

General information

SIMA² Master Station for controlling and supervising AUMA actuators and for easier integration into host systems.

Features and functions

Housing	Standard:	Housing for installation in 19" systems Dimensions: 4 HE/84 TE Integral 7" multi-touchscreen as user interface
	Options:	Housing for installation on control cabinet mounting plate Dimensions (W x H x D): 483 x 177 x 340 mm Desktop housing with front handle and knuckle feet
Power supply Mains frequency	Standard:	1-phase AC current: 110 – 240 V AC +/-10 %, 50/60 Hz +/-10 %
	Option:	DC current: 24 V DC, approx. 1 A
Type of connection (customer connections)	Standard:	Connection via IEC device plug (type C14) at the housing rear
	Option:	Lateral arrangement of IEC device plug (type C14) Required for installation on control cabinet mounting plate
Power consumption	Approx. 20 W per SIMA ² subsystem For redundant version (hot standby system redundancy) approx. 2 x 20 W	
Supported field devices	The following AUMA actuators can be connected to SIMA²: - Multi-turn actuators (SA .2, SAR .2, SAV .2, SARV .2) or part-turn actuators (SQ .2, SQR .2) in combination with AC 01.2 or ACV 01.2 actuator controls - Multi-turn actuators (SAEx .2, SAREx .2, SAVEx .2, SARVEx .2) or part-turn actuators (SQEx .2, SQREx .2) in combination with ACExC 01.2 bzw. ACVExC 01.2 actuator controls - Multi-turn actuators of TIGRON type range - Multi-turn actuators of the iMatic (DiM(Ex), DiMR(Ex)) type range as well as part-turn actuators of the DPiM(Ex) type range - Multi-turn actuators of type range SEVEN - Globe valve of SVC and SVM type ranges - Part-turn actuators of type ranges SGC and SGM - Actuators of the PROFOX type range Other field devices with Modbus RTU interface on request	
Communication to field devices	Communication to the actuators is established via RS-485 with Modbus RTU - Use of twisted, screened RS-485 copper cable in compliance with IEC 61158 - RS-485 ports accessible from the front side (hidden by hinged fold-out front doors) Modbus RTU: - Fieldbus termination can be activated at the RS-485 communication interfaces - Connection of the RS-485 communication cables via spring clamp terminals: Cross section of spring clamp terminals: - Single strand: 0.08 – 2.5 mm² - Fine stranded: 0.25 – 2.5 mm², with wire end sleeves up to 1.5 mm² - Modbus RTU communication parameters: - Supported baud rate: 0.3 – 115.2 kbit/s - Supported transmission formats: 8 data bits, 1 or 2 stop bits; parity: even, odd or none.	
	Options:	SIMA² supports up to two different, galvanically and logically separated fieldbus networks to the actuators with the following characteristics: - Two single-channel line topology or one redundant line topology - Cable length without repeater max. 1.2 km, with repeater approx. 10 km - Number of actuators: without repeater max. 32, with repeater max. 126

Features and functions

Communication between SIMA ² and host	Standard:	Without integration into a superordinate automation system (stand-alone mode): SIMA ² is operated in stand-alone mode; the operation commands for the AUMA actuators are entered manually by the operator via the user interface.
	Options:	Modbus RTU in single-channel or redundant version • Communication to the host is established via RS-485 with Modbus RTU • Fieldbus termination can be activated at the RS-485 communication interfaces • Use of twisted, screened RS-485 copper cable in compliance with IEC 61158 • Connection of the RS-485 communication cables via spring clamp terminals accessible from the front side (hidden by hinged fold-out front doors) Cross section of spring clamp terminals: - Single strand: 0.08 – 2.5 mm² - Fine stranded: 0.25 – 2.5 mm², with wire end sleeves up to 1.5 mm² Configuration of the Modbus RTU communication parameters (baud rate, transmission format, slave address) is made via the HMI user interface. Supported baud rates: 0.3 – 115.2 kbit/s Supported transmission formats: 8 data bits, 1 or 2 stop bits; parity: Even, Odd or None. Supported Modbus function codes: • 01 Read Coil Status • 02 Read Input Status • 03 Read Holding Registers • 04 Read Input Registers • 05 Force Single Coils • 06 Preset Single Registers • 15 (0x0F) Force Multiple Coils • 16 (0x10) Preset Multiple Registers • 08 Diagnostics - 00 00 Loopback - 00 10 (0AHex) Clear Counters and Diagnostic Register - 00 11 (0BHex) Return Bus Message Count - 00 12 (0CHex) Return Bus Communication Error Count - 00 13 (0DHex) Return Bus Exception Error Count - 00 14 (0EHex) Return Slave Message Count - 00 15 (0FHex) Return Slave No Response Count - 00 16 (10Hex) Return Slave NAK Count - 00 17 (11Hex) Return Slave Busy Count - 00 18 (12Hex) Return Character Overrun Count Modbus TCP/IP in single-channel or redundant version • Communication via host is established via Ethernet, 10 Base-T or 100 Base-T (IEEE 802.3) using Modbus TCP/IP • Up to four simultaneous Modbus TCP/IP connections • 10/100 Mbit/s Configuration of the Modbus TCP/IP communication parameters (IP address and subnet mask, port as well as Unit ID) is made via the HMI user interface. Communication in Modbus data format via TCP/IP protocols For redundant version: Connection to identical or to different subnets possible (option). Supported Modbus function codes: • 01 Read Coil Status • 02 Read Input Status • 03 Read Holding Registers • 04 Read Input Registers • 05 Force Single Coils • 06 Preset Single Registers • 15 (0x0F) Force Multiple Coils • 16 (0x10) Preset Multiple Registers

Features and functions							
Hot standby system redundancy (option)	For redundant applications, SIMA² can be implemented as redundant configuration. Two separate SIMA² subsystems permanently monitor each other. In case of failure of one SIMA² subsystem, the redundant subsystem takes over control (only available in combination with Modbus RTU as communication protocol between SIMA² and the actuators). Continuous mutual monitoring of the two SIMA² subsystems is established via an Ethernet synchronisation cable <table> <tr> <td>Versions:</td><td> Hot standby system redundancy of SIMA² within a single housing • Compact design (requires mounting space for just one SIMA² housing) • Two complete SIMA² subsystems, each with a 7" multi-touchscreen are located within the housing • Redundant power supply, separately for each SIMA² subsystem • Supports up to two RS-485 Modbus RTU communication interfaces to the actuators, e.g. appropriate for two single-channel line topologies or one redundant line or loop topology. Hot standby system redundancy of SIMA² in two separate housings • Requires mounting space for two SIMA² housings • Each of the two housings is equipped with a complete SIMA² subsystem including 7" multi-touchscreen and power supply • Supports up to eight RS-485 Modbus RTU communication interfaces to the actuators which can be used in up to four different communication networks, e.g. suitable for up to four single-channel line topologies or up to four redundant line or ring. </td></tr> </table>	Versions:	Hot standby system redundancy of SIMA² within a single housing • Compact design (requires mounting space for just one SIMA² housing) • Two complete SIMA² subsystems, each with a 7" multi-touchscreen are located within the housing • Redundant power supply, separately for each SIMA² subsystem • Supports up to two RS-485 Modbus RTU communication interfaces to the actuators, e.g. appropriate for two single-channel line topologies or one redundant line or loop topology. Hot standby system redundancy of SIMA² in two separate housings • Requires mounting space for two SIMA² housings • Each of the two housings is equipped with a complete SIMA² subsystem including 7" multi-touchscreen and power supply • Supports up to eight RS-485 Modbus RTU communication interfaces to the actuators which can be used in up to four different communication networks, e.g. suitable for up to four single-channel line topologies or up to four redundant line or ring.				
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Dual operation (option)	For applications with space constraints inside the control cabinet, two galvanically and logically isolated SIMA² subsystems can be located within a joint housing. Version: • Compact design (requires mounting space for just one SIMA² housing) • Two complete SIMA² subsystems, each with a 7" multi-touchscreen are located within the housing • Separate power supply, separately for each SIMA² subsystem • Supports up to two RS-485 Modbus RTU communication interfaces each to the actuators, e.g. appropriate for two single-channel line topologies or one redundant line or loop topology						
System interface	The number of available RS-485 and Ethernet interfaces depends on the number of fieldbus networks, the type of communication to the host and the selected redundancy model. At least one Ethernet port (RJ45) is available for diagnostics or for integrating the optional OPC UA server within an automation network, two further USB ports are used for transmitting configuration and diagnostic data.						
Operating and monitoring	Display and operation functions of the HMI: • Control and status indication of the connected AUMA actuators • Status indication of the communication to the actuators and to the host • Operation, configuration and diagnostics of SIMA² and the respective interfaces <table> <tr> <td>Standard:</td><td>User interface languages: English and German (can be changed during operation)</td></tr> </table> SIMA² offers various access facilities to the HMI. <table> <tr> <td>Standard:</td><td> Operation via the integral 7" multi touchscreen Features: • Resolution: WVGA, 800 x 480 Pixel • Colours: 16.7 million • Brightness: usually 500 cd / m² • Contrast: typically 600:1 • Observation angle: usually 60 – 70° </td></tr> <tr> <td>Option:</td><td> Access to the web based HMI user interface using remote stations via Ethernet (network connection: RJ45 port), enabling the connection of the following components: • External work stations, PCs, laptops via LAN connection • External tablets, smartphones via WLAN connection The responsive web design of the HMI is optimised for use in combination with Google Chrome and Mozilla Firefox browser. </td></tr> </table>	Standard:	User interface languages: English and German (can be changed during operation)	Standard:	Operation via the integral 7" multi touchscreen Features: • Resolution: WVGA, 800 x 480 Pixel • Colours: 16.7 million • Brightness: usually 500 cd / m² • Contrast: typically 600:1 • Observation angle: usually 60 – 70°	Option:	Access to the web based HMI user interface using remote stations via Ethernet (network connection: RJ45 port), enabling the connection of the following components: • External work stations, PCs, laptops via LAN connection • External tablets, smartphones via WLAN connection The responsive web design of the HMI is optimised for use in combination with Google Chrome and Mozilla Firefox browser.
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Cooling	Passive cooling without fan (maintenance-free)						

Functions of the SIMA² software	
Web based user interface for operating and monitoring SIMA ²	Automatic display of the most important status information of SIMA ² as well as the connected actuators immediately after switching on (once commissioning and definition of the system configuration is complete).
	Password-protected access to settings and entry of manual operation commands for the actuators.
	Control of connected actuators.
	Visualisation of feedback from connected actuators.
Actuator identification via the user interface	Optional specification of the individual designation for each actuator.
Adapting the communication characteristics via the HMI user interface	Setting the communication between SIMA ² and actuators (e.g. redundancy, baud rate, parity, number of actuators, highest field device address).
	Setting the communication between SIMA ² and DCS (baud rate, parity, number of stop bits, address, monitoring time, IP address, subnet mask, port, unit ID).
Communication monitoring	Monitoring and visualising the communication status with the host
	For redundant communication to the host: Two communication channels with equal access rights.
Redundancy functions	Support, monitoring and management of redundant communication to the DCS (option), and the redundant communication to the actuators (option). Upon occurrence of a fault, the function is immediately adopted by the redundant communication channel or the redundant system without any interference.
Gateway function	Administration of different communication protocols of the DCS and the actuators (e.g.: Modbus TCP/IP <> Modbus RTU or Profibus DP or)
	Implementation of various solutions for communication to the DCS and communication to the actuators (e.g. single-channel communication for DCS <> redundant line topology to the actuators)

Data interface to host	
Output data from the DCS to the SIMA ²	Output data (operation commands) to the actuators connected to SIMA ²
Input data from the SIMA ² to the DCS	Input data (feedback signals) from the connected actuators as well as additional status information of SIMA ² : • Communication status to the actuators • Communication status to the host • Number of currently available actuators • Deviation from the planned number of actuators

Service conditions	
Enclosure protection according to EN 60529	IP20 (higher enclosure protection on request)
Ambient temperature	–20 °C to +50 °C (higher ambient temperatures on request)
Humidity	5 % to 90 % (non-condensing)

Options and accessories	
RS-485 overvoltage protection	Protection of RS-485 communication interface against overvoltages
Digital inputs	6 or 12 inputs Nominal voltage 24 V DC, type 1 input characteristics (according to EN 61131-2), current consumption approx. 3.75 mA. Suitable for e.g. discrete control signals for activating the ESD function, for control cabinet monitoring functions or enabling the HMI, etc.)
Digital outputs	2 change-over contacts, 240 V AC/5 A, 24 V DC/5 A Suitable for e.g. configurable alarm output
Front handle and knuckle feet	Appropriate for 19" pull out systems and bench housing
Project-specific control cabinet	Customised basic Rittal IT, 19" rack (800 x 800 x 2,200 mm)
Project-specific software programming	On request
Project design	On request

Further information	
Weight	Approx. 9 kg
EU Directives	Low Voltage Directive 2014/35/EU EMC Directive 2014/30/EU
Reference documents	Dimensions SIMA ² Master Station