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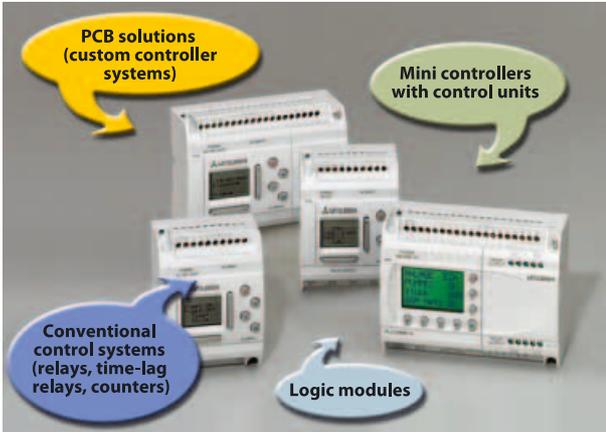
**The ALPHA
Family –
In a Class of
its Own**



**Just one ALPHA instead
of multiple components**



The ALPHA Family – Defining a New Class of Performance



The modern approach: One ALPHA controller instead of multiple components. Each controller in the ALPHA family can replace an entire group of traditional components, opening up many exciting new possibilities.

The family currently includes the following models:

- ALPHA 6 with 4I/2O
- ALPHA 10 with 6I/4O
- ALPHA 20 with 12I/8O
- ALPHA XL 14 with 8I/6O
- ALPHA XL 24 with 15I/9O

Other benefits of ALPHA controllers:

- Save space and time
- Reduce hardware, programming, wiring and installation costs

The revolutionary ALPHA family is a new class of controller that closes the gap between low-performance individual components and compact PLC systems that are too large for some applications.

The ALPHA class

The new ALPHA family from Mitsubishi Electric – the world market leader in the compact PLC sector – defines a new class of performance for automation applications. With its outstanding capabilities the ALPHA family is set to dominate the class it has created, and it will exceed your expectations in any task you set it. It can process up to 200 function blocks (ALPHA XL) in a single program, and every single function (timers, counters, analog signal processing, calendar, clock etc.) can be used as many times as you need in all your programs.

Analog signal processing

In the 24V DC versions you can configure up to 8 digital inputs for analog signals (0-10V), with signal processing functions for analog signal shift, an integrated Schmitt trigger (range controller) and simple comparisons.

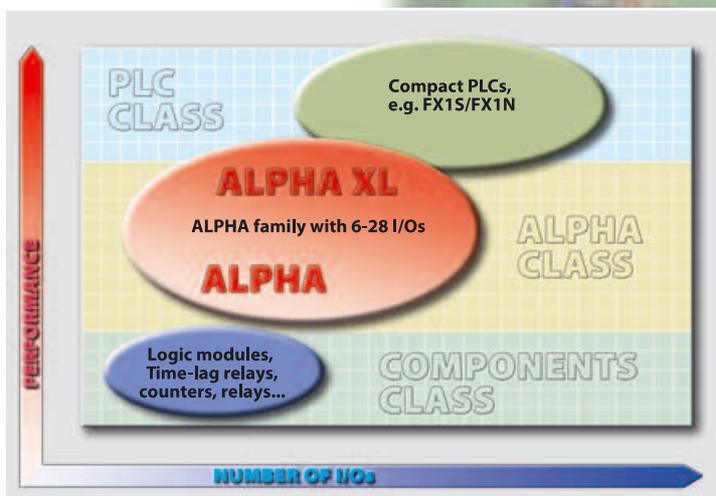
Automation instruction set

The entire ALPHA instruction set was designed specifically for the real needs of the automation sector. You get both unparalleled performance and genuinely useful capabilities, with functions like simple and complex Boolean operations, set/reset, remote control

switches, 8 timer functions (even including the generation of signal bursts), incrementing/decrementing counters, operating hours counters and more.

Direct programming

This is another highlight of the ALPHA family. In addition to a user-friendly PC-based programming environment you can also program the controller directly, without additional equipment. The front-panel control centre features a graphical LCD screen and eight function keys for fast, efficient programming.



**ALPHA
Controllers**

User support is provided with clear menus in a choice of 6 languages (D, GB, F, I, E, S). All information for every instruction is displayed in detail on the display and can be modified by the user.

Full-featured calendar and clock

The ALPHA family has a calendar and clock function with automatic summer/winter time switching. Each controller program can process up to 1,200 clock/calendar-activated on/off switching commands (ALPHA: 350). Memory is non-volatile with power failure data backup power for up to 20 days.

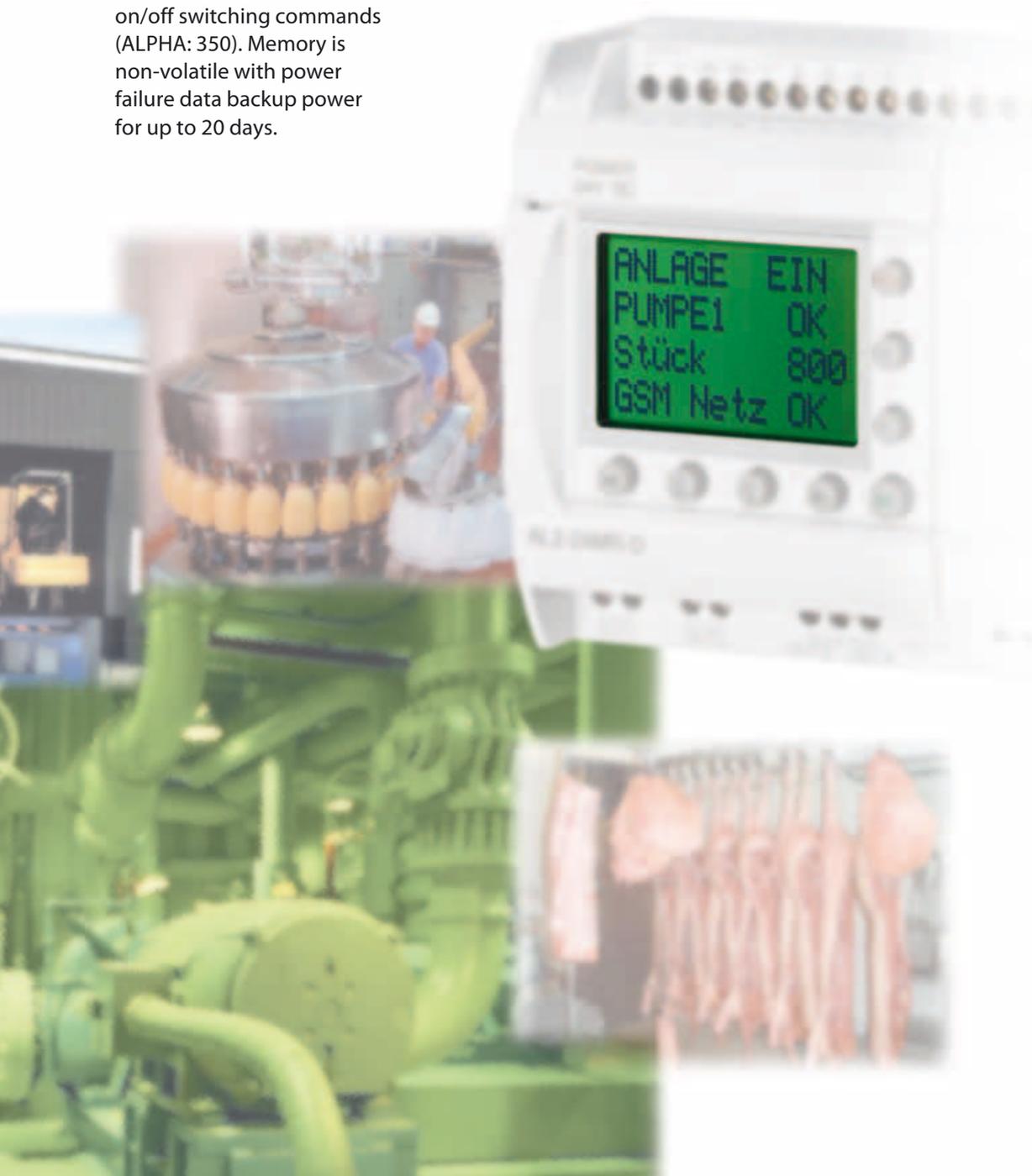


The advanced new display functions enable you to view and edit function block values and plain text messages directly on the unit, without additional equipment.

A practical control centre: An LCD screen and 8 function keys for programming and viewing and editing values and plain-text messages.

The ALPHA family is ideal for a huge range of applications in many fields of industry and building services, including:

- Textile industry
- Paper manufacturing and finishing
- Cardboard boxes and packaging
- Water treatment
- Woodworking and processing
- Special-purpose machines
- Greenhouses
- Agricultural machines
- Pump controllers
- Handling systems
- DNV-certified ship equipment
- Door, gate and window blind controllers
- Special-purpose vehicles
- Heating, air-conditioning and ventilation
- Lighting
- Alarm and security systems



The New ALPHA XL – The Future is Now

There is no competition in sight, and that applies until well beyond the next generation. The superlative performance of the new ALPHA XL mini controller is simply unparalleled by innovative new functions:

- **PID controller function block with Autotuning function** – e. g. flow control applications.
- **Temperature/voltage converter for direct connection of PT100 and K-type thermocouple** ideal for heating controllers.
- **Output module with 2 analog outputs (0-10V / 4-20mA)** – for example as a setpoint source for frequency inverters.
- **DCF77 radio clock signal interpretation** – use as a synchronised timestamp.

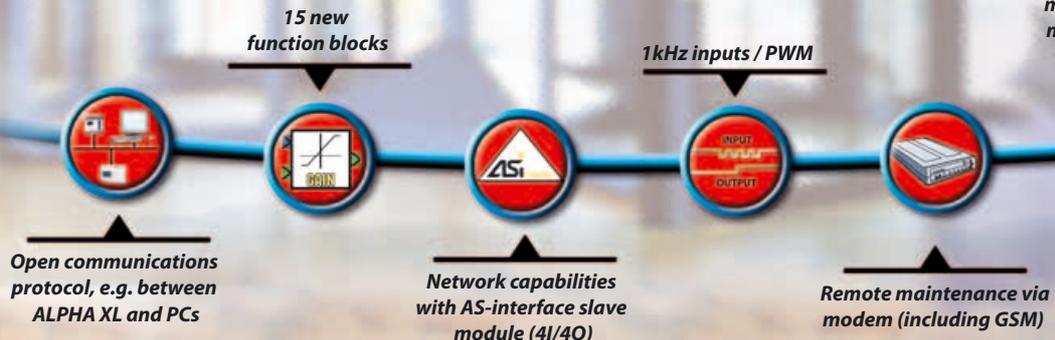


The domain of the ALPHA XL begins where the standard ALPHA reaches its limits. With its extended capabilities and innovative new functions it now has an even greater range of potential applications, particularly in mechanical and apparatus engineering and building services automation. The top enhancements in the ALPHA XL include a tripling of maximum program capacity to 200 func-

tion blocks, an extra-large display, expansion capabilities and a second communications port. Fifteen new function blocks have been added to the instruction set, including arithmetic operations, pulse-width modulation and SMS mobile phone text messaging and e-mail functions. These controllers open up a whole new range of possibilities, particularly for applications calling for analog signal processing.

Integrated analog inputs and expansion I/Os

Each of the four different base units can be expanded with one I/O expansion module for a total of up to 28 I/Os. Four modules are currently available: 4 digital 24V DC inputs with two integrated 1KHz counters; 4 digital 240V AC/DC inputs; 4 relay outputs; 4 transistor outputs. An additional module with two analog outputs is under development. The resolution of the eight base unit inputs that can also be configured as 0-10V analog inputs has been improved to 20mV (9 bits).



Integrated HMI functions

The ALPHA XL features an enhanced display and even friendlier operation. The backlight makes the extra-large LCD screen easier to read and new display functions like bar graphs, blinking and moving text enhance your applications. A three-level password system prevents unauthorised access to the editable process data and other parameters that can be displayed and modified directly with the eight function keys.

Enhanced communications capabilities

The ALPHA XL has a second communications port for communication with other automation components. In addition to remote maintenance via modem (including GSM) the system can also send SMS text messages to mobile phones, e-mails to PCs and even faxes (messages, alarms, process

data). And like the ALPHA the ALPHA XL can be integrated in an AS-interface network (industrial actuator/sensor interface bus).

Outdoor applications are not a problem

The operating ambient temperature range has been extended to -25°C – +55°C, which means that ALPHA controllers also deliver reliable precision performance outdoors (e.g. in special-purpose vehicles) and even in refrigeration applications.

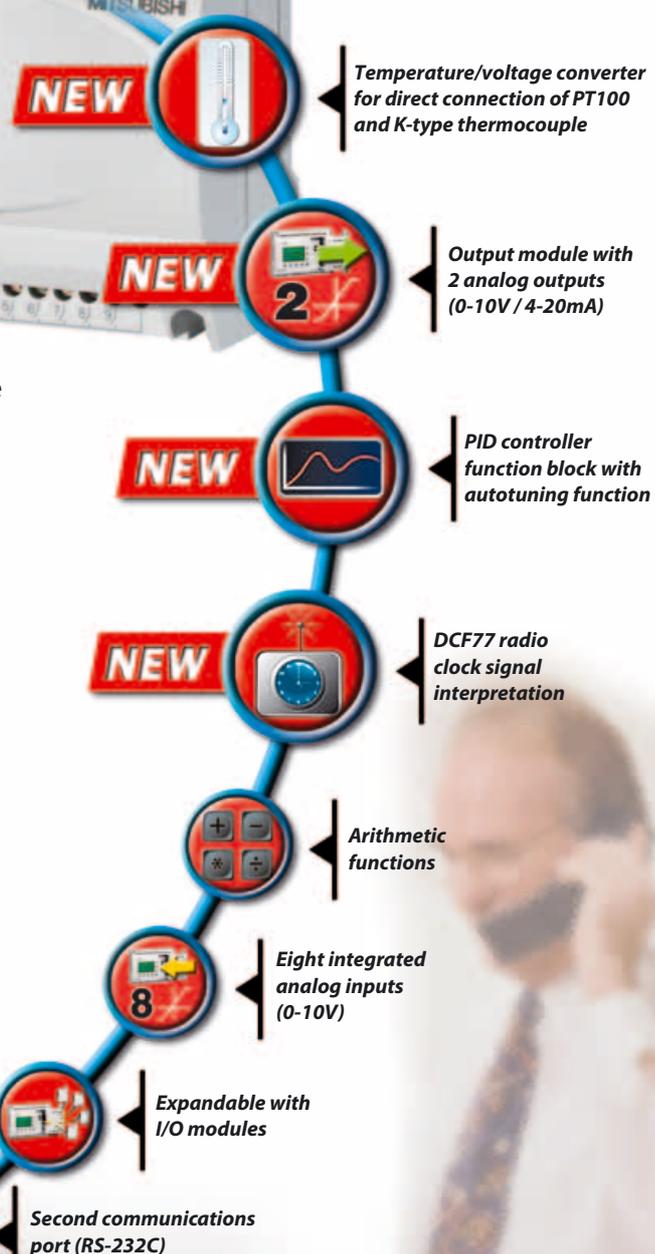


Enhanced communications capabilities, including mobile phone SMS text messaging and e-mail

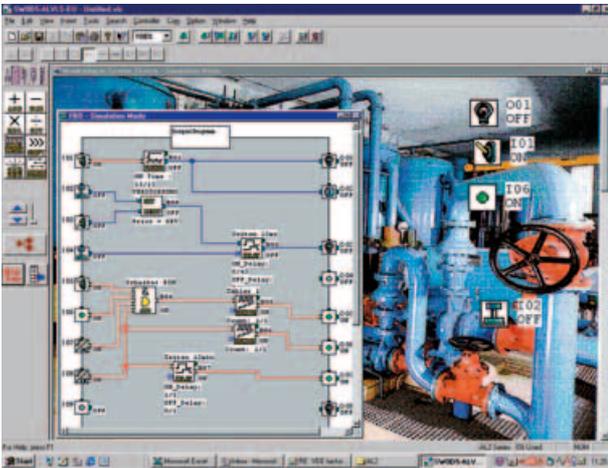
Extra-large program capacity, up to 200 function blocks

Suitable for outdoor applications at temperatures down to -25°C

Extra-large display with backlight and additional HMI functions



AL-PCS/WIN – The Graphical 3-in-1 Software for Programming, Simulation and



All the controllers in the ALPHA family can be programmed with the powerful Windows-based AL-PCS/WIN package. This program is very easy to use and requires no special skills on the user's part. The programming software can be installed in six different languages (D/GB/F/I/E/S) with a complete online help system in each language.

Easier programming

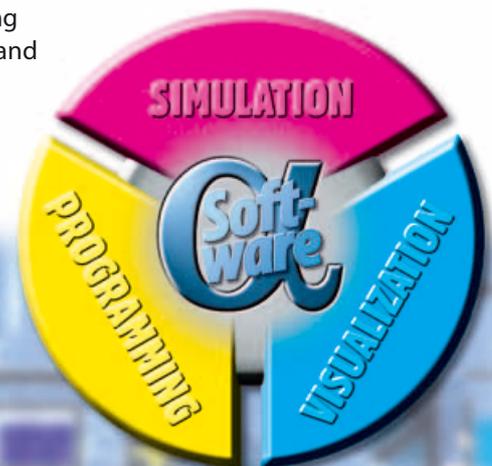
The graphical user interface of the AL-PCS/WIN package makes programming the ALPHA series very easy. On the left and right you have graphical representations of the inputs and outputs, with the pre-programmed function blocks between them (timers, counters, real-time clocks etc). You just use the mouse to "draw" graphical connections (circuits) between the inputs, function blocks and outputs to define the program logic. Using this simple approach you can create programs with up to 200 function blocks (ALPHA XL), and each function block can be reused as many

times as necessary within the same program. A double-click on a function block displays an editing box with its settings (e.g. on period for time relays, presets for counters etc). AL-PCS/WIN also includes integrated functions with which you can generate complete documentation for your program.

The program simulation and monitoring functions make troubleshooting and debugging much faster, significantly reducing programming time and cost overheads.

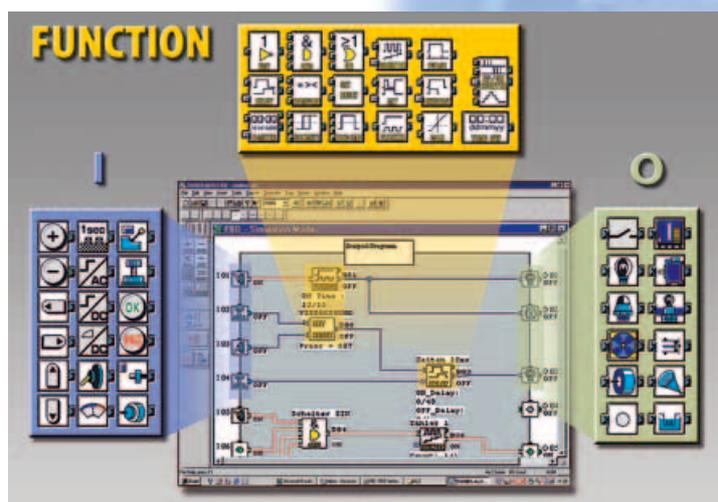
Program simulation

This feature is particularly useful, enabling you to simulate your program without an ALPHA controller connected to your PC. The AL-PCS/WIN simulation module displays a realistic representation of the controller program. You can activate inputs by clicking with the mouse and the statuses of the function blocks and program execution are displayed graphically on your screen.



Quick and easy programming: The user-friendly AL-PCS/WIN programming software has a very clear and practical layout:

- Inputs on the left (I)
- Outputs on the right (O)
- Function blocks in the middle (Function).

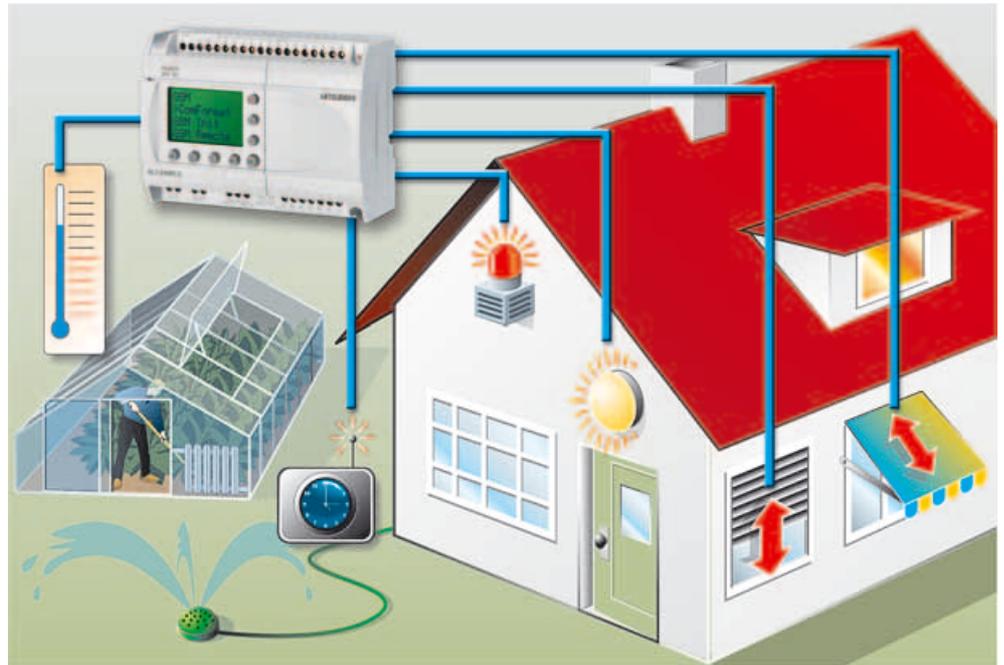


Monitoring functions

The AL-PCS/WIN "Monitor" function enables you to connect an ALPHA controller to your computer and monitor actual program execution on your computer screen. In this mode the current statuses of the I/Os and function blocks are displayed on the screen during program execution.

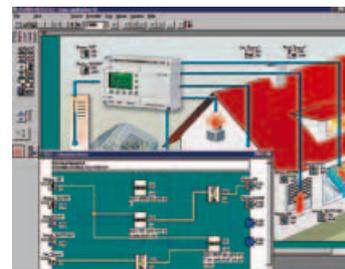
Process visualisation

AL-PCS/WIN also comes with a simple process visualisation system called "System Sketch". It is displayed in a separate window into which you can copy and configure graphical elements and elements from your program (inputs, outputs, function blocks etc) or from another Windows application. Once you have set up the System

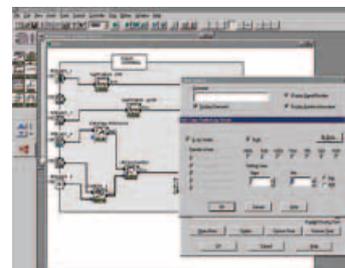


Sketch window you can use it to perform a graphical simulation and monitoring of your program without using the programming interface.

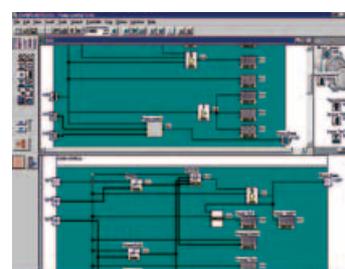
Among other things this can make setting up, installing and maintaining your application much simpler.



Graphical application visualisation and simulation couldn't be easier. You just copy application images to a separate window then add program elements.



A double-click on one of the pre-programmed function blocks displays a dialog in which you can edit its settings and parameters.



The library for user-defined function blocks provides additional flexibility. Your user-defined function blocks are displayed in their own windows, which helps to make complex programs comprehensible and

The new ALPHA family delivers unbeatable features and performance:

- **Comprehensive range of ready-to-use functions**
- **Large program memory for up to 200 function blocks**
- **LC display with 8 function keys and HMI functionality**
- **Eight analog inputs, gain function, integrated Schmitt trigger controller**
- **Integrated calendar/clock function supporting up to 1,200 on/off commands**
- **ALPHA 20 and XL with communication capabilities for the AS-i field bus**
- **Graphical 3-in-1 software package for programming, simulation and visualisation**
- **Fast 1kHz inputs**
- **Second serial port for connection to (GSM) modems and PCs**
- **Suitable for outdoor applications down to -25°C**
- **DNV, CE, UL and cUL certifications**
- **PID controller function block**
- **Temperature/voltage converter**
- **2 analog outputs**
- **DCF77 radio clock signal interpretation**

The ALPHA Family – A Pioneering New Controller Concept

ALPHA Specifications

Base units	AL-6MR-A	AL-10MR-A	AL-10MR-D	AL-10MT-D	AL-20MR-A	AL-20MR-D	AL-20MT-D
I/Os	6	10	10	10	20	20	20
Power supply	100-240 V AC	100-240 V AC	24 V DC	24 V DC	100-240 V AC	24 V DC	24 V DC
Digital inputs	4 (100-240 V AC)	6 (100-240 V AC)	6 (24 V DC)	6 (24 V DC)	12 (100-240 V AC)	12 (24 V DC)	12 (24 V DC)
Digital inputs w. analog capability (0-10V, 8 bits)	-	-	6	6	-	8	8
Outputs	2 (relay 8 A)	4 (relay 8 A)	4 (relay 8 A)	4 (trans. 1 A/24 V DC)	8 (relay 8 A)	8 (relay 8 A)	8 (trans. 1 A/24 V DC)
FBs/functions	Max. 64 function blocks, 23 integrated functions						
Dimensions (W x H x D) in mm	71.2 x 90 x 55	71.2 x 90 x 55	71.2 x 90 x 55	71.2 x 90 x 55	124.6 x 90 x 55	124.6 x 90 x 55	124.6 x 90 x 55

ALPHA XL Specifications

Base units	AL2-14MR-A	AL2-14MR-D	AL2-24MR-A	AL2-24MR-D
I/Os	14, expandable to 18	14, expandable to 18	24, expandable to 28	24, expandable to 28
Power supply	100-240 V AC	24 V DC	100-240 V AC	24 V DC
Digital inputs	8 (100-240 V AC)	15 (24 V DC)	15 (100-240 V AC)	15 (24 V DC)
Digital inputs w. analog capability (0-10V, 9 bits)	-	8	-	8
Relay outputs	6 (8 A)	6 (8 A)	9 (4x 8 A/5x 2 A)	9 (4x 8 A/5x 2 A)
FBs/functions	Max. 200 function blocks, 38 integrated functions			
Dimensions (B x H x T) in mm	124.6 x 90 x 52	124.6 x 90 x 52	124.6 x 90 x 52	124.6 x 90 x 52

Expansion modules for ALPHA XL

AL2-4EX: 4 dig. inputs (24V DC) with 2 selectable high-speed counters (1kHz)	New expansion modules
AL2-4EXR: 4 dig. inputs (240V AC)	AL2-DA: 2 analog outputs (0-10 V / 4-20 mA)
AL2-4EYT: 4 transistor outputs (1A)	AL2PT-ADP: 2 PT100 temperature converters
AL2-4EYR: 4 relay outputs (2A)	AL2TC-ADP: 2 K-type thermocouple converters

Accessories for ALPHA and ALPHA XL

AL-PCS/WIN-EU	Software CD for Windows, in 6 languages (D/GB/F/I/E/S), manuals, sample programs	ALPHA and ALPHA XL
AL-PCS/WIN-EU-Demo	Demo software CD for Windows (without communication functions), in 6 languages (D/GB/F/I/SP/S), manuals, sample programs	ALPHA and ALPHA XL
AL-232CAB	Cable for connecting ALPHA/ALPHA XL to PC, 2.5m	ALPHA and ALPHA XL
AL2-GSM-CAB	RS-232C for second communications port	only ALPHA XL
AL-EEPROM	Memory cassette for 64 FBs	only ALPHA
AL2-EEPROM-2	Memory cassette for 200 FBs	only ALPHA XL
AL-ASI-BD	Expansion module for ALPHA 20, AS-interface field bus, slave	only ALPHA
AL2-ASI-BD	Expansion module for ALPHA XL, AS-interface field bus, slave	only ALPHA XL
AL-FRAME 20-IP40:	IP40 installation frame	only ALPHA XL
AL-FRAME 20-IP54:	IP54 installation frame with transparent lid	only ALPHA XL
ALPHA POWER 24-1.5:	100-240 V AC / 24 V DC power supply; 1.5 A output	only ALPHA XL

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