Art. No. 19200

USER GUIDE
ESERA-STATION 200

- Central hard- and software control (system-open) for smart home, building automation, IoT and commercial automation
- Hybrid construction consisting of Embedded Computer and 1-Wire Gateway
- Powerful, modern quad core computer with 1.4GHz CPU speed
- Fast reading of all 1-Wire devices within 1-2 seconds
- Data exchange among 1-Wire Gateway and computer via Modbus or text protocol
- Large 1-wire libraries for sensors and actuators
- 2 x binary output 16A
- 2 x binary input 10-30VDC
- 2 x System clocks with power-failure buffering
- Convenient configuration program for 1-Wire Gateway and interface parameters
- 24V power supply for Embedded Computer and 1-Wire gateway
- Designed for all sizes of 1-Wire Networks
- Top-hat rail case for switchboard assembly

1 INTRODUCTION

Before you start assembling the ESERA-Station 200 and before you take the device into operation, please read this assembly and operating instruction carefully to the end, especially the section referring to the safety notes.

2 PRODUCT DESCRIPTION

The ESERA-Station 200 is a modern and system-open hybrid system consisting of two modules, a powerful 1-Wire gateway and an Embedded Computer.
Both modules are internally connected by a serial data interface and the power supply.
Each module has an own power supply and a system clock (real time clock) with power-failure buffering by a low-maintenance, high-performance capacitor (Goldcap).

2.1 EMBEDDED COMPUTER

The ESERA-Station 200 includes a standardized and powerful computer that comes with a Quad Core CPU with 1400MHz. This CPU provides enormous power reserves by low power consumption. Given to its 1024 MB RAM memory, even large automation projects can be implemented.
All modern interfaces such as LAN, WLAN with 2.4GHz and 5GHz, as well as Bluetooth with standard 4.2 are available for connection with the "outside world".
The Embedded Computer also has 3 external and one internal USB 2.0 interfaces.

2.2 1-WIRE GATEWAY

In addition to the Embedded Computer, the ESERA-Station 200 has an extremely powerful and reliable 1-Wire interface, the 1-Wire Gateway developed by ESERA.
The 1-Wire Gateway is internally connected to the Embedded Computer by serial interface. Via an USB slave interface, the 1-Wire Gateway can also be accessed directly, without an Embedded Computer. Once you use the USB interface, the internal communication to the Embedded Computer is interrupted. The Embedded Computer is only able to receive data.

Standard Modbus TCP protocol
You can work with your industrial controller, e.g. SPS to communicate with the 1-Wire Gateway 20 via standard Modbus TCP protocol. The addressing is structured in a way that is comparable to many other Modbus systems. Addresses for system and sensor or actuator data are available.
An address overview with all available data points is available at the article download section of our website.

Independent administration
The ESERA-Station 200 is intended for self-sufficient management of 1-Wire networks. You no longer have to worry about 1-Wire commands or formulas for evaluating sensor data. The ESERA-Station 200 independently scans the 1-Wire network for new sensors and actuators and makes them available, in plain text by using Modbus protocol, depending on the modules found and the corresponding data converted.

Formatted data output
The ESERA-Station 200 provides plausibility checked sensor and actuator data in a ready to use format. E.g. temperature sensor provides values in Celsius degrees with 2 decimal places. You only need to divide this number by 100. Within the 1-Wire Gateway a product specific transformation table is available for all 1-Wire sensor and actuator products offered by ESERA.

Designed for all 1-Wire Networks
The 1-Wire interface of the ESERA-Station 200 is specially designed to securely support all sizes of 1-Wire networks, even for huge cable length. 1-Wire sensor devices can be operated in parasitic or normal mode at the same time.
The latest available most powerful 1-Wire interface for a maximum level of data security has been used. This includes complex network structures as well.

1-Wire Gateway configuration
Free configuration software (Config-Tool 3) is provided. When using Config-Tool 3, the latest documentation is available at any time hence it automatically updates via internet. This software is available for download on our webpage. Communication to Modbus TCP is parallel with no switching.

System time / real time clock
No real time clock with battery buffering available in your system? No problem at all. ESERA-Station 200 is providing time and date as real time clock including an integrated backup battery. Data plausibility check is possible at any time.

Power supply
The ESERA-Station 200 is supplied with the industrial 24V voltage.

Connection
Standard connectors are provided for USB and Ethernet connections. All other connectors are designed in modern screwless push-in technology for rigid and fine-stranded cables with cross sections up to 1.5 or 2.5qmm.
Input voltage for the ESERA-Station 200 is 16 – 30 VDC. Therefore it can be used for 24 VDC (industrial applications). Appropriate hat-rail mounted power supplies or power plugs can be found in our webshop.

3 AUTO-E-CONNECT® SUPPORT

The ESERA **Auto-E-Connect®** 1-Wire Plug and Play system will be used for the 1-Wire Bus supported. This enables fully automatic configurations of 1-Wire sensors and actuators on the 1-Wire bus. It is optimized for industrial applications and enables significant added value beyond the sensor and chip data.

The Auto-E-Connect function automatically recognizes ESERA chips, sensors and actuators, starts suitable libraries and outputs fully formatted data.

The Auto-E-Connect functionality will be available from mid-2020 via 1-Wire Controllers, 1-Wire Gateways and 1-Wire ECO from ESERA available.
Further information on ESERA Auto-E-Connect can be found on the ESERA website, ESERA Config-Tool 3, or in the download area for this article in the ESERA Webshop.

4 TECHNICAL DATA

EMBEDDED COMPUTER

CPU:	Quad-Core processor ARM-Cortex-A53 64Bit, 1400 MHz
Memory:	RAM 1024 MB LPDDR2 memory microSD card 8GB for operating system and software application
Operating system:	Linux Debian (Raspian), software already installed
Software, option:	- IP-Symcon, basic, professional or unlimited - Codesys 3.x
External interface:	LAN RJ45 10/100/1000 Mbit (Gigabit LAN by USB 2.0 with up to 300 Mbit) - Auto negotiation (full-duplex and half-duplex) - Support for DHCP and IP-address - DNS support - Auto MDI/MDIX WLAN 802.11 b/g/n/ac (2,4 + 5,0 GHz) Bluetooth 4.2
System clock (RTC):	DS1307 with ability to bypass power failure with Goldcap for min. 24 hours

1-Wire Gateway

Data interface:	Modbus RTU and ESERA ASCII text protocol
Internal interface:	serial, 19200 baud 8 data bit, 1 start bit, no stop bit
Firmware update and configuration	by ESERA Config-Tool 3
1-Wire interface:	1-Wire bus (Masse/GND, 5V, 12V and data)
Protection circuits:	ESD- and reverse polarity protection
Connection:	Push In connector for cables up to 1.5qmm cable cross section
Output voltage:	5V max. 1A, 12VDC max. 1,2A Overload and short circuit proof
Digital- /binary input:	2 x input 10-30VDC, max. 10mA per channel isolated with common negative pole Push In connector for cables up to 1.5qmm cable cross section
Digital- /binary output:	2 x output (relays) 16A switching current (NO), isolated Push In connector for cables up to 2.5qmm cable cross section
System clock (RTC):	DS1307 with ability to bypass power failure with Goldcap for min. 24 hours

ENTIRE SYSTEM

Power supply:	16 – 30 VDC
Input:	3,4 – 38W* * depending on the CPU load and load on the 1-wire interface

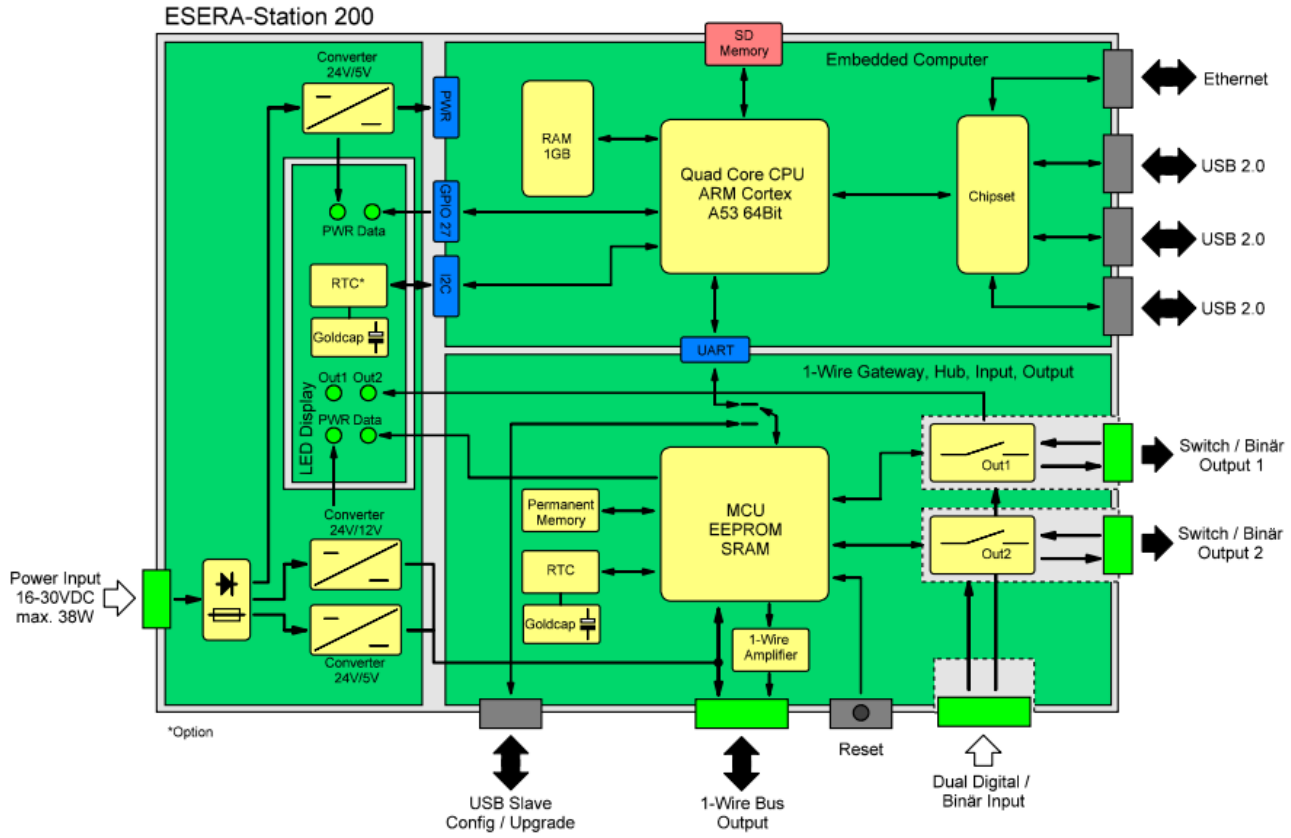
5 AMBIENT CONDITIONS

Temperature, operation	-10 °C up to +55 °C (extended temperature range available upon request)
Air humidity:	10 – 92 % (non-condensing)
Protection system:	IP20
Protection class:	III
Dimensions:	35 x 90 x 70mm (WxHxD)

6 CONFORMITY

EN 50090-2-2
EN 61000-4-2, ESD
EN 61000-4-3, HF
EN 61000-4-4, Burst
EN 61000-4-5, Surge
EN 61000-6-1, Fault-free operation
EN 61000-6-3, Stray radiation
RoHS

7 BLOCK DIAGRAM



8 LED DISPLAY

The ESERA-Station 200 has various display LEDs. Please refer to the following table for their functions:

LED Status	Description	Function
Embedded Computer		
LED green front	PWR	Display supply voltage Embedded Computer
LED green front	DATA	LED, can be programmed for individual use (GPIO 27)
LED green Ethernet	DATA	Flashes while transferring data
LED green Ethernet	LINK	Is lit if Ethernet connection is active
1-Wire Gateway		
LED green	PWR	Display supply voltage 1-Wire Gateway
LED green	DATA	• LED flashes 3 times after power on • Flashes at 1-Wire activity • Flashes while transferring data by the data interface • Flashes rapidly if "KAL Receive" has been activated no “KAL messages" received.
LED green	REL1	Output 1, is lit when relay 1 is active
LED green	REL2	Output 2, is lit when relay 1 is active

9 CONNECTION

Module top side (left to right)

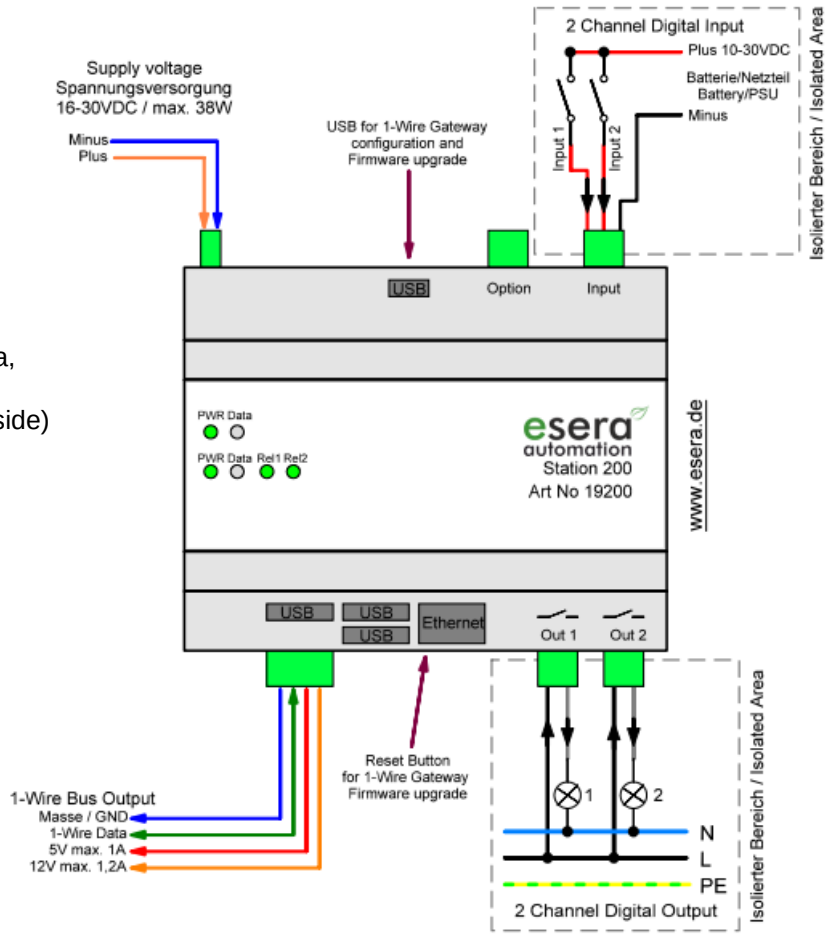
- Supply voltage 16-30VDC
- USB Slave for 1-Wire Gateway Configuration and firmware update/upgrade
- Optional input (not equipped)
- 2 x digital input 10-30VDC isolated

Module bottom side (left to right)
lower level

- 1-Wire bus output, Masse/GND, Data, 5V (max. 1A) and 12V (max. 1,2A)
- Reset button for 1-Wire Gateway (inside)
- Digital output 1 (max. 16A)
- Digital output 2 (max. 16A)

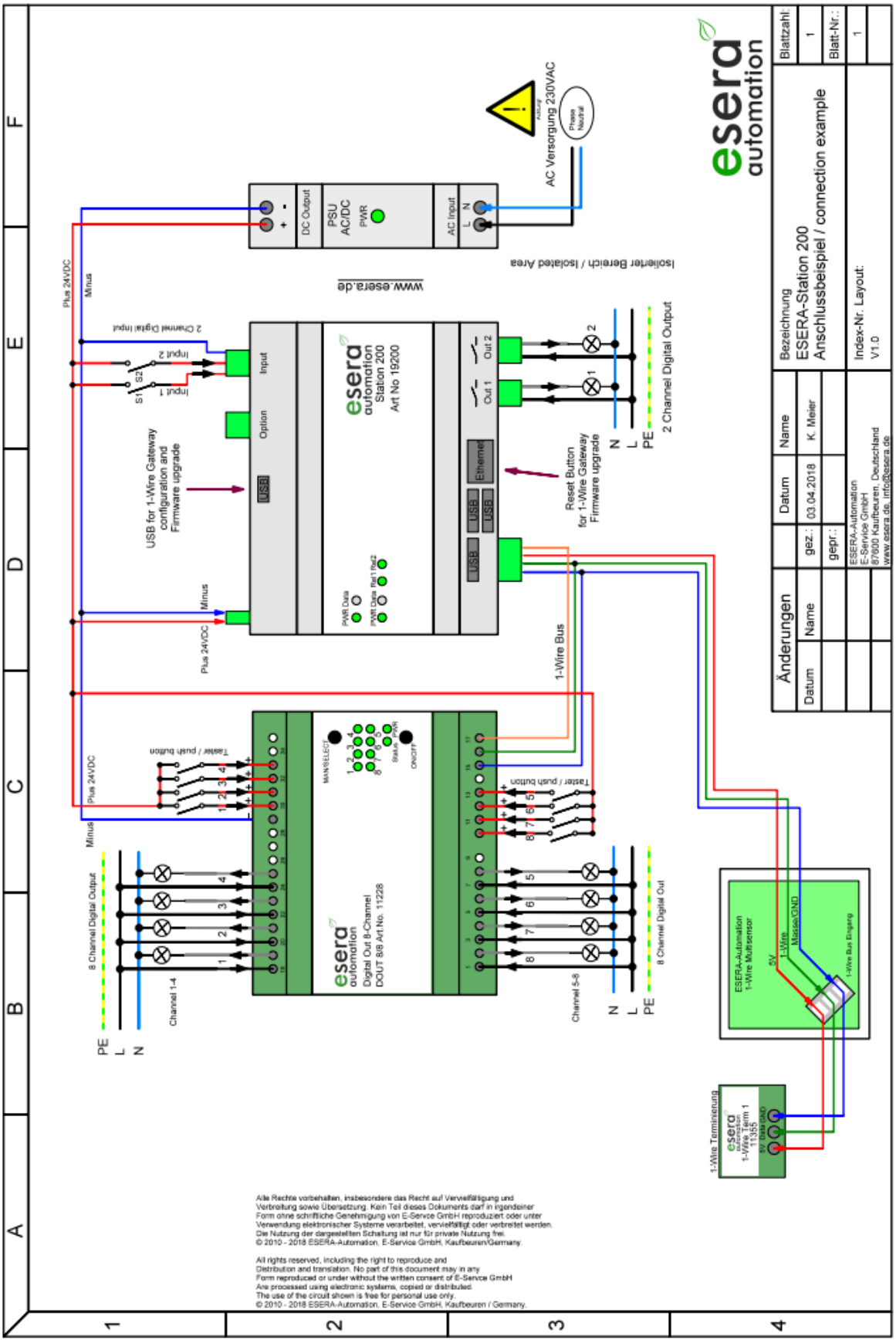
upper level

- 3 x USB output (5V max. 0,5A)
- Ethernet input RJ45 10/100/1000 MBit



Note: Basics and tips for 1-Wire bus systems can be found in our webshop (https://www.esera.de/1-wire-grundlagen/) or in our e-book which is also available in our webshop (https://www.esera.de/service-support/dokumentation/352/grundlagen-1-wire-bus-ebook?number=11901).

10 CONNECTION ESERA-STATION 200, SENSORS AND ACTUATORS



11 SOFTWARE

Data interface Modbus RTU and ESERA ASCII text protocol

You can address the 1-Wire Gateway either by the USB slave socket on the top of the device or by the internal data interface between the 1-Wire Gateway and the Embedded Computer.
When the USB slave interface is used, internal communication among 1-wire gateway and Embedded Computer will automatically be interrupted. Both, USB slave and internal serial interface have the setting 19200 baud, 8 data bits, 1 start bit and no stop bit (19200,8N1).
The software "Config Tool 3" for Windows operating systems can be found in the download area of the article or at our website, Service & Support, Download. https://www.esera.de/produkte/software/downloads-firmware-1-wire-controller-1-wire-gateway/.

This software is available for download on our webpage.

12 INTEGRATION IP-SYMCON / ESERA-STATION

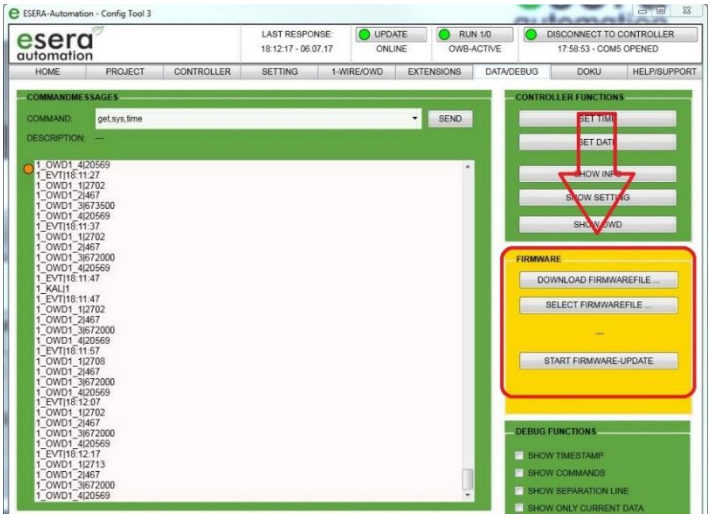
ESERA IP-Symcon software modules are provided at our webpage for easy integration of the ESERA-Station 1-Wire Gateway. Using software scripts are no longer necessary. Further details can be found on our webpage: https://www.esera.de/kompatible-steuerungen-zentralen/ip-symcon-integration/.

A script for regular connections by 1-Wire Bus Coupler is also available for download on our webpage. Further details can be found in the sample script.

13 CONFIGURATION AND COMMUNICATION 1-WIRE GATEWAY

The well-tested 1-Wire Gateway is installed inside the ESERA-Station. The 1-Wire Gateway has a wide range of configuration and formatting options, which are read out and operated with the ESERA "Config-Tool 3". For communication among 1-Wire Gateway and Config-Tool 3 the open ESERA ASCII text protocol is used. Any communication can also be handled directly from the Embedded Computer or a terminal program (e.g., Hercules or Putty).
Binary inputs and outputs are available by 1-wire gateway for the Embedded Computer to control.

14 FIRMWARE UPDATE 1-WIRE GATEWAY



Firmware will be updated by using an existing USB connection (USB slave module top side) with Config-Tool 3 software which can be found at the “DEBUG/DATA” tab. By clicking the button “DOWNLOAD FIRMWARE” a new window opens to download new software (firmware) for the 1-Wire Controller / 1-Wire Gateway.
This firmware is compatible with all releases of the 1-Wire Controller and 1-Wire Gateways as well as ESERA-Station 200. The features are individually unlocked at the installed device.

Recovery function Firmware-update

Should an error occur during the firmware update e.g. losing power while updating the firmware, a recovery function can be started. Press and hold the reset button (module bottom side (inside). Then start the update in Config-Tool 3 and release the reset button after 1 second after the update has been started. The update should start now.
When the updated is completed we recommend to disconnect ESERA-Station 200 for approx. 30 seconds, then restart again. If any issues should occur when installing the update, please contact the ESERA support team: E-Mail: support@esera.de.

15 INTERNAL COMMUNICATION AMONG 1-WIRE GATEWAY AND EMBEDDED COMPUTER

15.1 ESERA ASCII TEXT PROTOCOL / PROGRAMMING MANUAL

The 1-Wire Gateway inside the ESERA-Station 200 provides two types of protocols. The ESERA text protocol in ASCII format easily supports configuration and analysis whereas the ESERA text protocol runs on “GET” and “SET” commands.
The ESERA text protocol is totally open and documented. The latest version of the ESERA protocol description is available for download in our webshop (https://www.esera.de/produkte/software/downloads-firmware-1-wire-controller-1-wire-gateway/) as well as in the ESERA Config-Tool 3 download area.

15.2 MODBUS PROTOCOL

ESERA-Station 200 is able to communicate to ESERA text protocol or Modbus TCP protocol with no switching. For communication any Modbus slave-address (device address) can be chosen. Device address equals the 1-wire Gateway / Controller number. Device address is set to 1 by default.
The Modbus protocol is standardized configured. Please refer to the following table for a partial address-overview. The entire addressing overview can be found in the programming manual, which can be found in the download area of this product on our website and by the configuration software ESERA "Config Tool 3".

Partial Modbus address specification

Specification	**reading address**	**number of words (16Bit)**	**type of data**
Controller No.	60000	1	text
Article-No.	60001	1	text
Firmware Version	61000	4	string
Hardware	61010	3	string
Serial number	61020	9	string
Time	61030	4	string
Date	61035	4	string
…			

1-Wire bus sensors and actuators			
OWD 1/1-Wire module 1	40100	1	Integer
	40101, 40102	2	Dword1
	40103, 40104	2	Dword2
	40105, 40106	2	Dword3
	40107, 40108	2	Dword4
	40109, 40110	2	Dword5
	40111, 40112	2	Dword6
	40113, 40114	2	Dword7
	40115, 40116	2	Dword8
OWD 2/1-Wire module 2	40200	1	Integer
	40201, 40202	2	Dword1
	40203, 40204	2	Dword2
	…		

16 OPERATING CONDITIONS

The operation of the assembly group can take place only on condition of observing the required voltage and the ambient conditions. The operating position of the device is irrelevant. The device is meant to be used in dry areas free of dust.
Should condensed water build up within the sensor, an acclimatization period of at least 2 hours must be met. The components can be operated only under the supervision of an electrically skilled person. Assembly groups and components do not belong into the hands of children
In industrial facilities, the accident prevention regulations of the federation of industrial professional associations for electrical installations and equipment must be observed. Do not operate the components in an environment with inflammable gases, vapors or dusts or in an environment where such gases, vapors or dusts may occur.

17 ASSEMBLY

The device may only be used in dry indoor areas. The sensor must be mounted upright, with the ventilation openings at the top and bottom.
The mounting place must be protected against moisture. The module may only be used in dry indoor rooms or protected outside areas. The device is designed for fixed installation within a switching cabinet

18 DISPOSAL

Electronic devices must not be disposed of with household waste. According to the directive on waste electrical and electronic equipment, electronic devices must be disposed of at designated local collection points for electronic waste. These collection points are specialized facilities that ensure electronic devices are properly recycled and reused to minimize potential environmental impacts and recover valuable resources.

Please note that the specific collection points and procedures for disposing of electronic devices may vary depending on the region. Therefore, consult local authorities, recycling centers, or waste disposal companies to learn the correct procedure for disposing of electronic devices in your area. By properly disposing of electronic devices, you contribute to environmental protection and the sustainable use of resources.

19 SAFETY INSTRUCTIONS

When dealing with products that come into contact with electrical voltage, it is very important to observe the applicable VDE regulations. The VDE regulations are standards set by the Association for Electrical, Electronic & Information Technologies (VDE) and are designed to ensure safety when working with electrical systems and devices.

Here are some of the relevant VDE regulations to consider when handling electrical voltage:

VDE 0100
This standard defines the general provisions for low-voltage electrical installations, including planning, installation, commissioning, maintenance, and testing.

VDE 0550/0551
These standards address the safety of electrical household appliances and similar purposes. They cover requirements for household devices such as hairdryers, irons, coffee machines, etc.

VDE 0700
This standard focuses on the safety of electrical devices in commercial, industrial, and similar environments. It includes requirements for electrical machines, tools, and other devices used in these settings.

VDE 0711
This standard specifies requirements for the electrical safety of medical devices. It applies to medical equipment used for diagnosing, treating, and monitoring patients.

VDE 0860
This standard covers the safety of electronic devices used in office applications, including computers, printers, monitors, etc.

It is important that professionals working with electrical systems and devices are familiar with and follow the relevant VDE regulations to ensure the safety of people and property.

Basic Safety Rules
When working on electrical devices, always observe basic safety rules.

- **All connection** or **wiring work must be carried out in a de-energized** state.
  It is a fundamental safety measure that all connection and wiring work on electrical systems and devices should only be done when they are not live. Never work on electrical devices while they are powered.
- Before starting work, check that the device is disconnected by unplugging it or turning off the relevant power supply.

- Be especially cautious when handling high voltages and be aware of potential hazards.
- Always unplug the device or ensure it is de-energized before opening it.
- Components, assemblies, or devices must only be operated if they are safely enclosed. They must be de-energized during installation.
- Tools may only be used on devices, components, or assemblies when it has been ensured that they are disconnected from the power supply and any electrical charges stored in the device have been discharged.
- Power cables or lines connected to the device, component, or assembly must always be inspected for insulation faults or breaks.
- If a fault is found in the supply line, the device must be immediately removed from service until the faulty line is replaced.
- When using components or assemblies, always strictly adhere to the specified electrical values mentioned in the accompanying documentation.
- If it is unclear which electrical ratings apply to a component or assembly, how external wiring should be carried out, or which external components or accessories may be connected and their connection values, a qualified electrician must be consulted.
- Before commissioning a device, always verify that the device or assembly is suitable for the intended application.
- In case of doubt, always consult experts, professionals, or the manufacturer of the used assemblies.
- We assume no liability for damages resulting from operational or connection errors beyond our control.
- Kits that do not function properly should be returned without the housing and with a detailed description of the error and the corresponding assembly instructions. Repairs cannot be made without an error description. Time-consuming assembly or disassembly of housings will be additionally charged.
- When installing and handling parts that will later carry mains voltage, always observe the relevant VDE regulations.
- Devices operating at voltages greater than 35 VDC/12mA must only be connected and commissioned by qualified electricians.
- Commissioning should only take place if the circuit is installed in an enclosure that prevents accidental contact.
- If measurements must be taken with the housing open, a safety isolating transformer or suitable power supply must be used for safety reasons.
- After installation, a required inspection must be conducted in accordance with DGUV Regulation 3 (formerly known as BGV A3).

  DGUV Regulation 3 is a safety regulation for electrical systems and equipment and defines the requirements for electrical safety.

  The DGUV Regulation 3 inspection includes checking the proper installation, functionality, and safety of the electrical device.

  The inspection should be carried out by a qualified electrician or an authorized inspection service.
  The purpose of the inspection is to identify potential hazards, detect defects, and take appropriate measures to ensure electrical safety.

  The DGUV Regulation 3 inspection should be repeated at regular intervals to ensure the continuous safety of electrical systems and equipment.
  The DGUV Regulation 3 inspection is legally required in many countries and serves to protect people and property from electrical hazards.

  Also, be aware of additional national and local regulations and standards that may apply in your region.

20 WARRANTY

ESERA GmbH warrants that the goods sold are free from material and manufacturing defects at the time of transfer of risk and have the contractually warranted characteristics. The statutory warranty period of two years from the date of invoice shall apply. The warranty does not extend to normal wear and tear. Claims of the customer for damages, e.g. due to non-performance, culpa in contrahendo, breach of secondary contractual obligations, consequential damages, damages in tort and other legal grounds are excluded. ESERA GmbH shall be liable in the absence of a warranted characteristic, in the event of intent or gross negligence. Claims arising from the Product Liability Act are not affected. Should defects occur for which ESERA GmbH is responsible, and if the replacement delivery is also defective in the event that the goods are exchanged, the purchaser shall be entitled to cancel the contract or reduce the purchase price. ESERA GmbH accepts no liability for the constant and uninterrupted availability of ESERA GmbH or for technical or electronic errors in the online offer.

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