Reliance
Industrial SCADA/HMI system

Reliance 4

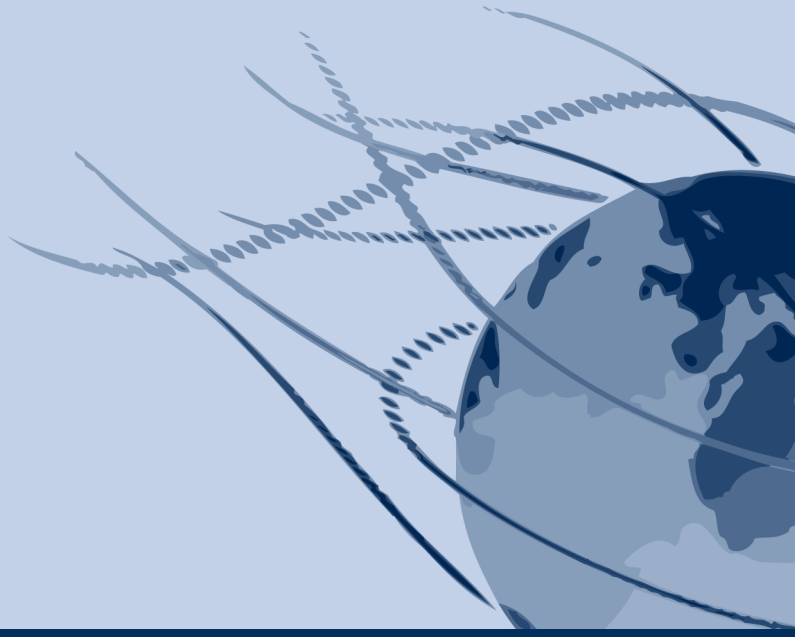
RUNTIME SOFTWARE

GEOVAP

Reliance
Industrial SCADA/HMI system

Reliance 4

RUNTIME SOFTWARE



GEOVAP

GEOVAP, spol. s r.o.
Cechovo nabrezi 1790
530 03 Pardubice
Czech Republic
+420 466 024 618
http://www.geovap.cz

Table of Contents

1 Introduction

In the context of **Reliance**, runtime software is a program designed to run a visualization project on the end user's computer. Runtime software is a common term for the following programs: **Reliance 4 View, Reliance 4 Control, Reliance 4 Control Server** and **Reliance 4 Server**. The last mentioned program doesn't have a graphical user interface (GUI) and is intended to run as a Windows service. When a visualization project is run on multiple computers, an identical copy of the project must be present on each computer. A visualization project on a specific computer is usually started via a shortcut. For additional information on how to start a project and how to create a shortcut file, see the Appendix section.

Reliance 4 – Factory Demo

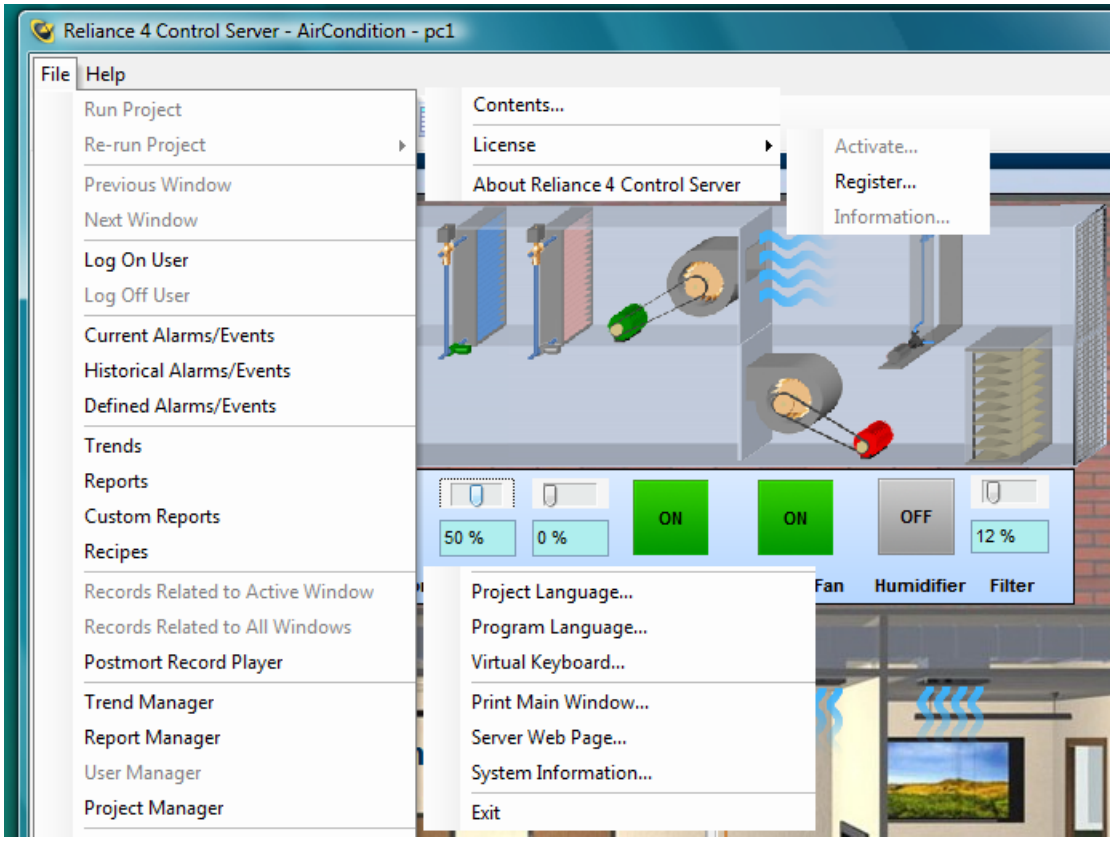
2 Runtime software description

All kinds of runtime software that have a graphical user interface (GUI) provide the user with the same commands and functions, which can be accessed through the Main menu or the Toolbar. Other functions of a visualization project are provided by means of Components embedded into visualization windows when the project was created.

Reliance 4 – AirCondition Demo

2.1 Main menu

The menu contains commands for accessing basic commands (functions) of the runtime software. For example, these are commands for running a visualization project, logging a user on to the program, accessing trends and reports, changing the language and invoking diagnostic tools. The following text describes all commands accessible via this menu. The most frequently used commands are also available in the Toolbar. In this text, the toolbar commands are indicated with an appropriate icon next to command name.



Reliance 4 – File and Help Menu

File menu

View menu

Managers menu

Tools menu

Window menu

Help menu

2.1.1 File menu

Run Project

Opens and starts the selected visualization project (the command is enabled only if the runtime software has been started without parameters). To start another project when a project is already running, the runtime software has to be closed and started again.

Log On User

Shows a dialog window where the user can enter his/her *user name* and *password* to log on to the program. After a successful logon, user settings are loaded (e.g. language version and settings of alarm/event viewers). For more information on this topic, see the chapter Logging on/off.

Log Off User

Logs off the current user and loads the *Default* settings.

Logged On User Information

Brings up the Information dialog with a name of the currently logged on user.

Project Language

Brings up the Select Project Language dialog. If there are multiple languages defined in the project, the user can switch between these languages.

Program Language

Brings up the Select Program Language dialog which contains a list of runtime software languages. The user can switch the language of the program's GUI (text in the menus, toolbars, alarm/event viewers, trend viewer, etc.).

Print Main Window

Brings up the standard Windows print dialog which allows you to select a printer and configure print settings in order to print the image of the program's main window.

Exit

Exits the runtime software.

2.1.2 View menu

Current Alarms/Events

Displays a list of current alarms/events which are those that are still active or have not yet been acknowledged. For additional information see the chapter Alarm/event viewers.

Historical Alarms/Events

Displays a list of historical alarms/events which are those that are stored in a database. The database contains alarms/events defined in the project and operating events, such as starting and terminating the project, logging users on and off the program, losing and restoring connection with other computers and devices, etc. For more information on this topic, see the chapter Alarm/event viewers.

Defined Alarms/Events

Displays a list of alarms/events defined in the project. For additional information see the chapter Alarm/event viewers.

Trend

Displays a list of available Trends. A trend selected in the list is afterwards displayed in the *trend viewer*. A trend can also be printed or exported to various formats through the trend viewer. The data for trends is stored in data tables (databases).

Report

Displays a list of available Reports. A report selected from the list is displayed in the *report viewer*. A report can also be printed or exported to various formats with the report viewer. The data for reports is stored in data tables (databases).

Custom Report

Displays a list of available Custom reports. A custom report selected from the list is displayed in the *custom report viewer*. A custom report can also be printed, exported to various formats or e-mailed by means of the custom report viewer. Custom reports are designed to generate reports based on custom templates.

2.1.3 Managers menu

Trend Manager

Brings up the Trend Manager which allows you to define and configure trends.

Report manager

Brings up the Report Manager which allows you to define and configure reports.

User Manager

Brings up the User Manager which allows you to define and configure users.

Project Manager

Brings up the Project Manager which shows information about all objects defined in the project (e.g. devices, tags, alarms/events, data tables, etc.).

2.1.4 Tools menu

Virtual Keyboard

Brings up a Virtual Keyboard which enables the user to type text even on the computers without a keyboard. The *Virtual Keyboard* window is always on top. The *Virtual Keyboard* function has to be activated when developing a visualization project.

Recipe Editor

Opens a tool for working with Recipes.

Postmort Record Player

Brings up the Postmort Record Player which allows you to replay the process visualization from a chosen time.

Server Web Page

Opens the main page of the built-in Web server in the default Web browser. This command is only available in *Reliance 4 Control Server*.

System Information

Displays the System Information window which shows information about connected devices, tags, data tables, server connections, DDE sharing, etc.

2.1.5 Window menu

Previous Window

Shows the previously shown window. The user can go at most 10 previous windows back.

Next Window

Shows the next window. The command can be used after the *Previous Window* command.

Records Related to Active Window

Displays a list of records (text notes) made by the users for the active visualization window. For example an operator working in the first shift can leave a note about a problem in the visualized process for the operator working in the second shift. The user can create and edit records only when he/she is logged on.

Records Related to All Windows

Displays an overall list of records (text notes) made by the users for all visualization windows.

2.1.6 Help menu

Contents

Opens a help document for the Reliance runtime software in the `CHM` format.

License

Activate

Brings up the *Activate License Wizard* where you can activate your SW license. The command is disabled in case an HW key (dongle) is connected. For detailed information see the *LicenseActivation* document.

Register

Brings up a dialog where the user can select a registration file. A registration file contains the user and company names. It can be created with the *License Key Utility*. The utility is part of **Reliance 4** and it is located in the `<Reliance4>\ Utils\ LicenseKeyUtil` directory upon installing the software. The registration information is shown in the program's About box. The command is only visible if the software has not yet been registered.

Information

Opens the *License key utility* to show the information stored in the license key. The Microsoft .NET framework version 2.0 or later is required to run the utility.

About Reliance 4 View/Control/Control Server

Brings up the program's About box, i.e. a dialog box showing the version and type of runtime software, maximum number of licensed data points, computer system information, memory usage, registration information, etc. Click the Serial number label to show the license detection method or launch *License Key Utility* to view the information stored in the license key.

2.2 Toolbar

The *toolbar* of the runtime software contains the most commonly used commands. All of them can also be accessed through the > *File* menu.

Reliance 4 – Toolbar

The toolbar is located just below the main menu and contains the following commands:

Previous Window

Shows the previously shown window. The user can go at most 10 previous windows back.

Next Window

Shows the next window. The command can be used after the *Previous Window* command.

Log On User

Shows a dialog window where the user can enter his/her *user name* and *password* to log on to the program. After a successful logon, user settings are loaded (e.g. language version and settings of alarm/event viewers). For more information on this topic, see the chapter Logging on/off.

Log Off User

Logs off the current user and loads the *Default* settings.

Historical Alarms/Events

Displays a list of historical alarms/events which are those that are stored in a database. The database contains alarms/events defined in the project and operating events, such as starting and terminating the project, logging users on and off the program, losing and restoring connection with other computers and devices, etc. For more information on this topic, see the chapter Alarm/event viewers.

Current Alarms/Events

Displays a list of current alarms/events which are those that are still active or have not yet been acknowledged. For additional information see the chapter Alarm/event viewers.

Trend

Displays a list of available Trends. A trend selected in the list is afterwards displayed in the *trend viewer*. A trend can also be printed or exported to various formats through the trend viewer. The data for trends is stored in data tables (databases).

Report

Displays a list of available Reports. A report selected from the list is displayed in the *report viewer*. A report can also be printed or exported to various formats with the report viewer. The data for reports is stored in data tables (databases).

Custom Report

Displays a list of available Custom reports. A custom report selected from the list is displayed in the *custom report viewer*. A custom report can also be printed, exported to various formats or e-mailed by means of the custom report viewer. Custom reports are designed to generate reports based on custom templates.

Records Related to Active Window

Displays a list of records (text notes) made by the users for the active visualization window. For example an operator working in the first shift can leave a note about a problem in the visualized process for the operator working in the second shift. The user can create and edit records only when he/she is logged on.

Records Related to All Windows

Displays an overall list of records (text notes) made by the users for all visualization windows.

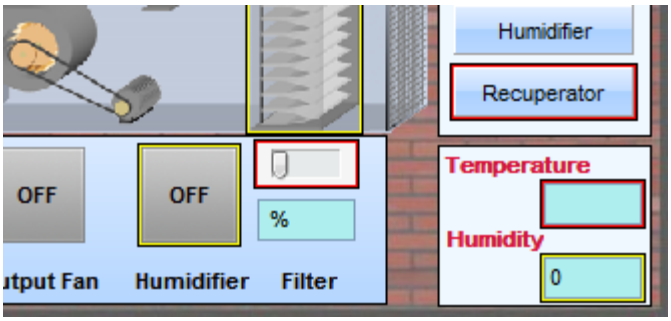
Virtual Keyboard

Brings up a Virtual Keyboard which enables the user to type text even on the computers without a keyboard. The *Virtual Keyboard* window is always on top. The *Virtual Keyboard* function has to be activated when developing a visualization project.

2.3 Components

Components are graphical objects embedded into visualization windows. Some components are designed to display real-time data (i.e. the values of tags defined in a project; e.g. the *Display* component can show a numerical or text value). The properties of most components can be dynamically controlled by tags (e.g. component visibility, position, size, color, etc.).

Every tag has a special attribute – *quality*. The tag quality can be either *good* or *bad.* A component linked to a tag that has a quality other than good is indicated with a *yellow* border around the component. This applies to any tag affecting the component whether its value is displayed by the component or controls the component's visibility, position, size, etc. The tag quality is bad for example if an error occurs in communication with a device (PLC) or if a project has just started and the values of tags have not yet been returned by the communication driver.



Red frame – invalid link
Yellow frame – invalid data

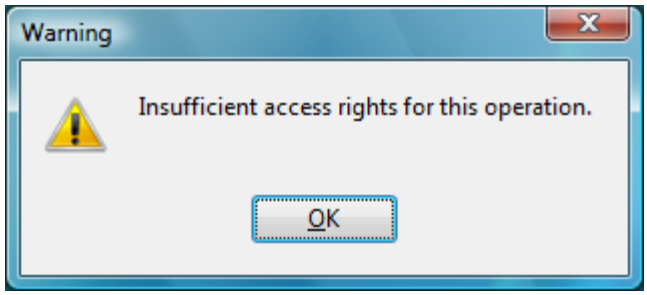
A *red* border around a component indicates an invalid link to a tag (a missing link or link to a tag that was later deleted). A red border usually indicates a problem in project design.

Short help (*hint*) can be displayed when mouse cursor is positioned over the component.

By clicking on a component, the user can open another window, activate a *Popup menu*, execute an *Action*, run a *Script* or perform some other operations (e.g. bring up the dialog where the user can enter a new value for a tag). The operations can be restricted using *Access rights*. The user won't be permitted access to these operations when his/her rights are insufficient.

2.4 Logging on/off

The whole application can be secured against unauthorized use by means of access rights which can be assigned to users defined in the project (see the chapter User Manager). Components or commands secured with access rights are enabled (can be accessed) only after the user with sufficient access rights logs on to the program. A user can log on in the following two ways:



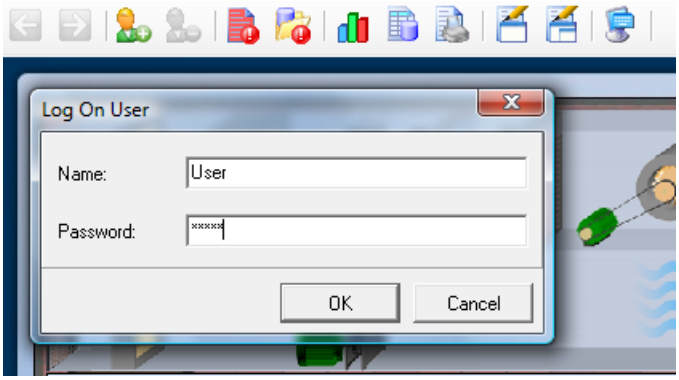
Reliance 4 – Insufficient access rights

Using a name and password

Using a HW code reader

2.4.1 Logging on/off using a name and password

To log on to the program, the user must choose the > *File* > *Log On User* command or the *Log On User* command from the toolbar. This brings up the *Log On User* dialog.



Reliance 4 – User log on

The user must then enter his/her login name and password.

The login name is the name defined for the user through the *User Manager*. It is not case sensitive.

The password (also defined through the *User Manager*) **is case sensitive**. Characters of the password are shown as asterisks for security reasons.

After confirming the dialog, the name and password are verified. If they are correct, the log-on process is completed and user settings are loaded.

To log off, the user must choose the *> File > Log Off User* command or the *Log Off User* command from the toolbar.

2.4.2 Logging on/off using a HW code reader

If the computer is equipped with a special HW code reader, the user can log on to the program by putting his/her card near the reader. The program makes a beep sound if the log-on is successful. To log off, the user must again put his/her card near the reader.

The user can also log on by means of a fingerprint reader.

2.5 Alarm/event viewers

Alarm/event viewers display a list of the occurrences of alarms/events defined in the project and operating events, such as starting and terminating the project, logging users on and off the program, losing and restoring connection with other computers and devices, etc.

The state of an alarm/event is indicated by the background color of the respective row in the list:

Red background

The alarm/event is active and has not been acknowledged.

Yellow background

The alarm/event is active and has been acknowledged.

White background

The alarm/event is not active and has not been acknowledged. The alarm condition no longer exists.

The acknowledgment state of an alarm/event is indicated by one of the following symbols:


The alarm/event has been acknowledged.


The alarm/event has not been acknowledged.

The type of condition that triggers an alarm/event is indicated by one of the following symbols:


Tag data change.


Leading edge of the tag.


Trailing edge of the tag.


High critical limit of the tag.


High warning limit of the tag.


Low warning limit of the tag.


Low critical limit of the tag.

- Popup menu

  To configure the list of alarms/events, right-click on the list. This brings up a popup menu that contains the following commands:

  Load User Settings

  Brings up a dialog with a list of all users that have the viewer settings stored in their profile. In addition to these users, the list can include an item named *Default* which corresponds to the default settings. These are used if the user does not yet have his/her own settings or when no user is logged on. Upon selecting a user from the list and confirming the dialog, the settings stored in the selected user's profile are applied.

  Save User Settings

  Brings up a dialog with a list of all users to which the viewer settings can be made available. In addition to these users, the list can include an item named *Default* which corresponds to the default settings. The user is always allowed to save the settings to his/her own profile and the *Default* profile. If the user has the *User administrator* option active or is assigned the *Servicing right*, he/she can save the settings to all user profiles.

  Properties

  Brings up a dialog with a list of items corresponding to the available fields (columns). The list on the **Displayed fields** page of the dialog allows you to select the columns to be visible in the viewer. The **Up** and **Down** commands are used to change the column order (the topmost checked item in the list corresponds to the leftmost column in the viewer). The list on the **Sorting** page of the dialog lets you select the columns to be used for sorting. For each selected column, you can configure the **Order** property *(Ascending, Descending)* which determines the direction of sorting by that column. The position of items in the list determines the priority for sorting (the topmost checked item has the highest priority – the sorting will occur first for the corresponding column; the position can be changed with the **Up** and **Down** commands).

The following lists of Alarms/Events are available in *Runtime* programs:

Current Alarms/Events list

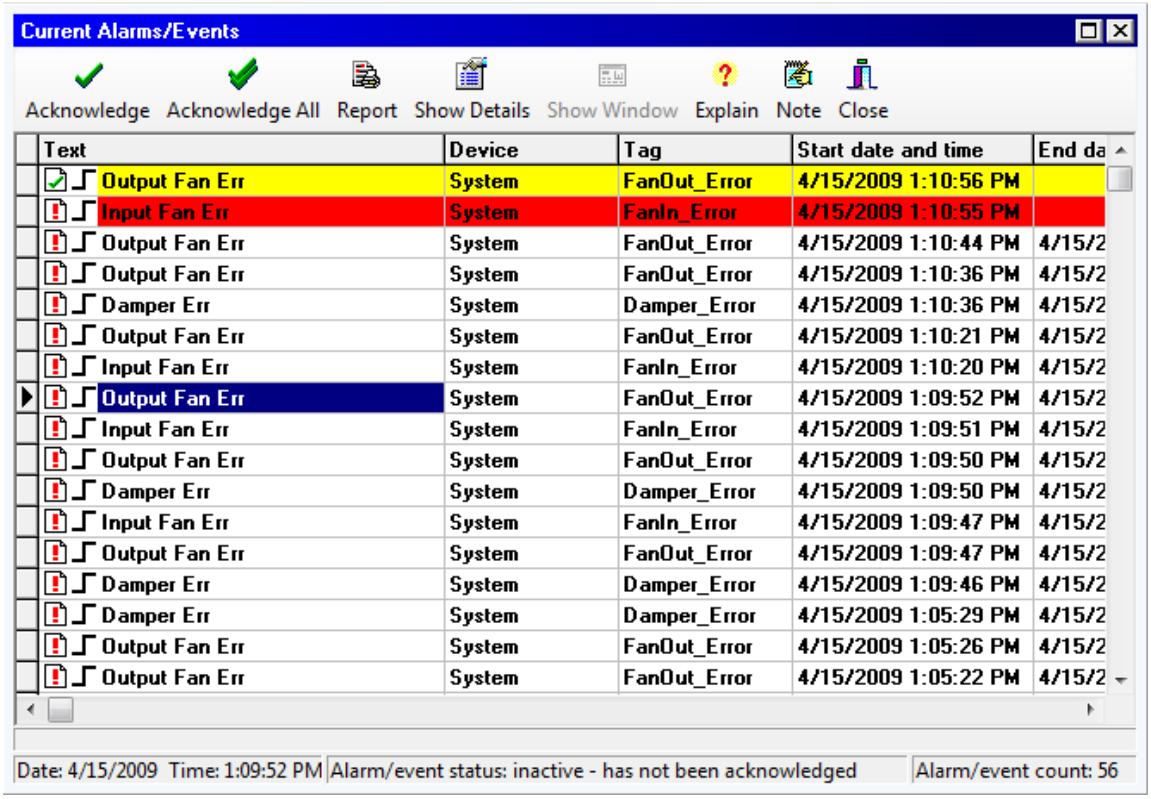
Archived Alarms/Events list

Defined Alarms/Events list

Alarms/Event at bottom panel

2.5.1 Current alarm/event viewer

The current alarm/event viewer can be displayed with the > *File* > *Current Alarms/Events* command or the *Current Alarms/Events* command from the toolbar. The viewer shows a list of current alarms/events which are those that are still active or have not yet been acknowledged (and need to be acknowledged). The list is automatically updated with new information.



Reliance 4 – Current Alarms/Events

The top part of the viewer window contains a toolbar with the following buttons (commands):

Acknowledge

Acknowledges the alarms/events selected in the list (multiple rows can be selected at a time).

Acknowledge All

Acknowledges all alarms/events in the list.

Report

Opens the Alarms/Events Report Editor which is designed to prepare a report of alarms/events. The report can be printed on the selected printer or saved to a file.

Show Details

Brings up a window containing detailed information about the selected alarm/event – Detailed Information on Alarm/Event. The same window is displayed after double click on an item in Alarms/Events list. This command can also be invoked by double-clicking a row in the list.

Show Window

Shows a visualization window associated with the selected alarm/event (if such a window was specified at design-time). This enables the user to immediately see and work with the part of the visualization that is related to the alarm/event.

Explain

Shows an explanation (specified as the value of the *Description* property at design-time) for the selected alarm/event.

Note

Brings up a dialog window where the user can enter a note about the selected alarm/event. For example, an operator working in the first shift might describe the steps taken to fix the cause of the alarm/event. Later, the operator working in the second shift can read the note.

2.5.1.1 Detailed Information on Alarm/event

The *Detailed Information on Alarm/Event* window can be invoked from the current alarm/event viewer to display detailed information on the selected alarm/event. The toolbar contains the *First*, *Previous*, *Next* and *Last* commands for navigating through alarm/event in the list, and the *Show Window*, *Explain* and *Note* commands. For the description of the last mentioned group of commands, see the chapter Current alarm/event viewer. The status bar displays information on the selected alarm/event (start date and time, status) and the number of current alarms/events (total count, unacknowledged count).

Text

Text of the alarm/event.

Comment

Comment about the alarm/event intended mainly for the visualization project developer (system integrator).

Type

Type of alarm/event (Alert, Command, System message).

Condition

Specifies the condition that generates the alarm/event (*Any change, Increment, Decrement, Leading edge, Trailing edge, High/Low critical limit, High/Low warning limit, Value in range*).

Priority

Numerical value of the priority that affects the order in which the sound triggered by the alarms/event's start and end should be played. The greater the value, the higher the priority.

Tag

Name of the tag related to the alarm/event.

Log

Determines whether to log the alarm/event to a database.

Ack

Determines whether acknowledgment by the operator is required for the alarm/event before it can be removed from the list of current alarms/events.

Device

Name of the device that the alarm/event belongs to.

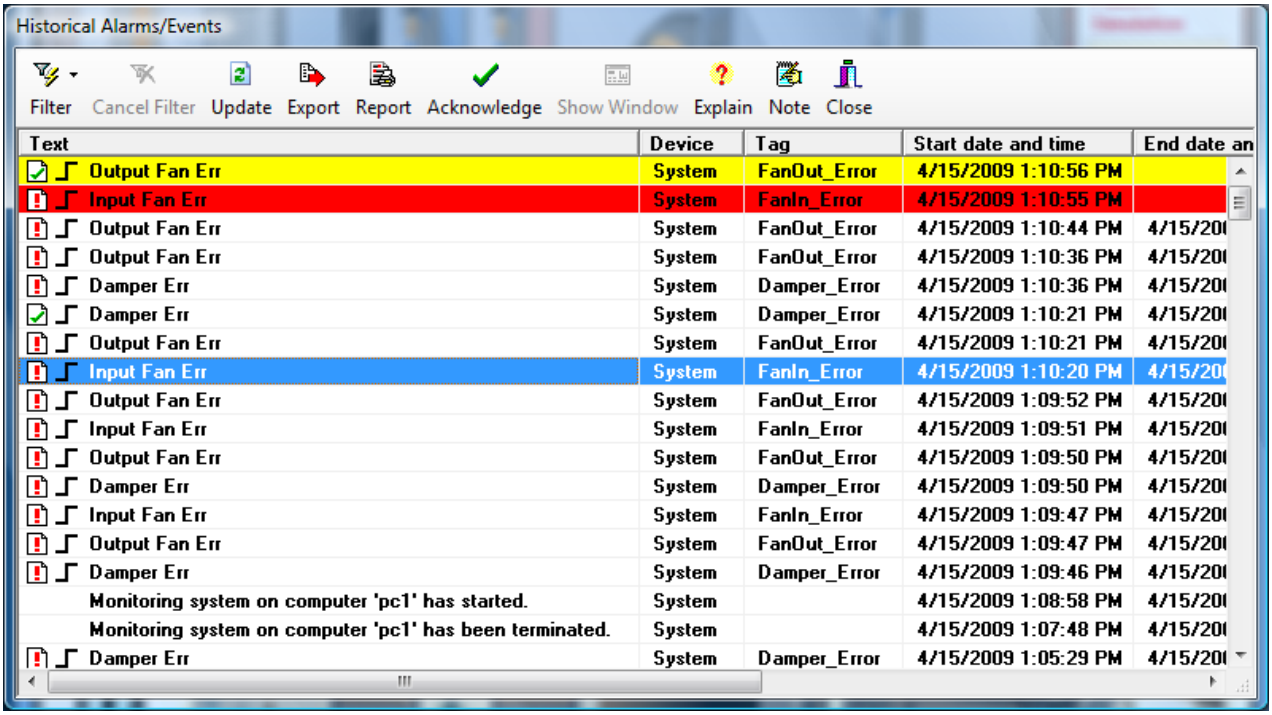
Ack rights

Specifies the access rights required to acknowledge the alarm/event. The user must have at least one of the specified rights.

2.5.2 Historical alarm/event viewer

The historical alarm/event viewer can be displayed with the > *File* > *Historical Alarms/Events* command or the *Historical Alarms/Events* command from the toolbar. The viewer shows a list of historical alarms/events which are those that are stored in a database. The list is not automatically updated with new information. To update the list, invoke the *Update* command from the toolbar. This is in contrast to the list of current alarms/events.

The list can be restricted with a *time* or *custom* filter. The list can be exported to a text file or printed/exported as a report prepared using the Alarms/Events Report Editor.



Reliance 4 – Historical Alarms/Events

The top part of the viewer window contains a toolbar with the following buttons (commands):

Filter

Shows a menu containing commands for working with filters:

Time Filter

Brings up a dialog in which a time interval can be selected. The interval determines which alarms/events should be shown in the list. For more information see the chapter Time Filter.

Custom Filter

Brings up a dialog for the definition and selection of custom filters. For detailed information see the chapter Custom Filter.

Cancel Filter

Cancels the active *time* or *user* filter. As a result, all alarms/events stored in the database are shown in the list.

Update

Updates the list of alarms/events with new information.

Export

Brings up a dialog for exporting of displayed alarms/events to a text file. For more information see the chapter Export.

Report

Opens the Alarms/Events Report Editor which is designed to prepare a report of alarms/events. The report can be printed on the selected printer or saved to a file.

Acknowledge

Acknowledges the alarm/event selected in the list (only a single row can be selected at a time).

Show Window

Shows a visualization window associated with the selected alarm/event (if such a window was specified at design-time). This enables the user to immediately see and work with the part of the visualization that is related to the alarm/event.

Explain

Shows an explanation (specified as the value of the *Description* property at design-time) for the selected alarm/event.

Note

Brings up a dialog window where the user can enter a note about the selected alarm/event. For example, an operator working in the first shift might describe the steps taken to fix the cause of the alarm/event. Later, the operator working in the second shift can read the note.

2.5.2.1 Time Filter

The *Time Filter* dialog can be invoked by choosing the > *Filter* > *Time Filter* command from the *Historical Alarms/Events* viewer's toolbar.

Filtered fields:

Specifies which time stamp (date and time) field is filtered (Start, End, Receipt, Acknowledgment, Note).

From:

The timestamp (date and time) of the oldest alarm/event meeting the filter condition.

Till:

The timestamp (date and time) of the latest alarm/event meeting the filter condition.

2.5.2.2 Custom filter

The *Custom Filter* dialog enables the user to select an existing *Custom Filter* or to create a new *Custom Filter*. The dialog can be invoked by choosing the > *Filter* > *Custom Filter* command from the *Historical Alarms/Events* viewer's toolbar. The top part of the window contains a toolbar with commands used to create and edit a custom filter. The left part of the window contains a list of fields which can be used to construct a logical expression. The right part of the window contains the constructed logical expression which will be used to filter the list of alarms/events.

A logical expression is constructed from terms. A term consists of a *field* selected from the list on the left, a *comparison operator* and a *value*. The field can be added by choosing the **Add Field** command, the comparison operator can be selected from the toolbar (< Less, > Greater, or = Equal) and the value can be specified through a dialog invoked by choosing the **Enter Value** command.

More complex expressions can be constructed with the help of the logical operators **and**, **or**. For better orientation, each term of a logical expression should be enclosed in parentheses.

- Toolbar

Filter

Shows a menu for working with custom filters. The menu contains the following commands:

New

Creates a new custom filter.

Select

Brings up a dialog with a list of already defined and saved custom filters.

Save

Saves the current custom filter to the profile of the user selected in the left column. If the filter has not yet been saved (new filter), the *Save As* command is invoked.

Save As

Brings up the *Save Filter* dialog to save the current custom filter using a new name.

In addition, the toolbar contains the following commands:

and

Adds an *and* operator (logical conjunction) to the expression. All terms connected with this logical operator have to be true in order for an alarm/event to be included in the list. Otherwise, it is filtered out of the list.

or

Adds an *or* operator (logical disjunction) to the expression. At least one of the terms connected with this logical operator must be true in order for an alarm/event to be included in the list. Otherwise, it is filtered out of the list.

Left Parenthesis

Adds a left parenthesis to the expression. It is strongly recommended to use parentheses for better clarity of longer expressions.

Add Field

Adds the selected field from the list on the left side to the logical expression.

Less

Adds a *less than* operator (<) to the logical expression.

Greater

Adds a *greater than* operator (>) to the logical expression.

Equal

Adds an *Equal to* operator (=) to the logical expression.

Enter Value

Brings up a dialog where the user can enter the value that restricts the preceding field. The value can be added only after the *Less/Greater/Equal* operators.

Right Parenthesis

Adds a right parenthesis to the expression. It is strongly recommended to use parenthesis for better clarity of longer expressions.

Change Value

Brings up a dialog where the user can change the value that restricts the preceding field.

Delete Last

Deletes the last item of the expression (field, value, parenthesis, etc.).

Undo

Reverts the last operation performed by the *Delete Last* command.

- Item list

Start date

Date when an alarm/event started (was generated).

Start time

Time when an alarm/event started (was generated).

Text

Text of an alarm/event. The filter condition does not require the whole text.

Condition

Condition that generates an alarm/event (Data change, Leading edge, Trailing edge, etc.).

Priority

Priority of an alarm/event.

Device

Name of the device that an alarm/event belongs to.

Tag

Name of the tag related to an alarm/event.

Computer

Name of the computer on which an alarm/event was saved to the database.

User

Name of the user logged on when an alarm/event was received.

Ack

Whether an alarm/event requires acknowledgment.

Ack rights

Access rights required for alarm/event acknowledgment.

Acked

Whether an alarm/event has been acknowledged.

Ack date

Date when an alarm/event was acknowledged.

Ack time

Time when an alarm/event was acknowledged.

Ack user

Name of the user who acknowledged an alarm/event.

End date

Date when an alarm/event ended.

End time

Time when an alarm/event ended.

Receipt date

Date when an alarm/event was received by the runtime software. An alarm/event may be received from a device or another instance of the runtime software (data server) later than it started.

Receipt time

Time when an alarm/event was received by the runtime software. An alarm/event may be received from a device or another instance of the runtime software (data server) later than it started.

Type

Type of alarm/event (Alert, Command, System message).

Active

Whether an alarm/event is still active.

Start date and time

Date and time when an alarm/event started (was generated).

End date and time

Date and time when an alarm/event ended.

Receipt date and time

Date and time when an alarm/event was received by the runtime software.

Ack date and time

Date and time when an alarm/event was acknowledged.

Note date and time

Date and time when the note related to an alarm/event was entered or last modified.

Tag value

The tag value that generated an alarm/event.

Note

Text of the note related to an alarm/event. The filter condition does not require the whole text.

- Example

It is required to display only the alarms/events that occurred since 4/6/2007, 6:00 AM (excluding) to 4/25/2007, 6:00 PM (including) and that are no longer active.

The filter expression consists of three logical conditions (terms). Each term will be enclosed in parentheses.

Choose the *Left Parenthesis* command, select the *Start date and time* field from the list on the left and invoke the *Add Field* command. Insert a *greater* (>) operator and choose the *Enter Value* command to enter a date and time (select 4/6/2007, 6:00 AM). Then complete the term with a *right parenthesis*.

Choose the logical *And* command and create the second part of the expression in the same manner. Insert a *left parenthesis*, select and insert the *End date and time* field, insert *less* and *equal* operators, and a date and time (select 4/25/2007, 6:00 PM). Then complete the term with a *right parenthesis*.

Choose the logical *And* command and create the third part of the expression in the same way. Insert a *left parenthesis*, select and insert the *Active* field, insert an *equal* operator, and a boolean value (select False). Then complete the term with a *right parenthesis*.

The logical expression is completed. It is advised to save the filter with the > *Filter* > *Save As* command before first using it. Close the *Custom Filter* dialog with the **OK** button to apply the filter to historical alarms/events.

2.5.2.3 Export

Exports the list of displayed alarms/events or report data to formatted text file (CSV) so that it can be further processed with third party applications (MS Excel, etc.).

Target file

Specifies whether to create a new file or append the exported text at the end of the target file.

Item delimiter

Specifies a character to be used to delimit the exported items (Space, Tab, Comma, Semicolon or another user defined character(s)).

After closing the dialog with the **OK** button, specify the name of the target file in the *Save As* dialog.

2.5.3 Alarm/Event Report Editor

The *Alarm/Event Report Editor* dialog can be displayed when the *Report* command from the current and historical alarm/event viewers is invoked. The editor window contains two pages – *Report elements* and *Report rows*. The *Report elements* page defines the parts (headers and a footer) making up the report and their properties. The *Report rows* page specifies report rows properties (height, font, grid).

▼ Report elements page

Report elements

Report header

Specifies whether the first page of the report should contain a header.

Page header

Specifies whether each page of the report should contain a header.

Column header

Specifies whether each page of the report should contain a column header (located right below the *Page header*).

Page footer

Specifies whether the bottom part of each page should contain a footer.

Properites

Height

Height of the selected header or footer (in pixels).

Text

Text of the selected header or footer.

Alignment

Specifies the text position. The text can be aligned to the *Left*, *Right* or *Center* of the page or the column.

Font

Brings up a font selection dialog. The selected font will be used for printing the selected header or footer.

First page header

Specifies whether the *Page header* should be also printed on the first page of the report.

Čísla stránek

Specifies whether the *Page footer* should contain *Page numbers.*

▾ Report rows page

Height

Height of the report rows.

Font

Brings up a font selection dialog. The selected font will be used for printing the text in report rows.

Grid

Specifies which lines of a grid should be displayed. The visibility of horizontal and vertical lines can be configured separately.

2.5.4 Defined alarm/event viewer

The defined alarm/event viewer can be displayed with the > *File* > *Defined Alarms/Events* command. The viewer shows a list of devices defined in the project. For each device, a list of alarms/events can be displayed. Selected alarms/events can be temporarily disabled (inhibited).

The top part of the viewer window contains a toolbar with the following buttons (commands):

View

Shows a menu containing the following commands:

Device List

Displays a list of connected devices.

Alarm/Event List

Displays a list of alarms/events defined in the selected device.

Enabled Alarms/Events

Specifies whether enabled alarms/events should be displayed in the list.

Disabled Alarms/Events

Specifies whether disabled alarms/events should be displayed in the list.

Up

Displays a list of connected devices if the list of alarms/events is displayed.

Sort

Sorts defined alarms/events by the specified criterion (Type, Condition, Tag, Priority, Text).

Disable

Disables generating selected alarms/events. This feature has to be activated through the development environment (the *Project Options* dialog), where required access rights can also be configured.

Enable

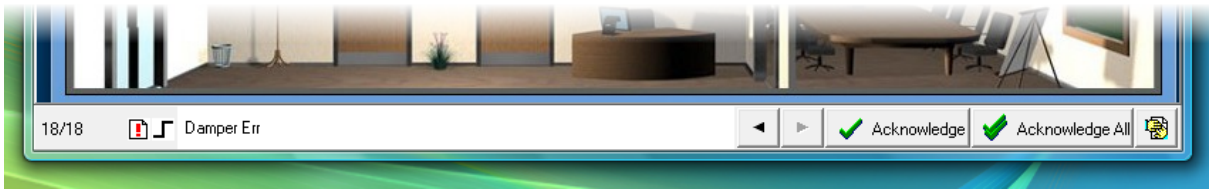
Enables generating selected alarms/events. This feature has to be activated through the development environment (the *Project Options* dialog), where required access rights can also be configured.

Disable online printing of Alarms/Events

Disables/enables the online printing of alarms/events. To change this option, the user must have the same access rights as are required for enabling/disabling generating alarms/events through the above commands.

2.5.5 Alarms/events in bottom panel

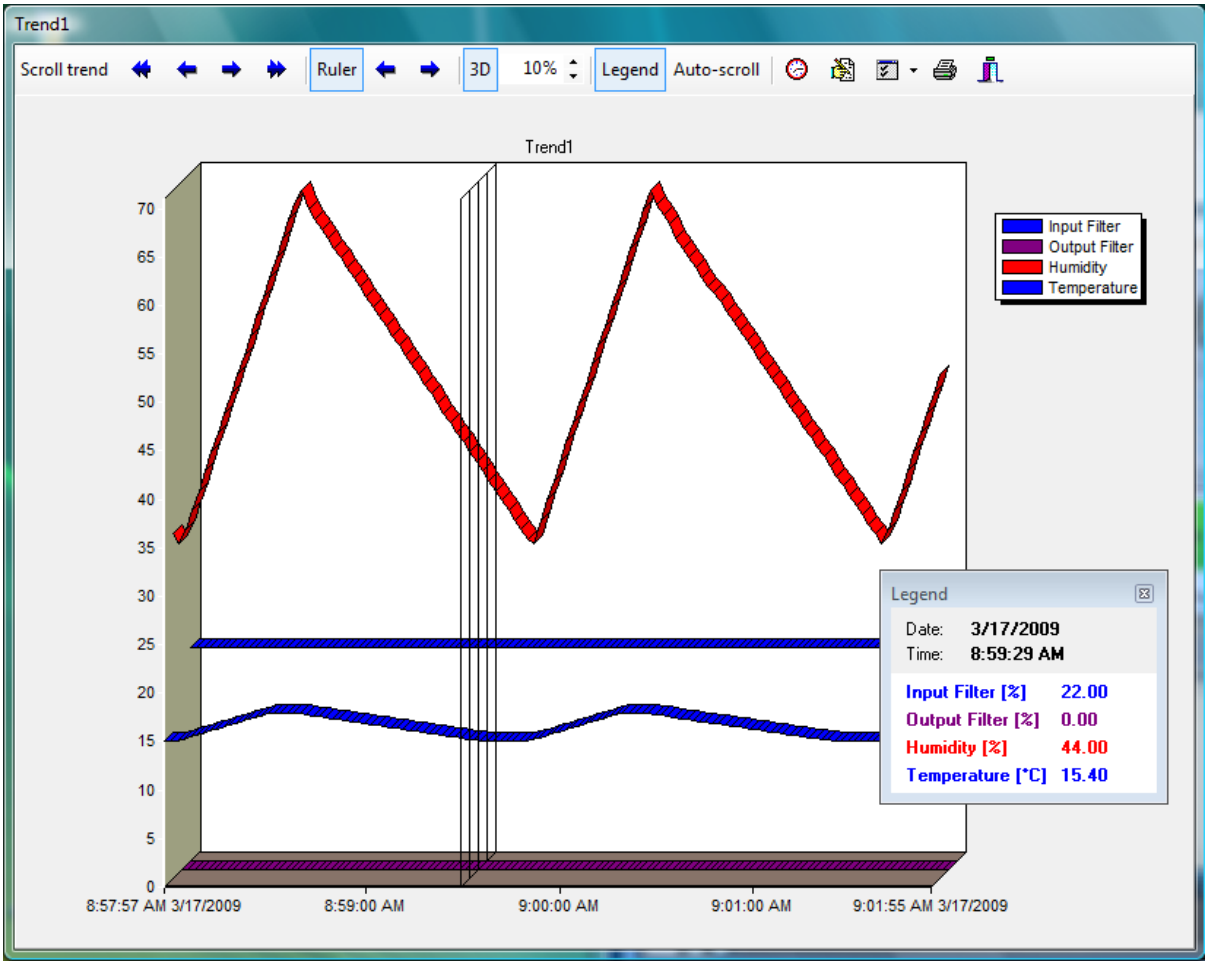
Current alarms/events can also be displayed in a panel located in the bottom part of the runtime software's main window. The panel shows the type and text of the selected alarm/event (a name of the device can be displayed, too). An alarm/event can be selected by using arrow buttons located on the right side of the panel. If the arrow buttons are not used, the selected alarm/event is always the last received/generated one. The panel also contains buttons for alarm/event acknowledgment and hiding the panel. After hiding, the panel remains invisible until a new alarm/event that requires acknowledgement is generated.



Reliance 4 – Alarms/Events in a bottom panel

2.6 Trends

Trends (sometimes called historical trends) are used to view historical data in the form of a trend chart with a bottom time axis. Historical data is the data of tags stored (along with a time stamp) in *data tables* (databases). A trend consists of one or more series. A series is a sequence of points (values of a tag, each with a time stamp). The data shown by a trend is usually stored in one *data table*, but it is possible to show data from any number of different data tables in a single *trend*. The visual appearance of a trend can be adjusted by means of many parameters. Every user defined in a project can have his/her own settings of trends. Trends can be displayed with a tool called *trend viewer*.



Reliance 4 – Trend viewer

Trends can be defined through a tool called *Trend Manager* (defined trends). A list of available defined trends can be accessed via the > *File* > *Trends* command.

Besides defined trends, a *tag trend* is available to display historical data of a single tag. A *tag trend* can be displayed by choosing the *Show Trend* command from the popup menu of a *display* component placed in a visualization window. A *tag trend* is only available if the tag displayed by the component is stored in a data table. If the tag is stored in multiple data tables, the data table with the most frequent sampling is automatically selected. Possible changes made to trend settings are saved but not for a particular tag. These settings will be applied even when showing a trend of any other tag (except for vertical axis range settings).

Trend viewer

Trend manager

2.6.1 Trend viewer

The trend viewer is a tool designed for displaying historical data in the form of a chart with a bottom time axis. It allows for fluently browsing data with the step of various size (1 page, half a page, dragging with the mouse).

The viewer can be opened as a stand-alone window or a window embedded into the main window of the runtime software. The way of opening the viewer is controlled by the *Insert trend window into main window* option in the list of available trends. If the option is active, the viewer gets embedded into the main window in the way allowing the user to move the viewer window and change its size. In this case, the viewer behaves as a sizeable stay-on-top visualization window with a title bar. This way, it is possible to view multiple trends at the same time. If the *Insert trend window into main window* option is not active, the viewer window opens maximized and covers up (obscures) the main window. The viewer window opened this way cannot be moved and resized. Therefore, the viewer must be closed before the user can continue to work with other parts of the application.

The top part of the viewer contains a toolbar for working with the trend. The actual trend is displayed in the area below the toolbar. In the bottom part of the area, a time axis is displayed. In the left part of the area, one ore more vertical axes are displayed.

The toolbar contains the following commands:

Scroll trend - single arrows

Scrolls the trend view forward by half a page. A page represents a predefined time range or the number of points.

Scroll trend - double arrows

Scrolls the trend view forward by one page. A page represents a predefined time range or the number of points.

Ruler

Allows for showing/hiding the ruler. If this option is active, a vertical straight line (called ruler) is displayed in the nearest point (point with the nearest time stamp in any series). The ruler can be moved to the nearest neighboring point using arrow buttons in the toolbar or using arrow keys (left and right) on the keyboard (only if the viewer is opened as a stand-alone window). The nearest neighboring point may belong to another series if the trend is showing data from multiple data tables with a different sampling rate.

3D

Switches on/off the 3-dimensional (3D) display mode. It is possible to change the 3D depth by specifying a percentage value (as a number or using arrow buttons).

Legend

Shows/hides a legend which displays the time stamp (date and time) corresponding to the current ruler position and a list of series. For each series, an *alias* (or *name*) and a *value* is displayed. The value corresponds to the current ruler position. The value may be *accurate*, *approximate* or *invalid*.

An accurate value is the one that corresponds to a series point (actual value read from a data table). An approximate value is the one calculated from the two neighboring series points if such values are available within the current page. An approximate value is marked with an asterisk (*) in the legend. This situation occurs when the trend shows data from multiple data tables with a different sampling rate. As a result, points of a series may have different time stamps than points of another series. An invalid value belongs to a series that does not contain any points within the current page. Also, a series may contain some points within the current page but the ruler position is outside the points. An invalid value is marked with a question mark (?) in the legend.

Auto-scroll

Switches on/off the auto-scroll feature, i.e. automatically scrolling the trend view to display the latest data.

Show Trend from Specified Date and Time

Shows a dialog for selecting a date and time where the trend view should start.

Customize Trend

Shows the *Customize Trend* dialog which allows for customizing all settings affecting the appearance and behavior of the trend. The changes are automatically saved when closing the viewer only if a user is logged on to the program.

Settings

Shows a menu for working with the trend's settings. The menu contains the following commands:

Load Design Settings

Loads the trend's design settings, i.e. the settings defined through the *Trend Manager*. This command is useful if the design settings have changed since user settings were saved to a user profile (see *Saving and loading trend settings* below).

Load User Settings

Brings up a dialog with a list of all users that have the trend's settings stored in their profile. In addition to these users, the list can include an item named *Default* which corresponds to the trend's default settings (see *Saving and loading trend settings* below). Upon selecting a user from the list and confirming the dialog, the trend's settings stored in the selected user's profile are applied.

Save User Settings

Brings up a dialog with a list of all users to which the trend's settings can be made available. In addition to these users, the list can include an item named *Default* which corresponds to the trend's default settings (see *Saving and loading trend settings* below). The user is always allowed to save the settings to his/her own profile. If the user is allowed to edit trends (i.e. use the *Trend Manager*), he/she can also save the settings to the *Default* profile. If the user has the *User administrator* option active or is assigned the *Servicing right*, he/she can save the settings to all user profiles.

Print Trend

Brings up a dialog that enables the user to set up various print options and print the trend. By default, the trend's background color is not printed. This is controlled by the *Print with transparent background* option which can be configured through the *Customize Trend* dialog.

Close

Closes the viewer. If a user is logged on, the trend's settings are automatically saved to the user's profile.

2.6.1.1 Saving and loading trend settings

When the viewer is closed, all the trend's settings are automatically saved to the currently logged-on user's profile; if no user is logged on, the settings are not saved. The settings can also be saved by choosing the *Save User Setting*s command from the *Setting*s button's menu.

Before a trend is displayed in the viewer, the trend's design settings (i.e. the settings defined through the *Trend Manager*) are applied first. If a user is logged on that has the trend's settings stored in his/her profile (i.e. if the file containing the settings exists), the settings are applied (overriding the design settings). Otherwise, the program searches for the trend's settings in the *Default* profile (in the folder `<Project> \ Settings \ Profiles \ Default \ DbTrends \ Trends`). If the settings are found they are applied (overriding the design settings).

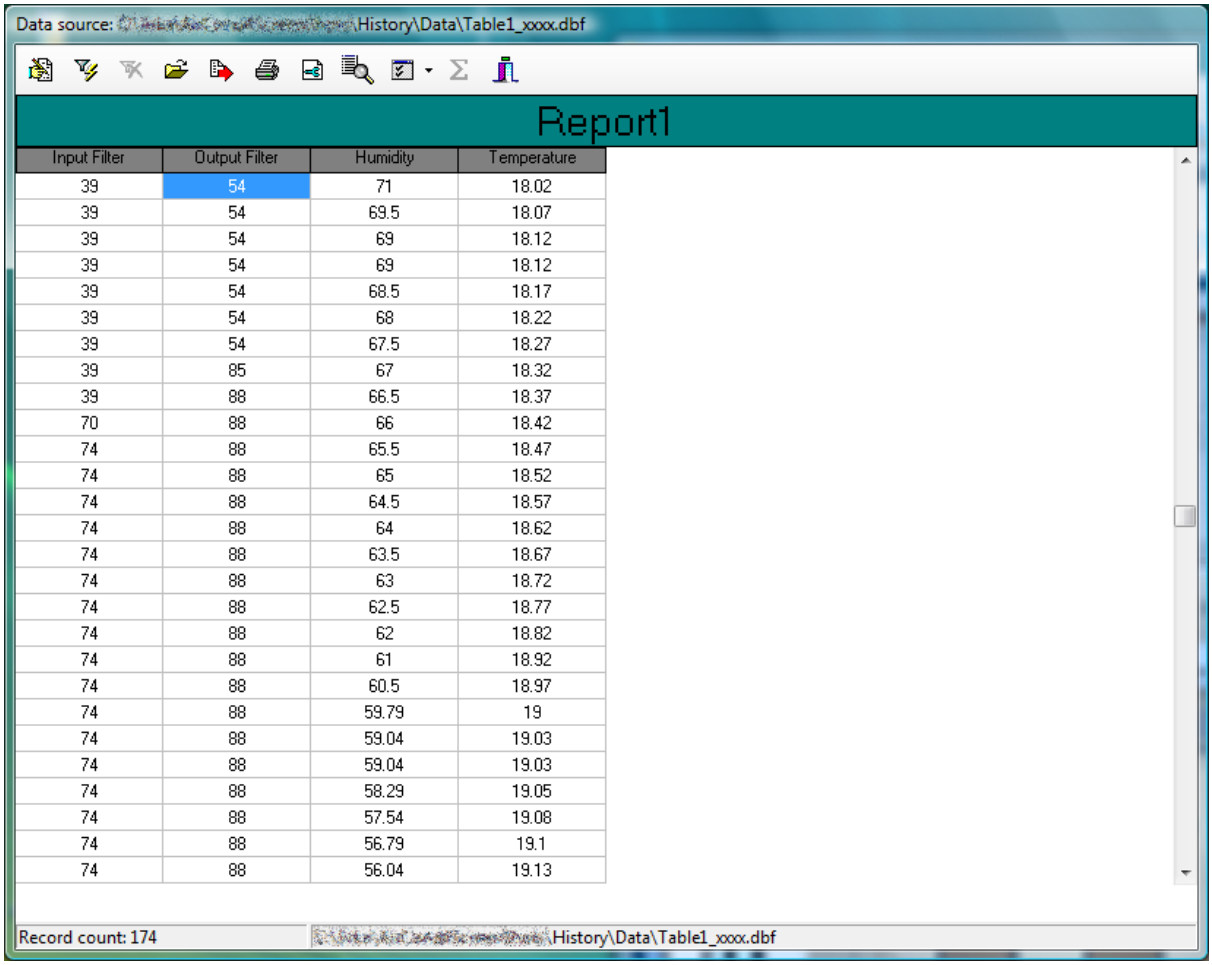
The settings for the trend can also be loaded from the profile of any user that already has his/her own settings of the trend (see the *Load User Setting*s command from the *Setting*s button's menu).

If a user already has his/her own settings of a trend and the trend's design settings are changed (e.g. background color), the changes will not take effect when the trend is displayed by the user. To apply the changes, the *Load Design Setting*s command from the *Setting*s button's menu must be invoked.

2.7 Reports

Reports (sometimes called historical reports) are used to view historical data. Historical data is the data of tags stored (along with a time stamp) in data tables (databases). Every user defined in a project can have his/her own settings of reports. Reports can be displayed with a tool called *report viewer*.

Reports can be defined through a tool called *Report Manager* (defined reports). A list of available defined reports can be accessed via the > *File* > *Reports* command.



Reliance 4 – Report viewer

Report viewer

Report Manager

2.7.1 Report viewer

The report viewer is a tool designed for displaying historical data in a tabular format.

The viewer can be opened as a stand-alone window or a window embedded into the main window of the runtime software. The way of opening the viewer is controlled by the *Insert report window into main window* option in the list of available reports. If the option is active, the viewer gets embedded into the main window in the way allowing the user to move the viewer window and change its size. In this case, the viewer behaves as a sizeable stay-on-top visualization window with a title bar. This way, it is possible to view multiple reports at the same time. If the *Insert report window into main window* option is not active, the viewer window opens maximized and covers up (obscures) the main window. The viewer window opened this way cannot be moved and resized. Therefore, the viewer must be closed before the user can continue to work with other parts of the application.

The top part of the viewer contains a toolbar for working with the report. The actual report is displayed in the area below the toolbar.

The toolbar contains the following commands:

Customize Report

Shows the *Customize Report* dialog which allows for customizing various settings, e.g. settings affecting report columns (visibility, width, summary calculations), report footer and printing. The changes are automatically saved when closing the viewer only if a user is logged on to the program. For more information, see the chapter Customize a report.

Set Filter

Enables the user to define and apply a filter for the data to be displayed. The report only shows the data table records meeting the filter conditions. For detailed information, see the chapter Report filter.

Cancel Filter

Cancels the apllied filter. The report shows all records from the data table.

Open File

Enables the user to select and open an archive file. The report shows the data contained in the file instead of the previously displayed data.

Export Report

Saves the data displayed in the report to a text file. For more information, see the chapter Export.

Print Report

Prints the displayed report.

Page Setup

Brings up a dialog for configuring various settings, such as page size, orientation and margins, to be used when printing the report.

Show Preview

Shows a print preview of the report. The preview enables the user to browse pages by using the toolbar commands available in the top part of the preview window. The toolbar also contains commands for printing and exporting the report into various file formats (e. g. PDF, XLS, FRP, RRP).

Settings

Shows a menu for working with the report's settings. The menu contains the following commands:

Load Design Settings

Loads the report's design settings, i.e. the settings defined through the *Report Manager*. This command is useful if the design settings have changed since user settings were saved to a user profile (see *Saving and loading report settings* below).

Load User Settings

Brings up a dialog with a list of all users that have the report's settings stored in their profile. In addition to these users, the list can include an item named *Default* which corresponds to the report's default settings (see *Saving and loading report settings* below). Upon selecting a user from the list and confirming the dialog, the report's settings stored in the selected user's profile are applied.

Save User Settings

Brings up a dialog with a list of all users to which the report's settings can be made available. In addition to these users, the list can include an item named *Default* which corresponds to the report's default settings (see *Saving and loading report settings* below). The user is always allowed to save the settings to his/her own profile. If the user is allowed to edit reports (i.e. use the *Report Manager*), he/she can also save the settings to the *Default* profile. If the user has the *User administrator* option active or is assigned the *Servicing right*, he/she can save the settings to all user profiles.

Summary Calculation Results

Brings up a window showing the results of summary calculations (*minimum*, *maximum*, *sum* or *arithmetic average*). The summary calculations feature can be turned on/off for individual report items (columns) through the *Customize Report* dialog. If summary calculations are not active for any column, the command is disabled.

Close

Closes the viewer. If a user is logged on, the report's settings are automatically saved to the user's profile.

2.7.1.1 Customizing a report

Columns

The left part of the this contains a list of report items (columns). The right part of the page enables you to view/modify the selected column's properties.

Visible

Determines whether to show the column in the report. It allows for temporarily hiding the column. By default, this option is active.

Width

Determines the column's width in pixels.

Summary calculations

Turns on/off the summary calculations feature for the column. The results of summary calculations can be displayed through the *Summary Calculation Results* command. If the report is printed, the results are printed at the end of the report in the respective column.

Report footer

This page contains an edit box that lets you specify the text to be displayed in the report footer.

Font

Brings up a font selection dialog. The selected font will be used for the text displayed in the report footer.

Print

This page lets you configure report print options.

Print on white background

If this option is active, all columns and other parts of the report (*Report title*, *Column header*, *Page footer*) will be printed with a transparent background regardless of their color settings.

2.7.1.2 Report filter

To configure and apply a filter for the report displayed in the viewer, choose the *Set Filter* command from the toolbar. This brings up a dialog that enables you to select report items (columns) to be filtered. After confirming this dialog, the **Filter Settings** dialog appears which lets you configure filter conditions for individual columns and the relationship between the conditions.

Relationship between columns filter conditions

If the *Concurrent meeting all conditions* option is active, a record will only be displayed if all conditions are met (logical conjunction). If the *Meeting at least one condition* option is active, a record will only be displayed if at least one condition is satisfied (logical disjunction).

Column name

Specifies the name of the column for which a condition is being defined.

Range limits

Specifies the limits of the range (*Minimum*, *Maximum*).

Value position

Specifies the position of values meeting the condition (*Inside range*, *Outside range*).

Include range limits

Determines if values equal to the limits meet the condition.

2.7.1.3 Saving and loading report settings

When the viewer is closed, all the report's settings are automatically saved to the currently logged-on user's profile; if no user is logged on, the settings are not saved. The settings can also be saved by choosing the *Save User Settings* command from the *Settings* button's menu.

Before a report is displayed in the viewer, the report's design settings (i.e. the settings defined through the *Report Manager*) are applied first. If a user is logged on that has the report's settings stored in his/her profile (i.e. if the file containing the settings exists), the settings are applied (overriding the design settings). Otherwise, the program searches for the report's settings in the *Default* profile (in the folder `<Project> \ Settings \ Profiles \ Default \ DbReports \ Reports`). If the settings are found they are applied (overriding the design settings).

The settings for the report can also be loaded from the profile of any user that already has his/her own settings of the report (see the *Load User Settings* command from the *Settings* button's menu).

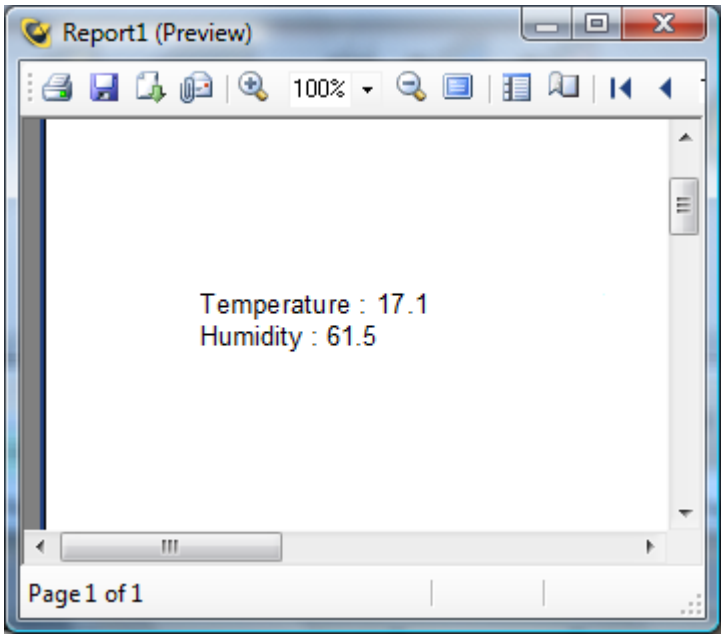
If a user already has his/her own settings of a report and the report's design settings are changed (e.g. column width), the changes will not take effect when the report is displayed by the user. To apply the changes, the *Load Design Settings* command from the *Settings* button's menu must be invoked.

2.8 Custom Reports

Custom reports are used to represent real-time or/and historical data in a customized layout. A custom report can contain additional text and graphical objects (e.g. pictures). The layout of a custom report is defined by a template. A template is a document (file) in one of the following formats: `*.txt` – a text file, `*.html` – an HTML page, or `*.rrp` – a FastReport template. A template contains special markers (so-called tags) that are be replaced with real-time data (from a visualization project) when the custom report is generated. Templates can be edited even at runtime to meet user requirements. Templates in text or HTML format can be changed using a text editor. Templates in FastReport format (*.rrp) can be changed through a program called Custom Report Designer (program R_FRDesigner.exe located in `<Reliance4>\Utils` folder).

A list of available custom reports can be accessed via the *> File > Custom Reports* command.

The custom report selected from the list is displayed in a tool called custom report viewer and can be printed or exported to various file formats.



Reliance 4 - Custom report preview

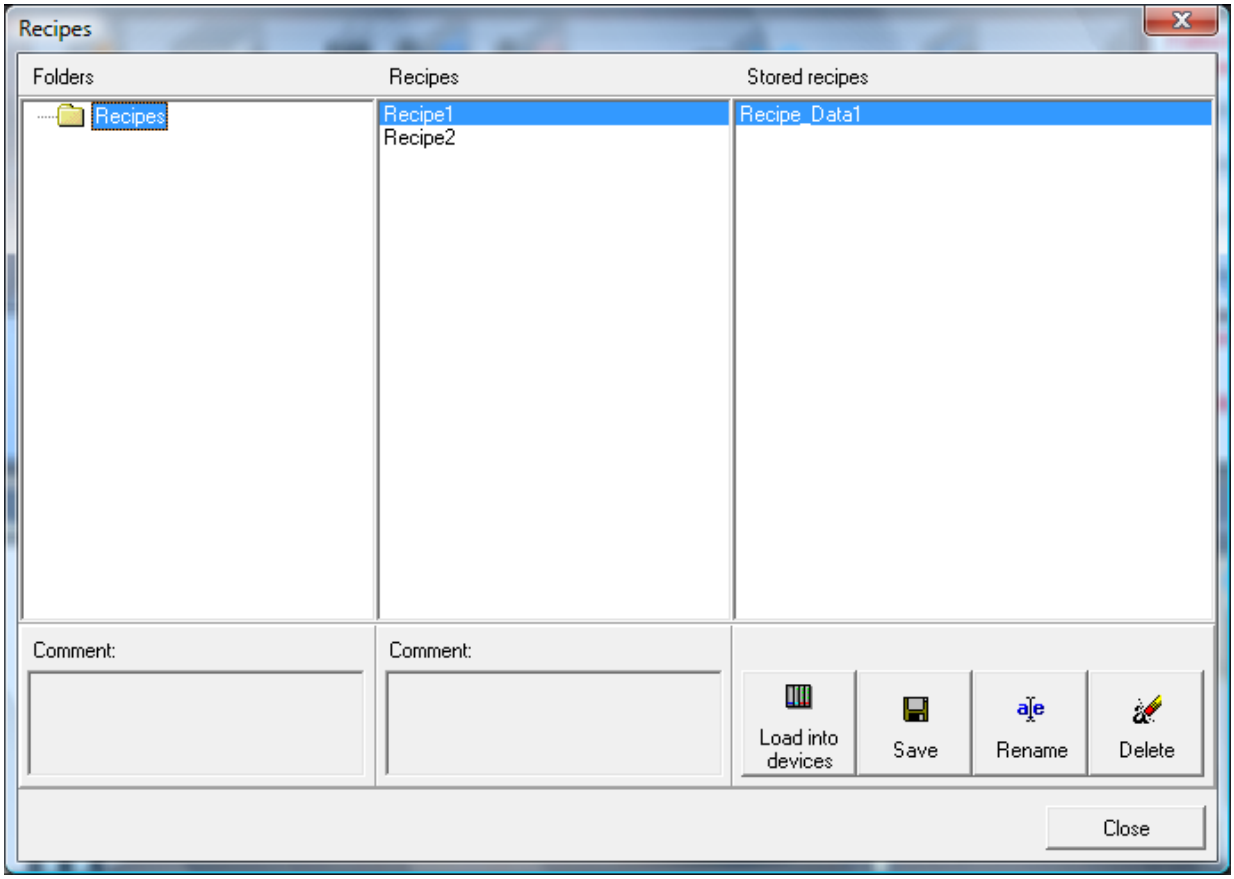
If the custom report is based on a template in text or HTML format, it is possible to save it to a `*.txt`, `*.html` or `*.mht` file.

If the custom report is based on a FastReport template, it is possible to save it to a `*.rrp` file which can later be viewed and/or printed with a program called Custom Report Viewer (program R_FRViewer.exe located in `<Reliance4>\Utils` folder). The custom report can also be exported to PDF or HTML format and saved in a user defined folder or sent via e-mail. It is recommended to use PDF format.

2.9 Recipes

A **recipe** is a group of tags from one or more devices. The values of these tags can be saved to a file. Later, the values can be loaded from the file and transferred (written) into the respective devices. Recipes (groups of tags) can be defined in the development environment. In the runtime software, it is only possible to save and load the data of these group of tags.

The dialog window for managing the recipes can be displayed via the *> File > Recipes* command. The left part of the window contains a list of recipe folders defined in the development environment. The middle part of the window contains recipes contained in the selected folder. The right part of the window contains a list of stored data files for the selected recipe. In the development environment, it is possible to define the access rights required for different operations with a recipe, such as loading the recipe to the device(s), saving the recipe to a file or deleting the recipe's data file.



Reliance 4 – Recipes

The following commands are available:

Load into devices

Transfers (writes) the data of the selected recipe from the selected data file into the respective device(s).

Save

Saves the tag values of the selected recipe to a data file. The recipe data files are stored in the `<Project> \ Settings \ Recipes` folder, and have an `*. rdt` extension.

Rename

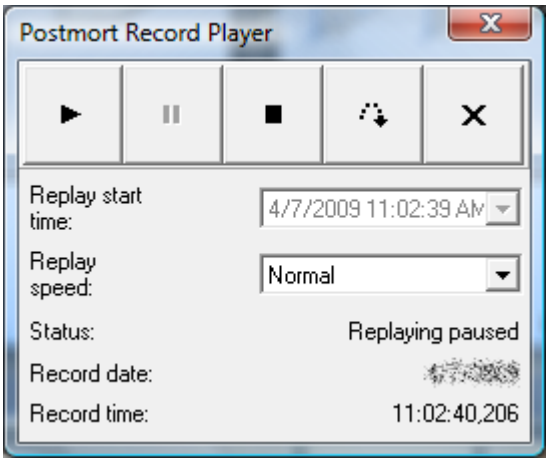
Enables the user to change the name of the selected recipe data file.

Delete

Deletes the selected recipe data file.

2.10 Postmort Record Player

Postmort is the unique feature designed for recording and replaying the operation of a monitored processes. In a simplified manner, it can be compared to a video recorder (VCR). The process's visualization can later be replayed from a selected time in the past using a selected (real-time or higher) speed. You can pause the replaying at any moment and navigate forward through the process record by record (each record represents a change in the process data) or continue the replaying using the same or different speed. This can be useful in case of an accident or process failure to find and analyze the cause of the problem.



Reliance 4 – Postmort

Most functions of the runtime software are stopped while replaying the process (e.g. reading real-time data of devices from communication drivers or data servers, logging historical data to data tables, executing scripts or processing recipes). Postmort recording is stopped, too. Therefore, in most applications one computer is usually designed for the playback of postmort records (recorded by other computer).

If postmort recording is active, the complete data of all connected devices is stored when recording starts and then every minute. Within each minute, only changes in data are stored to minimize the size of data files. This also ensures that all changes (even fast ones) are recorded. The length (number of days) of recorded history is defined in the project and it is limited only by disk space.

Postmort Record Player is accessible through the > *File* > *Postmort Record Player* command.

Postmort Record Player contains the following commands and parameters:

Play

Starts replaying the process from the selected time stamp (selected in the *Replay start time* combo box).

Pause

Pauses replaying the process. Afterwards, the process can be replayed record by record (change by change) or the replaying can be continued.

Stop

Stops replaying the process. The time stamp selected in the *Replay start time* combo box is not changed.

Step

Loads the data of the next record (next change).

Close

Closes the player and restores the data in the visualization.

Replay start time

Enables the user to select the time stamp from which the replay should start. The combo box contains a list of all available time stamps (the complete data is available for these time stamps).

Replay speed

Specifies the replay speed. The user can select the *Normal* speed (real-time) or higher speed (at most 50 times higher).

Status

Indicates the current state of the player. The possible states are: *Ready to replay*, *Replaying*, *Replaying paused.*

Record date

Displays the date of replayed data (the date when the data was recorded.).

Record time

Displays the time of replayed data (the time when the data was recorded.).

2.11 Managers

Managers are tools designed to view, create and configure objects that are part of a visualization project. All managers available in the runtime software have a similar layout:

Toolbar

Contains commands for working with objects. Most of the commands in the toolbar are common to all managers (see the chapter Common Toolbar Commands).

Top left pane

The top left pane displays the objects in a hierarchical tree diagram in order to show the subordination of one object to another.

Bottom left pane

The bottom left pane displays the objects in a list. These are the objects subordinated to the object selected in the top left pane. The list allows you to select and edit multiple objects at a time. When you select an object in the list, the manager displays the object's properties in the right pane. If multiple objects are selected in the list, the manager displays the properties of the selected object that has the input focus or the first object in the selection (if no object in the selection is focused).

Right pane

The right pane displays properties of the object(s) selected in the top left or bottom left pane. The properties can be edited as needed. When you edit a property, the corresponding control changes its color to yellow. This status is also indicated by a red exclamation mark displayed beside the edited object(s) in the top left and bottom left pane. When the selection is about to change, the manager checks all the edited properties to see if they are correct. If so, the manager assigns the edited properties to the selected object(s) and the red exclamation mark changes its color to blue. Otherwise, the selection remains unchanged. If the edits have been assigned to the selected object (s), they can later be saved to the appropriate files by the *Save All* command or canceled by invoking the *Close* command and choosing not to save the changes. Naturally, you can also edit a property and use the *Save All* command immediately. The manager checks all the edited properties to see if they are correct. If so, the manager assigns the edited properties to the selected object(s) and saves the object(s) to the appropriate files.

In the runtime software, objects can be configured/viewed through the following managers:

Trend Manager

2.11.1 Common object properties

Name

A name of the object that must be unique within the project or the parent object (e.g., a tag name within a device).

Alias

An optional alternative name of the object usually used in the GUI during runtime. Therefore, it should be descriptive and understandable to the user. In multilanguage projects, an alias can be localized (i.e., translated into all project languages), which is in contrast to a *Name*.

Comment

An optional comment about the object used by the visualization project developer (systems integrator). It can be useful when configuring, debugging, and altering an application.

Description

An optional description of the object intended for the end user. In multilanguage projects, a description can be localized (i.e., translated into all project languages), which is in contrast to a *Comment*.

2.11.2 Common toolbar commands

 **New Folder** (Alt+Ins)

Is used to create a new folder. The type of the newly created folder depends on the object selected when invoking the command.

View

Is used to change the view style of the objects listed in the bottom left pane of the manager. The *Picture Manager* allows for displaying pictures as thumbnails.

Sort

Is used to sort the objects directly subordinated to the object selected in the tree diagram by the selected column of the bottom left pane.

One Level Up (BkSp)

Is used to move the selection one level up in the tree diagram.

Find Object (Ctrl+F)

Is used to bring up the *Find Object* dialog box to search for an object by its name. To speed up searching the object, specify the type of the object to be searched and select the *Subtree of selected object only* option. Also, the *Whole strings only* and *Case sensitive* options are available. The search results are displayed in a separate window; select (mark) the found object in the respective manager by double-clicking it.

Options

Is used to bring up the *Options* dialog box to view or configure the settings related to the manager (e.g., to *Alphabetically sort object in the tree*). On the *Link substitution* page of the dialog, you can configure the options used while duplicating objects in the manager. The manager can substitute links to tags (when duplicating data tables, real-time trends, custom reports, and recipes) and links to data table fields (when duplicating trends and reports). In addition, the *Options* dialog of the *Trend Manager* enables you to configure the options related to adopting user settings of trends when the *Adopt trend user settings* property is used.

Undo (Ctrl+Z)

Is used to cancel the edits that have not yet been assigned to the selected object(s) (yellow background).

Copy (Ctrl+C)

Is used to copy the currently selected object(s) to the clipboard.

 **Cut** (Ctrl+X)

Is used to delete the currently selected object(s) from the structure and place it to the clipboard.

 **Paste** (Ctrl+V)

Is used to paste the contents of the clipboard into the structure. The contents of the clipboard remain unchanged.

 **Duplicate** (Ctrl+D)

Is used to duplicate the currently selected object(s). The contents of the clipboard remain unchanged.

 **Delete** (Del)

Is used to delete the currently selected object(s) from the structure.

2.11.2.1 Substitution of links to tags

Substitute links when duplicating an object

Determines whether to substitute the links to tags when an object is duplicated based on the same tag name in the source and the target device.

Remove the original link if a tag with the same name does not exist in the target device

Determines whether to remove the original link when the target device doesn't contain a tag with the same name.

2.11.2.2 Substitution of links to data table fields

Substitute links when duplicating an object

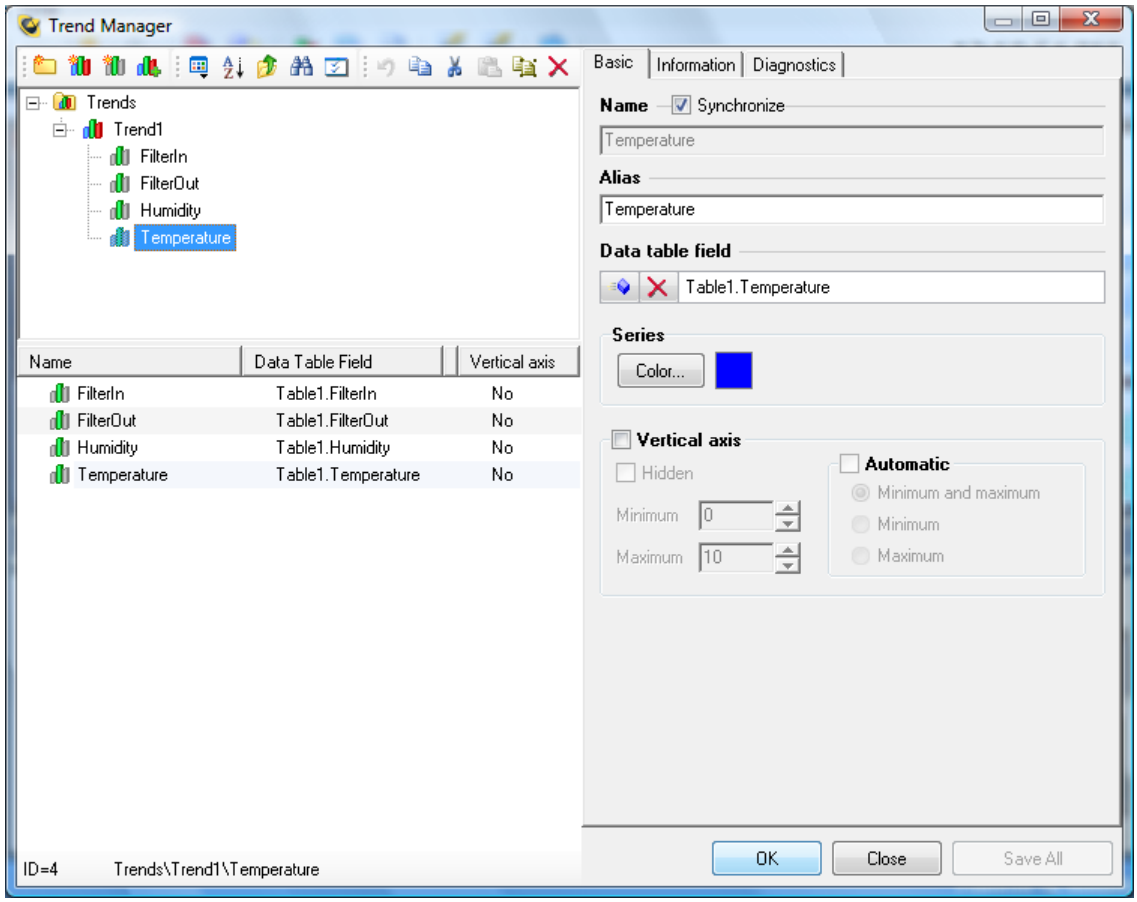
Determines whether to substitute the links to data table fields when an object is duplicated based on the same field name in the source and the target data table.

Remove the original link if a field with the same name does not exist in the target data table

Determines whether to remove the original link when the target data table doesn't contain a field with the same name.

2.11.3 Trend Manager

The **Trend Manager** allows you to define and configure *trends*. In the context of **Reliance**, a trend is an object used for graphic presentation of the data stored in a data table(s) (i.e., historical data). Trends can be displayed at runtime via the trend viewer.



Reliance 4 - Trend Manager

The *Trend Manager* window has the same layout as other managers (see the chapter Managers). In addition to the common toolbar commands, the toolbar contains the *New Trend*, *New Trend Series*, and *Add Trend Series* commands.

The options of the *Trend Manager* at runtime and design-time are identical. After a new trend is added, you have to select the computer(s) to which the trend should be connected.

Trend Properties

Trend Series Properties

2.11.3.1 Trend properties

Common Object Properties

Title

Specifies the text to be displayed as the title of the trend using the specified font. If the *Use trend alias or name* property is active, the trend's alias (or name if an alias is not specified) is used as the title.

Text

Specifies the *Font* of the title.

Background

Specifies the background *Color* of the trend.The color should contrast with colors used for individual series.

Ruler

Specifies the *Color* and *Width* of the ruler. The ruler is a vertical straight line drawn on the background. It is designed for accurate reading of values of individual series at the crossing point of the ruler and the series.The color of the ruler should contrast with the background color. The width is specified in pixels.

Vertical axis

Enables you to configure the behavior of the vertical axis common to all series. The *Hidden* property can be used to hide the axis in cases when each series uses its own vertical axis. The *Automatic* property determines whether the axis automatically adjusts its minimum and/or maximum to the series' values within the current time range. If the axis' minimum and/or maximum are not automatic, they must be specified as the *Minimum* and/or *Maximum* properties.

Trend type

Determines how to graphically represent the series' values. The series can be displayed as a *Line trend* or *Bar trend*. All trend series are of the same type.

Paging

Determines the time range displayed on a single page of the trend. If the **Point count** property is active, the trend viewer always attempts to display the specified number of series points on a single page. In this case, it is required that all the series be linked to the same data table so that each series displays points with the same time stamps. If the **Time range** property is active, the trend viewer always displays the specified time range on a single page regardless of the amount of series points.

Series

Contains the list with trend series. You are enabled to change the order of the series using arrows above the list. The specified order will take effect, for example, in the trend's legend.

2.11.3.2 Trend series properties

Common Object Properties

The name of a series can be synchronized with a data table field name.

Data table field

Specifies the link to the *data table field* whose values (time samples) are to be displayed by the series. If the *Paging* property is set to *Time range*, the series can be linked to different data table fields, i.e., the trend can display data stored in different data tables.

Series

Specifies the series' *Color*. It should contrast with the background color of the trend.

Vertical axis

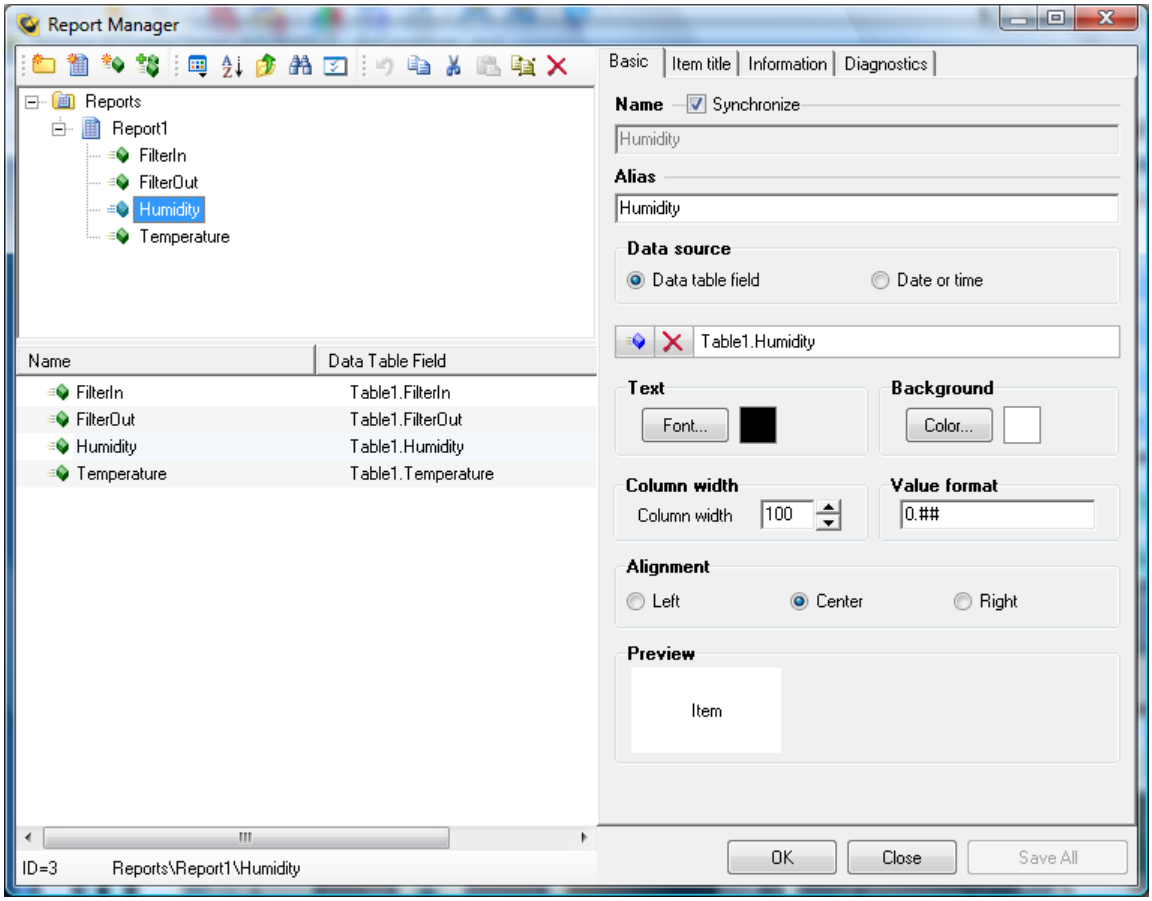
Determines whether the series has its own vertical axis or uses the vertical axis common to all series. The other properties enable you to configure the behavior of the vertical axis private to the series. The **Automatic** property determines whether the axis automatically adjusts its minimum and/or maximum to the series' values within the current time range. If the axis' minimum and/or maximum are not automatic, they must be specified as the *Minimum* and/or *Maximum* properties.

Hidden

If this property is inactive, the actual axis will not be displayed, but its setting will be used.

2.11.4 Report Manager

The **Report Manager** allows you to define and configure reports. In the context of **Reliance**, a report is an object used for graphic presentation of the data stored in a data table (i.e., historical data) in a tabular format. Reports can be displayed, printed, exported, and sent by e-mail at runtime via the report viewer.



Reliance 4 - Report Manager

The *Report Manager* window has the same layout as other managers – see the chapter Managers. In addition to the common toolbar commands, the toolbar contains the *New Report*, *New Report Item*, and *Add Report Items* commands. The last mentioned command brings up a dialog window for the selection of field(s) of a data table. New fields are added to the selected report after one or more data table fields are selected (*Shift* + left mouse button allows for the selection of multiple fields in a row, *Ctrl* + left mouse button allows for the selection of fields one by one).

The options of the *Report Manager* at runtime and design-time are identical. After a new report is added, you have to select the computer(s) to which the report should be connected.

Report Properties

Report Title

Report Column Header

Report Page Footer

For **data table fields**, the following settings can be edited:

Report Item Properties

Report Item Title

2.11.4.1 Report properties

Common Object Properties

Data table

Specifies the link to the data table whose contents are to be displayed by the report.

Report elements

Determines which elements to include in the report: *Title, Column header, Page footer.*

Grid

Determines whether to display grid lines on the background. The *Horizontal* and *Vertical lines* can be displayed independently.

Row height

Specifies the height (in pixels) of a single row of the report. It may affect the number of rows displayed on a single page of the report.

Column order

Contains a list of the specified *report items.* To change the order of a column, change the respective item's position in the list by using the arrow buttons in the toolbar above the list.

2.11.4.2 Report title

Specifies the title printed on the first report page. The title is printed only if it is enabled on the report properties' *Basic* page (the *Title* property must be active).

Use report alias or name

Determines whether to use the report's alias (or name if an alias is not specified) as the title. If this option is deactivated, any title can be entered.

Text

Specifies the *Font* of the title.

Background

Specifies the background *Color* of the title. The color should contrast with the text color.

Frame

Determines whether to frame the report header with a line of the specified *Color* and *Width* (in pixels).

Bar height

Specifies the height (in pixels) of the report header bar. The height should correspond to the size of the title's font.

Alignment

Specifies the alignment of the title within the report header.

2.11.4.3 Report column header

Specifies the text printed on top of every page of the report. The text is printed only if it is enabled on the report properties' *Basic* page (the *Column header* property must be active).

Frame

Determines whether to frame the column header with a line of the specified *Color* and *Width* (in pixels).

Height

Specifies the height (in pixels) of the column header.

2.11.4.4 Report page footer

Specifies the text printed on the bottom part of every report page. The text is printed only if it is enabled on the report properties' *Basic* page (the *Page footer* property must be active).

Text on footer

Determines whether to display the specified text on the footer using the specified *Font* and *Alignment.*

Page numbers

Determines whether to display the page number on the footer using the specified *Font* and *Alignment.*

Page numbers and text on separate rows

Determines whether to print the page number and the footer text on separate rows. If this property is not active, the footer is printed on a single line.

Background

Specifies the background *Color* of the footer. The color should contrast with the text color and the page number color.

Height

Specifies the height (in pixels) of the footer. The height should correspond to the size of the fonts.

2.11.4.5 Report item properties

Common Object Properties

The *Name* of an item can be *synchronized* with a *data table field* name.

Data source

Specifies the link to a data source. The data source can be a *Data table field* or *Date or time* of a data table record. For the most part, the first two report items are linked to date and time, the other report items are linked to *data table fields*.

Text

Specifies the *Font* of the item's text. The size of the font should correspond to the report's row height.

Background

Specifies the background *Color* of the item's text. The color should contrast with the text color.

Column width

Specifies the width (in pixels) of the item's column.

Value format

Specifies the format string to be used when converting the item's value to text for display purposes. It is only used for the report items linked to numeric data table fields.

Alignment

Specifies the alignment of the item's text within the item's column.

2.11.4.6 Report item title

Use item alias or name

Determines whether to use the item's alias (or name if an alias is not specified) as the column title. If this option is deactivated, any title can be entered.

Text

Specifies the *Font* of the item's column title.

Background

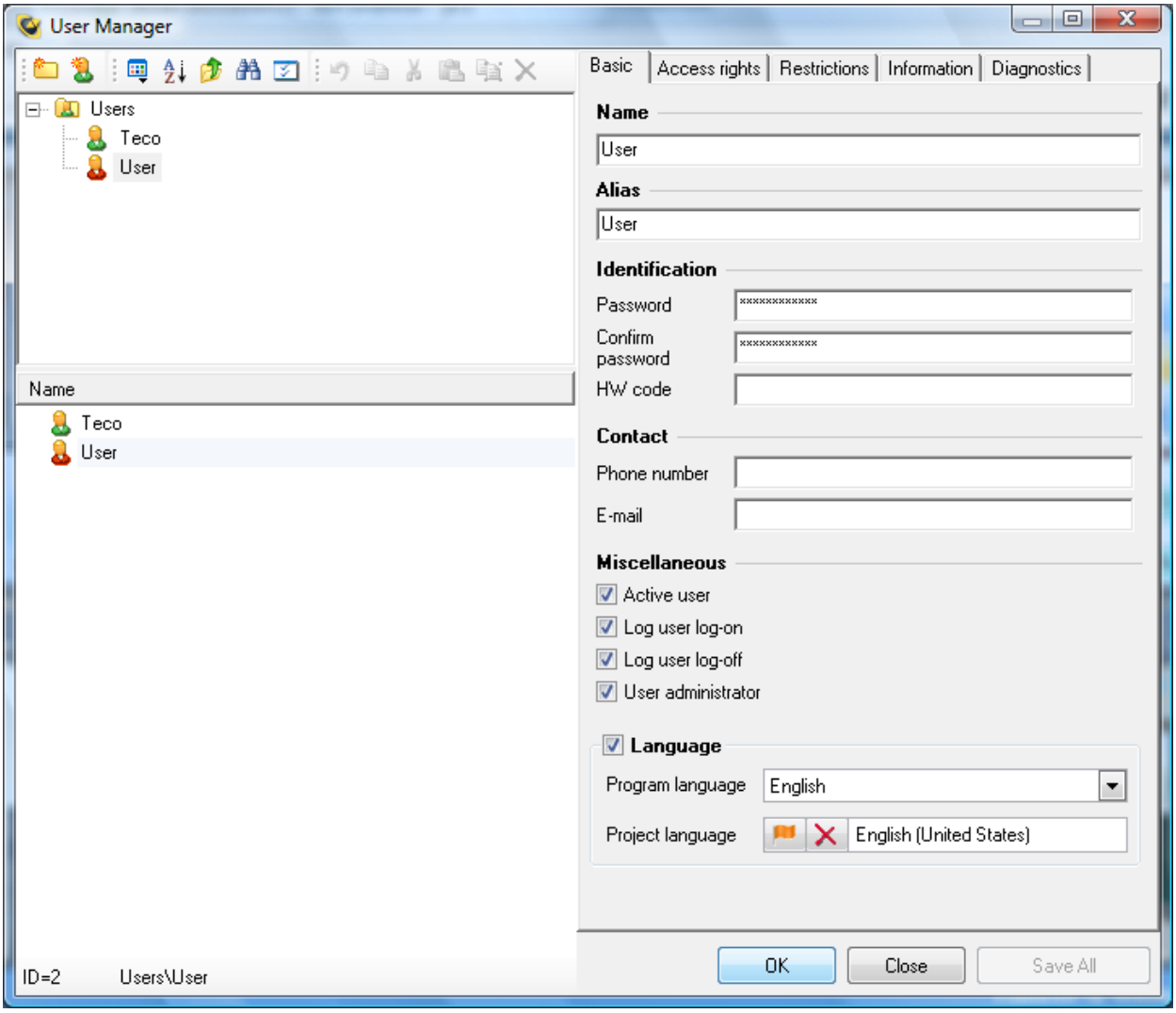
Specifies the background *Color* of the item's column title. The color should contrast with the text color.

Alignment

Specifies the alignment of the item's column title within the column.

2.11.5 User Manager

The **User Manager** allows you to define and configure users. In the context of **Reliance**, a *user* is an object representing an end user (usually operator) allowed to log on to the program.



Reliance 4 - User Manager

The *User Manager* window has the same layout as other managers (see the chapter Managers). In addition to the common toolbar commands, the toolbar contains the *New User* command.

The options of the *User Manager* at runtime and design-time are identical. After a new user is added, you have to select the computer(s) to which the trend should be connected.

2.11.5.1 User properties

Name

Specifies the user's login name that must be unique within the project and cannot contain illegal characters. The name is entered by the user when logging on to the program.

Identification

Password

Specifies the password that is entered by the user when logging on to the program. It *is case sensitive.*

Confirm password

Must have the same value as the *Password* property.

Code

Specifies the code assigned to the user if logging on by a hardware code sensor is used. Otherwise, the value is ignored. For more information, see the chapter *Logging on/off using a HW code reader* in the *Runtime Software* manual.

Contact

A *Phone number* and *E-mail* can be specified.

Miscellaneous

Allow user to log on

Determines whether the user's account is active. It allows you to temporarily enable or disable the user to log on to the program.

Log user log-on

Determines whether to log the information about logging the user on to the program to the alarm/event database.

Log user log-off

Determines whether to log the information about logging the user off of the program to the alarm/event database.

User administrator

Determines whether to allow the user to administrate users at runtime. If the property is active, the user can add new users and modify or delete existing users via the *User Manager*.

Language

Program language

Allows you to specify the language of the GUI which is to be set after the user logs on (labels in menus, toolbars, etc.).

Project language

Allows you to specify the language of project-defined texts which is to be set after the user logs on (labels of components in visualization windows, alarm/event texts, etc.).

2.11.5.2 User access rights

These properties specify the user's access rights to the program. For example, if the Control process right is required for switching on a pump by a *Button* component, it can only be done by a user(s) who has been assigned this access right.

Servicing right

Determines whether the user has a special right that ensures the user cannot be modified or deleted at runtime via the *User Manager* by a user administrator that has not been assigned the *Servicing right*. This right can only be activated through this property in the development environment. This feature enables Reliance system integrators to secure certain parts of the application from other users.

Check All

Is used to select all the rights in the list.

Uncheck All

Is used to unselect all the rights in the list.

Edit...

Is used to bring up the *Project Options* dialog box to rename the rights. This command can only be executed at design-time.

2.11.5.3 User Security restrictions

These properties determine the access restrictions applied when the user logs on to the program. After logging the user off of the program, the default restrictions configured for the computer are restored.

Disable 'Start' menu

Determines whether to disable using the Windows *Start* menu.

Hide task bar

Determines whether to hide the Windows task bar.

Hide icons on desktop

Determines whether to hide icons on the Windows desktop.

Disable minimizing runtime software's main window

Determines whether to disable minimizing the main window of the runtime software.

Disable moving runtime software's main window

Determines whether to disable moving the main window of the runtime software.

Disable closing runtime software's main window

Determines whether to disable closing the main window of the runtime software using the *Close* command from the system menu and the corresponding icon on the title bar. This options does not affect the *File* > *Exit* command.

Disable printing alarms/events, trends, reports...

Determines whether to disable printing alarms/events, trends, and reports at runtime.

Disable customizing trends

Determines whether to disable the commands for changing, loading, and saving the settings in the trend viewer at runtime.

Disable customizing reports

Determines whether to disable the commands for changing, loading, and saving the settings in the report viewer at runtime.

Disable Trend Manager

Determines whether to disable the *Trend Manager* command at runtime.

Disable Report Manager

Determines whether to disable the *Report Manager* command at runtime.

Disable Project Manager

Determines whether to disable the *Project Manager* command at runtime.

2.11.6 Project Manager

The **Project Manager** is a tool designed to display information about objects defined in the visualization project (devices, tags, alarms/events, data tables, trends, etc.). Objects not connected to the computer on which the project is running may not be listed. Diagnostics information is available for some object types (the value and quality of a tag, send and received packets via a communication channel, etc.).

The *Project Manager* window is divided into four basic areas (the toolbar, top left pane, bottom left pane and the right pane).

Toolbar

In addition to the *View*, *Sort*, *One Level Up*, *Find Objects* and *Options* commands (see the chapter Common toolbar commands), the toolbar contains the *Start Diagnostics* and *Stop Diagnostics* commands. These two commands activate/deactivate refreshing diagnostics information.

Top left pane

Displays the objects defined in the project in a hierarchical tree diagram in order to show the subordination of one object to another (see the chapter Managers). The objects are divided into folders named based on the managers in which they were defined. The root folder (named based on the project) contains the following folders: *Data Structures*, *Devices*, *Communication Drivers*, *Recipes*, *Data Tables*, *Trends*, *Real-Time Trends*, *Reports*, *Custom Reports*, *Pictures*, *Actions*, *Users* and *Control Areas*. The most useful information is usually contained in the *Devices* folder (devices, tags, alarms/events) and in the *Control Areas* folder (computers, connected devices, communication channels).

Bottom left pane

Displays a list of objects subordinated to the object selected in the top left pane (in the tree). The displayed objects are on the same level of hierarchy (of the tree structure).

Right pane

Displays properties of the object(s) selected in the tree (top left pane) or in the bottom left pane. During runtime, all properties are read-only (for detailed description of all properties, see the *Reliance 4 Development Environment* manual.

Object properties are organized into pages in the same way as in the respective managers. In addition, the *Diagnostics* page showing runtime information is displayed for some object types (tags, communication channels).

When a tag is selected, the *Diagnostics* page shows the following information: *Value* (value of the tag), *Quality* (determines whether the tag value is valid or invalid) and *Time stamp* (determines the time of the last update of the tag value).

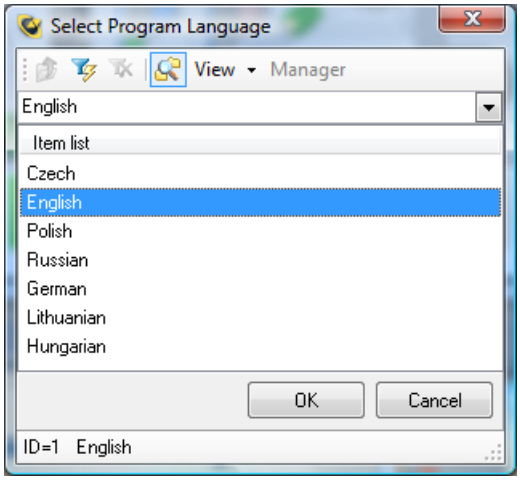
When a communication channel is selected, the *Diagnostics* page shows a dump of communication packets. For each packet, the dump includes the following information: *Device*, *Packet type*, *Packet length* and *Send/Receipt time*.

2.12 Selecting a language

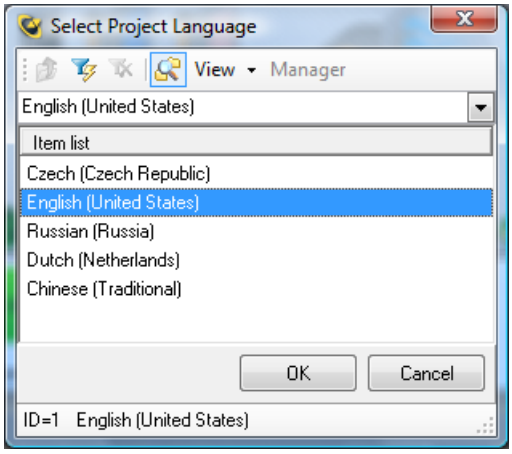
Even when a project is running, the user can change the program and project language by choosing by the *Program Language* and *Project Language* commands from the main menu.

Program Language

Enables the user to select the language of the GUI (menus, toolbars, managers, etc.). Currently, the following languages are available: Czech, English, Polish, Russian and German.



Reliance 4 – Program Language



Reliance 4 – Project Language

Project Language

Enables the user to select the language of the running visualization project (e.g. component labels in visualization windows, alarm/event texts, texts in custom reports, etc.). The languages to be available at runtime are defined in the project.

2.13 Virtual Keyboard

Virtual keyboard is a dialog window that contains keys in a similar layout as a common computer keyboard. The virtual keyboard is usually used in visualization projects running on computers without a physical keyboard (such as touch panels).

If the virtual keyboard is enabled in the project, it is possible to activate it from the toolbar or from the menu by the > *File* > *Virtual Keyboard* command. In these cases full 104 keyboard is displayed.

Dialog windows that require input contain command which brings up the virtual keyboard. Layout of the virtual keyboard corresponds to the type of data (e.g. if the input of a numerical value is required only the numerical part of the keyboard is visible). The virtual keyboard can be configured in such a way that it is displayed every time user input is required.

The virtual keyboard layout corresponds to the current keyboard selected in Windows.

Reliance 4 – Virtual keyboard

Behavior of the following keys on the virtual keyboard differs from a physical keyboard:

Shift

Activates the capital letter mode for the next typed letter. The Shift key on the virtual keyboard doesn't have to be pressed while typing a capital letter which is the main difference from the physical keyboard's Shift key.

NumLock

Displays the numerical keypad on the right side of the virtual keyboard dialog window.

Close

Closes the virtual keyboard window.

Language

Enables you to change currently selected keyboard in Windows.

2.14 System Information

The System Information window provides information on the runtime software and the running project. The information is divided into the following pages:

System

Project

The full path and name of the project's main file (file with an `.rp4` extension).

Started

Project start date and time.

Computer

The name of the computer on which the project is running.

Event log

Contains a list of messages generated during project startup. The message with a yellow background may be a sign of a problem, the message with a red background indicates an error.

Data tables

The red signal light indicates data tables activity (data logging).

Tags

The red signal light indicates updating the tags in the project.

Device communication

The red signal light indicates data communication between the runtime software and device communication drivers.

Scripts

The red signal light indicates that a script is running.

Devices

A list of all devices connected (available) to the computer.

Data tables

A list of all data tables connected (available) to the computer.

Tags

A list of tags of all devices connected (available) to the computer. Full tag names are displayed (including device name).

DDE sharing

A list of all project tags shared via DDE. The *Copy Link* command (Ctrl + C) from the popup menu copies DDE share name to the clipboard so that it can be used in other programs (e.g. MS Excel) to view the value.

Network connections

A list of network connections with other computers defined in the project. The list contains the following columns:

Remote computer

Project computer name of the remote computer.

Connection type

Information about the type of connection – client or server. Data servers (*Reliance Server* and *Reliance Control Server*) can be both client and server, *Reliance Control* and *Reliance View* can be only a client.

Connection status

Information about the state of a connection.

Latest request

Name (type) of the latest request to which a reply was sent.

Sent off

Number of sent packets.

Received OK

Number of received correct packets.

Received with error

Number of received erroneous packets.

3 Appendix

3.1 Running a project

A visualization project can run either as a standard application or as a Windows service (if running in *Reliance Server*). If a project is to run as a standard application, it can be started in several ways: from the development environment, through a shortcut to the runtime software with the required parameters, or from the runtime software by choosing the *Run Project* or *Re-run Project* command. Running a project as a Windows service (in *Reliance Server*) is described in the *Data Servers* manual.

- Running a project from the development environment

  A project opened in the *Reliance 4 Design* development environment can be run via *> Project > Run* command (F9). Before running a project for the first time, it is recommended to check and/or configure the options on the *> Project > Options > Runtime* page of the *Project Options* dialog.

  The *Runtime software* property specifies the program in which the project should run *(Reliance View, Reliance Control, Reliance Control Server)* when started from the development environment.

  The *Computer name* property specifies the computer (i.e. logical computer defined through the *Project Structure Manager*) on which the project should run when started from the development environment. The selected computer determines the settings (IP address or hostname, program and project language, visibility of the title bar, menu bar and the toolbar, etc.) and connected (available) objects (devices, data tables, trends, reports, custom reports, etc.).

- Creating a project shortcut from the development environment

  A shortcut to the project opened in the *Reliance 4 Design* development environment can be created via the *> Project > Create Shortcut* command which brings up the *Create Shortcut to Project* dialog with the following options:

  Software

  Specifies the software used to open the project *(Reliance Design)* or to run the project *(Reliance View, Reliance Control, Reliance Control Server).*

Computer to run project on

Specifies the computer (i.e. logical computer defined through the *Project Structure Manager*) on which the project should run when started from the development environment. The selected computer determines the settings (IP address or hostname, program and project language, visibility of the title bar, menu bar and the toolbar, etc.) and connected (available) objects (devices, data tables, trends, reports, custom reports, etc.).

Shortcut name

Specifies the shortcut name. By default, it consists of the project name and computer name in the "Project name (Computer name)" format. Usually, there is no reason to change the default value.

Shortcut location

By default, the shortcut location is set to the Windows desktop of the current user. Usually, there is no reason to change the default value.

Comment

Optional text describing the shortcut.

To create the specified shortcut, choose the *Create* command. The dialog is not closed so that more shortcuts could be created.

▼ Creating a project shortcut manually

A project shortcut can also be created manually. First create a shortcut to one of the following programs:

Reliance Design (`R_Design.exe`)

Reliance View (`R_View.exe`)

Reliance Control (`R_Ctl.exe`)

Reliance Control Server (`R_CtlSrv.exe`)

The listed programs are located in the `<Reliance4>` directory (usually `C:\Program Files\GEOVAP\Reliance4\`).

The next step is to change the shortcut properties so that the desired project is run/opened. Two more parameters have to be added into the **Target** edit box which contains the path and name of one of the above programs. The two parameters to be added are "Project main file path and name" and "Project computer name".

All the three parameters in the **Target** edit box must be enclosed in parentheses.

Example:

```
"C:\Program Files\GEOVAP\Reliance4\R_View.exe" "C:\Reliance4
\Projects\Demo\Demo.rp4" "PC1"
```

or

```
"C:\Program Files\GEOVAP\Reliance4\R_Ctl.exe" "D:\Reliance4
\Examples\Demos\BoilerRoom\BoilerRoom.rp4" "Server1"
```

If the project is to start automatically when a user logs on to Windows, the shortcut must to be copied to the user's > *Start* > *Programs* > *Startup* folder (or to *Startup* folder of All Users).

3.2 Communication drivers

In the context of **Reliance**, a communication driver is a program designed to provide communication with a hardware device. If the device is a PLC or other similar I/O device then the driver provides the transmission of process data from the device to the runtime software and transmission of commands (e.g. commands for changing process parameters, set-points or outputs) from the runtime software to the device. **Reliance 4** communication drivers are DLL libraries located in the `<Reliance4>\Drivers` directory. The drivers run as part of *Reliance Driver Server* (`R_DrvSrv.exe`). This program can run as a standard application (started by the runtime software) or as a Windows service (in combination with *Reliance Server*).

3.3 Help and Documentation

The **Reliance** system contains many help and documentation files. Most documents are available in several language translations and in two different formats. The documents contained in the `<Reliance>\ Doc` folder are print friendly (the PDF format). The documents contained in the `<Reliance>\ Help` folder are usually displayed as context help in various parts of the **Reliance** system (CHM files).

First Steps (FirstSteps)

A short tutorial designed for new users of **Reliance 4**. The user is introduced to the steps required to create a simple visualization project in the development environment – **Reliance 4 Design**.

License Activation (LicenseActivation)

A short tutorial that describes how to activate a license for **Reliance 4**. The activation is required only if your license is stored in a software key.

Development Environment (Design)

A reference guide for the **Reliance 4 Design** development environment.

Runtime Software (Runtime)

A user's guide for the runtime software (*Reliance 4 View*, *Reliance 4 Control*, and *Reliance 4 Control Server*).

Data Servers (DataServers)

A manual which describes how to configure and run **Reliance**'s data servers (*Reliance 4 Control Server* and *Reliance 4 Server*). The document also includes a detailed description of the Web pages provided by a built-in Web server.

Web Client (WebClient)

A reference guide for *Reliance 4 Web Client* which is based on the Java platform. The document describes how to run and work with *Reliance 4 Web Client*.

Mobile Client (MobileClient)

A reference guide for *Reliance 4 Mobile Client* which is based on Windows CE, Windows Mobile, etc. The document describes how to run and work with *Reliance 4 Mobile Client*.

Scripts (Scripts)

A reference guide for VBScript and **Reliance** objects used to access elements of a visualization project from scripts.

OPC Tutorial (Tutorial_OPC)

A short tutorial that shows how to connect to an OPC server from a **Reliance** project. The document describes the process of creating a new project with an OPC device and importing tags from an OPC server.

Data Exchange Methods (DataExchange)

A document describing various methods of data exchange between a **Reliance** project and an external application (CSV, SQL, DDE, COM, OPC, External Communicator, Web service).

Change Log (History)

An HTML document containing the list of new features and changes made to the **Reliance** system by version.

FastReport – Custom Reports (CustomReports)

A user's manual for the FastReport 4.0 tool which is integrated in the **Reliance** system. It is an original document which is only available in the English language.

Visual Basic Scripting (VBScript5)

An original Microsoft document containing a tutorial and a reference guide for VBScript.

Microsoft Windows Script Technologies (WindowsScript56)

An original Microsoft document containing user's guides for VBScript and JScript.