EXOdesigner

EXO programming environment

Windows-based programming environment for the EXO system controllers as well as SCADA and project design.

Programming of controllers with ready-made objects, function blocks and/or the high-level language EXOL. Designing of SCADA graphics using templates and symbols.

- **Designing of SCADA graphics using templates and symbols**
- **Programming of controllers**
- **Includes an on-line debugging tool for easy configuration**

EXOdesigner is a set of software for configuring your EXO system. It can be used for:

- Creating an EXO system with communication structure and general project design
- Configuring the controllers in a project
- Configuring computers and EXO4 SCADA graphics

All EXO controllers are fully software compatible and are programmed using EXOdesigner, a PC based development environment. The compatibility also applies across product generations, which offers a number of advantages:

- You can exchange controllers in a system without having to rewrite the programs. When you upgrade your system, the old programs can be re-used.
- In order to program the EXO controllers, you only need to learn one programming tool.
- Investments in program development stay the same over time.

The controllers are freely programmable, which gives maximal flexibility. You can create your own applications and program library.

- **Designing project structure, i.e. communication and computers**
- **Smart tools for re-using graphics and controller configuration**
- **Very flexible system design tool**

Ready-made controller functions

The programming can be performed in two ways. The easiest and fastest way is to use the ready-made controller functions in EXOdesigner. By combining these you quickly build full scale applications. A large number of functions for the most common tasks in building automation are included in EXOdesigner, e.g. for controlling pumps, fans and heating, handling alarms and time channels, communication, etc.

EXOL

The other way of programming the controllers is to use the high-level language EXOL. EXOL is a programming language especially developed for EXO, and has a large number of commands and functions that facilitate the programming of automation applications. Thanks to the possibility to use ready made functions, and to be able to customise the programs with EXOL programming, maximum speed and flexibility in the development process is guaranteed.

Software

EXOdesigner can be used on Windows 2000, Windows XP, Windows Server 2003, and Microsoft Windows Vista.

Creating an EXO system with communication structure and general project design

An EXO project is a plant consisting of a number of controllers, main computers, and a number of work computers. They all come together in a communication system. The entire project configuration is stored in a project folder with subfolders on the hard disk, which makes it easy to move a project from one PC to another without affecting other projects.

Structure

Projects are organised in a hierarchical structure. The project is the top level and can contain areas, stations, controllers and computers.

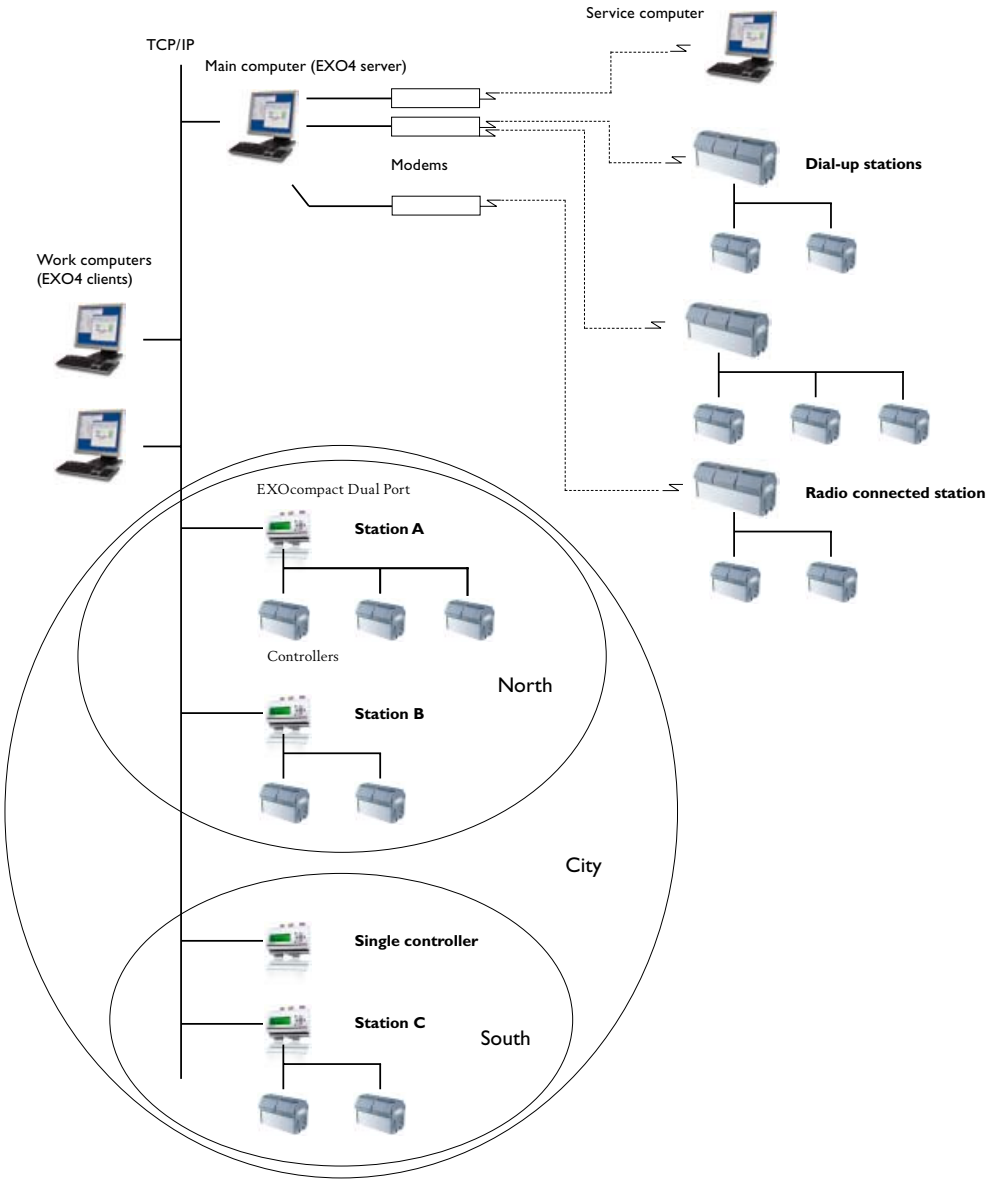
A project normally contains a main computer and a number of work computers that all have EXO4 installed.

A controller has a number of I/O points and up to three communication ports. The controllers control processes, collect data and generate alarms on errors, etc.

Controllers can be organised in stations. A station can consist of several controllers in a master/slave system. The master controller is generally connected to a main computer via e.g. a fixed cable, a TCP/IP network, a dial-up modem or a radio modem.

Areas are in general used to group the project's stations and single controllers into geographical areas. The image below displays the areas South and North. These areas are part of an even larger area, City.

See picture below.



Configuring the controllers in a project

Controller functions are used to provide the controller's functionality, such as display, alarm management and logging to the controller. When a controller has been created in Project Builder, buttons are displayed on the toolbar. These buttons are used to open various configuration tools (windows for configuration of the functions' properties). These windows can also be opened from the **Config** menu or by using hotkeys.

Button	Text	Description
	EXOflex I/O Inputs and Outputs	Configuration tool for the controller's inputs and outputs. The tool EXOflex I/O is used to define the PIFA units of the EXOflex unit. Thereafter, the inputs and outputs of the PIFA units are configured with the required functionality using the tool PIFA I/O. For EXOcompact, the tool Inputs and Outputs is used to configure the inputs and outputs.
	Objects	Tool for adding, deleting and configuring controller objects. EXOflex and EXOcompact are freely programmable, which makes them easy to adjust to each specific application. The programming of the control and automation functions of the controller can be performed by the use of objects or by using the high level programming language EXOL. The quickest and simplest way to program the control and automation functions is to use the objects in EXOdesigner. Objects can be added and configured using the tool Objects.
	Display	Tool for adding, deleting and configuring menu items and dialog boxes for the display of the controller.
	Alarms and Events	Tool for adding, deleting and configuring the alarm points and digital event points of the controller.
	Logging	Tool for adding, deleting and configuring analog signals on the controller for storing in a database on the main computer.
	Time Channels	Tool for adding, deleting and configuring time channels.

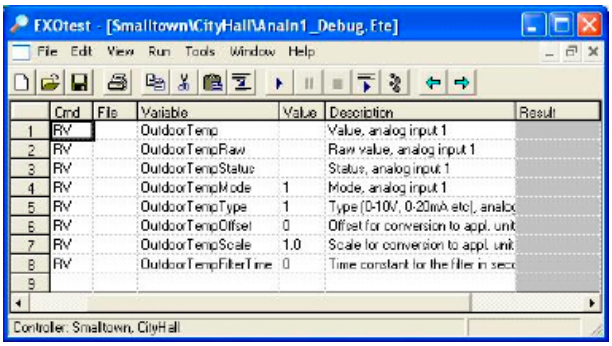
Adding More Controller Functions

It is possible to add more controller functions than the ones that initially were added to a controller, e.g. if you discover that you need time control.

Debugging

When you have configured your Controller functions, you probably want to start debugging. The tool EXOtest is used for testing and debugging the programs that have been loaded to the controller. EXOtest may be started from several different tools by clicking the Debug button.

- When EXOtest is opened from ***PIFA I/O*** or ***Inputs and Outputs***, all variables of the selected inputs and/or outputs are displayed.
- When EXOtest is opened from ***Display***, the variables of the selected dialog boxes are displayed.
- When EXOtest is opened from ***Objects***, the variables of the selected objects are displayed.
- When EXOtest is opened from ***EXOL Files***, all variables of the selected files are opened.



The toolbar

The toolbar in EXOtest includes some special buttons, for example:

Button	Description
	All commands of all lines are performed in order until the execution is stopped.
	Commands of the selected lines are performed in order until the execution is stopped.
	Stops the execution.
	The commands are performed step-by-step.

Commands

Each line in EXOtest is a communication message, a command (the column **Cmd**).

Read variable

The command **RV** (Read Value) is used for reading the value of a variable. The result is displayed in the column **Result**.

Set variable value

A variable value can be set (i.e. changed) in the controller by entering the command **SV** (Set Value) in the column **Cmd**, and then enter the required value in the column **Value**.

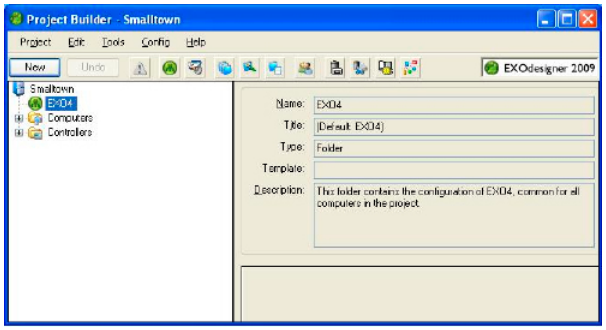
Configuring the computers

When a new project that uses the Regin SCADA EXO4 is created in Project Builder, the following is added to the project:

- A main computer with a database and two communication channels, one for serial communication and one for communication via a TCP/IP network.
- Standard templates for EXO4 windows, e.g. alarm status report, alarm events report, and real-time chart.
- Standard templates for system windows, which provide an overview of the project and contain buttons and menus for opening other standard windows.
- Standard templates for overview windows, to help you create windows in the specific application.
- If controllers were created on the templates for air handling or heating systems, process windows will be available for these applications.

Configuring EXO4

EXO4 is the operator program of the EXO system. EXO4 allows an operator to monitor and control the system processes from a computer, monitor alarms and perform alarm maneuvers, display historical values in reports and charts etc. EXO4 is configured in windows (so-called configuration tools) that are opened from Project Builder. The tools are normally opened by clicking on the buttons of the toolbar or by using the menu **Config**.



The toolbar

When EXO4 is selected in Project Builder, buttons with the following functions are displayed on the toolbar:

Button	Text	Description
	EXO4 Windows	Displays a list of the windows that are defined in the project. From this window you can start EXO4 Window Designer for the selected window.
	EXO4 Window Designer	Opens the configuration tool for EXO4 windows.
	EXO4 Menu Designer	Opens the configuration tool for menus for EXO4 windows.
	EXO4 Users	EXO4 Users is used to define users.
	Database Backup Script (of Main Computer)	Opens an editor with a script file that controls the copying of the database backup file to another media, e.g. to another computer in the network where backups are run regularly.
	EXO4 Action Categories	EXO4 Action Categories is used to configure actions (e.g. printouts) at different events.
	Nimbus Explorer (of Main Computer)	Opens the configuration tool for Nimbus Alarm Server.
	EXO4 Signals & Objects (of Main Computer)	The configuration tool for EXO4 Signals & Objects. The purpose of this tool is to, among other things, facilitate the transfer of variable values between controllers in different stations via EXO4.

Product documentation

Document	Type
EXO System Manual	Manual describing the EXO system and how to configure it

The product documentation is available for download from Regin's ftp server. It is intended for our system customers, who need to share files with us, for example at technical support. Contact one of our sales engineers for access via your own password.

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