SmartLogger

User's Guide

Release 4.0

ABB

Content:

1 Introduction

Whether the requirement is a printer replacement or tools for Alarm Management rationalisation projects, the SmartLogger delivers a price competitive solution with a comprehensive set of tools for configuration, logging, supervision and data analysis.

The SmartLogger and the associated programs have been under continuous development since 1998 and is today a recognized player on the global market for Alarm Management tools. It is designed to handle data from all kinds of text based data sources and compared to other printer replacement solutions, the SmartLogger has the advantage that events are validated and stored in a database, which makes it a perfect foundation for subsequent analysis.

1.1 Conventions and definitions

✋	Important note
Alias	Database alias specifying database parameters like path and database driver.
BDE	Borland Database Engine. A set of DLLs and support files that allow programs to access databases.
Control	The term 'control' is used when describing the user interface. A 'control' is a common name for edit boxes, push buttons and other items on a dialog.
ES	External Storage. Option used in connection with event consolidation in MS SQL or Oracle server databases.
Event	A common name in the process industry for an occurrence which is reported to the operator and/or a printer. An event in the SmartLogger terminology means a sequence of characters normally sent to the printer followed by a carriage return.
Field	A field corresponds to a column in a database table.
LPR	Line Printing Remote.
LPD	Line Printer Daemon. The LPD is a printer server that can receive print requests for several printers via TCP/IP network.
MDI	Multiple Documents Interface.
NM	Notification Module.
PDF	(Adobe) Portable Document Format. This is the format used for the online User's Guide.
Record	A record is one row of data (one event) in a database table.
RT	Remote Transfer.
SM	Status Module.
SMS	Short Message Service.
SQL	Structured Query Language. Standard language for accessing databases.
US	Utility Server. Server module for remote access of SmartLogger status and remote event subscription.
Template	Describes the structure of the destination table and how data are to be decoded. Templates are designed with the SmartBuilder™ program.
WAB	Windows Address Book
WD	Watchdog.

1.2 Templates

The main purpose of a template in the SmartLogger philosophy is to define how raw text are decoded and split up so it can be stored in a database. In addition to this the templates feature possibilities for:

- Logging of reports
- Color mapping
- Text conversions
- Tab conversions
- Multi-line merge

The SmartLogger is shipped with a number of standard templates.
One of the templates is designed for demo configurations, where SmartSim is used as data source.
Please refer to the SmartLogger Release Description for a complete list of all standard templates included in this program release.

You may have to build your own templates, in order to adapt the SmartLogger to your demands and requirements. This topic is described in the SmartBuilder User's Guide.

> A template defines how incoming events are to be decoded and split up. It also specifies the table structure of the destination table.

2   Installation and set-up

2.1   System requirements

Computer: A IBM PC compatible computer with a Pentium III 400 MHz processor and 512 MB RAM.

Operating system: Windows 2000/XP/2003/XP

Disk space: 50 MB free space for system files and additional space for data tables. 1 GB for data storage will be sufficient for most configurations.

2.2   Installation

The SmartLogger installation package is provided as a downloadable zip file. When downloaded execute the following:
1. Unzip all content to a temporary folder
2. Locate the SmartLogger40.msi file and run it.
3. Follow the instructions on screen.

2.3   Registration

When SmartLogger is executed the first time after installation the registration dialog will appear:
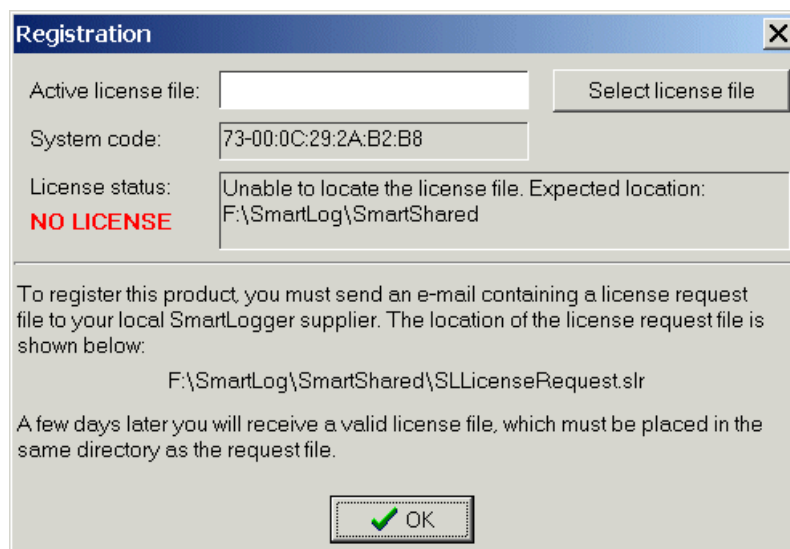
Figure 2-1

If a license file is available this can be applied by pressing the *Pick license* button. If no license file is available you must send the *license request file* to your local SmartLogger supplier for registration.

🖐   All SmartLogger packages are shipped with a time limited trial license ensuring that the SmartLogger is fully operational until the valid license file is received.

3   Quick start

This section describes step by step the basic operations required when configuring the SmartLogger for the first time.

If you intend to configure the SmartLogger for demo purposes in connection with the SmartSim event simulator, you can skip step 1 and go directly to step 2.

Step 1: Building a template
The template is essential for the event logging and is therefore the first thing you must define. If you can not use any of the templates included in the SmartLogger package, you must build your own according to your requirements and your data source. Please refer to the SmartBuilder User's Guide for more information.

Step 2: Configuring a port
When the template is ready, you must set up a port for your data source. How to do this is described in section 4.2 Port setup. In this quick start example, you should configure port 1 for event logging.

Step 3: Activating the port
The activation of the port is done from the Port Status dialog, which can be opened by clicking on the status icon on the toolbar. In this case it will be the icon with a '1' in a red box. The Port Status dialog is described in section 4.3 Port activation and status information.

Step 4: Verifying event logging
You can verify that the event logging is active either by looking at the statistic counters in the Port Status or by opening an Online View. The Online View function is described the section 4.4 Online views (MDI).

Step 5: Viewing stored events
The validated events are stored in a database table, which can be viewed with SmartClient as described in the SmartClient User's Guide.

4 Basic operations

4.1 Main menu

Menu	Item	Description
File	Text File Import...	Opens the Text File import dialog.
	Exit	Program exit.
View	Online▸	Used to access online views. A pop up menu containing all active ports is shown.
	Maximize event view	If checked then status bars and toolbars are hidden on Online views.
	Port Status...	Opens the Port Status.
	Remote Transfer...	Opens the Remote Transfer status view.
	Internal messages (log)...	Opens the text based trace log in Notepad.
	Internal messages (trace)...	Opens the table based trace log in MDI window.
Config	Ports...	Opens the port configuration dialog.
	Color Mapping...	Opens the Color Mapping dialog
	Remote Transfer...[1]	Opens the configuration dialog for Remote Transfer setup.
	External Storage...	Opens the configuration dialog for External Storage setup.
Tools	Alias Manager...	Opens the Alias Manager tool.
	Problem Report	Starts generation of a problem report.
	Shared Resources...	Shows the settings that are shared by all Smart* applications.
	Template Builder...	Opens the SmartBuilder application.
	Utility Server...[2]	Opens the Utility Server.
	Options...	Opens the Options dialog.
Window	Tile Horizontal	Tiles all active MDI windows horizontally.
	Tile Vertical	Tiles all active MDI windows vertically.
	Cascade	Cascade all active MDI windows.
	Auto arrange	Is set then windows are automatically arranged according to latest selection (horizontal or vertical)
Help	User's Guide	Shows this User's Guide in PDF format.
	Registration...[3]	Opens the registration dialog.
	About...	Shows the credits, license information and release version.

4.2 Port setup

In order to log events, a port must be configured for this purpose. The port configuration dialog is opened from the menu item Config | Ports...

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[1] Only visible if Remote Transfer add-on is registered
[2] Only available if the Status Module add-on is registered
[3] Only visible if the SmartLogger is unregistered. If the SmartLogger is registered, this dialog can be viewed by pressing <Ctrl>-R
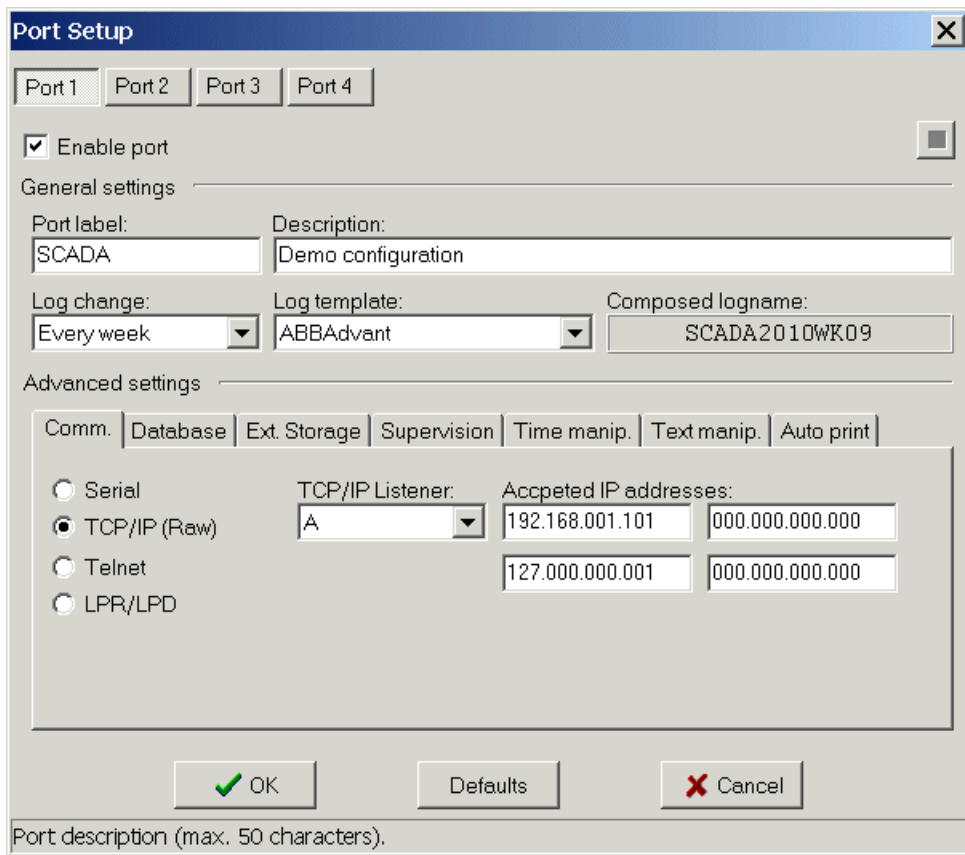
Figure 4-1

Port setup	
Enable port	Enables / disables the port for configuration and event logging.
Stop button	If the port is activated, it can be stopped by pressing this button.
General settings	
Port label [1]	Label to identify the port. Is also used to generate unique log names.
Description	Descriptive text for the port.
Log change [2]	Specifies how often a new log table is created. The log change setting also affects the log name.
Log template	Specifies the template used for the port. Must be configured in advance with SmartBuilder.
Composed Log name [2]	Shows the composed name based upon the port label and the log change settings. The log name is composed by SmartLogger, and can not be modified by the user.
Advanced settings	
	Refer to separate descriptions below.

4.2.1   Communication settings

Serial port settings

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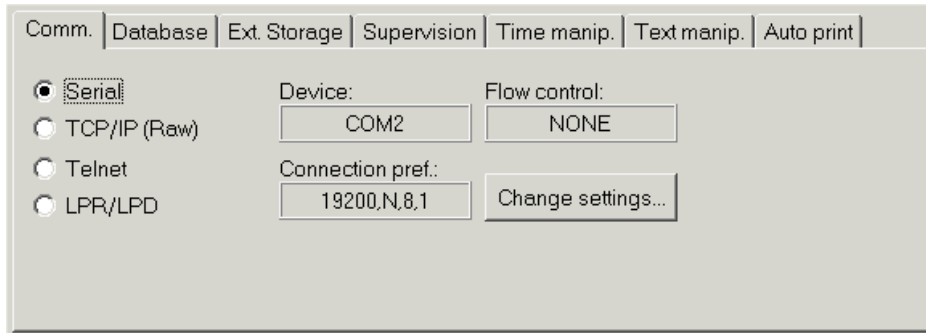
Figure 4-2

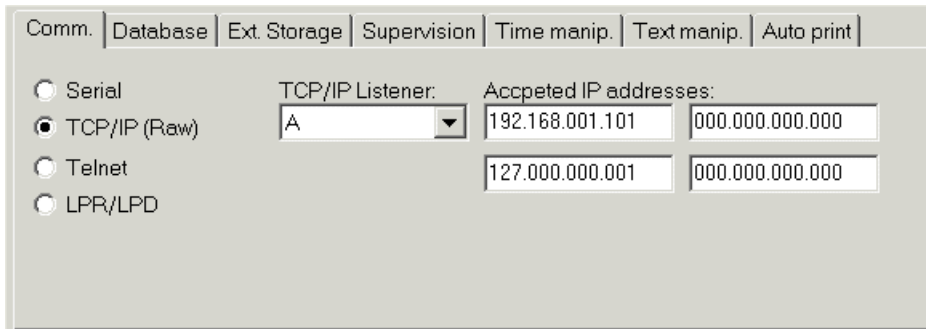| Serial port settings	
Device	Shows the selected device. Only devices actually available in the system can be specified.
Flow control	NONE or XON/XOFF
Connection pref.	Shows the currently selected connection preferences: baud rate, parity, data bit, stop bit.
Change settings…	Press this button to change the serial settings.

TCP/IP(raw) port settings

Figure 4-3

TCP/IP(raw) port settings	
TCP/IP Listener	Specifies the listener associated with this port. Multiple ports can share the same listener as long as the remote data sources use different IP addresses.
Accepted IP addresses	TCP connection requests will only be accepted if the remote IP address matches one of the 4 IP addresses that can be specified. Usually one IP address is sufficient, but in configurations with redundant data sources and redundant network up to 4 IP addresses are required.

Telnet port settings

Figure 4-4

Telnet port settings	
IP address	Identifies the remote server hosting the telnet server.
Port	Specifies the socket port to be used for communication. Telnet servers usually use port 23.

LPR / LPD port settings

Figure 4-5

LPR/LPD port settings	
Printer queue name	The printer name identifies the printer queue that is associated with the current port. I.e. in this case, the SmartLogger Line Printer Daemon will make sure that all print requests for "SLPORT1" will be redirected to this port.

4.2.2   Database settings

Figure 4-6

Database settings	
Enable local	Should always be enabled. Only if SmartLogger is used in a

|	
storage.	redundant configuration with external storage enabled, this option can be disabled. If disabled no local storage of events will be performed.
Database alias	Destination for log tables. Default alias LOGDATA should be used for standard configurations. Refer to section 6.1 Database Alias Manager for a description of aliases.
User name	Specifies the database user to be used in case of database access limitations.
Password	Specifies the database password to be used in case of database access limitations.

4.2.3   External Storage

External Storage is used for storage of events in external server database (Oracle or MS SQL Server). If enabled event will be stored in a text queue and then translated to the database server when possible.
Before enabling a port for external storage the database connection must be configured as described in section 8.2 External Storage.

The typical procedure for preparing a new system on a remote consolidation server will be:
1. Configure basic ES settings as described in section 8.2 and test the connection.
2. Enter location and source.
3. Press the *Get Procedures* button
4. Pick the wanted *Insert*, *Commit* and *Init* procedures from the drop down lists
5. Press the *Execute Init* button

If successful a confirmation message prompt will be shown.
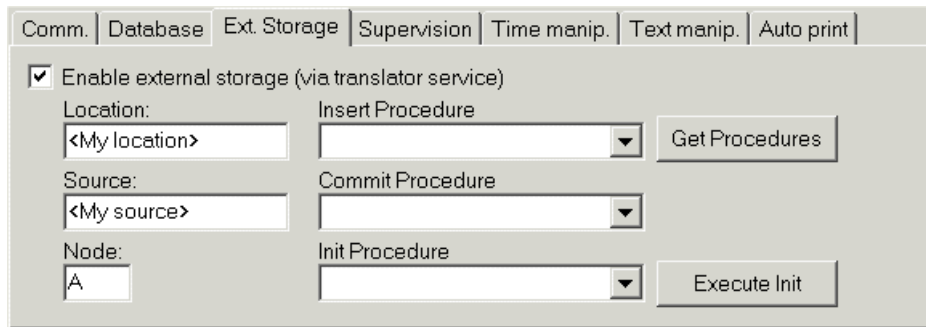
Figure 4-7

External Storage	
Enable…	If set, queue files for external storage are generated.
Location	Location, source and node identifies the origin of the event.
Source	See above.
Node	See above. In redundant configurations the Node id is used to merge events from multiple SmartLoggers. In this case the Node must be either A, B or C.
Insert Procedure	Stored procedure used for inserting events into the consolidation server.

Commit Procedure	Stored procedure used for committing changes in the consolidation server.
Init Procedure	Stored Procedure for initializing a new system in the consolidation server. The Init procedure is only used when initializing a new system using the *Execute Init* button
Get Procedures	Updates the pick lists with a list of available stored procedures from the database server.
Execute Init.	Use this to initialize a new system in the consolidation server. When invoked Location, Source, Node and template settings are transferred to the server. Location and source in combination identifies the system and must be unique.

4.2.4 Supervision
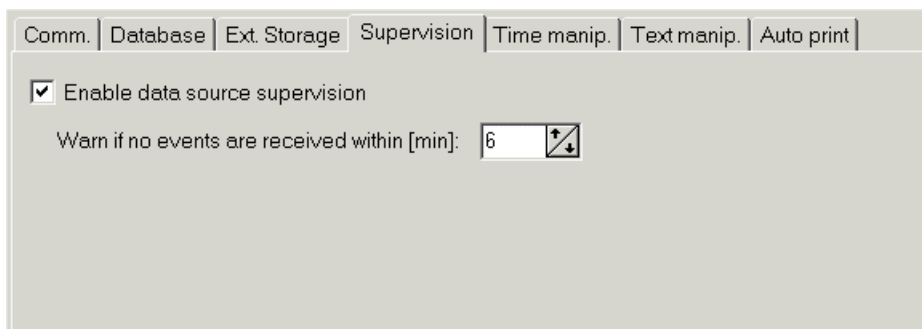
Figure 4-8

Supervision	
Enable data source sup.	If checked, data source supervision is active. See section 5.2 Supervision for details
Warn if no…	If no data is received within the specified time period, an alert is raised.

4.2.5 Time manipulation

The time manipulation features makes it possible to correct or adjust timestamps from data source that does not provide proper timestamps. All adjustments are applied to the raw text event before the template based decoding is performed.

Figure 4-9

Time manipulation

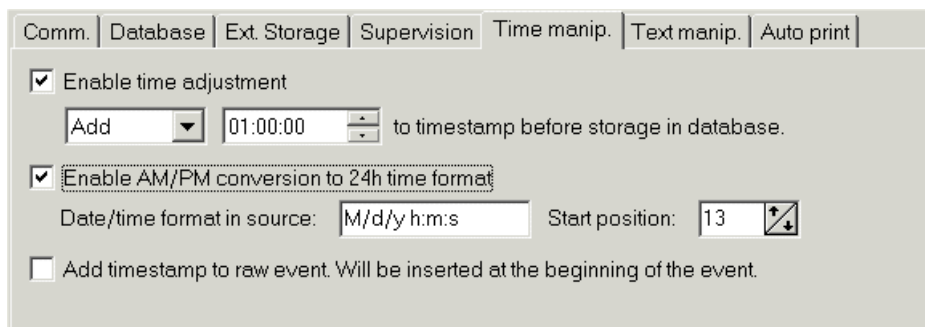|	
Enable time adjustment	If enabled, timestamp in event will be adjusted according to the specified settings.
Enable AM/PM conversion…	SmartLogger templates does not support AM/PM timestamps. If logging from an AM/PM timestamp, AM/PM conversion must be enabled in order to decode the timestamp. M(onth), d(ay), y(ear), h(our), m(inute) and s(econd) identifies sequence while *Start position* determines where in the event SmartLogger should find the AM/PM timestamp.
Add timestamp…	If enabled a timestamp is inserted in the beginning of the raw event.

4.2.6   Text manipulation

Many older data sources produce unwanted text combinations or may send printer codes to the SmartLogger. With the text manipulation feature these issues can be corrected before the event is validated and decomposed. Typical issues that need correction:

- Removal of printer codes
- Conversion of symbols to plain text
- Conversion of symbols / characters to native characters
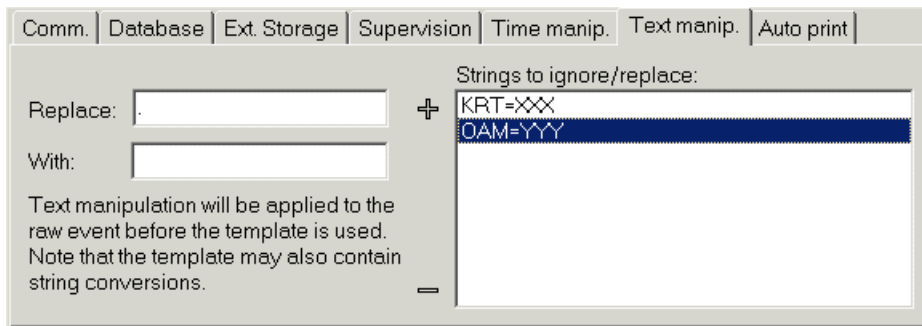
Figure 4-10

Text manipulation	
Replace	Enter text here that should be replaced or removed from the events. If a string with printer codes is pasted into the box, the codes will automatically be converted to an ASCII presentation, like for example <ESC> for the escape character.
With	Enter replacement string here and pres the *Plus* button. If the *With* box is left empty then the *Replace* string will be stripped from the data source.
Strings to ignore/replace	Shows a list of all strings that should be ignored or replaced.

The template may also contain string replacements. User-defined string replacements should always be configured in the Port configuration dialog while template defined string replacements should be maintained by the template vendor.

4.3 Port activation and status information

When a new port is configured and enabled, you will be prompted to activate the port. If you choose not to start the port now, the corresponding status icon on the toolbar will remain red until the event logging has been activated manually from the Port Status or until the SmartLogger program has been restarted.

🖐   At program start-up the SmartLogger automatically activates event logging for all configured ports.

For each configured port miscellaneous status information is available. The overall status for all ports is shown on the toolbar on the main form, while a detailed status can be obtained by pressing the corresponding status icon on the toolbar or by selecting the menu item *View | Port Status..*
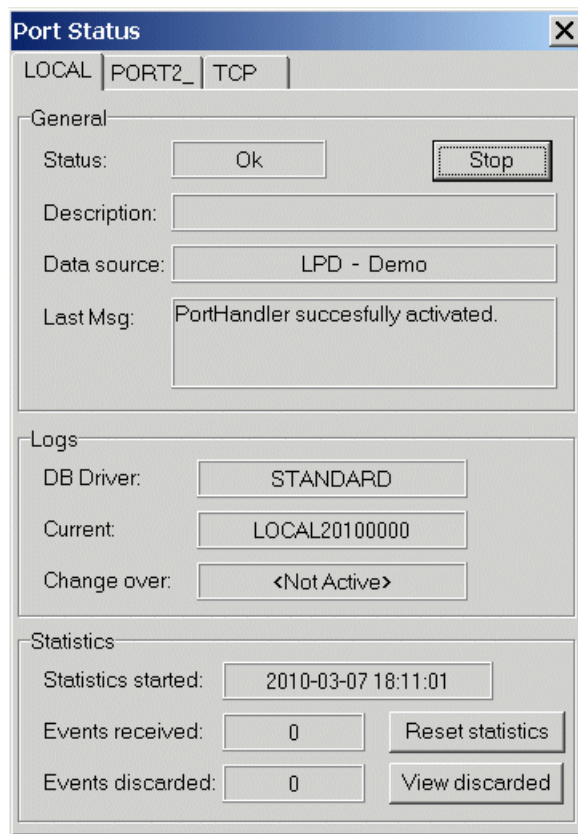
Figure 4-11

General	
Status	General port status, ACTIVE, WARNING, ALERT, STOPPED or ERROR.
Description	Port description.
Data source	Source type and either serial port, telnet or IP address / listener used.
Last Msg	The last message that has been reported by the port supervision. All messages can be found in the Internal Messages Log as described in section 5.1 Internal messages
Start/Stop	Used to manually start and stop a port.

button	
Logs	
DB driver	Shows the database driver used for data logging.
Current	Name of the log table that is currently being used.
Change over	Name of the change over log table if the change over period is active. Please refer to section 9.3 Log change philosophy for a description of the change over feature.
Statistics	
Statistics activated	Date and time for last reset of the statistic counters. The statistics are automatically reset when the SmartLogger is restarted.
Events received	Number of events received since last reset.
Events discarded	Number of events discarded since last reset.
Reset button	Resets the statistic counters.
View button	Opens the log file containing the discarded events (if any).

If you intend to disable a port completely, it is not enough to stop the logging from the Port Status. The port must also be disabled in the "Config | Ports" dialog – otherwise it will be activated next time the SmartLogger is restarted.

4.3.1 Toolbar information

In the SmartLogger toolbar a number of status icons/buttons are shown. The color of the status icons indicates the overall status for the corresponding port or module.

Figure 4-12

**Status indications:**
Green: Port or module is configured and started.
Yellow: Port or module is configured and started, but a warning has
                occurred.
Orange: Port or module is configured and started, but an alert has occurred.
Red: Port or module is configured, but stopped.
Faded out: Port or module is not configured.

If one or more ports/modules have the warning or alert flag set, an 'acknowledge' button will appear next to the status icons. When pressed, all warnings are reset and the button will disappear again. The 'acknowledge' button is shown as a green checkmark.

4.4 Online views (MDI)

The Online View shows incoming events as plain text and has a capacity of 2000 event lines. To view more than the latest 2000 events, the SmartClient has to be used. Please refer to the SmartClient User's Guide for more information.

The Online View can be opened from the menu: View | Online | <port label> or by pressing the associated toolbar icon
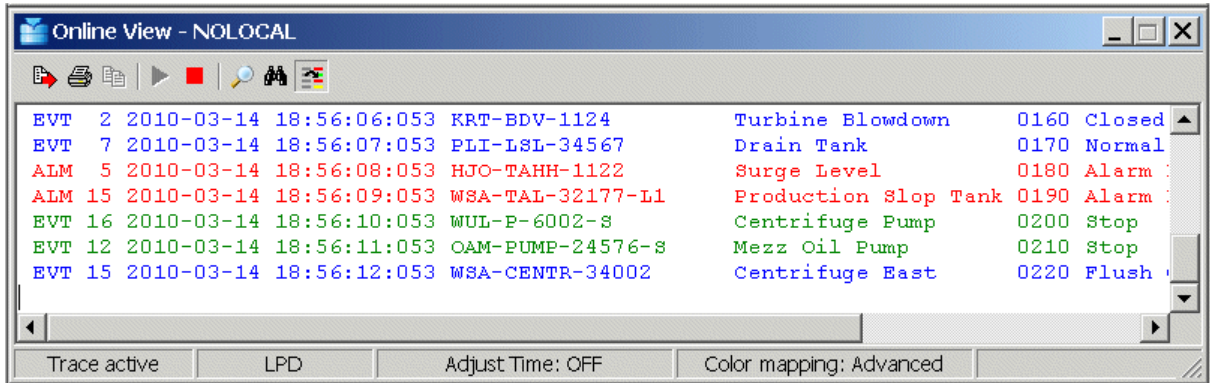
Figure 4-13

In order to perform an action, like search or copy, on the content of the Online View, the trace must be stopped. Stopping the trace does not affect the event logging for the port; it only stops updating of the Online View.

The Online View tool bar:

Figure 4-14

| Icon	Description	Click action
	Dump	Dumps the entire content of the Online View to disk.
	Print	Prints the entire content of the Online View.
	Copy	Copies the selected text to the clipboard.
	Start Trace	Starts the online trace of events.
	Stop Trace	Stops the online trace of events.
	Peek buffer	If enabled, unprocessed event lines are shown in a separate view.
	Search	Opens the search dialog.
	Color mapping	Toggles the color mapping feature on/off.

The Online View context menu offers the following functionality:

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Menu item	Description
Copy	Copies the selected text to the clipboard.
Show Toolbar	Shows or hides the toolbar.
Show StatusBar	Shows or hides the toolbar.
Clear all	Clears the content of the Online View.

4.5   Report Logging

A SmartLogger port can be configured for event logging, report logging or both. The nature of the port regarding event or report logging is defined in the associated template. For details on how to create a template for report logging, see the SmartBuilder User's Guide.

The following figures show an Online View port configured for both event and report logging:
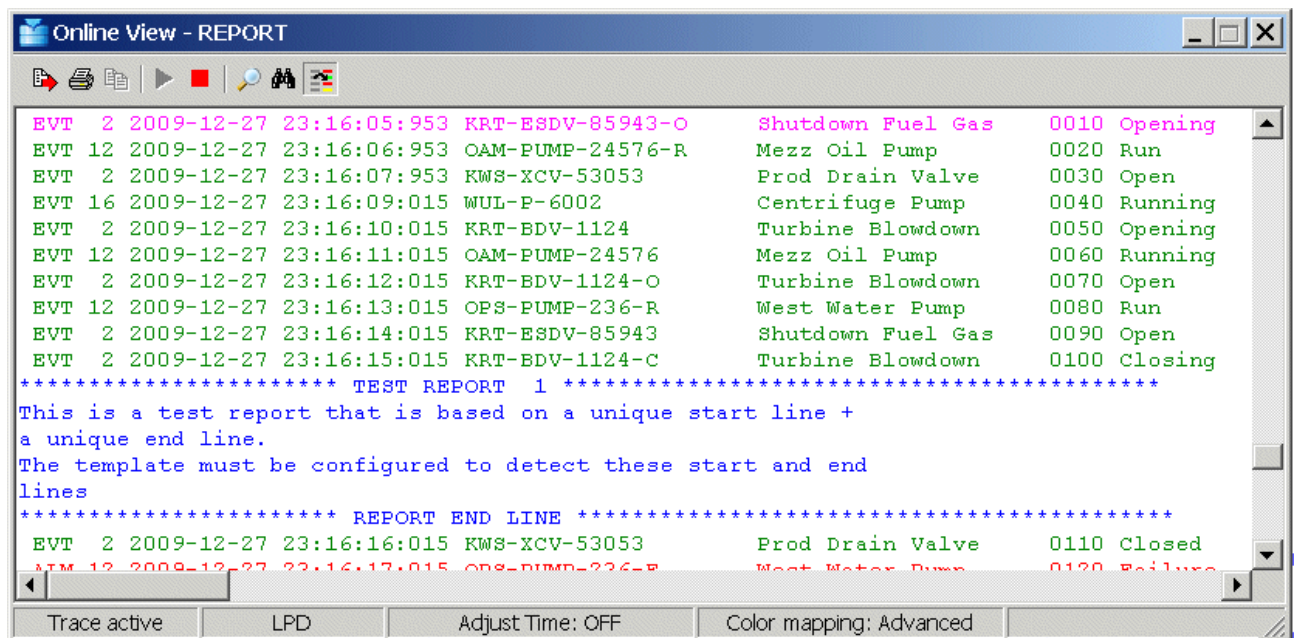
 Figure 4-15

In the example above a report is send to the SmartLogger port while events are processed as normal. The detected report lines a colored blue and the entire content of the report is stored in a separate text file.

The location of reports are *..\SmartLogger\ReportQueue* and each report will have the following naming convention:

> REP<port ID>_<Report name>_YYYYMMDD_hhmmss.log

Port ID is equal to the port number (1..4).
Report name is defined in the template.

Up to 6 report definitions can be configured per template.

For work flow description of the report handling please see section 9.1 Work flow diagram.

5 Maintenance

5.1 Internal messages and trace log

SmartLogger keeps track of all configuration changes and incidents, which may be of interest to an operator or system responsible. The messages are treated as *Internal messages* and are classified in the following severity levels:

Information	Standard messages indicating that the application has been started, port configuration has been changed etc.
Warning	Appears when the SmartLogger has detected an error in a module, in data validation or other incidents that later on may lead to serious data loss.
Alert	A warning the might lead to an error or data loss if no action is taking. This could be disk running full or no connection to a data source.
Error	Serious error has occurred. The particular module or port has been stopped.
Fatal	Last error before application close.

The internal messages can be viewed from the menu item *View | Internal Messages (trace)…*

Figure 5-1

or *View | Internal Messages (log)…*

Figure 5-2

The text log file contain more information and for a longer period compared to the trace view. The level of information stored in the text log is dependent of the *Trace Level* set in the Application options dialog:

Trace Level	Information stored in trace log
Normal	[I]nformation, [W]arnings, [A]lerts, [E]rrors and [F]atals are logged
Extended	[D]ebug information is logged in addition to the standard severities.
Heavy	Detailed [T]race information is logged as well.

5.2 Supervision alerts

SmartLogger has a number of built-in supervision features that will trigger an *alert* message if a condition that can lead to data loss is detected. If combined with a SmartNotification (add-on) these alert messages can be redirected to maintenance supervisors using email or used to trigger an exe application for customized handling.

The following list is a summation of supervision alerts in SmartLogger:

Data source supervision — Supervises the data source. If no events are received within a specified time then an alert is raised. This feature must be enabled individually per port in Port setup.

Disk space supervision — Supervises the free disk space on the destination folders for all BDE aliases in use. If free disk space gets below a specified size an alert is raised. This feature is configured in Application

options.

Serial port supervision	Supervises buffer overrun errors on serial board. If triggered characters have been lost. This error is very seldom on modern computer system but can happen on serial boards without FIFO buffers. Enabled by default for all serial ports.
Queue supervision	Supervises event queues for External Storage and Remote Transfer options. Triggers an alert if a queue file cannot be created or renamed and thereby causing loss of events. Enabled by default for all queues.

5.3 Shared Resources

A number of resources (file or folders) are shared between different Smart* applications. Usually the first Smart* application installed will create these references. If needed the settings can be viewed and changed from the menu item *Tools | Shared Resources…*:
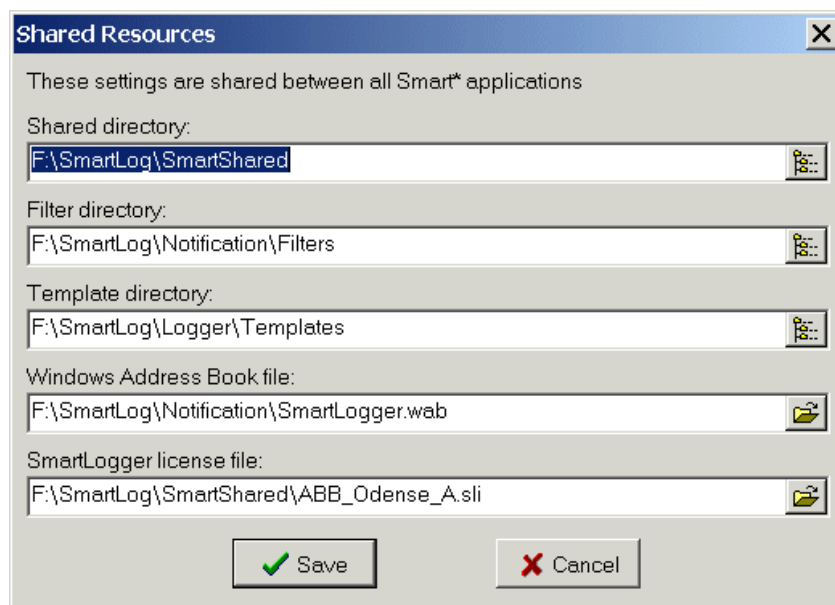
Figure 5-3

Shared Resources	
Shared directory	Default directory for shared files and license files.
Filter directory	Filter files for Utility Server (remote access) and SmartNotification.
Template directory	Templates shared by SmartLogger and SmartTranslator.
Windows address book	Common wab file used by SmartLogger and SmartNotification.
License file	License file covering all Smart* application on this machine.

5.4 Problem report

In case of problems with the SmartLogger configuration, the problem report feature must be used when submitting a problem report. The feature is invoked by selecting the menu item *Tools | Problem Report* and accepting to the confirm prompt:
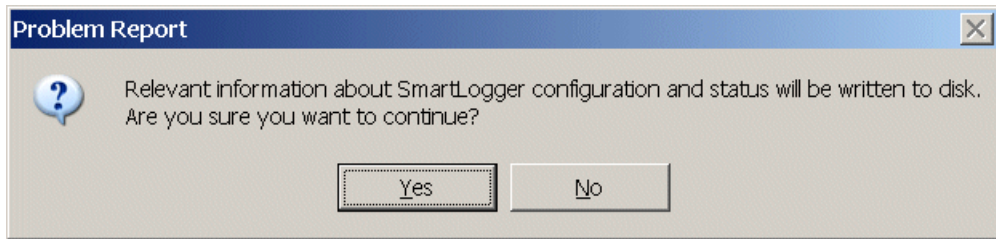
When finished a new folder containing all relevant files and information has been created:
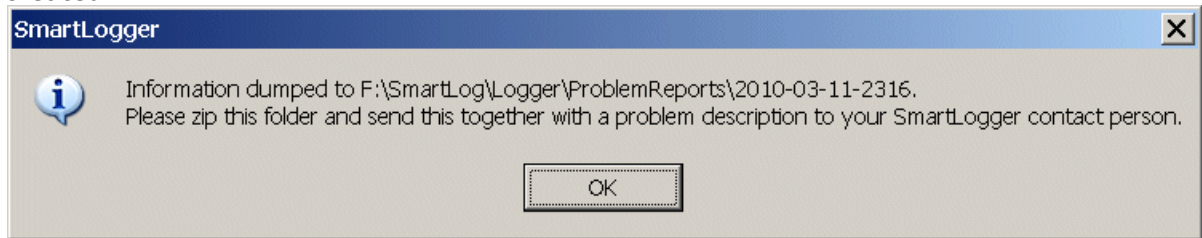
When zipped and submitted, the SmartLogger support responsible can test or simulate most situations and thereby being able to offer better support.

6   Utilities and options

6.1   Database Alias Manager

A database alias is needed in order to access a database. It defines the database driver, connection parameters and the destination path / database type.
The Alias Manager can be used to add, modify and delete aliases, with the restriction that only the basic settings, like database driver, destination path/database, default user etc. can be changed.
Normally the user only needs to access the basic settings, as the Alias Manager automatically configures all advanced settings.

If it is required to access the more advanced alias settings, the BDE Administrator tool has to be used. The BDE Administrator can be started by selecting *Settings | Control Panel | BDE Administrator* from the Windows start menu.

The Database Alias Manager dialog is opened from the menu item *Tools | Alias Manager...*
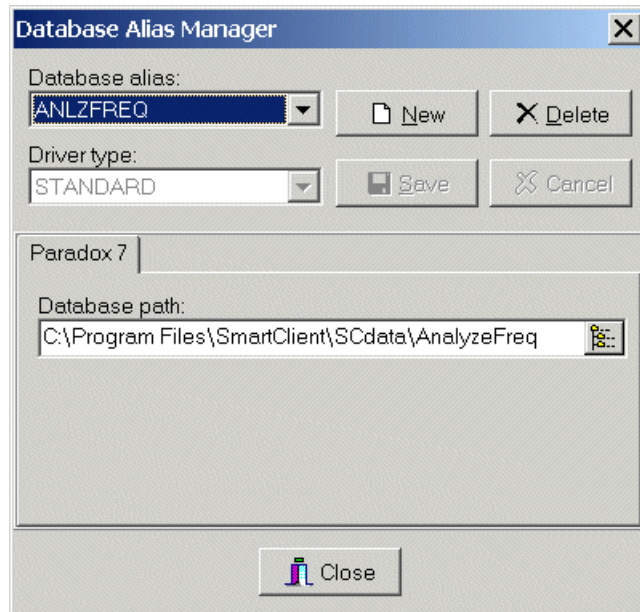
Figure 6-1

Database Alias Manager	
Database alias	Lists all aliases supported by the Alias Manager.
Driver type	Lists all database drivers available.
Database path:	Folder where all tables are located. To change the database path, press the small icon right to the current path value.

> It is recommended always to use the STANDARD (Paradox) driver for SmartLogger configurations unless it is explicitly required to use another database driver.

For more details about the Database Alias Manager features, see the SmartClient User's Guide.

6.2 Color mapping

SmartLogger supports two types of color mapping: Standard and advanced color mapping. In both modes the color mapping is performed according to the template settings and the event validation status.
The SmartLogger uses the following event categories:

Validated event: Events that are validated correctly, but do not match the *Alarm mask* pattern specified in the template.

Validated alarm: Events that are validated correctly and match the *Alarm mask* pattern specified in the template.

Excluded text: Text lines that match the text pattern specified in the *Exclude masks* in the template will be treated as excluded text.

Validation error: Events that did not pass the event validation.

The colors used for color mapping is configured from the menu item Config | Color Mapping...
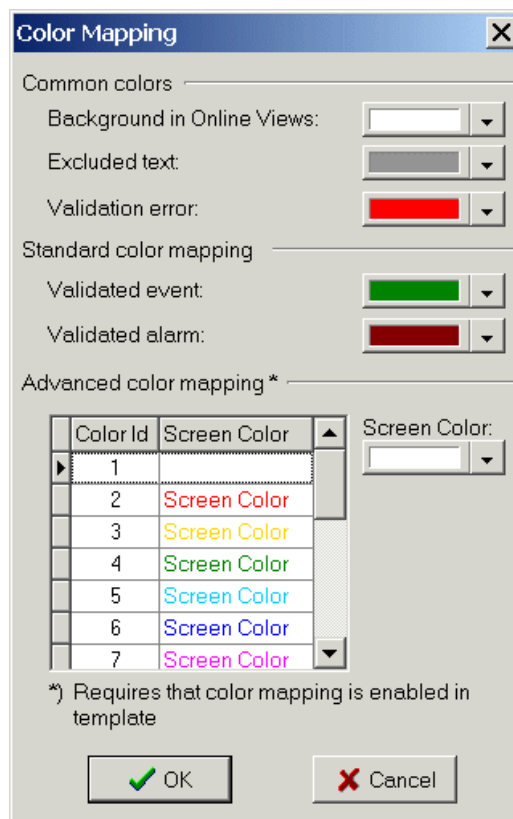
Figure 6-2

6.2.1 Standard color mapping

Standard color mapping can be used for data sources that does not provide an unique color id. The standard color mapping uses a simple text pattern (defined in the template) to distinguish alarms from events.

6.2.2 Advanced color mapping

For data sources (like ABB Advant systems) that provides a unique color id, it is possible to associate this color id to a user-defined color. In this version color id's in the rage from 1 to 16 is supported.

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The field used for the color mapping must be specified in the Template. For more information on how to set the color field, please see the "SmartBuilder User's Guide".

6.3 Application options

The options dialog can be opened from the menu item Tools | Options...

6.3.1 Supervision
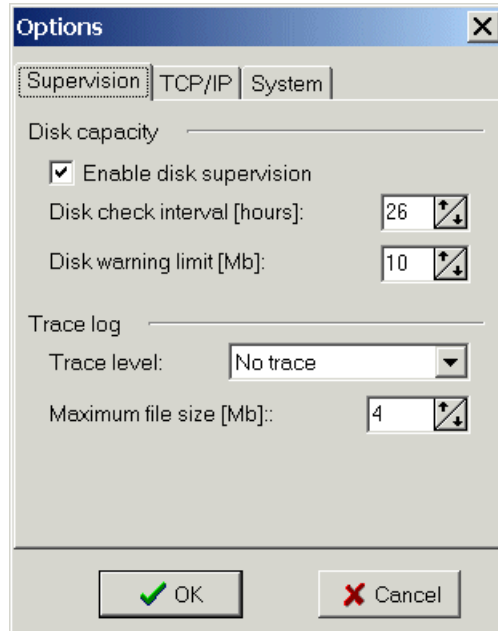
Figure 6-3

Options – Supervision – Disk capacity	
Enable disk supervision	If checked, disk space supervision is active. The disk capacity check raises an alert, if the free space on the destination disk(s) is running low. The disk capacity supervision does not support database servers or disks located on remote computers.
Check interval	Time in hours between each disk space supervision check.
Warning limit	Minimum MB free disk space that is accepted.
Options – Supervision – Trace log	
Trace level	Trace level can be set to No trace, Normal, Extended or Heavy. For a description of each trace level see Internal messages and trace log.
Max. file size	When the maximum file size is exceeded, the current trace logfile is renamed to *.old and a new log file is created.

6.3.2 TCP/IP Listeners

TCP/IP listeners are used for handling TCP/IP connections from remote data sources and to direct the connection to the correct SmartLogger port.
Normally only one listener is needed as it can handle connections from multiple data sources as long as they come from different IP addresses. In the case that several data sources, using TCP/IP raw connections, come from the same IP address, additional listeners must be used.

If remote printing is used (LPR / LPD) then only one listener is required. In this case the data sources are identified by a virtual printer name, which is specified in the port configuration dialog.
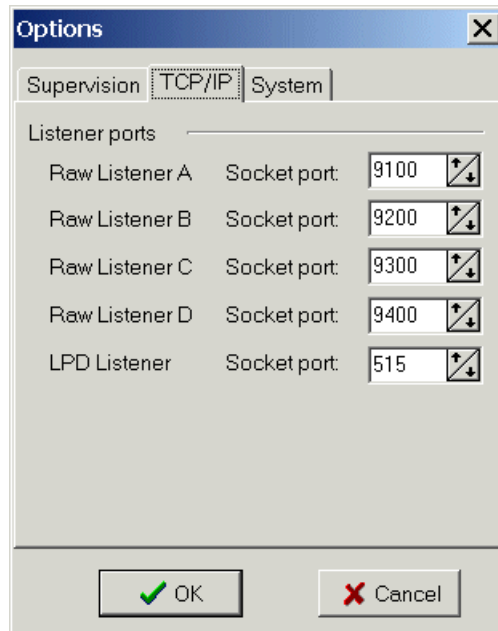
Figure 6-4

Options – TCP/IP – Listener ports	
Raw Listener A..D	Configures listener A..D. Multiple listeners are only needed if several data sources from the same IP have to be connected.
LPD Listener	Listener used for SmartLogger Line Printer Daemon. Default socket port number is 515.

6.3.3 System
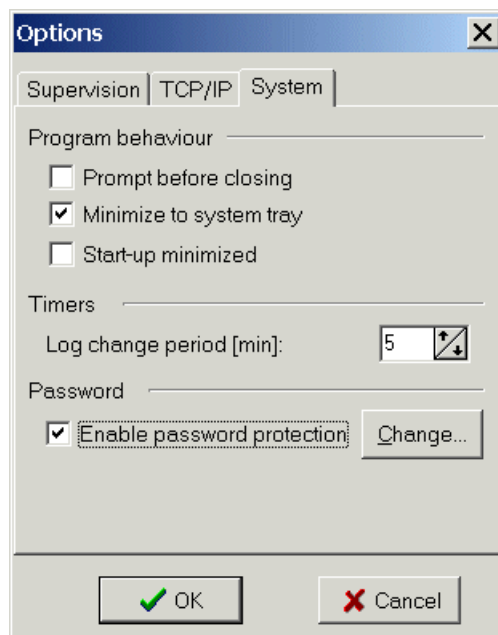
Figure 6-5

Options – System – Program behaviour	
Prompt before closing	If checked, you will always be warned when trying to exit the SmartLogger. The only exception is if Windows itself is shutting down.
Minimize to…	If checked, SmartLogger is minimized to the system tray instead of the application bar.
Start-up minimized	If checked, SmartLogger will start-up minimized.
Options – System – Timers	
Log change period	See to description below.
Options – System – Passwords	
Enable password…	See to description below.

Log change period
The 'Log change period' determines the period after a log change where events from the previous day are still accepted. This feature ensures that events from a data source without time synchronization are not lost during day shift period.
The change over period is only relevant if the used template decodes the date/time from the event. Please refer to Appendix 9.3 Log change philosophy for a detailed description of the log change philosophy.

Password protection
When the password protection is enabled, then all configuration dialogs and program exit are password protected. Although the program exit is protected, the SmartLogger will not prompt for a password in the case of a computer shutdown.

7 Utility Server (remote access)

The Utility Server makes it possible for other applications like SmartStatus and SmartNotification to get status information from the SmartLogger and to subscribe to events.

7.1 Main view

The Utility Server main view can be shown by clicking on the 'U' icon on the toolbar or by selecting the menu item *Tools | Utility Server…*
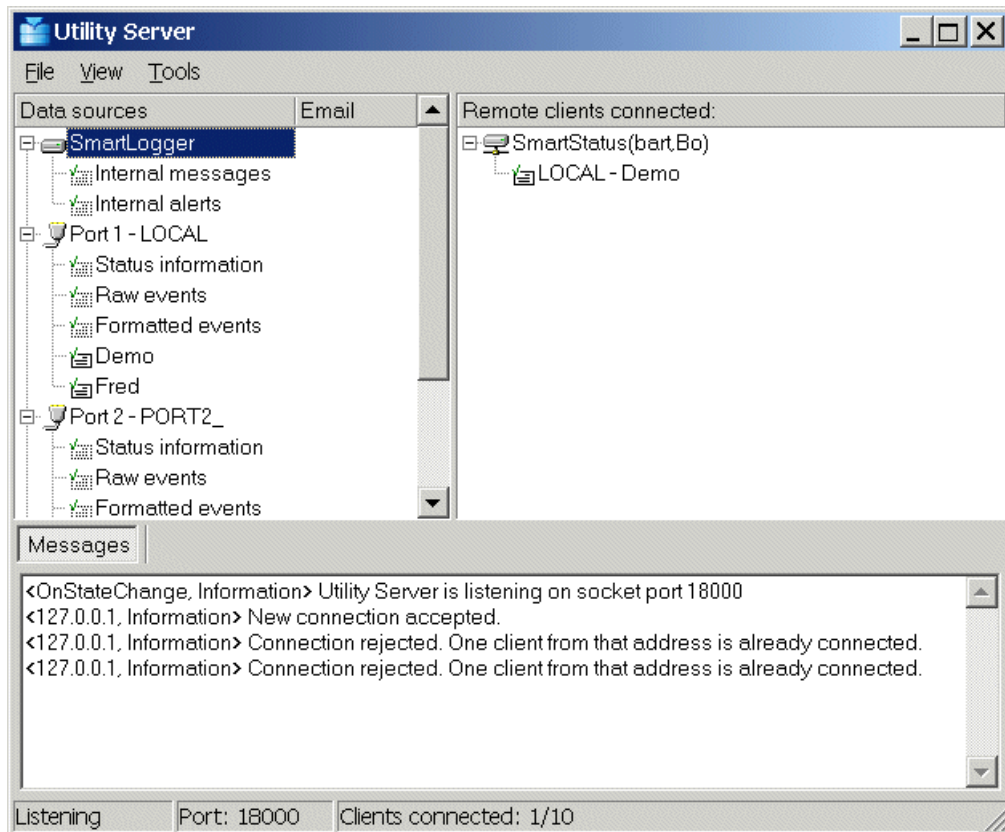
Figure 7-1

The main view is divided into three panes:

Configured data sources
The 'Configured data sources' tree view contains all available data sources related to the SmartLogger itself and all configured ports. The SmartLogger will as default have the following filters available:

Internal messages: For subscription to application internal messages.

Internal alerts: Internal alerts is a subset of Internal messages covering messages with the severity "Error" and "Alert". This makes it possible for remote clients to subscribe to errors and serious warnings.

Each active port will as default have the following three standard filters available:

Status information: Makes it possible for remote status clients (like SmartStatus applications) to subscribe to port status information, system messages etc.

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Raw events: This data source will supply any remote subscriber with the raw events as those shown in the Online View.

Formatted events: Subscribers to this data source will receive all events as a comma-separated text. The number of text fields in the comma-separated text depends on the template used for the actual port.

A port with a connected filter is called a **data source**.

In addition to this, it is possible to create new data sources by attaching user-defined filters to active ports (filters are described in section 7.2.1 New filter).
A filter can be used to limit the number events in order to let subscribers supervise or store important or special events only, like:

- All alarms from section 12
- All inhibited events from the ESD system
- All tagnames containing the text 'XCV'
- All operator actions that has ACK in the description

Clients connected
This pane shows a list of all remote and local clients currently connected to the Utility Server. For each client a list of subscribed data sources is provided.
Please note that the Notification Module add-on is considered as a local client to the Utility Server and will therefore also be listed in the 'Clients connected' view.

Messages
The message pane contains all messages related to the Utility Server module. The information here will be more detailed compared to the information stored in SmartLogger's common system log, as only important messages and errors are stored in the system log.

7.2 Filters

7.2.1 New filter

To create and add a new filter to a port, simply select the wanted port and choose the menu item *File | New Filter…*
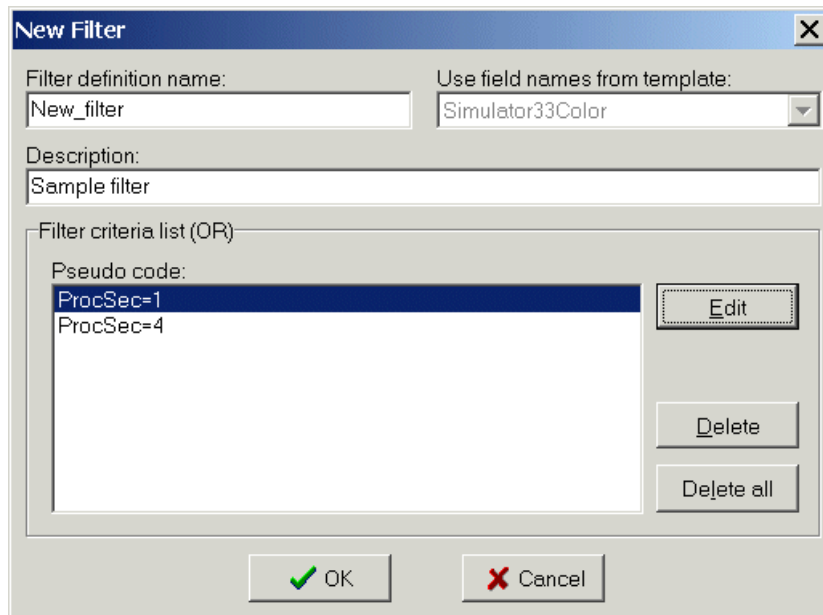
Figure 7-2

New filter	
Filter definition name	Name of the filter definition, which is identical to the name of the physical file where the filter is stored.
Use field names from…	This entry is fixed to the template that is configured for the selected port. The template is only used to gain access to a list of field names when building the filter criteria's.
Filter criteria list	
Pseudo code	This text box shows the filter criteria's in 'translated' pseudo code. Each text line is OR'd together when the filter criteria's are applied. To edit the criteria definitions, press the Edit button. The Criteria editor is described in section 7.2.5.

After creating a new filter it will automatically be attached to the selected port and activated.

7.2.2 Add existing filter
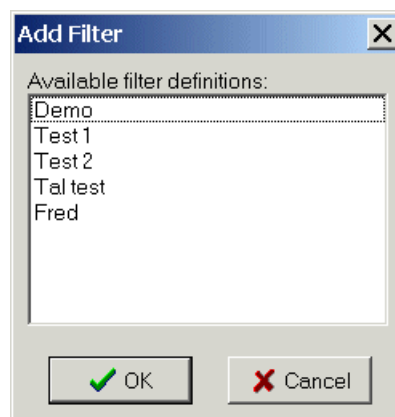
Figure 7-3

The field names used in the selected filter definition must be available for the chosen port. Otherwise a warning is raised when the OK button is pressed

7.2.3 Modify filter

It is possible to modify a filter already attached to a port, by choosing the menu item *File | Modify Filter…* or the corresponding pop-up menu item.
The dialog shown is the same as when creating a new filter, except that the filter name cannot be modified.
Please note that only the user-defined filters can be modified.

7.2.4 Filter maintenance

The Filter Maintenance tool combines the filter functions described in the previous sections in a single tool. From here it is possible to create, modify and delete filters - with the difference that it is the physical filter definition file that is affected only. In other words, If a new filter is created with the Filter Maintenance tool, then it must be attached manually to a port afterwards.

The Filter Maintenance tool can be opened by choosing the menu item *Tools | Filter Maintenance…*
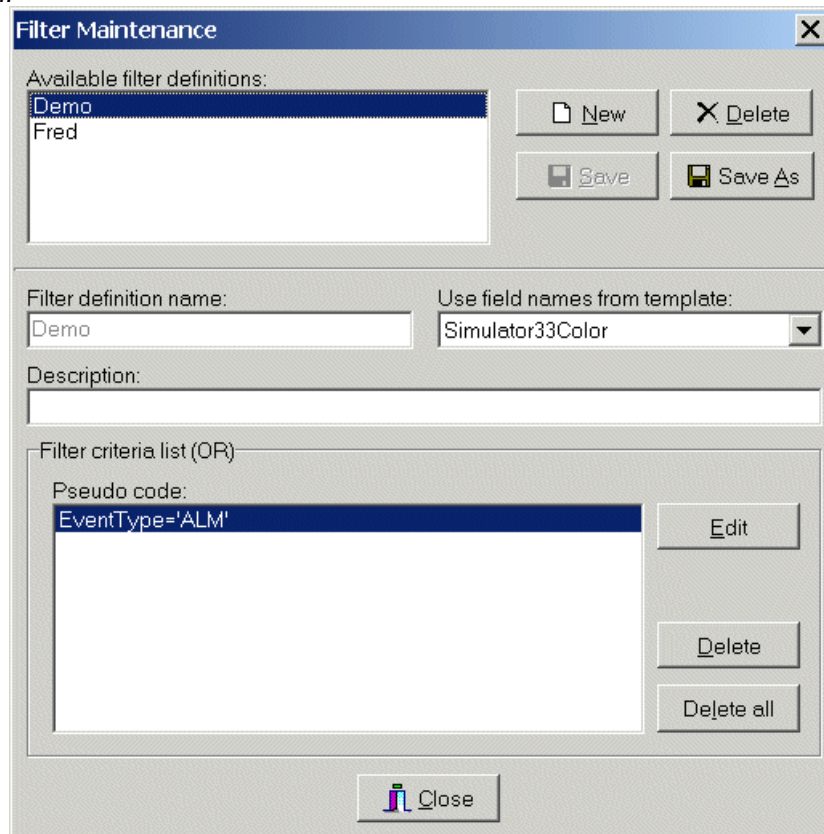
Figure 7-4

Filter maintenance	
Available filter definitions	Shows a list of available filters. To choose a filter for maintenance, simply click on the filter in the listbox.
Filter parameters	
Filter definition name	Name of the filter definition.
Use field names from…	The template reference is used to get a list of field names in order to be able to build the filter criteria's.

Description	A descriptive text.

Filter criteria list	
Pseudo code	This text box shows the filter criteria's in 'translated' pseudo code. Each line equals one criteria and all criteria's are OR'ed together in the final filter handling. To modify the criteria's, press the Edit button.
	The Criteria editor is described in section 7.2.5.

✋ The template reference is only used to get a list of field names in order to be able to build the filter criteria's.

7.2.5 Criteria editor

The Criteria Editor is a powerful tool for building any kind of simple or complex criteria for use in filters.
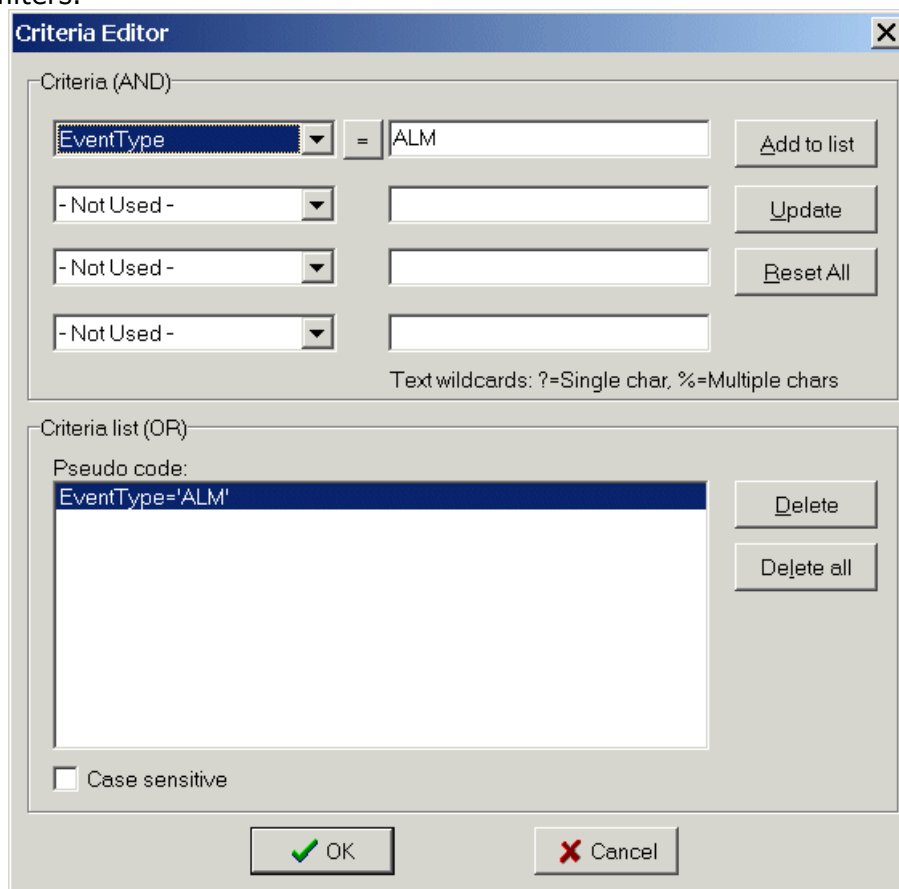
Figure 7-5

Criteria editor	
Criteria (AND)	One AND criteria is composed by up to 4 field criteria's AND'ed together. An AND criteria can be added to the criteria list by pressing the 'Add to list' button.
Criteria list (OR)	The criteria list (OR) show the filter criteria's in 'translated' pseudo code. Each line equals one criteria and each criteria are OR'ed together in the final filter handling.
'Criteria'	If a field is a numeric field, a small 'criteria' button will be visible

buttons	between the field name and the edit box. This button can be used to specify a range of numerical values. When it is pushed, it toggles between '=', '<', '>' and '<>'.
Case sensitive	If checked, only text that exactly matches the query criteria is accepted, i.e. "Pump Control" does not match "PUMP CONTROL".

7.2.6 Criteria examples

Exact match
If you want to see all records where the Tagname field contains the exact string 'HAS-OV-12222', you simply enter:

 Figure 7-6

Combined AND criteria
If you, in addition to the Tagname criteria, only want to look at records where PropertyACount is greater than 50, then you additionally enter:

 Figure 7-7

Using multiple character wildcards
If you, in addition to the criteria's above, only want to look at records where Description starts with 'Flare', then you must enter:

 Figure 7-8

It is also possible to use multiple wildcards in a single criterion. If you, for example, want to extract all records, where the Tagname starts with "KKS" and contains the characters "ZSC", the criteria should be "KKS%ZSC%".

🖐	A wildcard is valid for character fields only.

7.3 Utility Server options

The options dialog can be accessed from the Utility Server menu item *Tools | Options…*
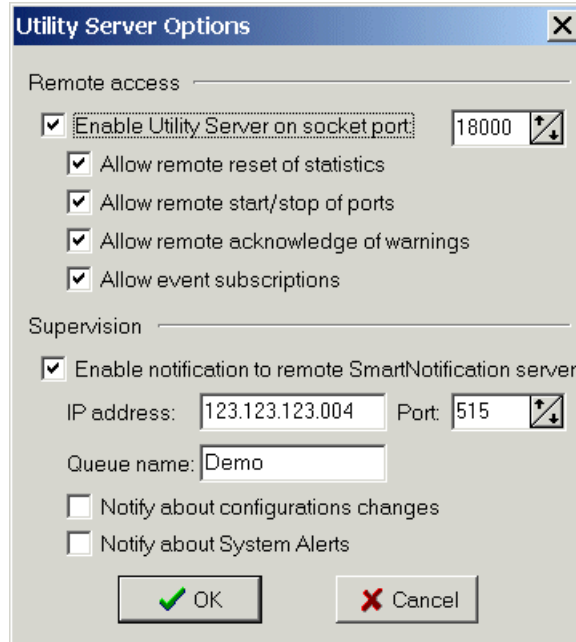
Figure 7-9

Utility Server options	
Enable utility server…	If checked, remote applications like SmartStatus are allowed to connect to the SmartLogger. The remote applications must connect on the socket port specified. Default port for SmartLogger is 18000.
Remote access options	
Allow remote reset…	If enabled, remote status clients can reset statistical counters.
Allow remote start/stop…	If enabled, remote status clients can start and stop ports.
Allow remote acknowledge…	If enabled, remote status clients can acknowledge warnings.
Allow event subscriptions	If enabled, remote clients can subscribe on event data sources.
Supervision	
Enable notification…	If enabled, notifications will be send to remote SmartNotification application. The notifications are send as print jobs and will be buffered if network or remote application is temporarily down. By default any error or fatal messages will trigger a notification.
IP address and port	IP address and port used by the remote printer server. Default port for LPR communication is 515.
Queue name	The printer server will support a number of "printers". This queue name must match on of the printers configured.

Notify about configuration…	If enabled, notifications will be sent every time the use changes the SmartLogger options or port setup.
Notify about system alerts…	If enabled, alerts will trigger a notification.

8 Extended configurations

8.1 Remote Transfer

The Remote Transfer add-on is used to transfer raw events to a remote host via a TCP/IP network. The function works independently of other port related configurations like log change, template and database settings. A port configured for remote transfer, transfers all events to the host in the same sequence as the port receives them from the data source.

Configuration
The Remote Transfer add-on is configured from the menu item *Config | Remote Transfer...*
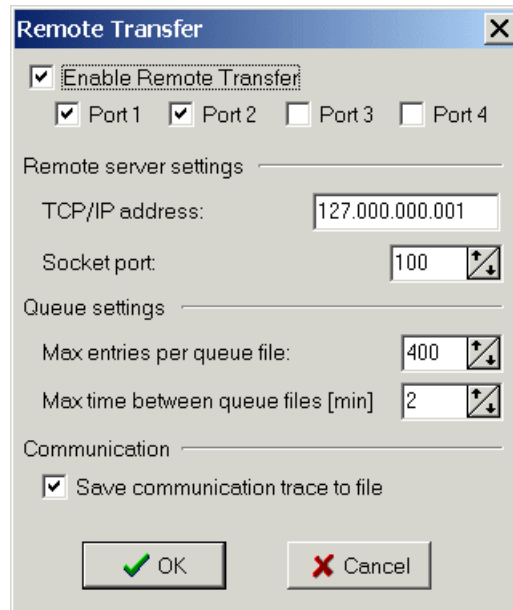
Figure 8-1

Remote Transfer	
Enable remote transfer	Enables/disables the Remote Transfer add-on.
Port 1..4 checkboxes	Enables/disables the individual ports.
Remote server settings	
TCP/IP address	Defines the IP address for the remote server.
Socket port	Socket to be used for transmission.
Queue settings	
Max entries per queue file	Defines the number of events allowed in each queue file. If exceeded, a new queue file is created.
Max time between…	Defines the maximum delay between each queue file in minutes. If exceeded, a new queue file is created.
Communication	
Save communication	If enabled, a separate trace file showing all communication messages with remote server is created. The file is located in the ..\SmartLogger\TraceLogs folder.

For a detailed description of the RT queue behavior, please refer to appendix 9.4 Remote Transfer details.

Status information
To see the status for the remote transfer:
- Press the corresponding status button on the toolbar OR
- Select the menu item View | Remote Transfer ...
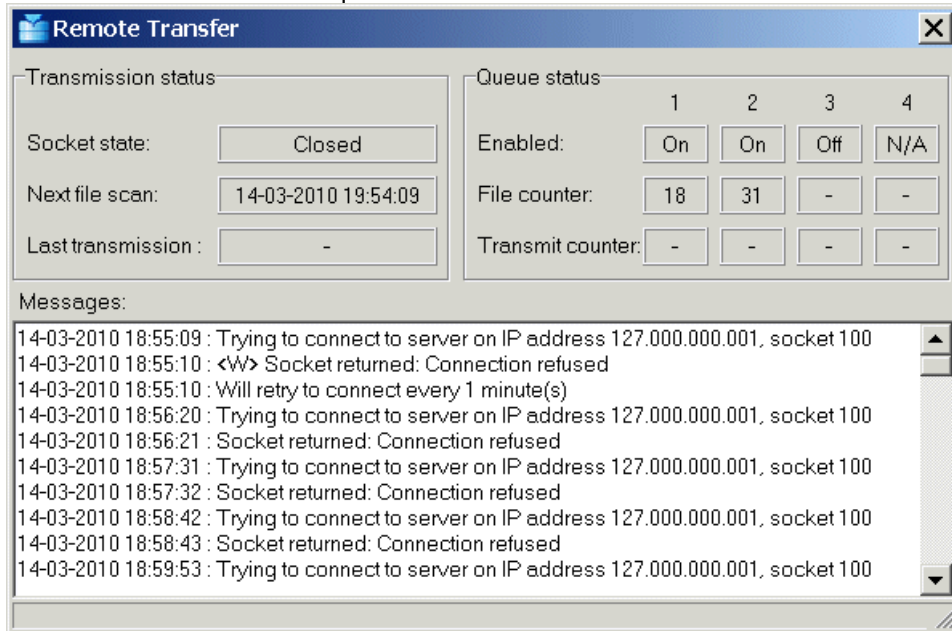
Figure 8-2

Transmission status	
Socket state	Shows the current state for the communication socket. Possible states are: Connecting, Connected, Closed or Error.
Next file scan	Shows the time when the RT module will look for completed queue files to transfer.
Last transmission	Timestamp for the last transmitted queue file.
Queue status	
Enabled	On: Port is configured and enabled for RT.
	Off: Port is configured, but not enabled for RT.
	N/A: Port is not configured.
File counter	Shows the id (1..99999) for the last completed queue file.
Transmission counter	Shows the id (1..99999) for the last transmitted queue file.

The message window shows the latest 200 messages. Messages related to the communication flow starts with a direction marker:

-> Messages send to the remote server
<- Messages received from the remote server

For a detailed description of the communication flow please refer to section 9.4 Remote Transfer details.

8.2 External Storage

External Storage is normally used in combination with SmartTranslator for storage of events in external server database (Oracle or MS SQL Server). From version 4.0 SmartLogger has got it own translator service based on the same principles as SmartTranslator but with a simplified configuration interface.

When external storage is enabled a text queue is created where all events are stored as raw text in queue files. The queue files are then translated by the translator service when server database is accessible.

External Storage must be enabled for each port individually using the Port setup dialog while the common connection settings are set from the menu item *Config | External Storage…*
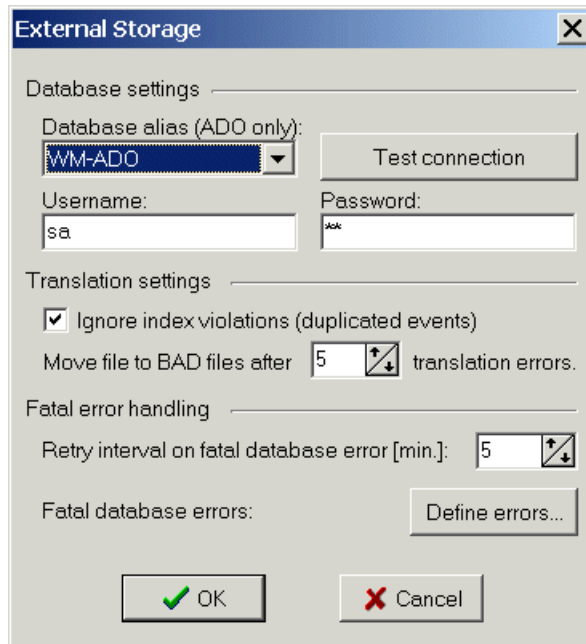
Figure 8-3

Database settings	
Database alias	Defines the database alias to be used. If no ADO aliases are available, a new one can be created using the alias manager tool as described in section 6.1 Database Alias Manager.
Test connection	Press this button to see if SmartLogger is able to connect to the selected alias.
Username	User name to be used if not specified in alias.
Password	Password to be used if not specified in alias.
Translation settings	
Ignore index vioations…	If enabled, SmartLogger will ignore index violations and not report this condition as a warning.
Move file to BAD files after…	Specifies the number of discarded or rejected (by database) events per file that are accepted before a translation is considered "bad". "Bad" files are moved to another folder for further inspection and must be removed manually.
Fatal error handling	
Retry interval on fatal…	Specifies the time to "wait" after a fatal error has occurred. After waiting, the SmartLogger translating service resumes the

	translation it was currently executing. A fatal error might be when the network is disconnected or the remote database server is not responding.
Fatal database errors	See below.

Fatal database errors

It is possible to define certain database errors that must cause the SmartLogger translating service to stop translation for a while. Proper definition of fatal database errors ensures that SmartLogger does not continue processing files and reporting lots of errors in case of a database error.

When the button "Define errors" is pushed, the following configuration dialog is shown:
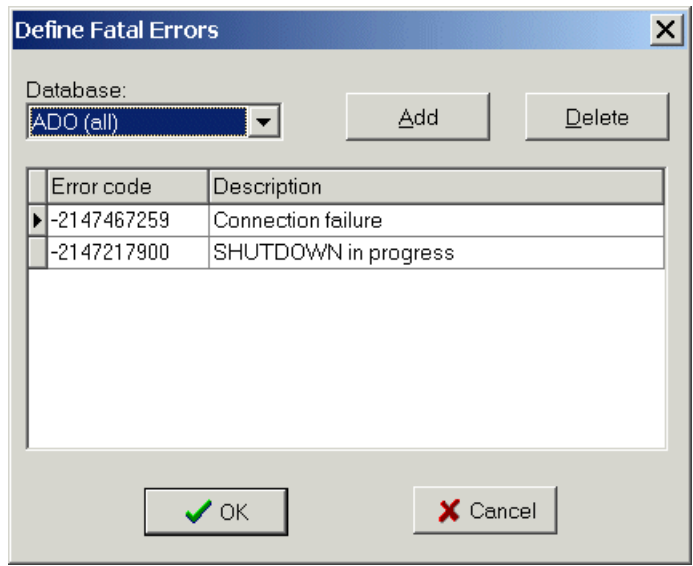
Figure 8-4

Define Fatal Errors	
Database	Determines the database used. Allowed values are "Oracle", "MS SQL Server" and "ADO (all)".
Add	Adds a new line to the grid.
Delete	Deletes the selected error code.
Grid	Shows all defined error codes.

9 Appendix

9.1 Work flow diagram
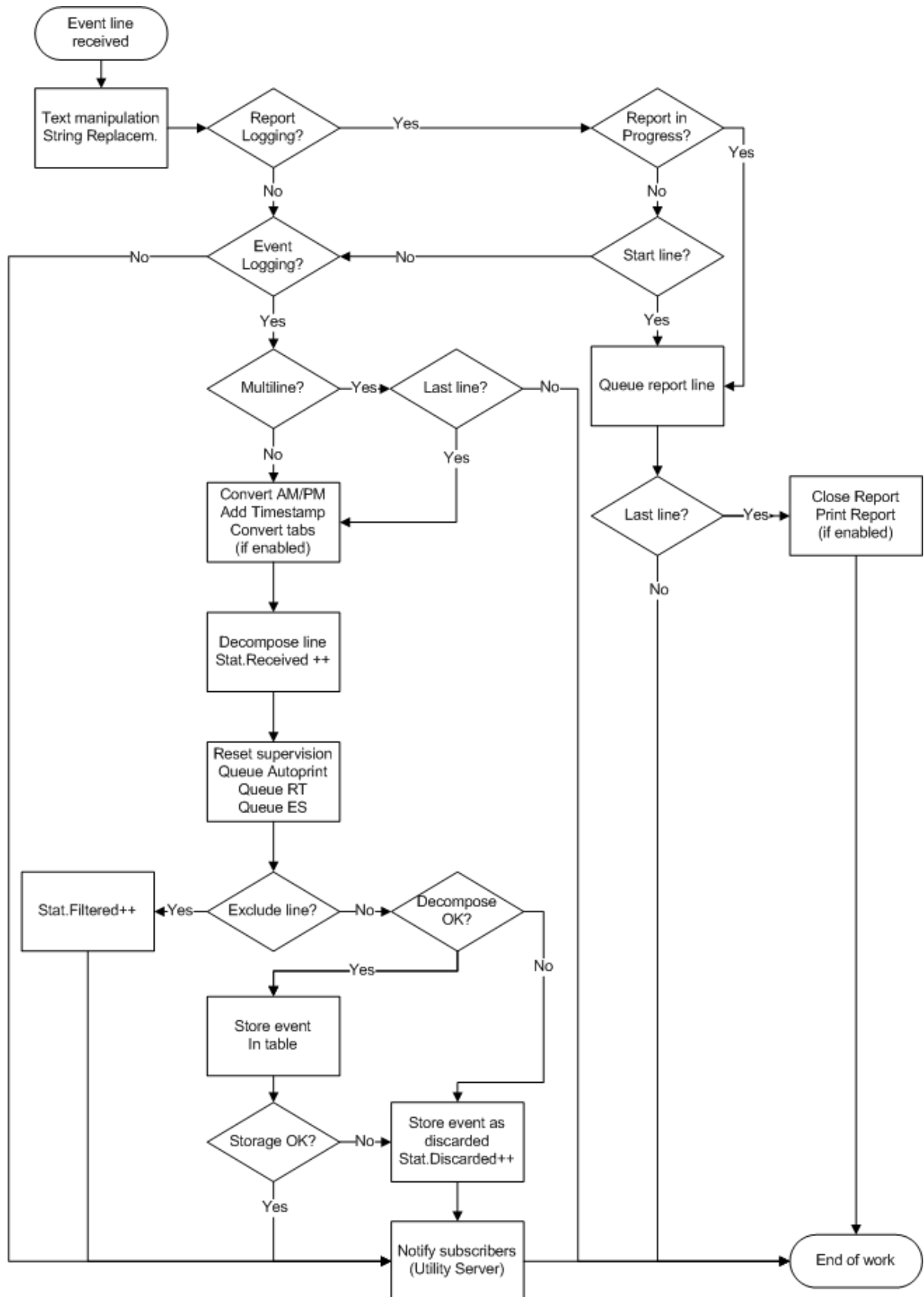
9.2 Timestamp handling

Depending on the timestamp settings in the template, the SmartLogger handles event timestamps differently:

Local timestamp
All events are stamped with the current local PC time as they are processed.

External timestamp
Timestamps are decoded from the event according to the specified event mask in the template.

Local intelligent date
If the local intelligent date feature is selected, then the date value is calculated according to the following formulas (pseudo code):

```
Date = LocalDate
if ((HourLocal + 8) < HourEvent)
     Date = Date - 1;
if ((HourEvent + 8) < HourLocal)
     Date = Date + 1;
```

where:
    HourLocal = Current hour value from local PC
    HourEvent = Hour value decoded from event

Adapted values
There is one case where the SmartLogger will store an event even though it could not decode all values correctly:
If the date is decoded correctly, but the time conversion fail, then the SmartLogger will store the event with the local PC time as time parameter. For each adaptation made a warning is raised.

9.3 Log change philosophy

The log change feature ensures that log tables do not grow inexpedient large. A port can be set up to perform a log change every DAY, every WEEK, every MONTH or every YEAR.

The composed log name depends on the specified change type as shown in the following example, where the today's date is 2009-08-27.

Change type	Composed log name
DAILY	TEST20090827
WEEKLY	TEST2009WK34
MONTHLY	TEST20090800
YEARLY	TEST20090000

As incoming events may not arrive in consecutive order, the SmartLogger operates with a term called "Log change period".

The following describes how the Log change period is handled for a port configured to DAILY log change:

- The log change period starts when an event with a newer date than the current destination log is received.
  Example: The current log is named TEST20091117. If an event with timestamp

2009-11-18 is received at 00:02:31 then the log change period is started at
00:02:31.
- During the log change period two destination logs are active at the same time.
  Events are stored in the log that corresponds to event's time stamp.
- The log change period ends when the log change timer expires. The timer can be
  changed from the Settings dialog as described in section 6.3 Application options.

Events with time stamps older than the current destination log will be discarded. If, for
example, the current log is TEST20091117 then events with time stamps 2009-11-16
and older be discarded.

9.3.1   Forced log change

In two cases the SmartLogger will execute a log change instantly, disregarding that the
change period timer has not expired. These are:

1. If events from a new day are received during a log change, then the current log
   change is completed instantly and a new log change period is started.

2. When the SmartLogger is started, the current date is used as default for
   composing table names. If events from the previous day are received before any
   events from the current day, then a log change to previous day is performed
   instantly. This ensures that events from previous day are not discarded, if the
   SmartLogger for some reason has been stopped during midnight and an event
   queue has been built up at the data source.

9.4   Remote Transfer details

The following sections describe the behaviour of the Remote Transfer add-on in details.

9.4.1   Remote Transfer queue

The RT Queue is a directory where the SmartLogger stores all queue files and queue
counters related to the Remote Transfer add-on.
The queue ensures that no events are lost due to transmission errors or temporary
network errors. All events received by the SmartLogger are stored in the queue
immediately, and no events are removed from the queue unless the remote server has
confirmed the transfer.

The RT queue has a capacity of 99999 queue files, which give a maximum storage
capacity of approximately 2 million events - depending on the RT settings 'Max entries
per queue file' and 'Max time between queue files'.

Each SmartLogger port has its own set of queue files:

RT1.ini	Contains information about queue counters.
~RT1.log	Queue file under construction.
RT1N00001.log	Queue file ready to be transmitted.
RT1N00002.log	Queue file ready to be transmitted.
RT1Nxxxxx.log	Queue file ready to be transmitted.

The listed files apply to port 1. For files associated with other ports replace RT1 with the
corresponding port number.

9.4.2   Communication messages

The Remote Transfer communication is based on the following message types:

Information message (SmartLogger -> Host)
Contains miscellaneous information about the SmartLogger set-up and each configured port. Is transmitted every time a connection is established i.e. at start-up and after a connection has been lost.
Must be confirmed by host.

Status message (SmartLogger -> Host)
Contains current status for all configured ports. Is transmitted every time status has changed. May be transmitted with up to one-minute delay, as the Remote Transfer module only scans for status changes every minute or when another message is transmitted.

Data message (SmartLogger -> Host)
Contains all events stored in one queue file. Is transmitted when required.
When confirmed by host the corresponding queue file is deleted.

Heartbeat message (Host -> SmartLogger)
Heartbeat message used to verify connection at idle periods.

Confirmation message (Host -> SmartLogger)
Confirmation for successful received information or data message.