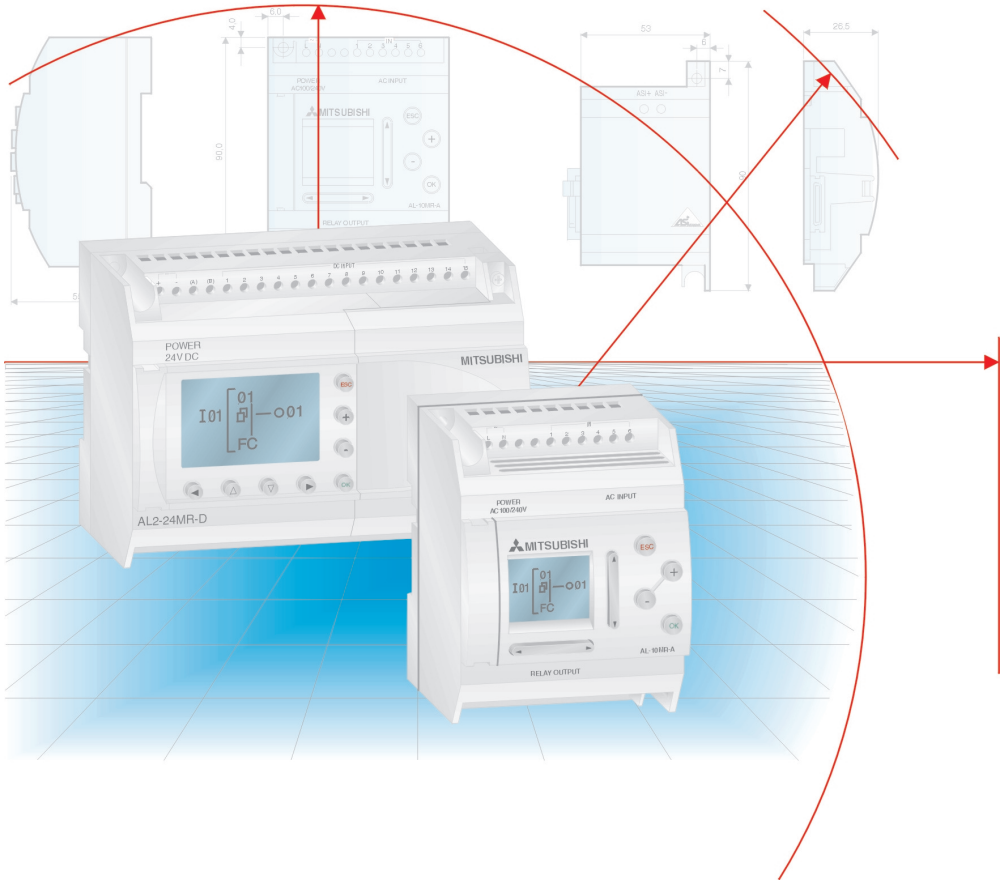
MITSUBISHI ELECTRIC

Simple
Application
Controllers

ALPHA
ALPHA XL



Technical Catalogue

2003

Return

A controller concept pointing the way

The new Alpha XL

The new ALPHA XL comes into its own where the existing products of the ALPHA series run up against their limitations. With many powerful new features it is predestined for applications on industrial machines and apparatus and in building automation services.

Key enhancements in the ALPHA XL include a tripling of program capacity to 200 function blocks, an extra-large display, expansion options and a second communications port.

Further publications within the PLC range

Technical Catalogues

Technical Catalogues MELSEC PLC

Product catalogues for programmable logic controllers and accessories for the further MELSEC PLC series

Technical Catalogue HMI

Product catalogue for operator terminals, supervision software and accessories (art. no. 68542)

Technical Catalogue Networks

Product catalogue for Master and Slave modules as well as accessories for the use of programmable logic controllers in open and MELSEC networks (art. no. 136730)

Technical Catalogues Drives

Product catalogues for frequency inverters, servo amplifiers, motion controllers and servo motors as well as the appropriate programming software and accessories

Additional Services

You will find current information on updates, alterations, new items, and technical support on the MITSUBISHI ELECTRIC's web pages (www.mitsubishi-automation.com). The products section of the MITSUBISHI home site includes various documentations of the whole product range by MITSUBISHI ELECTRIC as well as the current version of this catalogue on hand. All manuals and cataloques can be downloaded. The content is updated daily and to date is provided in German and English.

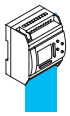
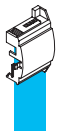
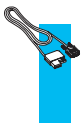
About this product catalogue

Due to the constantly growing product range, technical alteration, and new or changed characteristical features, this catalogue is updated frequently.

Texts, figures and diagrams shown in this product catalogue are intended exclusively for explanation and assistance in planning and ordering the programmable logic controllers of the ALPHA series and the associated accessories. Only the manuals supplied with the modules are relevant for installation, commissioning and handling of the controllers and the accessories. The information given in this documentation must be read before installation and commissioning of the modules.

Should questions arise with regard to the planning of modules described in this product catalogue, do not hesitate to contact the german branch of the MITSUBISHI ELECTRIC EUROPE B.V. in Ratingen or one of its distributors (see cover page).

ALPHA

BASIC COMPONENTS

EXTENSIONS

ACCESSORIES

TERMINAL ASSIGNMENT + DIMENSIONS

SOFTWARE

The ALPHA Series

Description

- Compact
- Self-sufficient
- Cost effective
- Versatile

The new ALPHA closes the present gap between single components and a PLC system. It combines all advantages of a PLC system in a very compact housing and therefore provides a room and cost saving alternative to relays and contactors.

Up to 64 functions (or 1.5 kB data) can be processed by a program. Each of the available functions (timers, counters, analog processing, calender/clock function etc.) can be used in all programs as frequently as needed.

Benefits

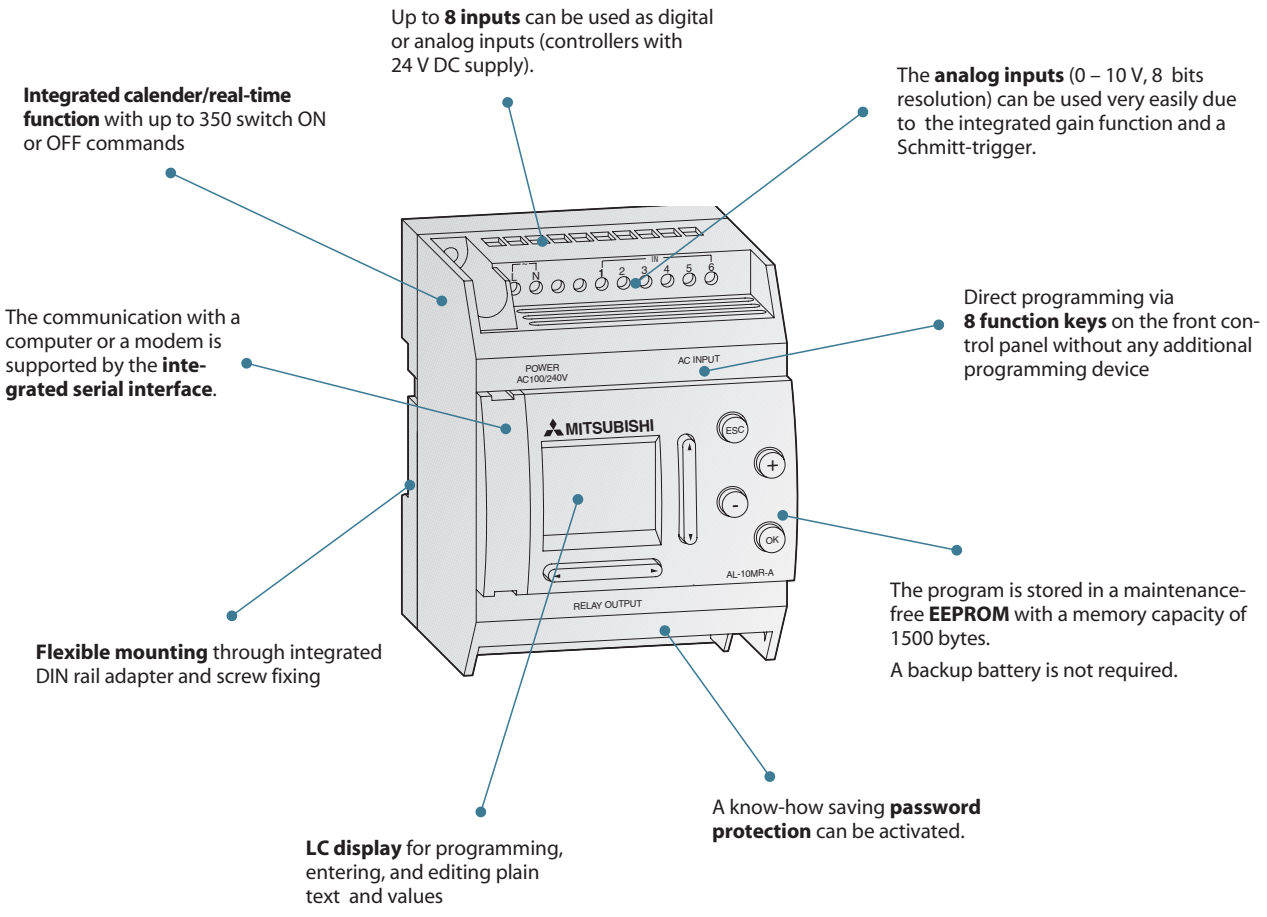
- Master controller with complete PLC functions
- Integrated power supply unit
- CPU
- Maintenance-free EEPROM memory
- Integrated inputs and outputs
- Analog signal processing for up to 8 configurable analog inputs (controllers with 24 V DC supply)
- Direct programming via the integrated control panel with graphical LCD display
- Control panel can be used as simple operator terminal (HMI)
- Comfortable calender/clock function
- Serial interface for external communications with a PC
- User-friendly programming software AL-PCS/WIN for comprehensive and structured programming under MS Windows 95/98/NT
- Connectable to the AS-Interface field bus via extension module (ALPHA 20 only)

Features

The master controllers are available in different variations regarding the power supply and the kind of outputs.

Controllers for a 230 V AC or 24 V DC power supply and with relay or transistor outputs are supplied.

All units feature the same CPU and the same characteristics. The ALPHA 20 can additionally be extended by a plug-in module for AS Interface network connection as a slave module.



The ALPHA XL Series

Description

The new ALPHA XL comes into its own where the existing products of the ALPHA series run up against their limitations. With many powerful new features it is predestined for applications on industrial machines and apparatus and in building automation services.

Key enhancements in the ALPHA XL include a tripling of program capacity to 200 function blocks, an extra-large display, expansion options and a second communications port. Fifteen new function blocks have been added to the instruction set, including math operations, PWM and SMS text messaging functions. All this opens up new possibilities for analog signal processing, for example in temperature control applications.

Benefits

As an addition to the extraordenary features of the ALPHA series the ALPHA XL offers further innovations:

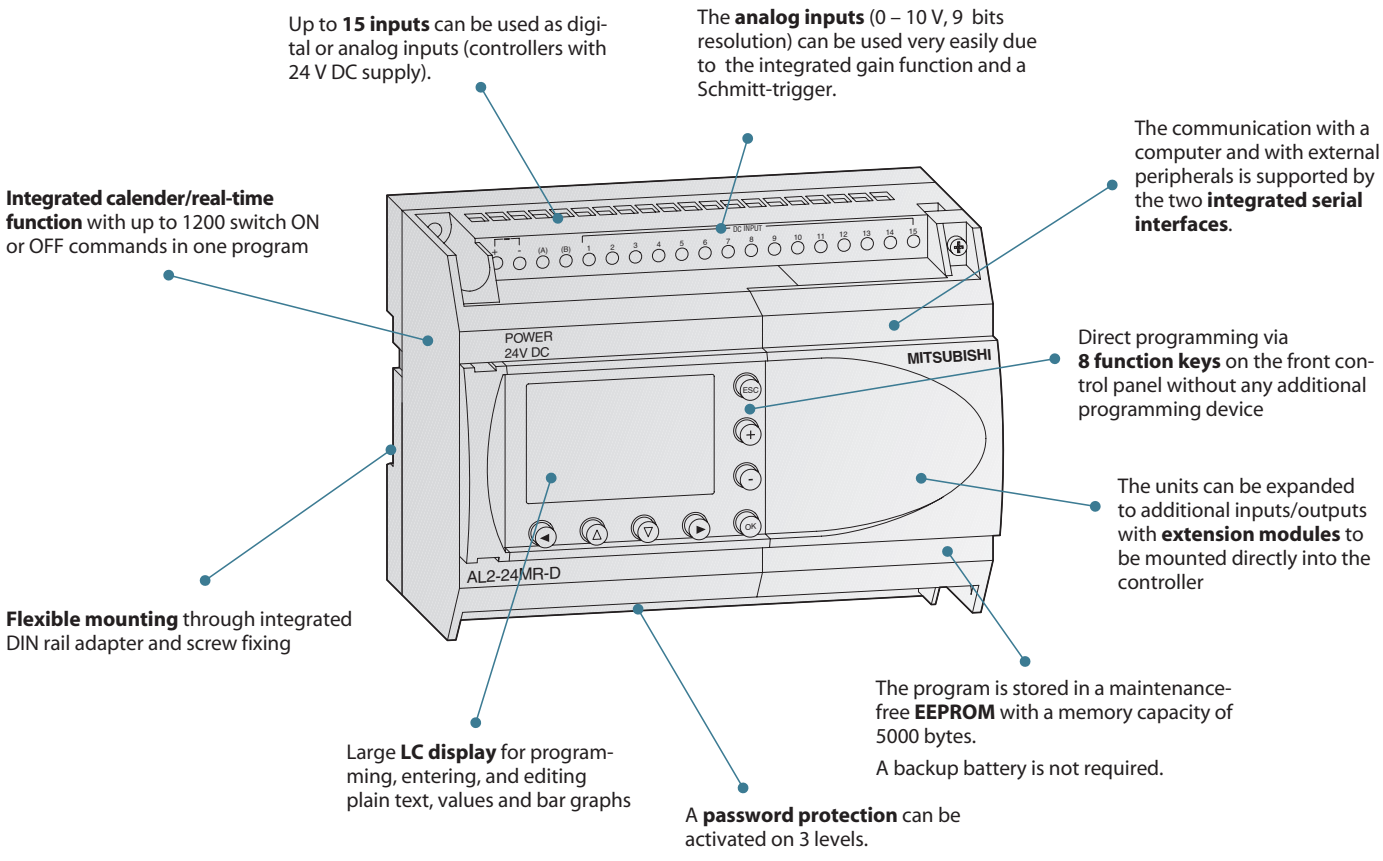
- Extra-big backlit LCD display
- Tripled program capacity with subtotal 200 function blocks
- 15 new user program blocks
- New display functions with integrated HMI functionality
- 8 Integrated analog inputs and 2 high-speed counters
- Integrated second communications port
- Remote maintenance and SMS text messaging via GSM cable
- Peripheral connection via RS-232C
- Significantly extended operating temperature range
- Extensive clock functions
- AS-I slave module connectable
- Extension modules for digital inputs and outputs

Features

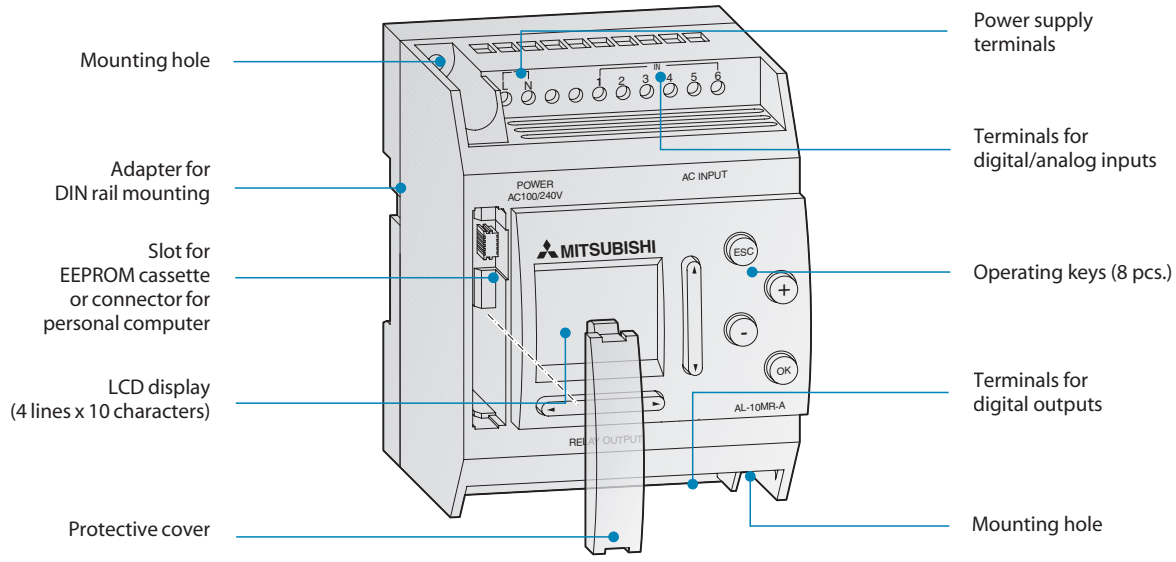
User-friendly operation and a highly legible display are two more strong points of the ALPHA XL. The extra-large, backlit information screen features new display options such as bar graphs and moving text displays.

Three-level password protection reliably prevents unauthorised access to editable process data and parameters, which can be changed directly via eight function keys.

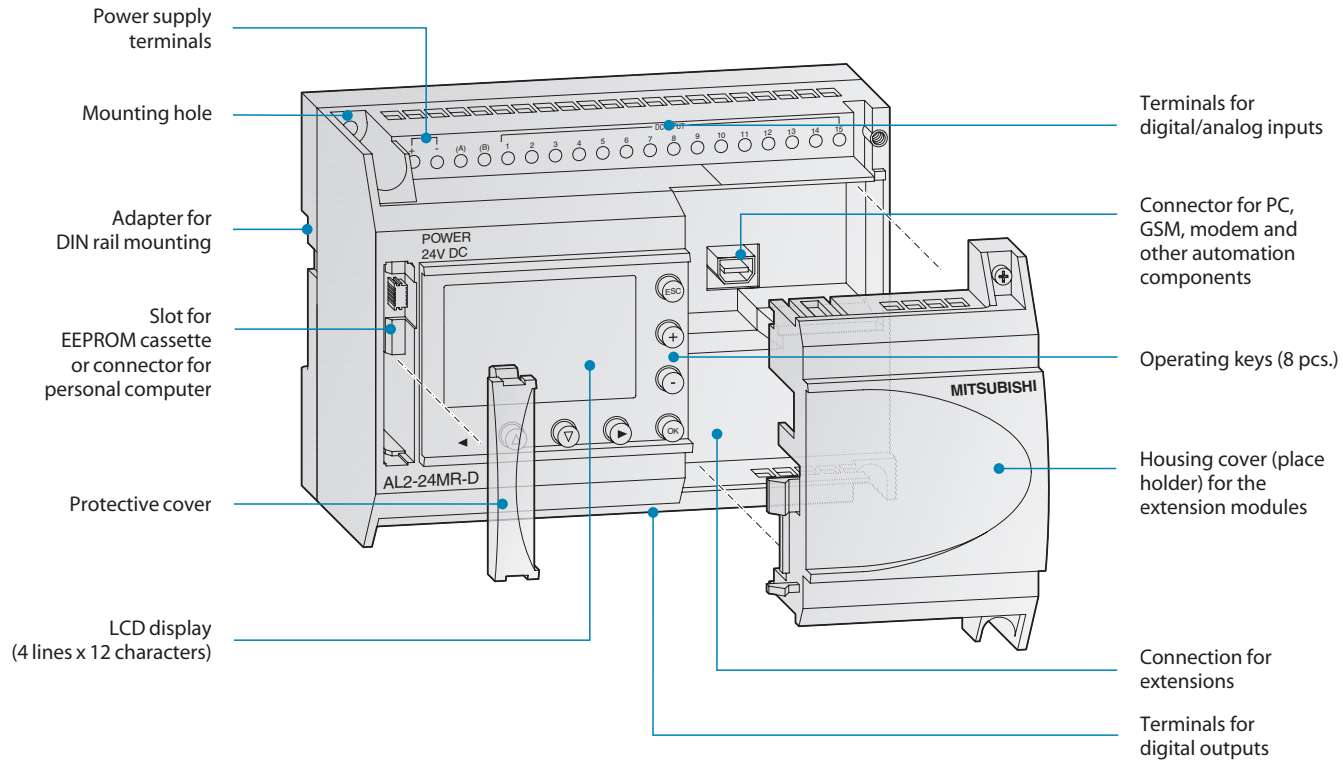
The operating temperature range has been extended to -25 – +55°C, making the unit suitable for outdoor (e. g. special vehicles) and refrigeration applications with the same precision and reliability.



Description of the Module Components ALPHA



Description of the Module Components ALPHA XL



Expansion Capabilities

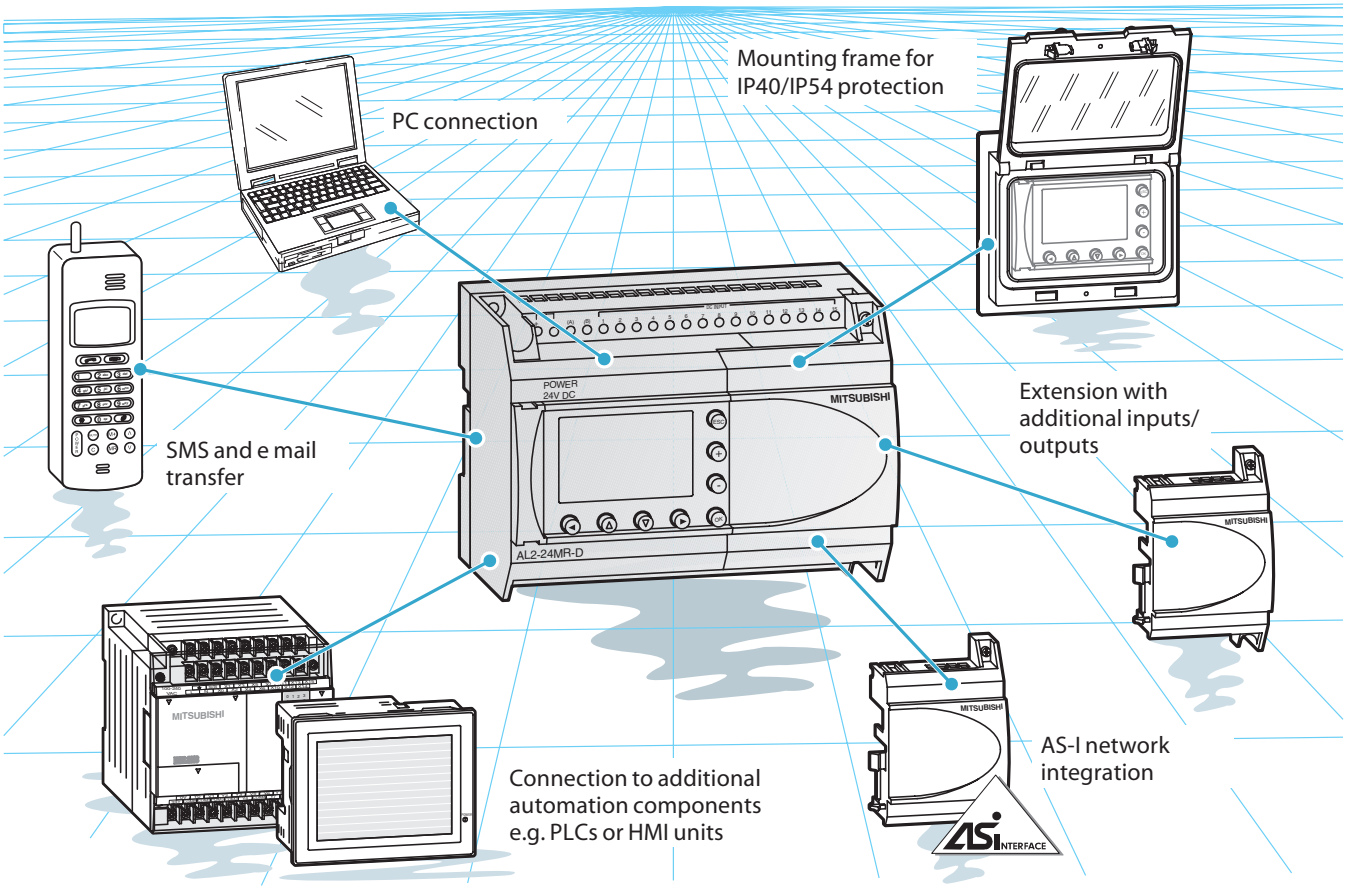
The ALPHA XL is equipped with a second communications interface. This allows communications with other automation components.

Also there is the possibility to carry out remote maintenance via a GSM modem. Additionally it is possible to send SMS text messages to a mobile telephone, e-mails to a personal computer and even faxes.

The integration into an AS interface network is achieved with the help of an AS-I module.

Extension modules are available for additional inputs and outputs allowing for an extension of up to 4 inputs or outputs.

Mounting frames simplify the assembly and also protect the controller in hostile environments.



Reference for Model Designation Code

AL	–	10	M	R	-	A
1		2	3	4		5

The code explanation in detail:

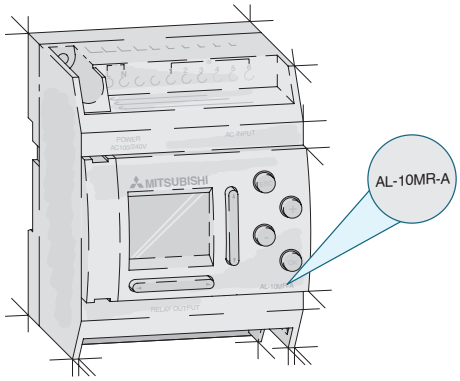
1 Designation of the ALPHA series
AL = ALPHA
AL2 = ALPHA XL

2 Number of inputs/outputs e.g. 10 I/Os

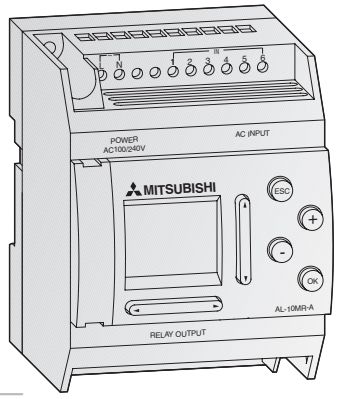
3 Designation of the module:
M = Master controller

4 Designation of the output type:
R = Relay
T = Transistor

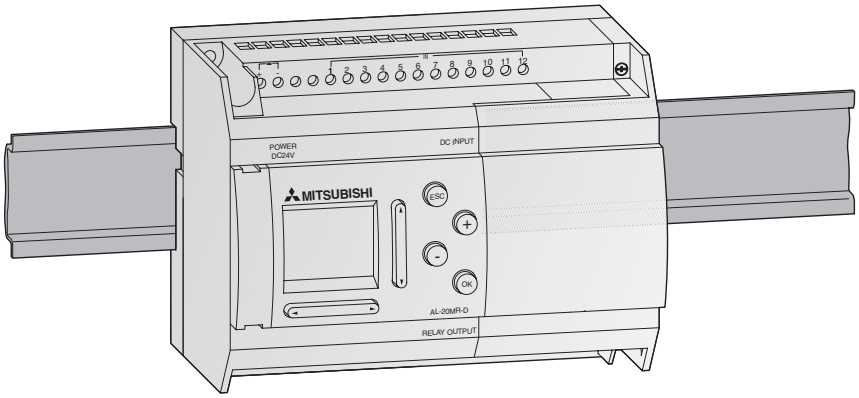
5 Designation of the power supply:
A = 100/240 V AC
D = 24 V DC



Specifications ALPHA



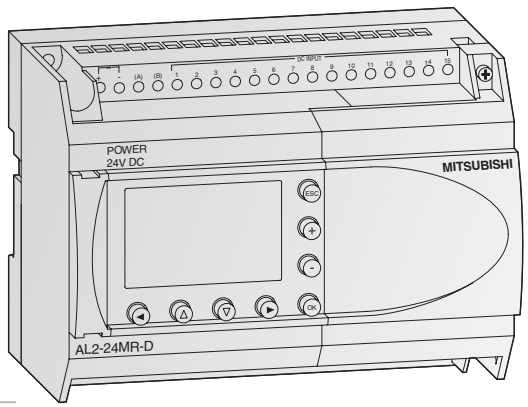
AL-6M□-□, AL-10M-□□



AL-20M□-□

Specifications			AL-6MR-A	AL-10MR-A	AL-10MR-D	AL-10MT-D	AL-20MR-A	AL-20MR-D	AL-20MT-D
Electrical specifications									
Integrated inputs/outputs			6	10	10	10	20	20	20
Power supply	AC range (+10 %, -15 %)		100–240 V AC	100–240 V AC	24 V DC	24 V DC	100–240 V AC	24 V DC	24 V DC
	Frequency at AC	Hz	50–60 Hz	50–60 Hz	—	—	50–60 Hz	—	—
	Voltage fluctuation		-15 – +10 %	-15 – +10 %	-15 – +20 %	-15 – +20 %	-15 – +10 %	-15 – +20 %	-15 – +20 %
Max. permissible voltage drop time		ms	10	10	5	5	10	5	5
Max. power consumption		W	3	4	3	2	8	7	5
Typ. power consumption	All I/Os ON	W	2.5	3.0	2.0	2.0	5.0	5.0	5.0
	All I/Os OFF	W	1.5	1.5	0.3	0.3	1.5	0.3	0.3
Inrush current			≤1.5 (at 240 V AC)	≤1.5 (at 240 V AC)	≤7.0 (at 24 V DC)	≤7.0 (at 24 V DC)	≤1.5 (at 240 V AC)	≤7.0 (at 24 V DC)	≤7.0 (at 24 V DC)
Digital inputs									
Integrated inputs		number	4	6	6	6	12	12	12
Input voltage			100–240 V AC	100–240 V AC	24 V DC	24 V DC	100–240 V AC	24 V DC	24 V DC
Input current			0.24 mA at 240 V	0.24 mA at 240 V	5.0 mA at 24 V	5.0 mA at 24 V	0.24 mA at 240 V	5.0 mA at 24 V	5.0 mA at 24 V
Response time		ms	50	50	10–40	10–40	50	10–40	10–40
Input frequency		Hz	5	5	20	20	5	20	20
Analog inputs									
Channels			—	—	6	6	—	8	8
Analog input range			—	—	0–250	0–250	—	0–250	0–250
Resolution			—	—	10000/250 mV	10000/250 mV	—	10000/250 mV	10000/250 mV
Conversion speed		ms	—	—	10	10	—	10	10
Voltage			—	—	0–10 V DC	0–10 V DC	—	0–10 V DC	0–10 V DC
Impedance			—	—	< 150 kΩ	< 150 kΩ	—	< 150 kΩ	< 150 kΩ
Accuracy			—	—	±5 % (0.5 V DC)	±5 % (0.5 V DC)	—	±5 % (0.5 V DC)	±5 % (0.5 V DC)
Outputs									
Integrated outputs		number	2	4	4	4	8	8	8
Type			Relay	Relay	Relay	Transistor	Relay	Relay	Transistor
Switched voltage (max.)		V	250 V AC, 30 V DC	250 V AC, 30 V DC	250 V AC, 30 V DC	5–24 V DC	250 V AC, 30 V DC	250 V AC, 30 V DC	5–24 V DC
Rated current		A	8	8	8	1 (at 8–24 V DC), 0.1 (at 5–8 V DC)	8	8	1 (at 8–24 V DC), 0.1 (at 5–8 V DC)
Max. switched load	- inductive load		—	—	—	1 A / 24 V DC	—	—	1 A / 24 V DC
	- resistive load		—	—	—	3 W / 24 V DC	—	—	3 W / 24 V DC
Minimum load			50 mW	50 mW	50 mW	1.0 mA	50 mW	50 mW	1.0 mA
Response time		ms	≤10	≤10	≤10	≤1	≤10	≤10	≤1
Leakage current			—	—	—	≤0.1 mA / 24 V DC	—	—	≤0.1 mA / 24 V DC
Relay contact lifetime cycles			100000 (at 8 A)	100000 (at 8 A)	100000 (at 8 A)	—	100000 (at 8 A)	100000 (at 8 A)	—
Mechanical specifications									
Weight		kg	02	0.2	0.2	0.2	0.32	0.32	0.32
Dimensions (W x H x D)		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
Order information		art. no.	87659	87660	87661	87672	125635	125636	125637
Accessory			Power supply ALPHA POWER 24-1,5 for DIN rail mounting, for DC supply of all 24 V DC modules; art. no.: 149046						

Specifications ALPHA XL



AL2-24M□-□

Specifications			AL2-14MR-A	AL2-14MR-D	AL2-24MR-A	AL2-24MR-D
Electrical specifications						
Integrated inputs/outputs			14	14	24	24
Power supply	AC range (+10 %, -15 %)		100–240 V AC	24 V DC	100–240 V AC	24 V DC
	Frequency at AC	Hz	50–60 Hz	—	50–60 Hz	—
	Voltage fluctuation		-15 – +10 %	-15 – +20 %	-15 – +10 %	-15 – +20 %
Max. permissible voltage drop time		ms	10	5	10	5
Max. power consumption		W	5.5	7.5	7.0	9.0
Typ. power consumption	All I/Os ON	W	4.5	4.0	5.5	5.0
	All I/Os OFF	W	2.0	1.0	2.5	1.0
Inrush current			≤6.5 A (at 240 V AC)	≤7.0 A (at 24 V DC)	≤6.5 A (at 240 V AC)	≤7.0 A (at 24 V DC)
Digital inputs						
Integrated inputs		number	8	8	15	15
Input voltage			100–240 V AC	24 V DC	100–240 V AC	24 V DC
Input current			0.24 mA at 240 V	5.0 mA at 24 V	0.24 mA at 240 V	5.0 mA at 24 V
Response time		ms	50	10 – 20	50	10 – 20
Input frequency		Hz	5	20	5	20
Analog inputs						
Channels			—	8	—	8
Analog input range			—	0–500	—	0–500
Resolution			—	9 bit, 20 mV (10 V, 500)	—	9 bit, 20 mV (10 V, 500)
Conversion speed		ms	—	8	—	8
Voltage			—	0–10 V DC	—	0–10 V DC
Impedance		kΩ	—	142 ±5 %	—	142 ±5 %
Accuracy			—	±5 % (0.5 V DC)	—	±5 % (0.5 V DC)
Outputs						
Integrated outputs		number	6	6	9	9
Type			Relay	Relay	Relay	Relay
Switched voltage (max.)		V	250 V AC, 30 V DC	250 V AC, 30 V DC	250 V AC, 30 V DC	250 V AC, 30 V DC
Rated current		A	8	8	8	8
Max. switched load	- inductive load		373 VA (at 250 V)	373 VA (at 250 V)	373 VA (001–004), 93 VA (005–009)	373 VA (001–004), 93 VA (005–009)
	- resistive load		—	—	—	—
Minimum load			50 mW	50 mW	50 mW	50 mW
Response time		ms	≤10	≤10	≤10	≤10
Leakage current			—	—	—	—
Relay contact lifetime cycles			100000 (at 8 A)	100000 (at 8 A)	100000 (at 8 A)	100000 (at 8 A)
Mechanical specifications						
Weight		kg	0.3	0.3	0.35	0.3
Dimensions (W x H x D)		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
Order information		art. no.	142517	142518	142519	142520
Accessory			Power supply ALPHA POWER 24-1,5 for DIN rail mounting, for DC supply of all 24 V DC modules; art. no.: 149046			

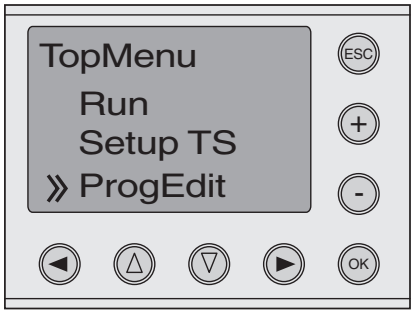
General Operating Conditions

Operating conditions		Alpha series	Alpha XL series
Ambient temperature		0 – 55 °C	Display: -10 – 55 °C, Hardware: -25 – 55 °C
Operating temperature		0 – 55 °C	Display: -10 – 55 °C, Hardware: -25 – 55 °C
Storage temperature		-30 – +70 °C	-30 – +70 °C
Protection rating		IP 20	IP 20
Noise immunity		1000 Vpp with noise generator; 1 µs at 30 – 100 Hz, tested by noise simulator	
Dielectric withstand voltage		3750 V AC, >1 min. according to EN60730	3750 V AC, >1 min. according to EN60730
Allowable relative humidity		35 – 85 % (no condensation)	35 – 85 % (no condensation)
Shosk resistance		Acc. to IEC 68-2-27: 147 m/s² acceleration, 11 ms 3 x 3 directions	Acc. to IEC 68-2-27: 147 m/s² acceleration, 11 ms 3 x 3 directions
Vibration resistance	direct mounting	Acc. to IEC-2-6: 147 m/s² acceleration, 80 min. in each direction	Acc. to IEC-2-6: 19,6 m/s² acceleration, 80 min. in each direction
	DIN rail mounting	Acc. to IEC 68-2-27: 9.8 m/s² acceleration, 80 min. in each direction	Acc. to IEC-2-6: 9.8 m/s² acceleration, 80 min. in each direction
Insulation resistance		500 V DC, 7 MΩ acc. to EN60730-1	500 V DC, 7 MΩ acc. to EN60730-1
Grounding		None	None
Ambient conditions		No corrosive gases, no dust	No corrosive gases, no dust
Approvals		CE, UL/cUL, DNV	CE, UL/cUL, DNV
Tests		UL 508, EN60730-1, EN61010, EN50081-1, EN50082-1, EN50082-2	UL 508, EN60730-1, EN61010, EN50081-1, EN50082-1, EN50082-2

General System and Programming Specifications

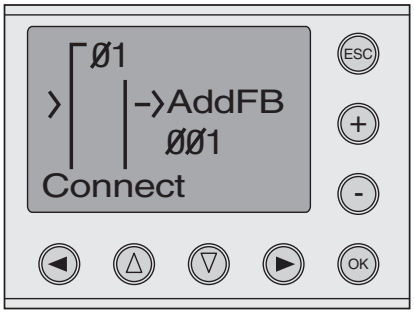
System specifications	Alpha series	Alpha XL series
Programm specifications		
Programming method	Function block	Function block
Program capacity	64 function blocks or 1500 bytes (internally)	200 function blocks or 5000 bytes
Programm processing	Cyclic processing of the stored program	Zyklische Abarbeitung des gespeicherten Programms
Number of available instructions	23 different function blocks (see page 22)	38 different function blocks (see page 22)
Programm storage	Integrated EEPROM and optional additional EEPROM cassette	Integrated EEPROM and optional additional EEPROM cassette
Data storage	At voltage loss the current status of values, running time meters, and real-time data are stored for up to 20 days (at temperatures of 0 to 25 °C) through integrated capacitors	
Processing time	1 ms + 20 µs / log. instruction (complex commands 500 µs / instruction)	
Real-time clock	Seconds, minutes, hours, day of week, month, year (4-digit); accuracy: 5 s / day; automatic summer and winter time toggling	
Program protection	Via program	Program and keys (3 levels)

Control Terminal Functions



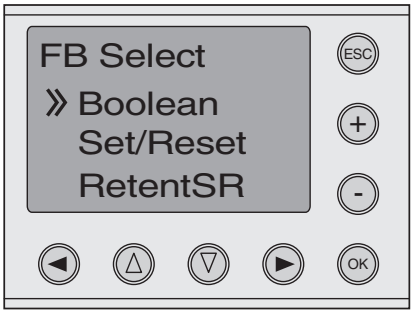
The ALPHA controllers can be completely programmed directly via the control terminal without any additional devices. 8 operating keys and a LC display (4 lines x 10 characters for the ALPHA and 4 lines x 12 characters for the ALPHA XL) are provided for this purpose.

The menus can be displayed in 6 different languages (german, english, french, italian, spanish and swedish).



The LC display is user-programmable so that besides ALPHA internal values as well as plain text messages (and bar graphs at the ALPHA XL) can be displayed.

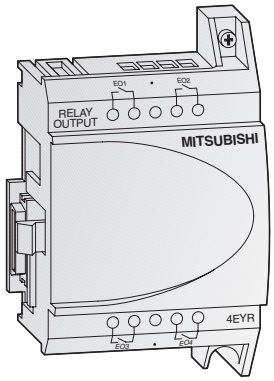
Displayed values of counters, timers, or running time meters can be edited directly via the 8 keys on the controller. Moreover, the keys are user-programmable similar to bits.



For the representation of function blocks all information is available on the display at the same time.

■ Extension Modules

☐ ALPHA ☑ ALPHA XL



There are 4 different extension modules available for the ALPHA XL, which allow the controller to be extended through additional inputs or outputs. The modules are inserted directly into the ALPHA XL and therefore do not take up any additional space.

The AL2-4EX has the additional feature that 2 inputs may be used as high-speed counters with a counting frequency of 1 kHz.

Specifications			AL2-4EX-A2	AL2-4EX	AL2-4EYR	AL2-4EYT
Electrical specifications						
Integrated inputs/outputs			4	4	4	4
Max. Schalt-leistun	AC range (+10 %, -15 %)		220–240 V AC	24 V DC	100–240 V AC	24 V DC
	Frequency at AC	Hz	50–60 Hz	—	50–60 Hz	—
	Voltage fluctuation		-15 – +10 %	-15 – +20 %	-15 – +10 %	-15 – +20 %
Inputs						
Integrated inputs		number	4	4	—	—
Input voltage			220–240 V AC	24 V DC	—	—
Input current			7.5 mA at 240 V AC (50 Hz), 9.0 mA at 240 V AC (60 Hz)	5.4 mA at 24 V DC	—	—
Response time		ms	15 – 40	10 – 20*	—	—
Insulation			Photocoupler	Photocoupler	—	—
Input resistance			32 kΩ (50 Hz), 27 kΩ (60 Hz)	—	—	—
Outputs						
Integrated outputs		number	—	—	4	4
Output type			—	—	Relay	Transistor
Switched voltage (max.)		V	—	—	250 V AC, 30 V DC	5–24 V DC
Rated current		A	—	—	2 A per output	1 A per output
Max. switched load	- inductive load		—	—	93 VA (at 250 V AC)	24 W (1 A, 24 V DC)
	- resistive load		—	—	—	3 W at 24 V DC
Minimum load			—	—	50 mW	1.0 A
Response time		ms	—	—	≤ 10	≤ 1
Leakage current			—	—	—	≤ 0.1 mA, 24 V DC
Relay contact lifetime cycles			—	—	100000	—
Insulation			—	—	Photocoupler	Photocoupler
Mechanical specifications						
Weight		kg	0.05	0.05	005	0.05
Dimensions (W x H x D)		mm	53.1 x 90 x 24.5	53.1 x 90 x 24.5	53.1 x 90 x 24.5	53.1 x 90 x 24.5
Order information		art. no.	142522	142521	142523	142524

* EI1 and EI2 of the AL2-4EX can be used as high-speed counter inputs. In each case the response time for the high-speed counter inputs will be 0.5 ms or less.

The Network with Actuator Sensor Interface

Data transfer

The AS interface is an international standard for the lowest field bus level.

The network suits versatile demands, is very flexible and particularly easy to install.

The following parts are controlled:

- Sensors
- Actors
- I/O units
- Gateways

Structure

ASI networks can be configured in any random tree structure.

The maximum extension without repeater is 100 m. Up to 2 repeaters are supported providing a maximum communication distance of 300 m. Terminating resistors are not needed.

Cable types

A special coded 2-wire cable is required.

The modules are connected to the cable via penetration clamb connections while the coding ensures a reverse protection.

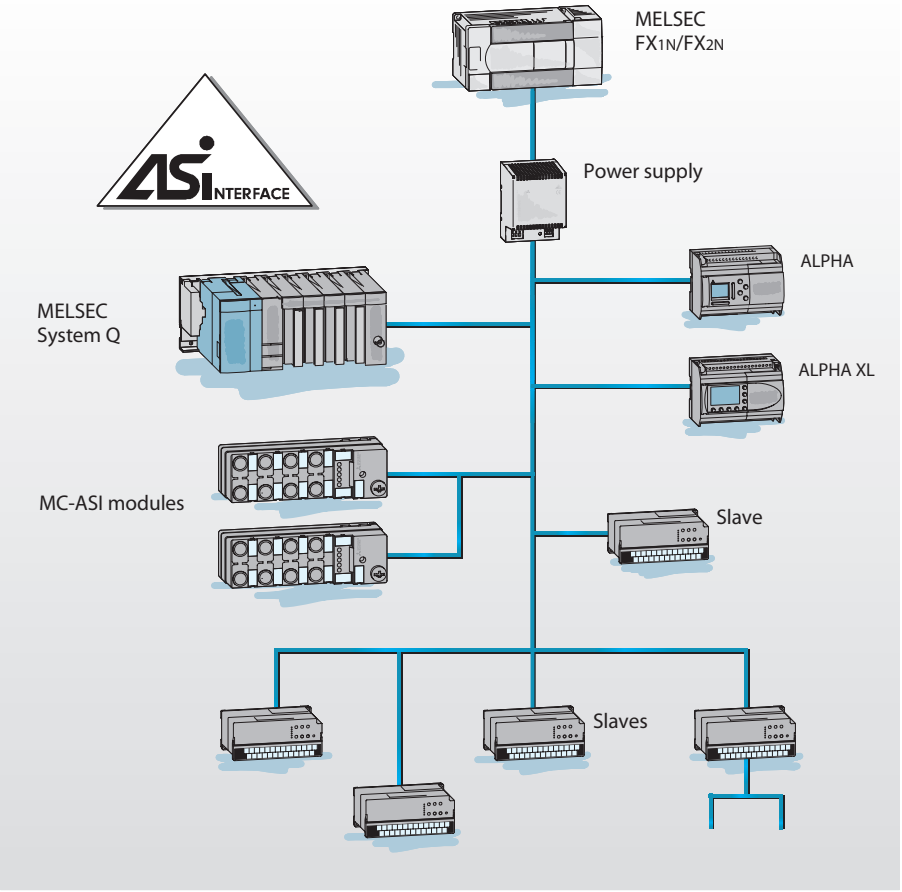
A communication via screw clamb connectors is also possible as well as other unshielded cables can be used.

Data exchange

The AS interface supports the connection of conventional sensors and actors following the master-slave principle.

Administration

The I/O points of the slave devices are assigned electronically through the bus connection or the PLC program addressing the master within the network.

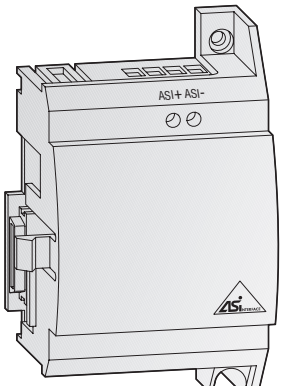


Specifications		AS interface
Network management		Master/slave
Cabling		Coded twisted-pair cable (unshielded)
Data transfer rate	kBit/s	167
Bus cycle time		≤5 ms
Max. overall distance	m	100 (300 with repeater)
Slave units per master		31
Repeaters per network		2

For further informations please refer to the technical catalogue for networks.

■ AS Interface Module AL□-ASI-BD

☑ ALPHA ☑ ALPHA XL



The Actuator Sensor Interface module AL□-ASI-BD in combination with an ALPHA controller facilitates the data communications via an AS interface system.

The AL-ASI-BD is plugged on the AL-20M□-□, the AL2-ASI-BD is plugged on an ALPHA XL series module and form a slave unit. Up to 4 inputs and 4 outputs can be exchanged with the ASI master.

The addresses of the slave devices in the ASI interface are assigned either automatically via the master in the network or via a programming device (software).

The maximum communication distance is 100 m without repeater. If 2 repeaters are used, the distance is extended to up to 300 m.

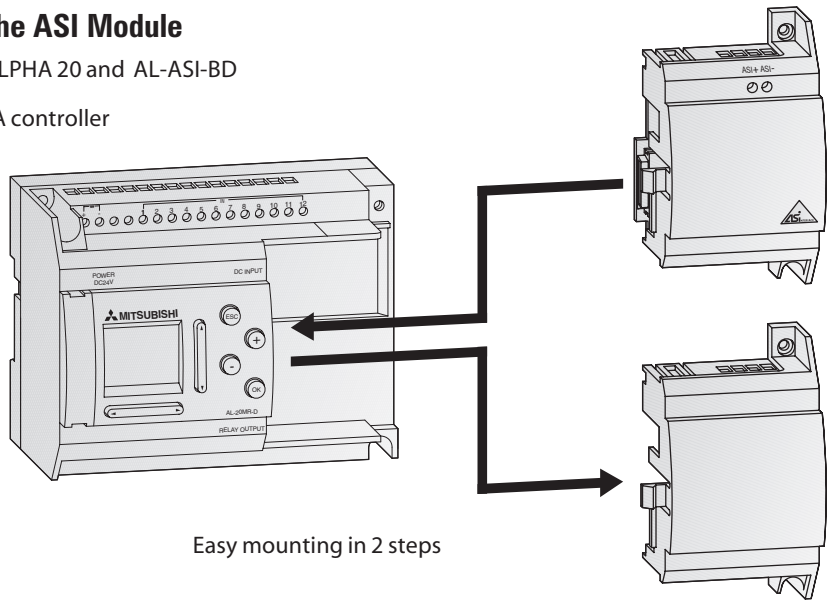
For the AS interface a separate power supply is required. The communication signal is superimposed on the power supply of the AS interface bus.

Specifications		AL-ASI-BD	AL2-ASI-BD
Applicable ALPHA controller		AL-20M□-□	ALPHA XL series
Module type		Slave module	
Number of I/O points		4 inputs, 4 outputs	
General operating conditions		Corresponding to ALPHA master controllers	
External power supply		30.5 V DC (AS interface power supply)	
External current consumption	mA	Max. 150	Max. 40
Communications protocol		ASI standard	
Transfer rate		167000 bit/s	
Communications method		APM (Alternating Pulse Modulation)	
Communications cable		ASI standard cable	
Communications distance	m	100 (300 with repeater)	
Max. data transfer per slave		4 read / 4 write; up to 31 slave modules	
I/O refresh		Max. 5 ms	
Number of modules per master		31	
Weight	kg	0.03	
Dimensions (W x H x D)	mm	61.5 x 90 x 26.5	53.1 x 90 x 24.5
Order information	art. no.	124894	142525

Mounting of the ASI Module

Example shows ALPHA 20 and AL-ASI-BD

ALPHA controller



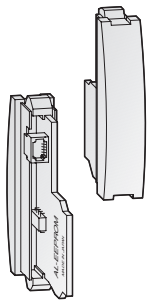
Remove module cover from the ALPHA 20.

Plug the AL-ASI-BD module on the ALPHA 20.

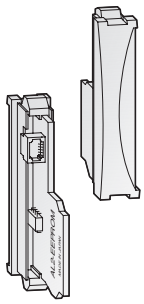
Easy mounting in 2 steps

Memory Cassettes AL-EEPROM

☑ ALPHA ☑ ALPHA XL



AL-EEPROM



AL2-EEPROM2

By means of the memory cassettes AL-EEPROM or AL2-EEPROM2 (for ALPHA XL series) a new program can be transferred to the internal system memory of the ALPHA controller or the program of the internal system memory can be saved on the external memory cassette.

If the memory cassette is used, a certain program can be run temporarily by simply plugging the external memory module.

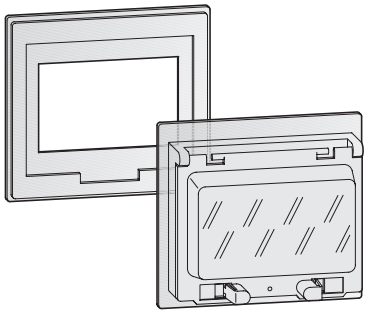
After removing the memory cassette the former program in the internal memory is active again.

The memory cassette AL☐-EEPROM☐ is not a memory expansion but a medium for data exchange.

Data	AL-EEPROM	AL2-EEPROM2
Memory type	EEPROM	EEPROM
Application	ALPHA	ALPHA XL
Memory capacity	1.500 bytes	5.000 bytes
Function blocks	Max. 64	Max. 200
Dimensions (W x H x D) mm	10 x 45 x 25	10 x 45 x 25
Order information Art. no.	87673	142526

IP40/IP54 Mounting Frames

☑ ALPHA ☑ ALPHA XL



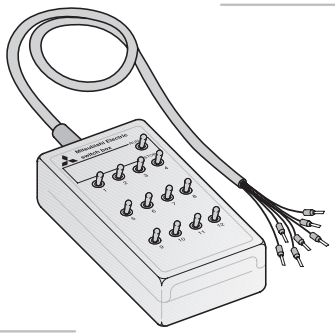
The ALPHA and ALPHA XL controllers can be built into control panels and the doors of control cabinets with the aid of special mounting frames. These mounting frames are available in the protection classes IP40 and IP54.

The IP54 frames are equipped with a flap allowing the function keys on the controller to be accessed when the flap is opened.

Data	AL-FRAME-6/10-IP40	AL-FRAME-6/10-IP54	AL-FRAME-20-IP40	AL-FRAME-20-IP54
Application	ALPHA		ALPHA XL	
Protection class	IP40	IP54	IP40	IP54
Design	Frame only	With transparent flap	Frame only	With transparent flap
Dimensions (W x H x D) mm	104 x 94 x 4	104 x 94 x 28	170 x 94 x 4	170 x 94 x 28
Order information Art. no.	132332	132335	132333	132337

Simulation Box

☑ ALPHA ☑ ALPHA XL



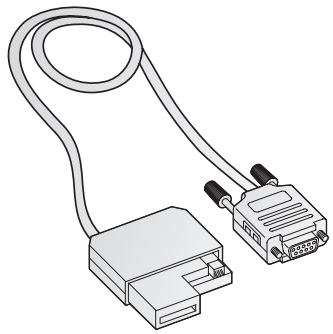
The simulation box provides 12 switches for simulating digital inputs.

The box can be used on all ALPHA controllers.

Data	Simulation box
Switches	12
Dimensions (W x H x D) mm	50 x 100 x 25
Order information Art. no.	3386

Interface Cable AL-232CAB

☑ ALPHA ☑ ALPHA XL



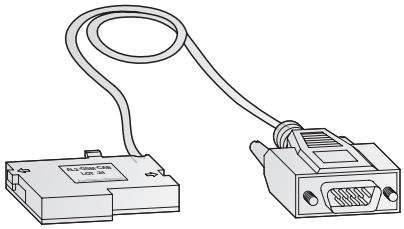
The AL-232CAB is an RS232C interface cable. It connects the ALPHA controller to a personal computer running the programming software for the ALPHA controller.

The cable ensures a galvanic isolation between the ALPHA controller and the personal computer. The cable AL-232CAB can not be used for any other connection.

Data		AL-232CAB
Application		ALPHA <-> PC
Length	m	2.5
Order information	Art. no.	87674

GSM Cable

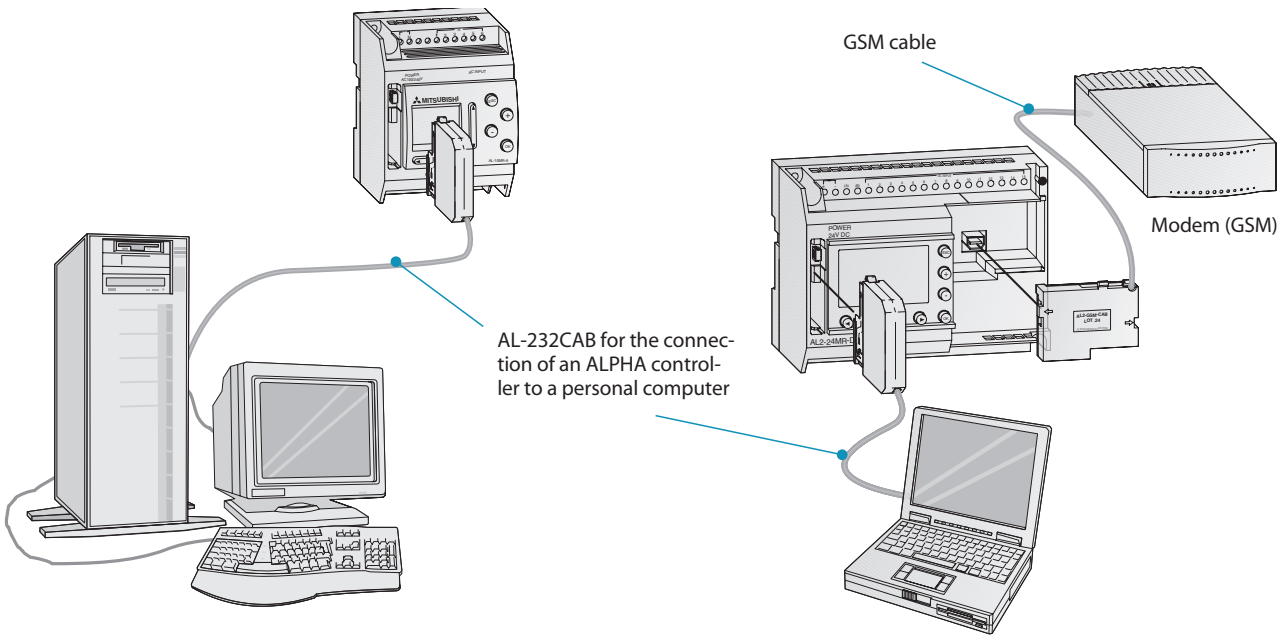
☐ ALPHA ☑ ALPHA XL



The GSM AL2-GSM-CAB is an RS232C interface cable and it is used to connect the ALPHA XL controller to a normal or GSM modem, a personal computer or other serial devices. It can transfer SMS data to a GSM modem for onward transmission to mobile telephones or e-mail addresses.

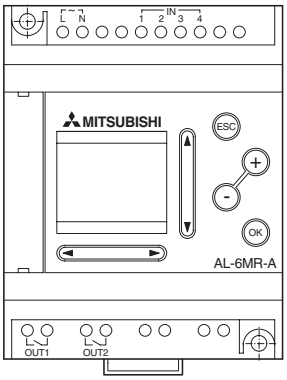
It also permits remote monitoring and remote maintenance.

Data		AL2-GSM-CAB
Connector		9-pin D-SUB connector
Application		ALPHA XL <-> PC, modem
Cable length	m	1.5
Order information	Art. no.	142528

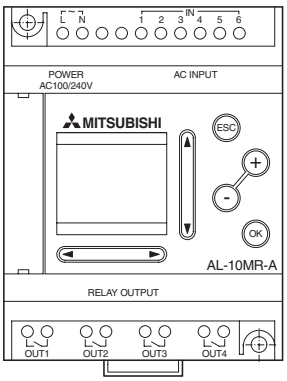


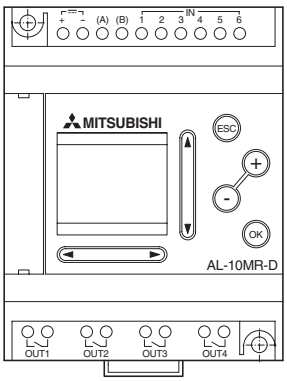
Terminal Assignment of the Master Controllers ALPHA

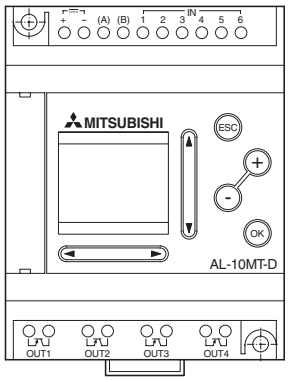
AL-6M□-□



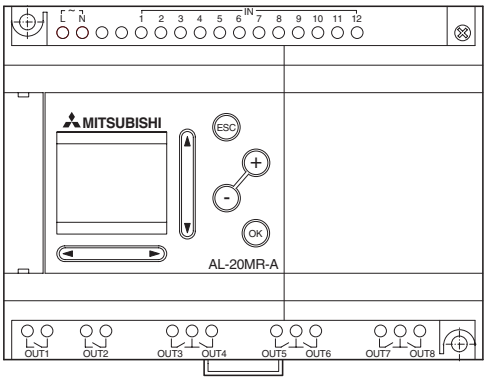
AL-10M□-□

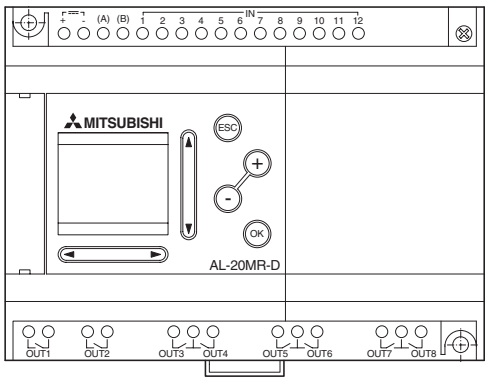


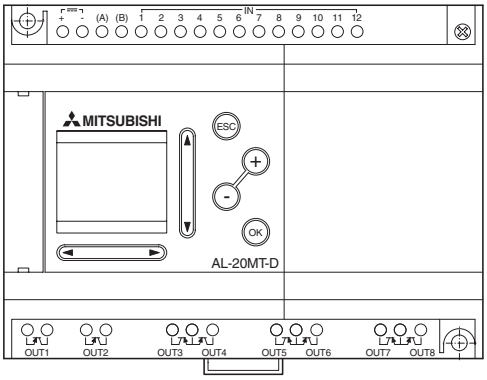




AL-20M□-□

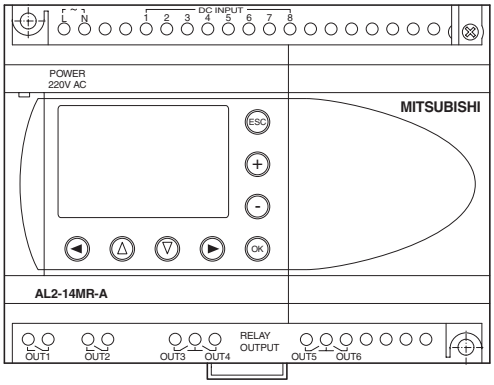


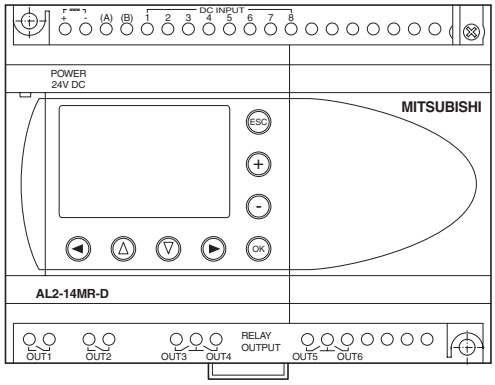




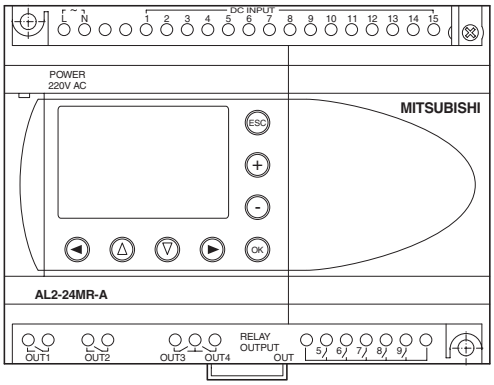
Terminal Assignment of the Master Controllers and Extension Modules ALPHA XL

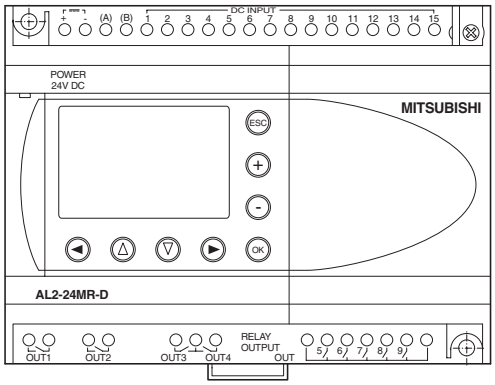
AL2-14M□-□



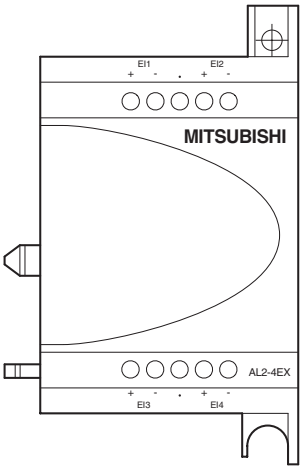


AL2-24M□-□

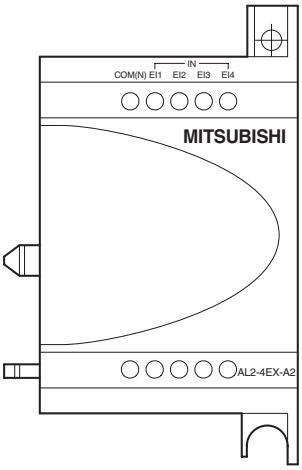




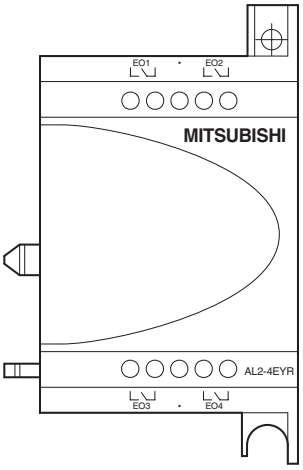
AL2-4EX



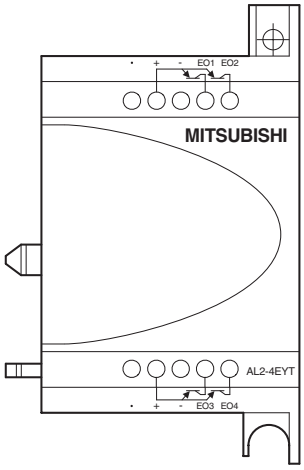
AL2-4EX-A2



AL2-4EYR

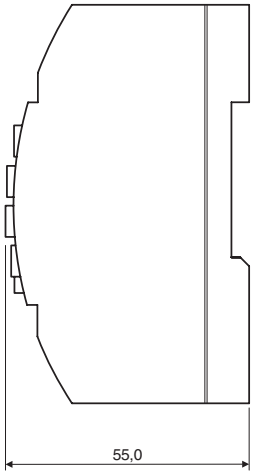


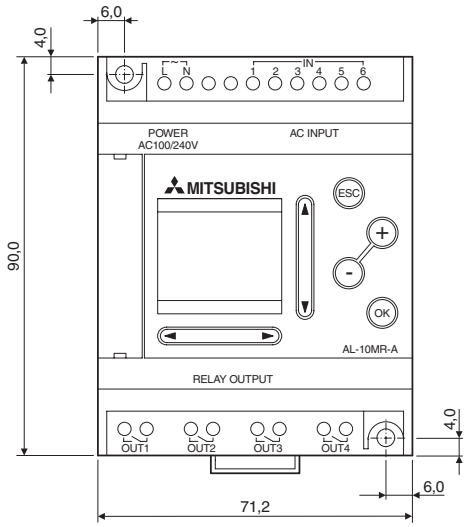
AL2-4EYT



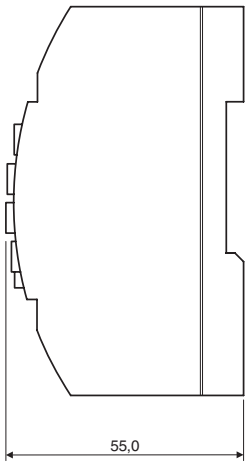
Dimensions of the Master Controllers

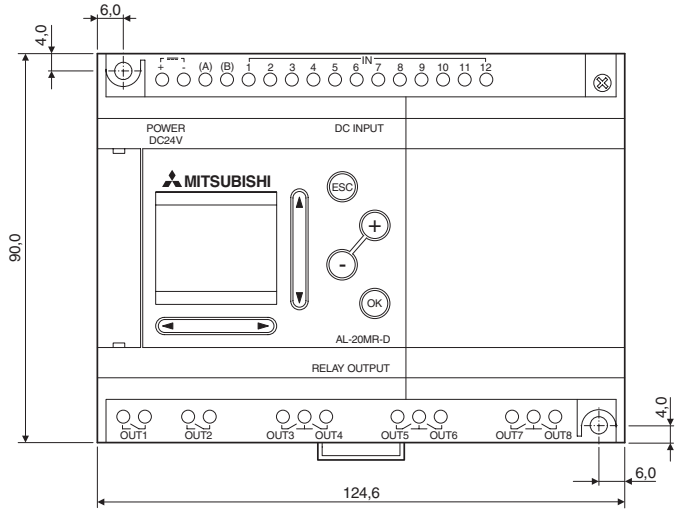
AL-6M□-□, AL-10M□-□



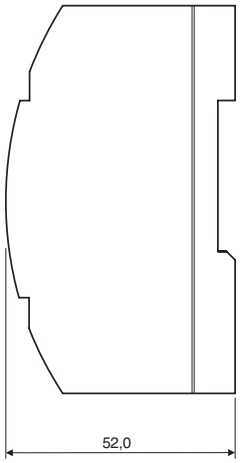


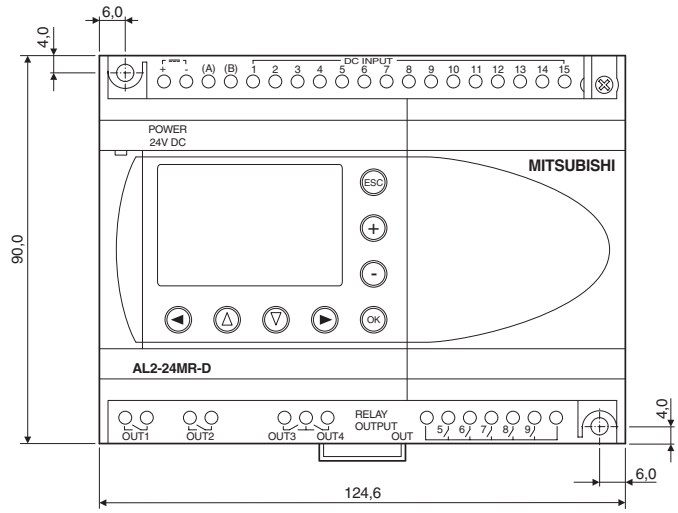
AL-20M□-□





AL2-14M□-□, AL2-24M□-□

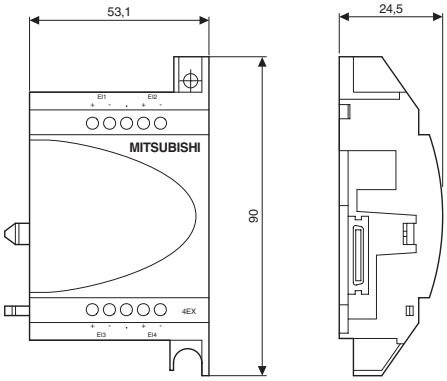




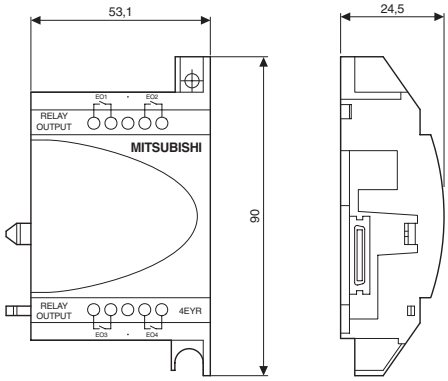
All dimensions in mm

Dimensions of the Extension Modules and ASI Modules

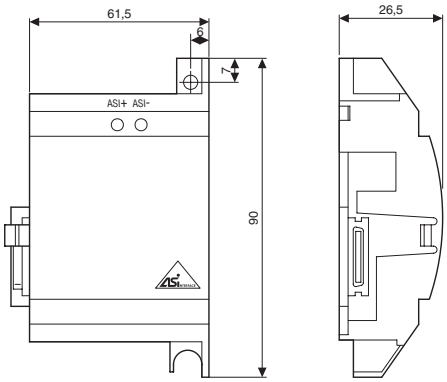
AL-4EX-☐



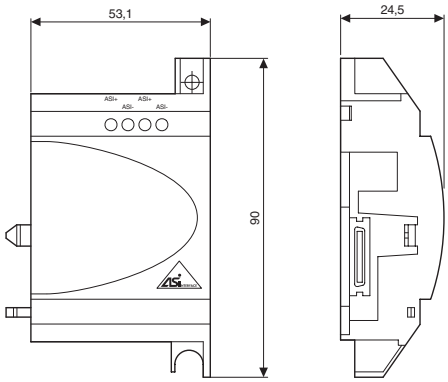
AL2-4EY☐



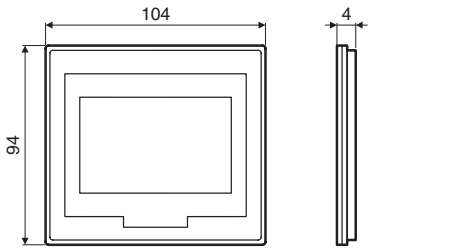
AL-ASI-BD

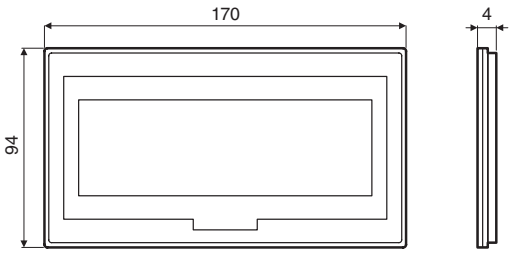


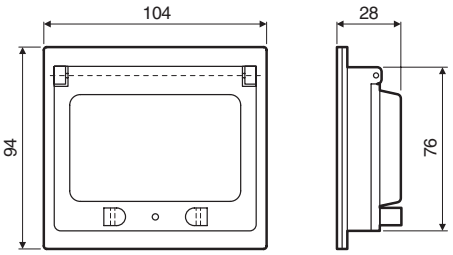
AL2-ASI-BD

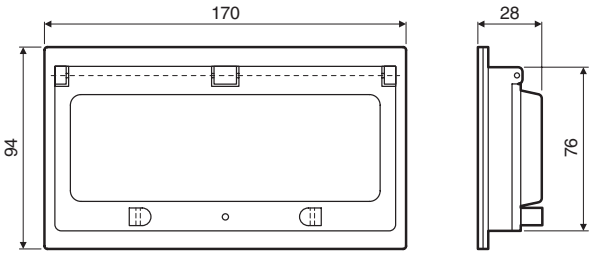


Mounting frame AL-FRAME









All dimensions in mm

Highly Efficient PC Programming Software AL-PCS/WIN

All controllers of the ALPHA series can be programmed with the MS Windows software AL-PCS/WIN. This software is very easy to use and requires no previous experience of the user.

The software can be installed in 6 different languages (D, GB, F, I, E) and also provides online help in the respective language.

Programming the ALPHA is very easy and is done by placing the different program elements on a graphical programming environment: The inputs on the left, the outputs on the right, and in between the different predefined function blocks (timers, counters, real-time clock, etc.). The connections (wiring) between the inputs, function blocks, and outputs are drawn graphically by mouse click to build the logic. By this, programs with up to 200 function blocks (ALPHA XL) can be created, where each single function in a program can be used as many times as desired. By means of a double-click on the respective function block the parameters of the function block are set (e.g. relay switching times, counter presets).

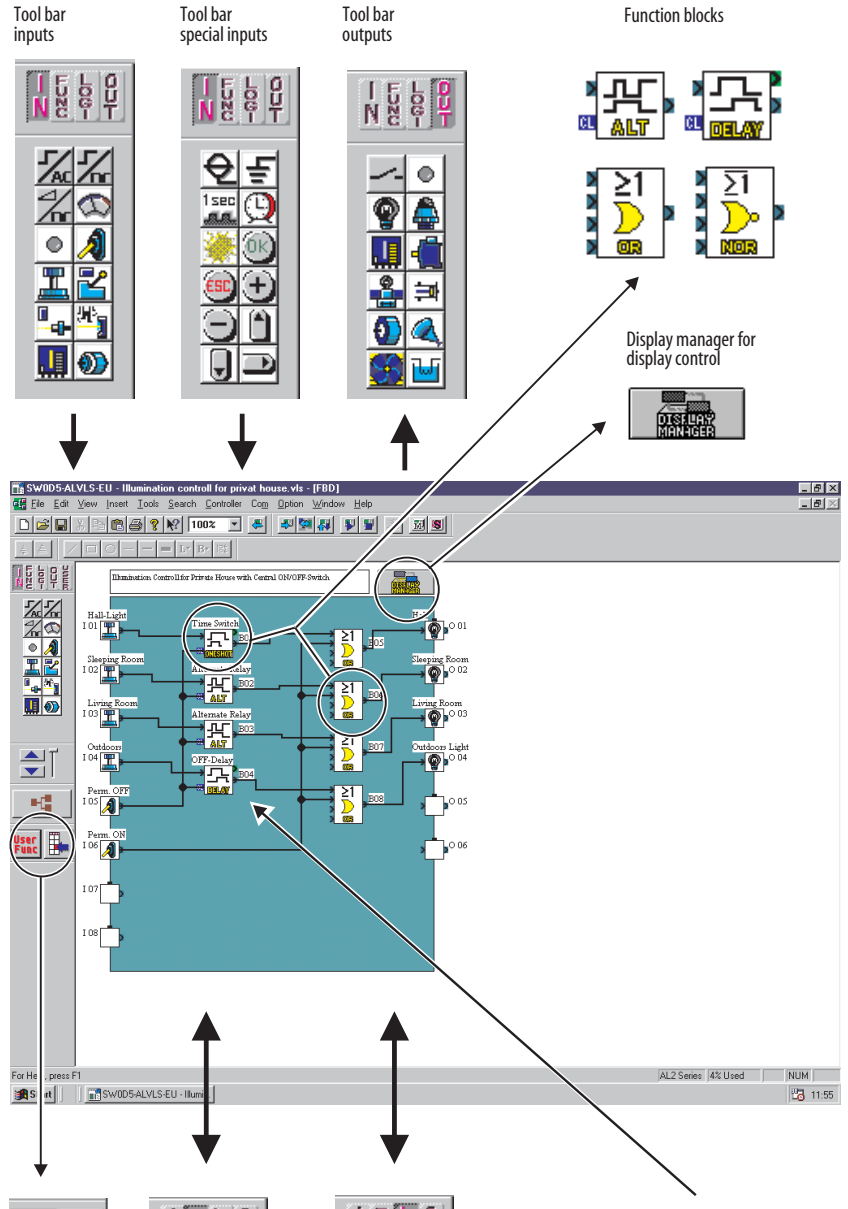
A complete documentation of the program can be created directly from AL-PCS/WIN.

Extent of delivery for AL-PCS/WIN

- CD-ROM with programming software AL-PCS/WIN (6 languages: D, F, GB, I, E, S)
- Product presentation of the ALPHA controller in different languages
- Complete documentation of the ALPHA controller in different languages (PDF files)
- Sample programs for all instructions of the ALPHA with comments in different languages
- Sample program with concrete program applications and comments in different languages.

DEMO version

The software is also available as an AL-PCS/WIN-DEMO version and can be downloaded at any time via the ALPHA homepage www.the-new-alpha.com. The DEMO version does, however, have the restriction that a written program cannot be transferred from the PC to the ALPHA controller, otherwise it has the same range of features.



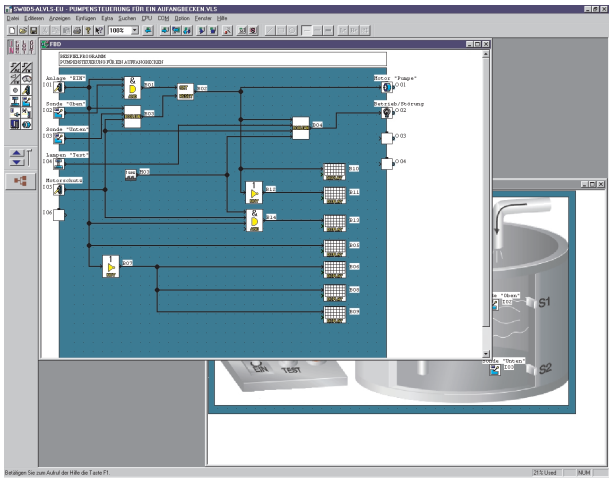
Special Features of the Programming Software AL-PCS/WIN

Program simulation

A particular convenient advantage is the supported program simulation without a connected ALPHA controller. For this purpose the application program is simulated in the simulation module of the AL-PCS/WIN software.

By a mouse click, for example, inputs can be enabled and the status of the function blocks and the processes in the program are displayed graphically.

The simulation reduces the programming effort considerably - especially the programming of malfunctions is significantly minimized. A program can be tested locally separated from the hardware without endangering the hardware.

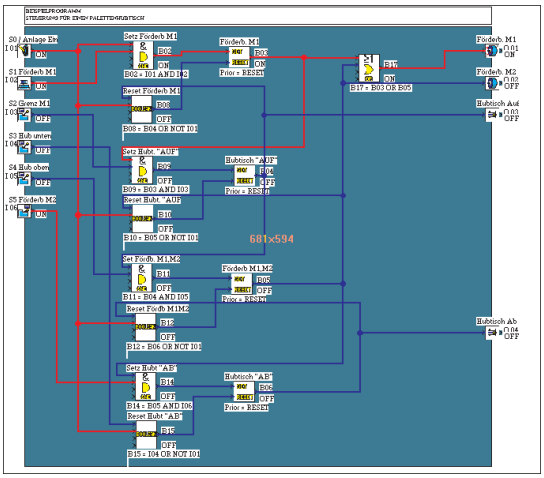


Monitor function

By means of the AL-PCS/WIN function "Monitor" the program execution can be monitored online on a PC (with connected ALPHA controller) under real conditions.

In this operation mode the real status of the inputs/outputs and function blocks is displayed during the program execution.

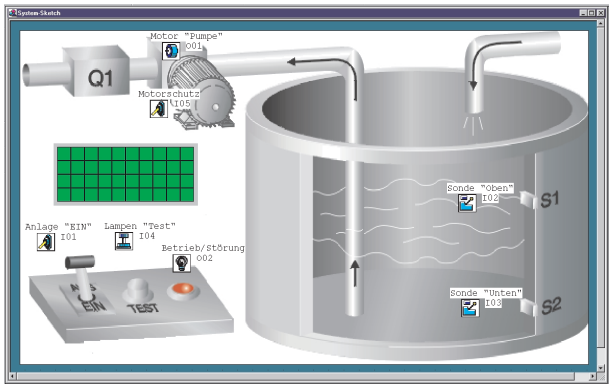
The monitoring function reduces programming times and the programming costs because failure diagnosis and debugging are speeded up significantly.



Process visualization

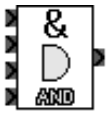
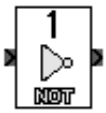
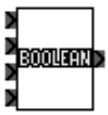
By means of the "System Sketch" window the AL-PCS/WIN software provides a simple process visualization as standard.

In a window separated from the programming environment graphical elements and elements from the program (inputs, outputs, function blocks, etc.) can be copied and configured. By this a graphical simulation and supervision of the program can be performed without accessing the programming environment. This enables an easy setup and maintenance of your application.

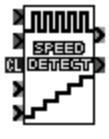


Data	AL-PCS/WIN-EU	AL-PCS/WIN-EU-DEMO
Version	Full featured version	Demo version (no comunication with ALPHA controller)
Language	6 languages (German/English/French/Italian/Spanish/Swedish)	6 languages (German/English/French/Italian/Spanish/Swedish)
Extent of supply	CD-ROM including program and extensive documentation	CD-ROM including program and extensive documentation
Order information Art. no.	145191	145192 (available as download from www.the-new-alpha.com)

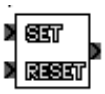
Function Blocks of the Programming Software AL-PCS/WIN

Function	Symbol	Description
AND		AND connection with up to 4 signals, vacant inputs are processed as ON.
OR		OR connection with up to 4 signals, vacant inputs are processed as ON.
NOT		Inverts a signal. Outputs become ON, when inputs are OFF and vice versa.
XOR		EXCLUSIVE OR connection with 2 signals
NAND		NOT AND connection with up to 4 signals, vacant inputs are processed as OFF.
NOR		NOT OR connection with up to 4 signals, vacant inputs are processed as OFF.
BOOLEAN		User programmable complex boolean connections with up to 4 signals, bracket notation and simulation option.
SET/RESET		Sets (ON) or resets (OFF) an output with priority detection.

Function	Symbol	Description
PULSE		Generates a pulse for one cycle at leading or trailing edge of an input signal.
ALT		Alternating pulse relay (alternating self retaining ON/OFF status of the output).
ONE SHOT		One shot (Increases or decreases a pulse). Value range: 0.1 – 6553.5 s
FLICKER		Symmetric or asymmetric pulse generator with defineable number of pulses and total length. Value range: 0.1 – 3276.7 s
TIME SWITCH		Switches an output ON or OFF depending on date and time of the real-time clock (weekly or date programming).
TIME SWITCH M		Switches an output ON or OFF depending on a calender or a given weekly schedule.
COUNTER		Up counter with count and RESET input; generates an output signal when the setting value is exceeded. Value range: 0 – 32767
UP/DOWN COUNTER		Up/down counter with 2 inputs and 2 reset inputs; output signal when exceeding the setting value. Value range: -32767 – 32767

Function	Symbol	Description
COMPARE		Compares two values (less than, greater than, less than or equal, greater than or equal, not equal).
OFFSET/GAIN		Increases signal (for analog value processing).
DISPLAY		Displays messages or data on the LC display.
ZONE COMPARE		Sets or resets an output, when a value is within a specified range. Value range: -32767 – 32767
SCHMITT TRIGGER		Sets output ON when reaching an upper limit value. Resets to OFF when reaching a lower limit value (or vice versa).
HOUR METER		Running time meter counts hours and minutes; with output signal when exceeding the setting value. Value range: up to 32767 h and 59"
SPEED DETECT		The signal input frequency is measured for a set length of time. The frequency is compared to a value range and the output is turned ON/OFF according to the result .
PWM		A continuous pulse train is output. The pulse duty and the cycle time of the pulse can be defined.

Function	Symbol	Description
RETENTIVE ALTERNATE		Output alternates turning ON or OFF with each input pulse. The last output status is kept when the power supply is cycled OFF and ON.
ADDITION		Addition of the inputs A and B and output the result to Y.
SUBTRACTION		Subtraction of the inputs A and B and output the result to Y.
MULTIPLICATION		Multiplication of the inputs A and B and output the result to Y.
DIVISION		Division of the inputs A and B and output quotient Q and remainder R.
CALCULATION		Equation using different arithmetical functions and the selected data.
SHIFT		Shift operation. When the Shift signal is input the last signal status is output.
GSM SMS		The contents of an LCD screen is sent as an SMS message to a GSM phone number.

Function	Symbol	Description
RANDOM ONE SHOT		A random length single pulse is output to provide a random generator.
DELAYED ONE SHOT		After a set delay time, a single puls is sent out.
DELAYED ALTERNATE		After a delay time, output alternates turning ON or OFF with each input pulse.
RETENTIVE SET/RESET		Latch a relay in SET or RESET position and give Set or Reset priority. The last output status is kept when the power supply is cycled OFF and ON.
DELAY		Delay a signal on the rising, falling or both edges. Value range: 0.1–6553.5 s

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