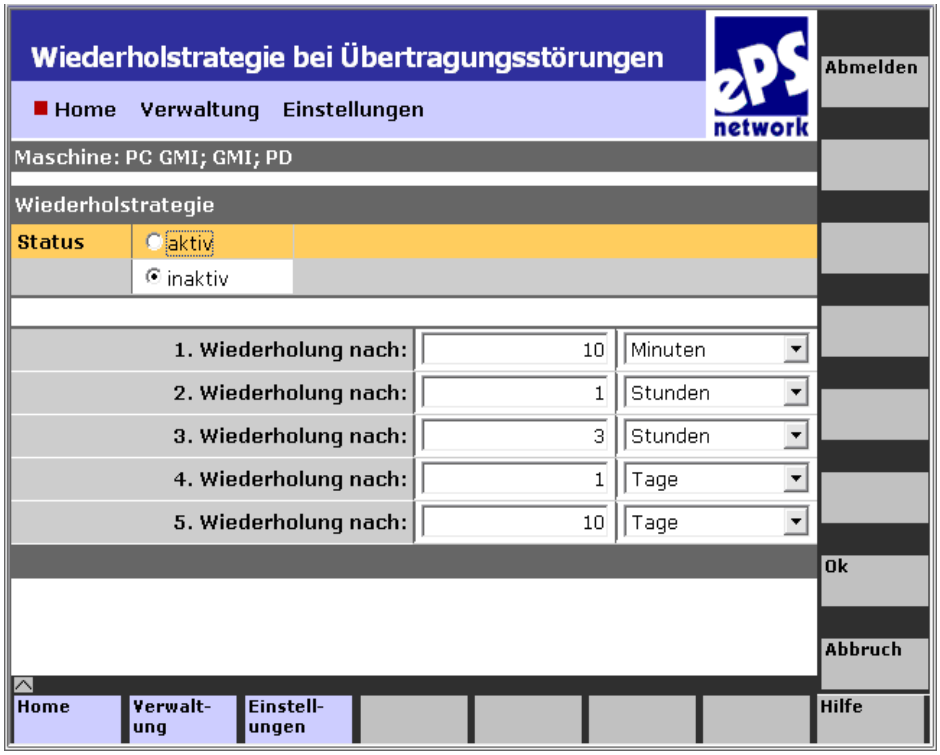


Fig. 7-16: Configuring the repetition strategy on the HMI

Field array	Contents
Active/inactive	Change the status of the repetition strategy
1st - 5th repetition	Time delay after which access to the Internet will be retried.

7.1.5 Editing the prolog and epilog program

Editing the prolog and epilog program

The prolog and epilog program is reloaded into the control with name "N_EPS_PROLOGEPILOG_SPF" every time a test is run. HMI Advanced can be used as program editor on the operator panel in order to adjust this program.

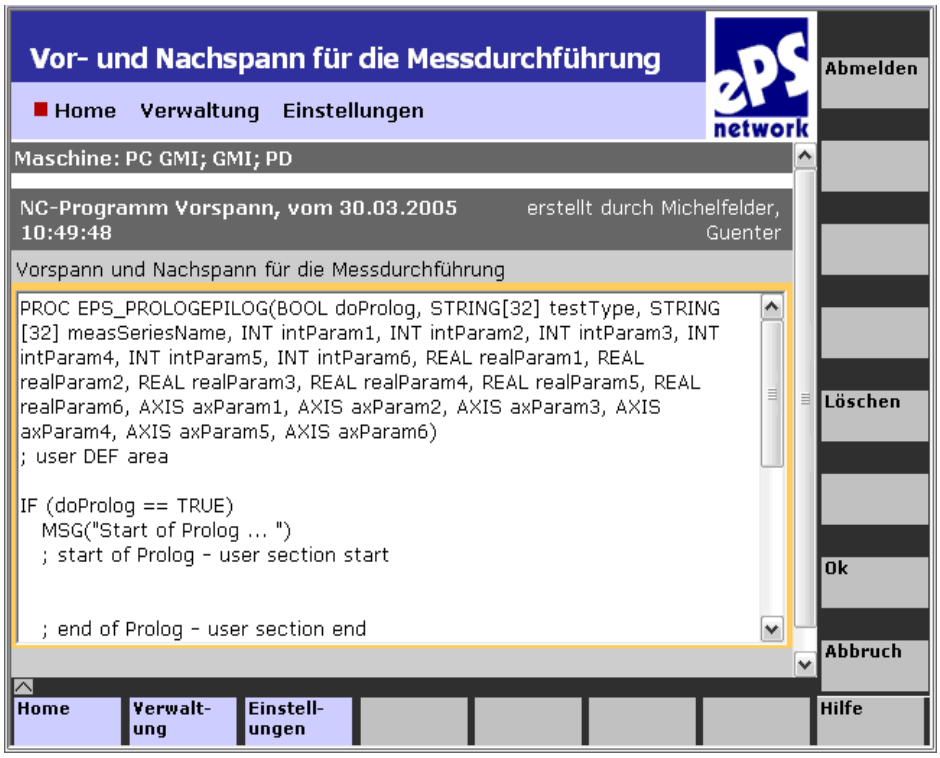


Fig. 7-17: Example of a prolog and epilog program

7.2 Cooperation areas

Description of functions

The owner organization can use the "cooperation area" function to make one of its machines in the ePS Network Services accessible to other organizations. This allows experts from different organizations to cooperate efficiently when performing troubleshooting on a machine.

Each person involved can access the released machine as if it were within their own organization. This applies with just a few exceptions: see "Administrator" (machine manufacturer), "Service engineer" or "Machine operator" in the Appendix.

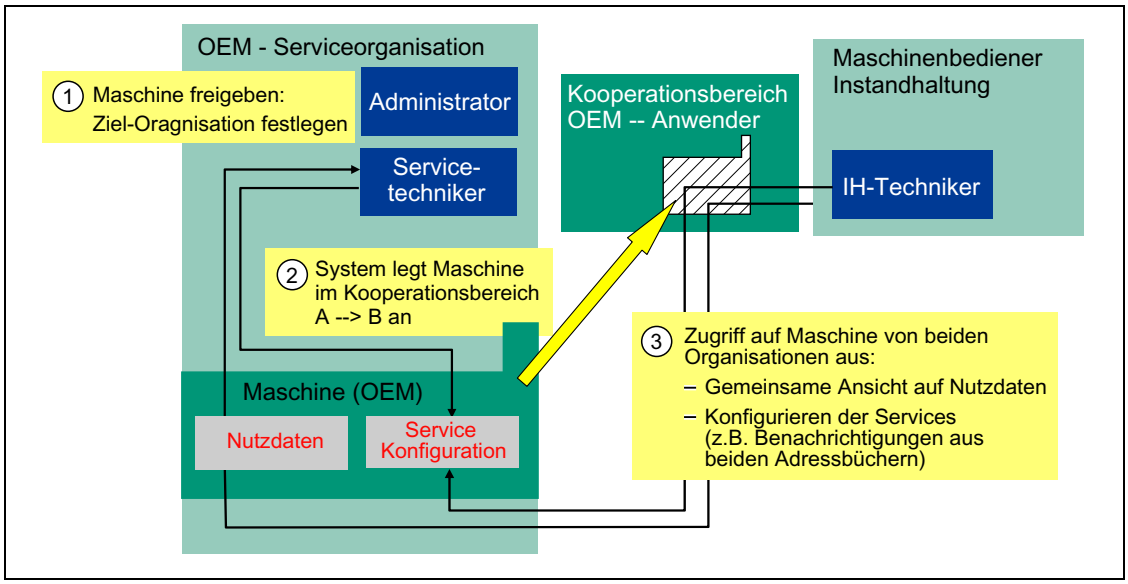


Fig. 7-18: How cooperation areas work

"Cooperation area between machine OEM and end user"; the machine tool is located on the end user's premises but is managed by the OEM (e.g. during the warranty period).

This function therefore permits cooperation between companies (machine manufacturers, machine users, external service providers) because release is not limited to one additional partner but any number of organizations can be connected to one machine.

The release mechanism is conveniently designed to permit short-term release for eliminating faults quickly as well as long-term release, e.g. for maintenance by an external service provider.

A requirement for using the cooperation area is that the organization to which a machine is to be released for use is also set up as an OEM service organization.

7.2.1 Releasing a machine to an organization

Overview

In ePS Network Services, a machine is always assigned to just one organization when it is set up. Depending on their assigned user roles, the machine operators in an organization can access the functions of the machine. The administrator of the owner organization can use the "cooperation area" function to release a machine of that organization for use by another organization.

Note

In this documentation, source organization designates the organization that releases a machine. In this documentation, target organization designates the organization to which a machine is released.

Release rights specified by the administrator of the source organization define the type of access granted to the target organization. Machine function rights may be further limited in the target organization by the user roles that apply there.

A machine can **only be released by the administrator of the source organization**. A target organization cannot pass on a release to other organizations. This means that the source organization always maintains control over which other organization has access rights to its machine, data, and settings.

The administrator of the target organization must define a release password for receiving machines from other organizations. The target organization administrator discloses the release password together with the name of its organization to the administrator of the source organization.

This allows the source organization to release machines to its organization.

Caution

The release password and organization name must be communicated outside the ePS system, e.g. by phone or fax. On no account must the current password for the generic "administrator" account be used as the release password for the "cooperation area" function.

As soon as the administrator of the source organization has received the enable password and the name of the target organization, he or she enters it in the ePS Network Services and can release machines of its organization to the target organization with immediate effect. A machine can be released to several target organizations simultaneously. Once the machine has been released to the target organization, the target organization administrator can enter his/her own name in the Machine ID field (Machine Alias) by which users in his or her organization will be able to find the machine.

Any changes to the settings made by any participants – either in the source organization or target organization – will be effective on the machine.

The configurations (control monitors, PLC and NC monitors, etc.) and user data (uploaded data, archives, etc.) which result from use of ePS Network Services are always assigned to the machine. By consulting the machine list, a user can easily find out at any particular time whether the machine on which he/she is currently working belongs to his/her own or an external organization (machine list divided up according to organizations).

The users of the source organization see the organizations for which the machine is released and the users of the target organization see the organization that is making a machine accessible. This applies to the "administrator", "system startup engineer", and "service engineer" user roles on a PC; users on the control are unable to see that it is an external machine.

To end cooperation, either the administrator of the source organization can remove the machine from the cooperation area (cancel access rights of other organization) or the administrator of the target organization can reject the machine from the cooperation area.

In both cases, the administrators can choose whether the recipients in the target organization will be removed from the notification configuration of the machine or whether they are kept. The other settings (configuration of monitors, service case notification configuration, etc.) are kept on the machine.

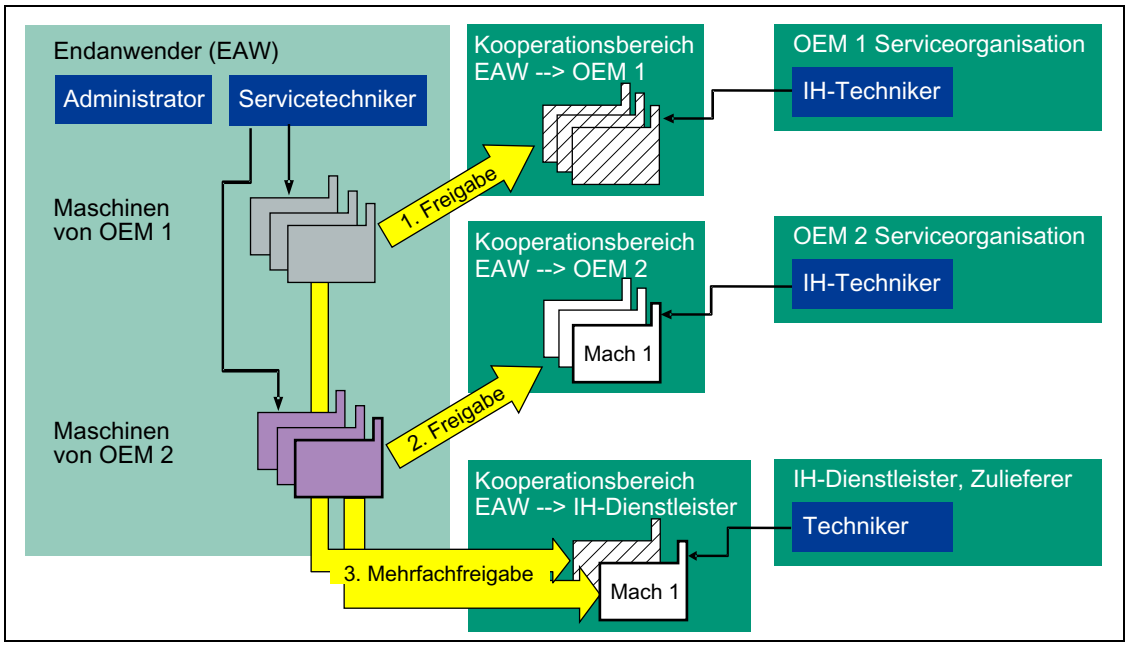


Fig. 7-19: Multiple release of machines

Cooperation area between one end user with a large machine park and various OEMs or service providers. One machine can be released simultaneously to several organizations (machine "Mach 1" surrounded by thick border)

As soon as the machine has been removed from the cooperation area, the target organization and its users cannot access the data of the machine until it is released again.

If recipients in the target organization are still in the notification configuration of the machine they will continue to receive service case notifications etc. if an alarm occurs until they are deleted by the source organization.

7.2.2 Machines in a cooperation area

Overview

The limitations and special aspects of the functions of ePS Network Services when used with a machine via a cooperation are described below.

Machine tree

The machine ID used by the partner can be viewed in the machine tree views in the machine selection or machine management for machines in the cooperation area:

- "Partner of external machines" view (machines that the organization of the user can access when granted release)
- "Partner of own machines" view (machines released by the organization of the machine operator)

This ensures that the machine can always be clearly identified, e.g. during a hotline call. The partner's valid machine ID is displayed in the "Partner ID" field.

Managing/releasing machines

For security reasons, a machine can only be released by the administrator of the owner organization. The administrator always keeps control over which other organizations can work with his or her machines.
That is why the administrator of a target organization cannot release a machine released to his or her organization to other organizations via the cooperation area.

Deleting/deactivating machines

A machine can only be deleted from the ePS Network server by the administrator of the owner organization. Only the administrator can activate/deactivate the machines and change or re-release the machine master data.

The administrators of both the source organization and the target organization can change the master data of a machine released via a cooperation area. These changes do not affect the other organization, so both organizations keep separate versions of machine master data (for example, if they use different naming and numbering systems).

The users of a target organization can only access the configuration and user data of a machine while it is released to their organization. If a machine is removed from the cooperation area by one of the administrators of the source or target organization, its users can no longer view or change that data.

Recipient addresses for notifications

A user can only enter the addresses from the address book of his or her own organization in a list of notification recipients.
A user can remove all the addresses from a list of recipients, even if they originate from another organization.
A user has no access to the address books of other organizations and cannot change the content of external recipient addresses (address book entry).

Upgrading the server software version

The server software version of the machine can only be upgraded by the administrator of the owner organization.

Reading/processing service cases

Service cases (synonym: trouble tickets), generated, for example, by a request to process a fault, can be read or processed by any organization that has access to the machine.
Users of target organizations that access an external machine via a cooperation area can also set up service cases for this machine using the "Create Service Case" function.

Linking a machine / uploading an alarm model

To link a control with the machine image on the ePS Network server, the user at the HMI of the control must be a member of the owner organization of the machine.

7.3 Client diagnostics

Description of functions

A local application has been developed for ePS client diagnostics, with which the user at the machine can analyze the ePS client software while the control is running.

As soon as client diagnostics is started a screen displaying the main diagnostic information required for an initial problem analysis appears.

The user can also start a comprehensive "diagnostics session" if problems occur and transmit detailed information to the ePS service. (Start session)

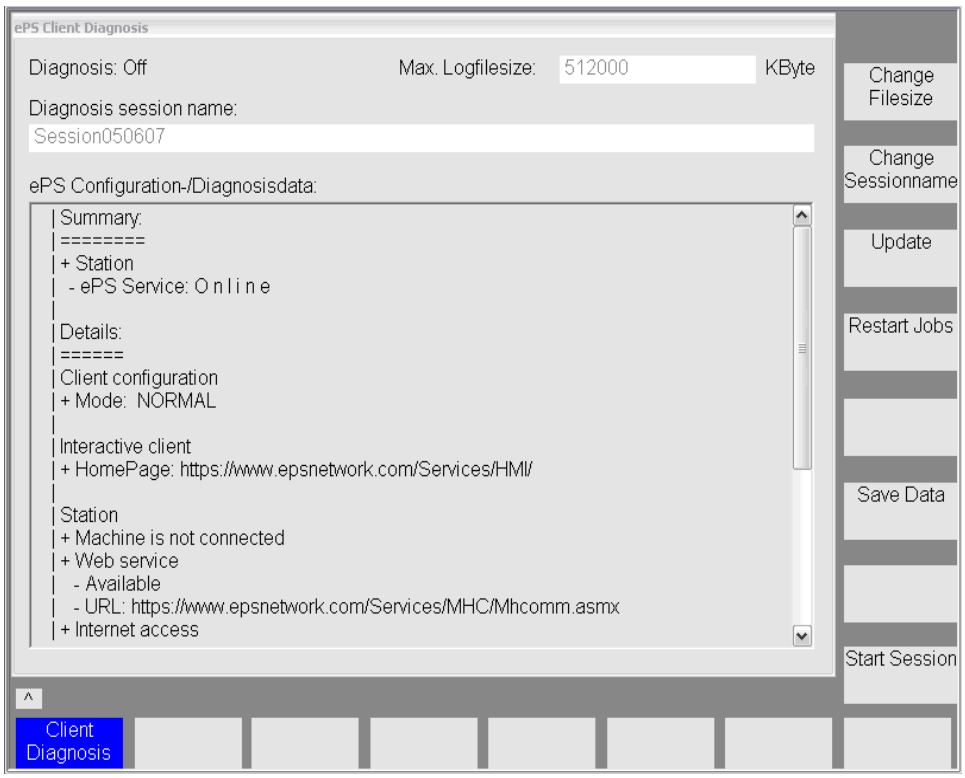


Fig. 7-20: Example of ePS client diagnostics

7.3.1 Components of client diagnostics

Status information

Fig. 7-21: Session name

Operating functions

Change Filesize	→ Change maximum file size of log files
Change Sessionname	→ Change the name of the diagnostics session
Update	→ Update diagnostics information
Restart Jobs	→ Restart machine handler jobs
Save Data	→ Save diagnostics data of a diagnostics session
Start Session	→ Start a diagnostics session

Fig. 7-22: Softkeys on the HMI

Summary of diagnostics functions

When diagnostics is started, a summary states whether the ePS client is connected to the Internet.

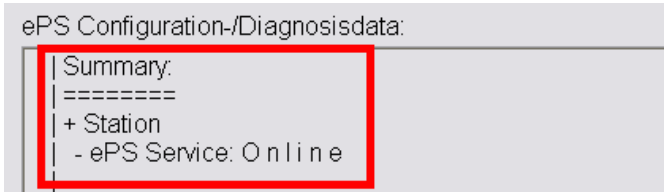


Fig. 7-23: Diagnostics summary

Detailed Information

More precise information required for further diagnostics is shown under Details.

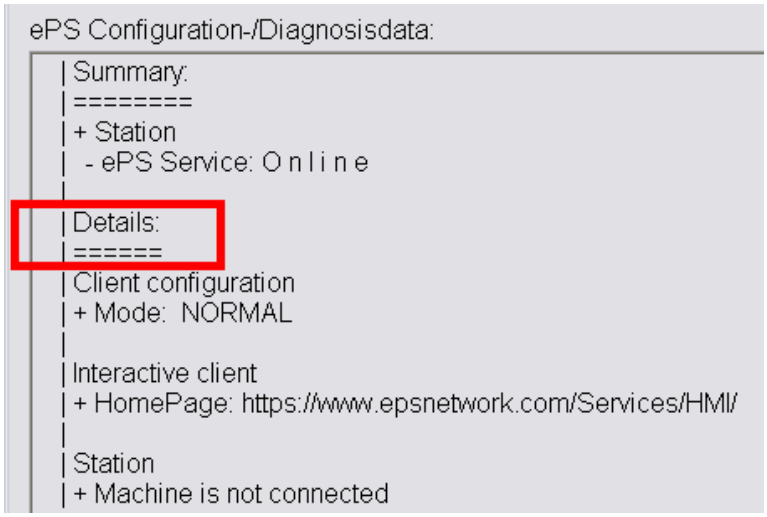


Fig. 7-24: Detailed diagnostics

Client configuration

This display informs the user whether the installation is a normal 1:1 or a 1:N configuration.

Interactive client

The URL of the IAC is displayed for information purposes and to provide a comparison with the URL Web service.

Station

Fig. 7-25: Station details

The user is informed whether the control is connected or not connected to a database machine.

- **Web service**
  URL of the machine handler (for comparison with the URL of the IAC)
- **Internet access**
  Proxy configuration overview
- **Active ePS jobs**
  Status of active ePS jobs
  Status of the repetition strategy

7.3.2 Performing a diagnostics session

Start of the diagnostics session

Start the diagnostics session with the "Start Session" softkey to execute the following actions:

- Rename existing log files
- Create new log files with maximum LOG level

Executing ePS functions that cause problems

You should now execute the ePS functions that cause problems and need to be diagnosed.

Stopping the diagnostics session

Stop the diagnostics session with the "Stop Session" softkey to execute the following actions:

- Place script files in a buffer
- Place log files generated during the session in a buffer
- Place SETTINGS.INI in a buffer
- Place file with session information in XML format in a buffer
- Reset LOG level to default value

Storing the LOG data

Generated data can be stored on any storage medium as long as it can be accessed online. Pressing the "Save Data" softkey starts an application that allows you to save any data you have generated as a ZIP file.
You can enter a storage path and an archive name. You can also define a maximum ZIP archive size to make transmission by e-mail easier.

Transmitting diagnostics information to ePS

The stored ZIP archive should then be transferred to the OEM service or to the ePS hotline, for example.

7.3.3 Other functions

Starting ePS client software

"Diagnosis" softkey via HMI-Advanced

Restarting the ePS client job

Diagnostics might require you to restart all ePS client jobs. After a safety query the jobs are restarted.

Update

The "Update" softkey is used to update the screen content.

7.4 1:N connections

Configuring connections

Every NCU of a 1:N connection can be selected via a configuration tool and then like a "standard machine" connected to an ePS database machine.

The configuration tool is called up automatically during the ePS client installation if a 1:N configuration is detected by ePS.

After installation, one instance of the Machine Handler service is started for each NCU selected.

Note

Every NCU selected must be connected to a separate database machine.

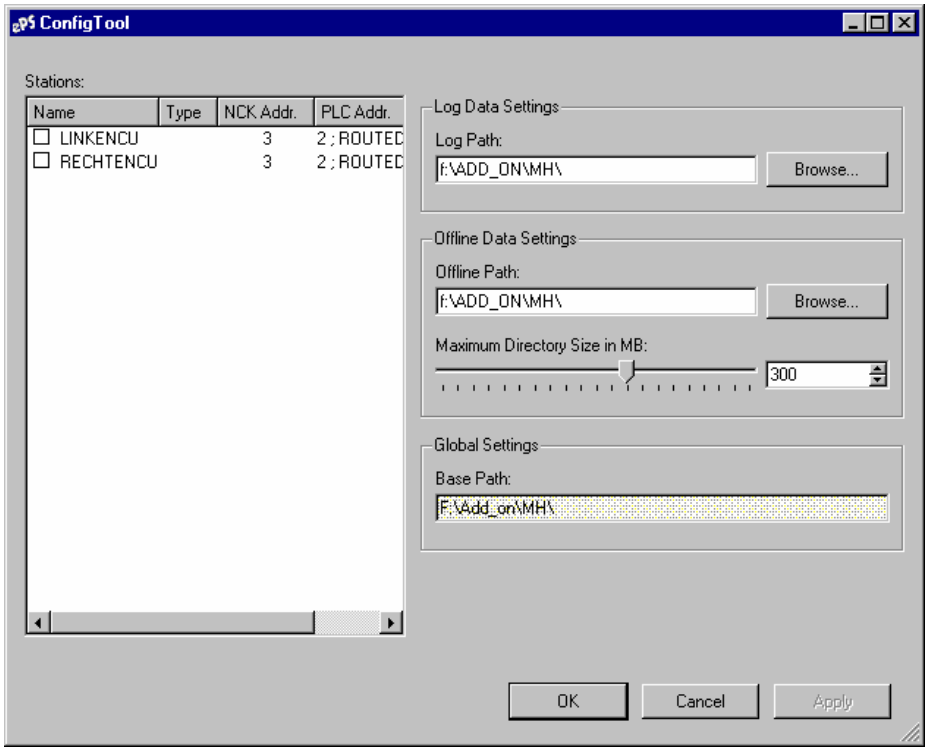


Fig. 7-26: 1:N configuration

Description of functions

ePS reads information from MMC.INI and NETNAMES.INI and displays the information it contains about the individual NCUs.

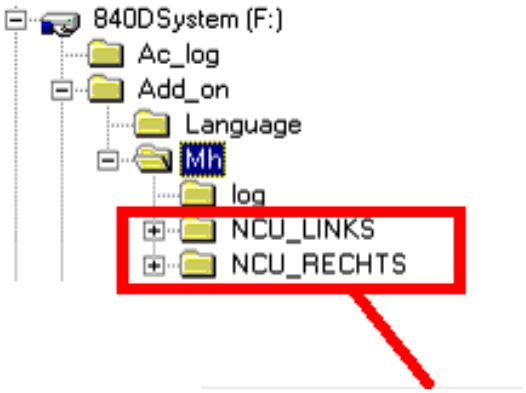
Selecting an NCU makes it available to ePS for connection to a database machine.

Changing the LOG path

Directories for the LOG files of the individually selected NCUs are created below this path.

Changing the path for OFFLINE data

Directories for the OFFLINE data of the individually selected NCUs are created below this path.



Directory structure

Fig. 7-27: Path for offline data 1:N

Changing the maximum directory size for OFFLINE data

Specify the maximum directory size for the OFFLINE data.

Saving the configuration

Press the OK button to save and activate the settings you have selected.

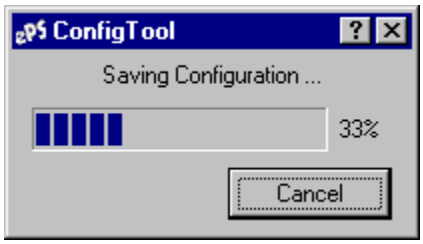


Fig. 7-28: Saving the 1:N configuration

When the HMI starts up the associated "machine handlers" are automatically started, one after the other.

■

A

A Appendix

A.1 Useful functions of the various device classes

Functions at the control

The device class defines which ePS Network Services functions can always be used on a particular machine.

Function	SINUMERIK	S7	IPC
Management	x	x	x
Connecting machine	x	x	x
Uploading alarm text file	x		
Disconnecting machine	x	x	x
Master data of the machine	x	x	x
Setting up functions	x	x	x
Synchronization	x	x	x
Repetition strategy	x	x	x
Prolog and epilog of measurement	x		
Fault services	x	x	x
Requesting help in the event of a fault	x	x	x
Requesting teleservice	x	x	x
Maintenance services	x	x	x
Data services	x		
Measurements and measurement series	x		
NC monitors	x		
Maintenance jobs	x	x	x

Functions on the PC

Function	SINUMERIK	S7	IPC
Machine information	**x**	**x**	**x**
Machine overview	x	x	x
Current control software Overview	x	x	
Viewing machine events	x	x	x
NC monitors data view	x		
PLC monitors data view	x	x	
Measurements and measurement series data view	x		
Corrective maintenance	x	x	x
Viewing maintenance jobs	x	x	x

Function	SINUMERIK	S7	IPC
Fault services	x	x	x
Requesting help in the event of a fault	x	x	x
Remote access	x	x	x
Executing remote access	x	x	x
Teleconference link	x	x	x
Setting up functions	**x**	**x**	**x**
Corrective maintenance	x	x	x
Editing maintenance schedules	x	x	x
Editing PLC monitors	x	x	
Editing NC monitors	x		
Editing test suites	x		
Editing measurement series	x		
Editing prolog and epilog of measurement	x		
Fault services	x	x	x
Control monitors (selection)	x	x	x
Machine trigger	x	x	x
Trigger on alarm group	x	x	
Trigger on PLC variable	x	x	
Combined trigger on alarms and PLC variable	x	x	x
Trigger on fault message at HMI	x	x	x
Time trigger	x	x	x
Server trigger			
Trigger on measurement series reaches limit value	x	x	
Trigger on maintenance job due	x	x	x
Trigger on PLC monitor reaches limit values	x		
Cyclic trigger on NC monitor	x		
Cyclic trigger on PLC monitor	x	x	
Trigger on fault message at PC	x	x	x
Actions	x	x	x
Upload file	x	x	x
Uploading HMI action log	x	x	
Uploading machine data	x	x	
NC status data	x		
Editing PLC trace	x	x	
Uploading a PLC data block	x	x	
Editing PLC monitor	x	x	
Workflow actions	x	x	x
Notifying persons via e-mail or SMS	x	x	x
Creating a maintenance job	x	x	x
Global settings	x	x	x
PLC settings	x	x	
Notification limitation	x	x	x
Function settings for PLC feedback	x		
Editing NC settings	x		
Copying function settings	x	x	x
Copying function settings to a new machine	x	x	x
Client/server communication	x	x	x
Synchronization times	x	x	x
Monitoring ePS services	x	x	x

Function	SINUMERIK	S7	IPC
Organizational tasks	**x**	**x**	**x**
Viewing and acknowledging maintenance jobs	x	x	x
Viewing and acknowledging service case help requests	x	x	x
Statistics/export	**x**	**x**	**x**
Multi-machine view	x	x	x
Viewing machine events	x	x	x
Viewing measurement series	x		
Viewing reports	x	x	x
Import	x	x	x
Importing a file	x	x	x
Importing a directory	x	x	x
Active import procedures	x	x	x
Export	x	x	x
Export PLC data	x	x	
Overviews	x	x	x
Synchronization overview	x	x	x
Monitoring ePS services	x	x	x
Management	**x**	**x**	**x**
Organization management	x	x	x
Addresses	x	x	x
Users	x	x	x
Machines: Editing master data (Creating/copying machines)	x	x	x
Organizational data	x	x	x
Download areas	x	x	x
Personal settings	x	x	x
Changing the password	x	x	x
Data protection guidelines	x	x	x
Resetting filter and search settings	x	x	x

A.2 Functions of the various roles (privilege matrix)

Admin	Administrator
IB	System startup engineer
SE	Service engineer
AS	Machine operator

	Own machines (PC)				Own machines (HMI)			
Assigning the rights to the individual roles	**Admin**	**IB**	**SE**	**AS**	**Admin**	**IB**	**SE**	**AS**
Management								
Machines								
Create new machine	x							
Create new machine as copy of an existing machine	x	x						
Delete machine	x							
Connecting machine						x	x	x
Disconnecting machine	x	x				x		
Change machine master data	x	x				x		
View machine master data	x	x				x		
Activate/deactivate machine	x							
Release machine / define rights for release	x	x						
Reject release of external machine	x	x						
View rights assigned for external machine	x	x						
Users								
Create new user	x							
Master data / change password of any user	x							
Delete a user	x							
Activate / deactivate user	x							
Enable locked out user	x	x						
Change password for own account	x	x	x	x		x	x	x
View / accept / reject data protection guidelines	x	x	x	x				
Address book								
Create new address	x	x						
Change address	x	x						
Copy address	x	x						
Delete address	x	x						
View address	x	x						
Organizational data								
View / change organizational data	x							
Workflow services								
Maintenance schedules/jobs								
Create new maintenance schedule		x	x					
View maintenance schedule		x	x					
Edit / schedule maintenance schedule / Append documents / Delete documents / Process responsible organization		x	x					
Delete maintenance schedule		x	x					
Copy maintenance schedule		x	x					
Edit maintenance job scheduling / Edit responsible organization / Edit info display		x	x					

	Own machines (PC)				Own machines (HMI)			
Assigning the rights to the individual roles	**Admin**	**IB**	**SE**	**AS**	**Admin**	**IB**	**SE**	**AS**
Process maintenance job / Change status / result		x	x			x	x	x
Delete maintenance job		x	x					
Service cases								
Create new service case manually		x	x					
Edit service case / Change status / Assign author / Link other events		x	x					
Requesting fault processing						x	x	x
Condition monitor services								
Measurement: Perform a measurement						x		
Measurement: Viewing measurement		x	x			x		
Measurement: Deleting measurement		x				x		
Measurement: Editing comment		x				x		
Measurement series:						x		
Measurement series: Performing measurement/Changing comment on a measurement within a measurement series						x	x	x
Measurement series: Editing parameters						x		
Measurement series: Viewing		x	x			x	x	x
Measurement series: Delete		x				x		
Measurement series: Editing comment		x				x		
Performance monitor: Configuration						x		
Performance monitor: Viewing		x	x			x	x	
Performance monitor: Delete		x				x		
Performance monitor: Editing comment		x				x		
PLC monitor: Configuration		x						
PLC monitor: Viewing		x	x					
PLC monitor: Delete		x						
Edit / delete OEM additions						x		
View OEM additions		x	x			x	x	
Control monitor services								
Create new control monitor		x						
View control monitor (configuration)		x	x					
Edit control / Change trigger / Change actions		x						
Activate / deactivate individual control monitors		x	x					
Activate / deactivate all control monitors simultaneously		x	x					
Delete control monitor		x						
Control monitor: Viewing notification limitation		x	x					
Control monitor: Changing notification limitation		x						
Control monitor: Viewing configuration PLC trace/trigger blocks		x	x					
Control monitor: Change configuration PLC trace/trigger blocks		x						

	Own machines (PC)				Own machines (HMI)			
Assigning the rights to the individual roles	**Admin**	**IB**	**SE**	**AS**	**Admin**	**IB**	**SE**	**AS**
Remote access								
Performing teleservice/"Provide"		x	x					
Participate in teleconference link		x	x					
Request teleservice / within "Request fault processing"		x	x	x		x	x	x
Event history								
View event history		x	x					
View event detail		x	x					
Delete event		x						
View control monitor configuration related to event		x	x					
Internal services								
Synchronize manually						x	x	x
Configure synchronization		x				x		
View configuration synchronization		x	x			x	x	
Configure monitoring of ePS services		x						
View configuration monitoring of ePS services		x	x					
Define / edit repetition strategy						x		
View repetition strategy						x	x	
Uploading an alarm model						x	x	x
Overview of machines								
View synchronization overview		x	x					
View monitoring of ePS services		x	x					
Data Services								
Create archive						x	x	
Read-in archive						x	x	
Clearing an archive						x		
Viewing/exporting/printing reports		x	x					
Platform services								
Import offline data								
Importing a file		x	x					
Importing a directory		x	x					
View active import procedures		x	x					
Miscellaneous								
View invoice data	x							
View configurations on HMI overview page						x	x	x

A.3 References

/R1/ ePS Network Services installation instructions
/R2/ Base software and HMI Advanced Commissioning Manual
/R3/ Description of Teleservice Session Types

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Feedback on the documentation

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