Art. No. 11319

Instruction Manual

EC 1
SMART HOME SENSOR-Gateway

https://lnk.esera.de/uwsmks8w

1-Wire Gateway
for sophisticated solutions in your home

- The Smart Home Sensor-Gateway EC 1 is an intelligent system interface between sensors and your Smart Home System or Smart Home Software.
- Thousands of times and for almost 10 years the
  EC 1 (formerly 1-Wire Controller 1) forms a standard for the connection of 1-Wire sensors and many, successful smart home systems and software solutions.
- PLUG and PLAY and many fully automatic functions are the unique strengths of the EC 1 Sensor-Gateways. You will save a lot of time and quickly get to your desired smart home solution.
- The AUTO-E-CONNECT PLUG and PLAY system patented by ESERA is now also used in this inexpensive entry-level module. You are already benefiting to a large extent from the PLUG and PLAY solutions of the Profi ECO Sensor Gateways.

All rights reserved. Reprinting, including excerpts, not permitted without the express consent of ESERA GmbH.
Subject to technical changes. © ESERA GmbH 2023

1 CORE FUNCTION

- Fast readout of all 1-Wire devices and all Smart Building sensors*.
- Cyclic output of the prepared 1-Wire data in plain text
- Operation without additional driver
- Power supply for 1-Wire sensor network
- Expandable by ESERA 1-Wire HUB and many actuators.
- Designed for small to large 1-wire networks
- Top-hat rail housing for control cabinet installation
- Wide supply voltage range

Note
Before you start assembling the device and put it into operation, read this operating manual through to the end at your leisure, especially the section on safety instructions.

All settings and configurations of the 1-Wire gateway are carried out with the "Config Tool 3".
This software can be found on the ESERA website. Please refer to the operating instructions for Config Tool 3, which can be found within the Config Tool software under the "HELP/SUPPORT" tab.

2 PRODUCT DESCRIPTION

Autonomous Management
The EC 1 Sensor-Gateway is intended for the autonomous management of a 1-Wire network. The user certainly does not have to worry about any 1-Wire commands or formulas for evaluating the sensor data. The gateway independently scans the 1-Wire network for components (sensors and actuators).

Formatted Data Output
The EC 1 Sensor-Gateway evaluates the sensor and actuator data internally and outputs them cyclically (1-2 seconds) after conversion in plain text (e.g. in C° for temperature sensors).
In addition, the article number for ESERA modules can be entered, the calculation and output is adapted to the function of the module.

Designed for all 1-Wire Network
The 1-Wire interface of the EC 1 Sensor-Gateway is designed in such a way that both small and large 1-Wire networks with long cable runs can be safely designed. The 1-Wire sensors can be operated simultaneously in mixed parasitic* or normal mode.
For this purpose, the currently most powerful 1-Wire interface was installed for maximum data security, even for complex network structures.

System time / Real time
You don't have a real-time clock with battery buffering in your system? No problem, the EC 1 Sensor Gateway provides the time and date. If the supply voltage fails, the real-time clock (RTC) is supplied for approx. 2 days by a maintenance-free gold cap (super capacitor).
What is a goldcap (supercapacitor)? see: https://de.wikipedia.org/wiki/Superkondensator

Voltage Supply
The EC 1 Sensor-Gateway has a wide-range input of 9 - 30VDC for the power supply. It is therefore equally suitable for 12VDC and the industry-typical 24VDC supplies. You can find suitable DIN rail or plug-in power supplies in our web shop.
.
Comissioning
Support videos for commissioning and configuration can be found on our website www.esera.de under Service and Support, Support Videos.

All rights reserved. Reprinting, including excerpts, not permitted without the express consent of ESERA GmbH.
Subject to technical changes. © ESERA GmbH 2023

3 AUTO-E-CONNECT® SUPPORT

The EC 1 Smart Home SENSOR-CONTROLLER supports Auto-E-Connect Level I and II.

4 AUTO-E-CONNECT SYSTEM

The gateway now introduces and supports the ESERA Auto-E-Connect® 1-Wire Plug and Play system for the 1-Wire bus.
This means that fully automatic configurations of the 1-Wire Devices* (sensors and actuators) are now possible
1-wire bus possible.
It is optimized for Smart Building, IoT and Industrial IoT applications.

The Auto-E-Connect functionality has been available for the EC and ECO gateways and the ESERA station 200 Pro since 2021. The Auto-E-Connect function is currently available in three levels.
With Auto-E-Connect Level III, fully automatic configurations of 1-Wire devices are possible
1-wire bus possible. The function automatically recognizes ESERA devices, starts suitable libraries and outputs fully formatted data. Extended sensor and chip data of the devices bring significant added value for the user

Auto-E-Connect Level I

OWD Detect: Detect new sensors* and actuators* and automatically start customized libraries

Auto-E-Connect Level II

- **Visualize product data**: Readout and visualization of Auto-E-Connect and manufacturer data of sensors* and actuators*, such as part number, date of manufacture, firmware and hardware version.

- **Classes assignment:** ESERA 1-Wire devices are assigned to OWD classes with the same properties. This assignment enables fully automatic visualization and data evaluation in control systems. A list of classes is available from ESERA.

Auto-E-Connect Level III (not EC 1, only supported from ECO 100 PRO onwards)

Advanced Plug and Play System for 1-Wire Bus

- **Pre Configuration**: The OWD number for the next installation can be written to the 1-Wire device*.
- **Automatic Positioning**: The device* logs on to each gateway with Auto-E-Connect III with the new desired OWD number. This automatic login works up to the maximum possible OWD number of the gateway.
- **Sensorfinder Function**: The gateway can activate a status LED within the ESERA 1-Wire Pro sensors*. The status LED flashes or lights up permanently for a certain time. This makes the detection of a device in a 1-Wire network much easier. A faster detection saves a lot of time and therefore money when searching for a 1-Wire device.
- **Classes Assignment**: ESERA 1-Wire Devices are assigned to OWD classes with the same properties. This assignment enables fully automatic visualization and data evaluation in control systems. A class list is available from ESERA.

It will also feature the ESERA Auto-E-Connect® 1-Wire Plug and Play system for the
1-Wire bus supported. This enables fully automatic configurations of the 1-Wire sensors and actuators on the 1-Wire bus. With the AUTO-E-CONNECT function, ESERA chips, sensors and actuators are recognized fully automatically, suitable libraries are started and formatted data is output.
For further information on ESERA AUTO-E-CONNECT, please refer to the ESERA website, ESERA Config-Tool 3, or the download area for this article in the ESERA Webshop.

Note
AUTO-E-CONNECT is protected by a European ESERA patent.
This device supports part of the patented and state-of-the-art AUTO-E-CONNECT functions. The ESERA devices of the ECO series have the full range of functions.

All rights reserved. Reprinting, including excerpts, not permitted without the express consent of ESERA GmbH.
Subject to technical changes. © ESERA GmbH 2023

5 TECHNICAL DATA

Ethernet interface:	TCP/IP or UDP - 10/100 MBit Ethernet Interface (RJ45) - Auto Negotiation (Full-duplex and Half-duplex) - Auto MDI/MDIX - Support for DHCP and fixed IP address
Firmware Update/ Configuration:	ESERA Config Tool III
Supply voltage:	9-30VDC
Power consumption:	max. 500mA
Power supply RTC:	Goldcap, buffering of the internal clock (RTC) in case of failure of the supply voltage for approx. 2 days. In the event of a longer failure, the RTC must be reset. The Goldcap is charged after approx. 2 hours.
1-Wire interface:	1-Wire bus (+5V, ground and data)
Protection circuits:	ESD and reverse polarity protection
Connection:	Screw terminals (up to 2.5qmm cable cross-section)
Output voltage:	+5V (+/-10%), max. 200mA, overload and short circuit proof
Isolation:	Galvanic isolation between Ethernet and 1-Wire interface
Supported 1-Wire devices:	DS2401, DS1963, DS1990, DS1820, DS18S20, DS18B20, DS2413, DS2438, DS2450, DS2408, DS2405, DS2406 (input only), DS2423, further chips on request. We are happy to support further chips as OEM product for them.

6 ENVIRONMENTAL CONDITIONS

Temperature, operation:	-5°C to +55°C
Humidity:	10 - 92% (non-condensing)
Protection class	IP20
Protection class	III
Dimensions	35 x 90 x 70mm (WxHxD)

7 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, Noise immunity
EN 61000-6-3, Interference radiation
RoHS

All rights reserved. Reprinting, including excerpts, not permitted without the express consent of ESERA GmbH.
Subject to technical changes. © ESERA GmbH 2023

8 DISPLAY LEDS

The module has different display LEDs. The function of the displays is as follows

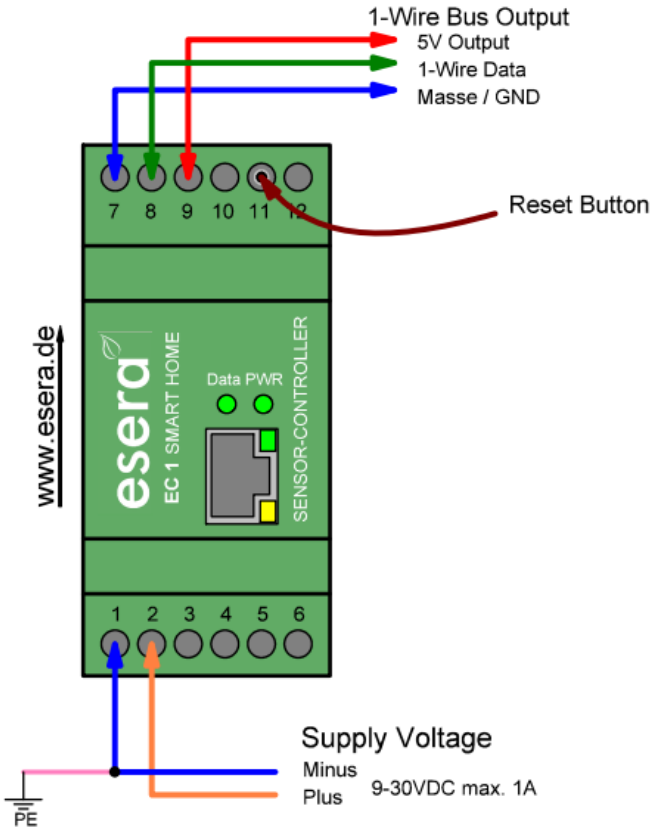
Display	Designation	Function
LED Green	PWR	Display for supply voltage
LED Green	DATA	• After switching on the device, the LED flashes 3x • Flashes during 1-Wire activity • Looks when sending data via the data interface • Flashes very quickly when "KAL Receive" has been activated and the "KAL messages" from the control system are absent.
LED Green Data interface		Network Link LED, lights up when network connection is established
LED Green Data interface		Network data LED Lights up during data traffic via the data interface

9 CONNECTION PLAN

Module top
1-Wire bus
7 = Ground 1-Wire
8 = 1-Wire Data
9 = + 5V output

Module bottom side power supply
10-30VDC
1 = Minus supply voltage
2 = Plus supply voltage

Notice:
11 = Reset Button

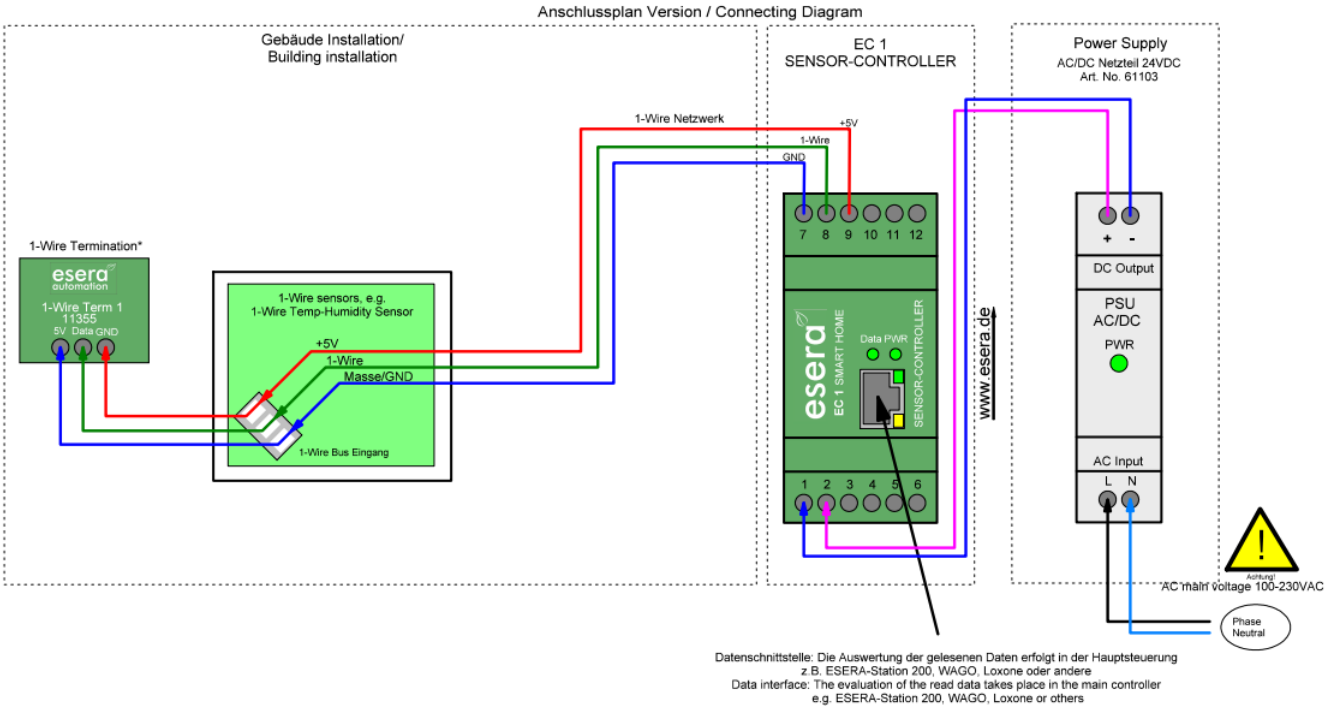


Note
The module may only be operated at the voltages and ambient conditions intended for it
The modules may only be commissioned by a qualified electrician.

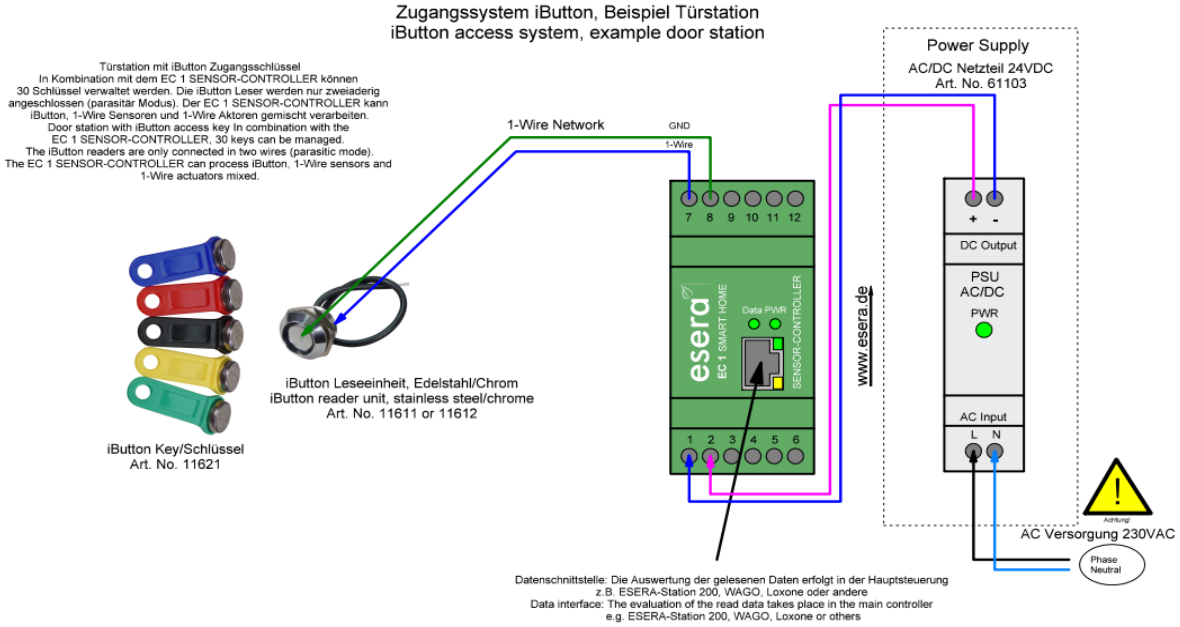
For further information on the operating conditions, see the following instructions under "Operating Conditions".

All rights reserved. Reprinting, including excerpts, not permitted without the express consent of ESERA GmbH.
Subject to technical changes. © ESERA GmbH 2023

10 CONNECTION EXAMPLE 1
1-Wire multisensor

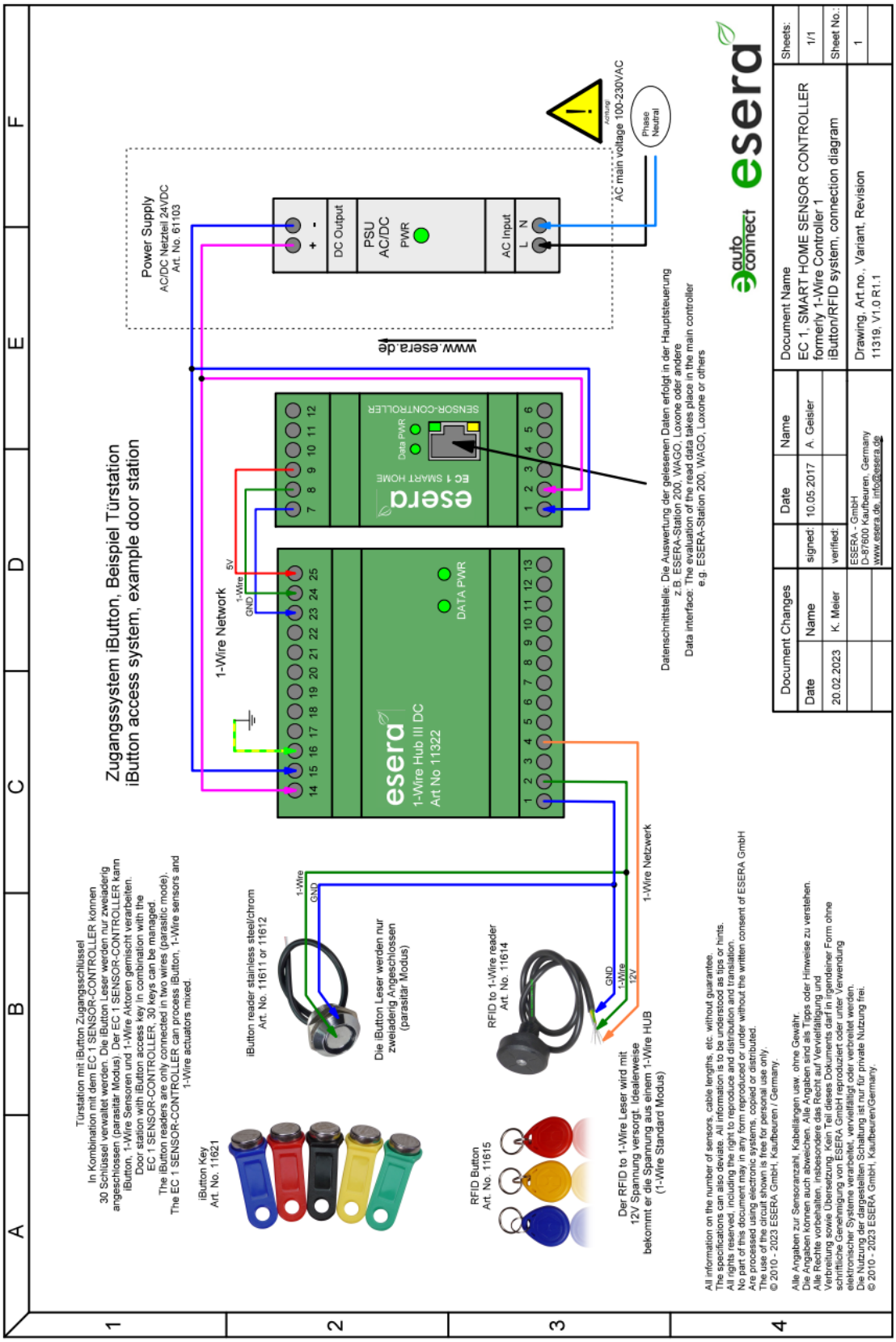


11 CONNECTION EXAMPLE 2
EC 1 and iButton reader unit



All rights reserved. Reprinting, including excerpts, not permitted without the express consent of ESERA GmbH.
Subject to technical changes. © ESERA GmbH 2023

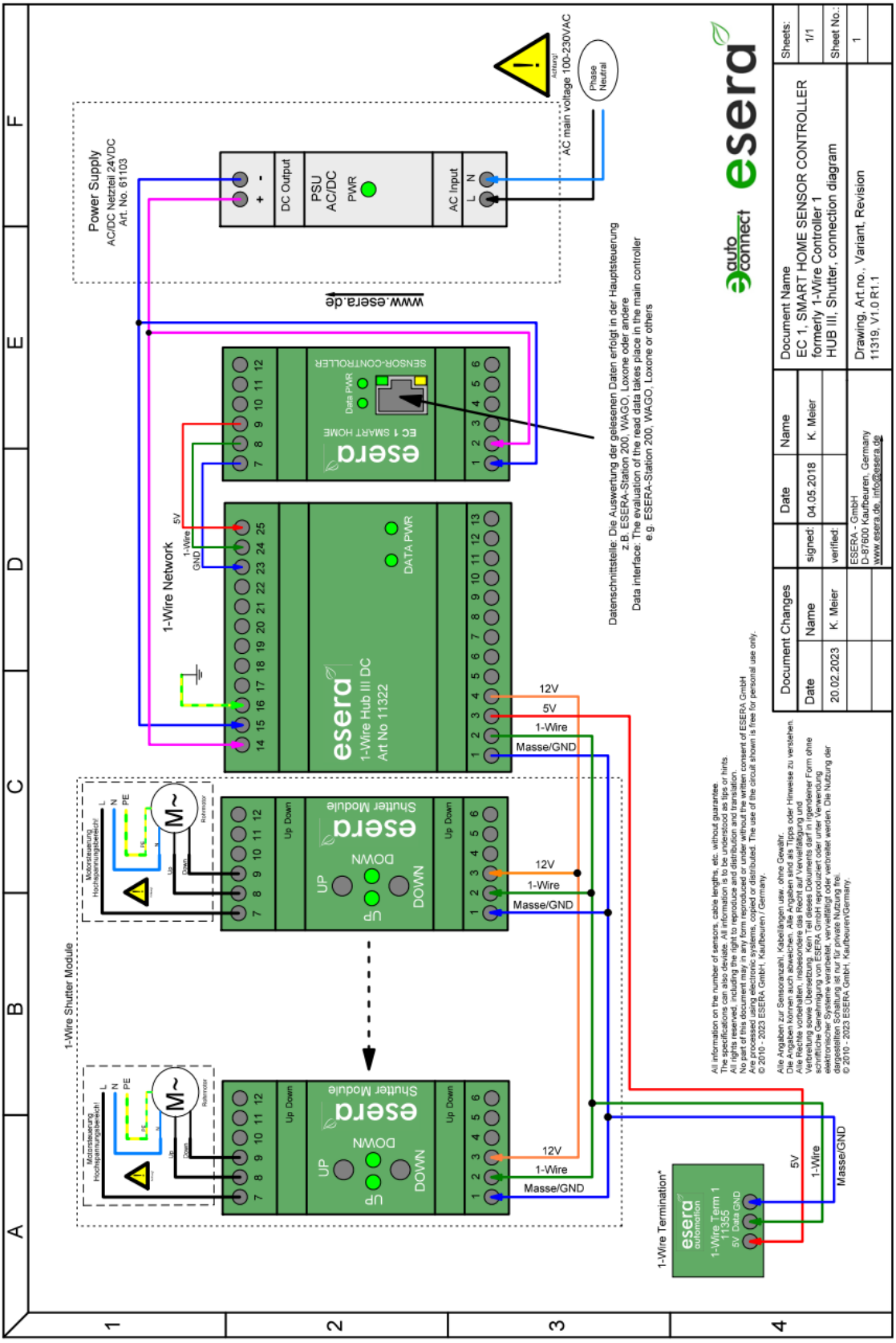
12 CONNECTION EXAMPLE 3
EC 1, 1-Wire Hub III, sensors and actuators



All rights reserved. Reprinting, including excerpts, not permitted without the express consent of ESERA GmbH.
Subject to technical changes. © ESERA GmbH 2023

13 CONNECTION EXAMPLE 4

EC 1, 1-Wire HUB III (system power supply) and shutter modules for shutter control

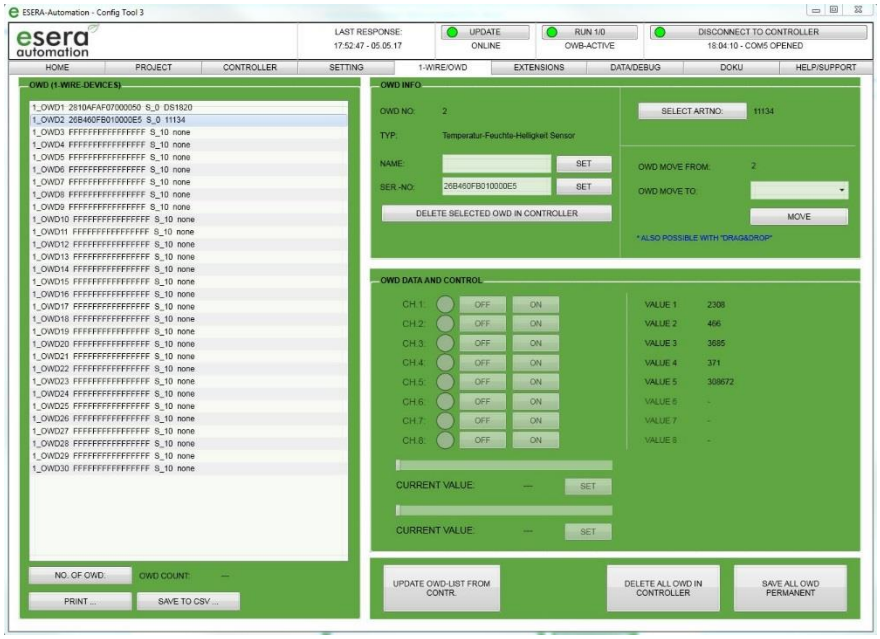


All rights reserved. Reprinting, including excerpts, not permitted without the express consent of ESERA GmbH.
Subject to technical changes. © ESERA GmbH 2023

14 SOFTWARE

Data interface ESERA ASCII text protocol

You configure the Ethernet interface with the help of the Windows ESERA program "Config Tool 3". You can find this program in the download area of the ESERA online store



15 CONFIGURATION AND COMMUNICATION with EC 1

The EC 1 SENSOR-CONTROLLER has extensive configuration and formatting possibilities, which are read out and operated with the ESERA "Config-Tool 3".
Since the communication between EC 1 sensor controller and Config-Tool 3 is done via the open ESERA ASCII text protocol, you can also use any terminal program at any time to (e.g. Hercules or Putty) via UDP / TCPIP to exchange data with the EC 1 sensor controller and perform the configuration.
Details about the communication commands can be found in the document "Programming Manual", which can be found in the download area of the ESERA online store and within the Config-Tool 3.

> **Note**
> For security reasons, only one socket data connection with the EC 1 is possible at any time.
> The IP address is preset to DHCP

16 ESERA ASCII TEXT PROTOCOL

The gateway provides a protocol in ASCII format. For configuration and analysis, the ESERA text protocol in ASCII format can be used very easily. Here, special emphasis was placed on good readability and traceability. The ESERA text protocol works with "GET" and "SET" commands, which probably every programmer has already used in his own projects.

17 1-WIRE NETWORK INSTALLATION

The special feature of the 1-Wire system is the "BUS technology". All devices (sensors and actuators) are operated in parallel on a three-wire cable, which is used for both power supply and data communication. The 1-Wire bus system joins the list of other successful bus systems, such as CAN or Modbus RTU. All of the installation principles recommended for these are also applicable and applicable for 1-Wire.
The maximum size of a 1-Wire network is determined by various factors. These are mainly:

- Cable length in total and cable type
- Number of 1-Wire Devices
- Installation type of cable laying (topology)
- Number and design of cable connectors (unnecessary connection transitions are to be avoided)

All factors in total are summarized and designated as 1-Wire bus load. Each increase in a factor increases the total 1-Wire bus load for the 1-Wire controller and thus reduces the maximum network size.

According to our many years of experience and a lot of feedback from customers, the following conservative recommendation can be made:

All rights reserved. Reprinting, including excerpts, not permitted without the express consent of ESERA GmbH.
Subject to technical changes. © ESERA GmbH 2023

- Cable distances maximum 50 - 120m
- Number of 1-Wire Devices not more than 20 - 22 pieces
- As linear a topology as possible without T-junctions

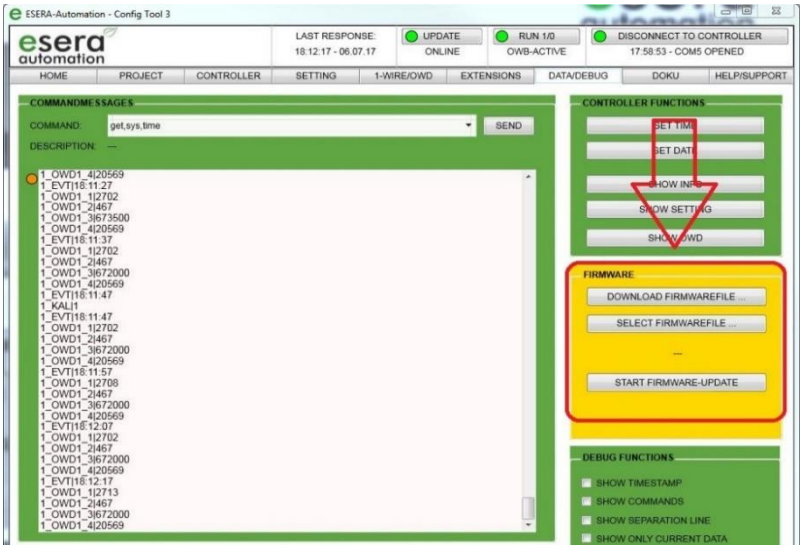
The topology in particular plays a major role. If possible, it should be installed in linear topology. The linear topology can be compared like pearls on a pearl necklace. The data line should be laid from one device to the next without T-joints.
Furthermore, you can also name the type of cable used here. We recommend for the cabling CAT5 or CAT6 network cable to be used. It is also possible to use J-Y(St)Y telephone cables and KNX cables. Longer cable runs are possible with CAT5 versus CAT7 cables.
With twisted pair cables, a greater connection length can be achieved in an undisturbed environment, as the capacitive bus load is lower. A total length of 50m and more can be easily achieved without additional measures. In disturbed, commercial and industrial environments, the cable should always be shielded to increase the "robustness" or interference sensitivity of the system.

Note
The above statements about 1-Wire are hints and tips and do not describe any product property or represent any guaranteed product property of the ECO 10.
Information about basics and tips for the 1-Wire bus system can also be found in the ESERA Online Shop at https://www.esera.de/1-wire-grundlagen/.

18 FIRMWARE UPDATE

The latest device software (firmware) can be found in the download area of Config Tool 3. Please check for a new firmware version when commissioning the SENSOR-CONTROLLER. Please always use the latest version.
The firmware is updated via Config Tool 3.

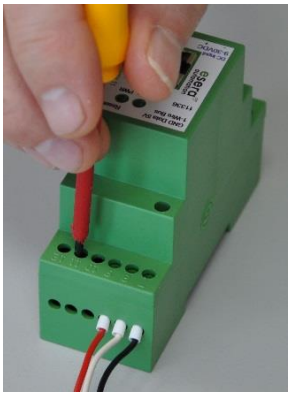
Please refer to the operating instructions for Config Tool 3, which can be found within the Config Tool software under the "HELP/SUPPORT" tab.
You can find a video about the firmware update on our website under "Service and Support, Support Videos".



18.1 REPEAT FUNCTION, firmware update

If the update is faulty, e.g. due to a power failure during the update, you can use the recovery function. To do this, press and hold the reset button (this is located under hole 11 on the top of the module), start the update in Config Tool 3 and release the reset button after approx. 1 second after starting in Config- Tool 3. Now the update should start.

If you have any problems with the installation, we will be happy to help you. Simply contact our support team by e-mail (support@esera.de).



Note
After performing an update, we recommend that you disconnect the EC 1 SENSOR-CONTROLLER from the power supply for approx. 30 seconds and restart it.

19 SOFTWARE EXAMPLE for EC 1 Integration in IP-Symcon

Via our website we provide ESERA IP-Symcon software modules for an easy integration of the SENSOR-CONTROLLER into IP-Symcon. This gives you a seamless integration into the software.

All rights reserved. Reprinting, including excerpts, not permitted without the express consent of ESERA GmbH.
Subject to technical changes. © ESERA GmbH 2023

Details can be found on the ESERA website under "Compatible controllers / Control centers / IP Symcon integration".
https://www.esera.de/kompatible-steuerungen-zentralen/ip-symcon-integration/

19.1 SOFTWARE EXAMPLE for integration in Loxone

Via the store we provide a sample project for the simple integration of the SENSOR-CONTROLLER into the Loxone Miniserver. With this you extend the Miniserver with many 1-Wire functions.
Details can be found on the ESERA website under "Compatible controllers / control units / Loxone integration".
https://www.esera.de/kompatible-steuerungen-zentralen/loxone-integration/demo-1-wire-controller-1-loxone-integration/

19.2 SOFTWARE EXAMPLE for integration in FHEM

For the integration into the open source automation software FHEM we provide a software module for the easy integration of the SENSOR-CONTROLLER. This provides you with a very powerful 1-Wire interface in FHEM.
Details can be found on the ESERA website under "Compatible controllers / control centers / FHEM integration".
https://www.esera.de/kompatible-steuerungen-zentralen/fhem-integration/

19.3 Your software not included?

The EC 1 sensor controller can be integrated extremely universally into many devices and software solutions due to the text protocol used.

20 OPERATING CONDITIONS

The module may only be operated at the voltages and under the ambient conditions specified for it. The operating position of the device is arbitrary. The device is intended for use in dry and dust-free rooms.
If condensation forms, wait for an acclimatization period of at least 2 hours.
The modules may only be commissioned under the supervision of a qualified electrician. Do not operate the module in an environment where flammable gases, vapors or dusts are present or could be present.

21 ASSEMBLY

The mounting location must be protected from moisture. The device may only be used in dry indoor areas. The device is intended for mounting inside a control cabinet as a stationary device.

22 DISPOSAL NOTICE

Do not dispose of the device in household waste! Electronic devices are to be disposed of according to
of the Directive on Waste Electrical and Electronic Equipment on the local
Collection points for electronic waste to dispose of!

23 SAFETY INSTRUCTIONS

When handling products that come into contact with electrical voltage, the applicable VDE regulations must be observed, in particular VDE 0100, VDE 0550/0551, VDE 0700, VDE 0711 and VDE 0860.

- All connection and wiring work may only be carried out when the device is de-energized.
- Before opening a device, always disconnect the power plug or ensure that the device is de-energized.
- Components, assemblies or devices may only be put into operation if they have previously been installed in a housing in such a way that they are safe to touch. They must be de-energized during installation.
- Tools may only be used on devices, components or assemblies if it has been ensured that the devices are disconnected from the supply voltage and that electrical charges stored in the components located in the device have been discharged beforehand.
- Live cables or lines to which the device, component or assembly is connected must always be inspected for insulation faults or breaks.
- If a fault is detected in the supply line, the device must be taken out of operation immediately until the defective line has been replaced.
- When using components or assemblies, attention must always be drawn to strict compliance with the characteristic data for electrical variables specified in the associated description.
- If it is not clear for the non-commercial end user from an existing description which electrical characteristic values apply to a component or an assembly, how external wiring is to be carried out or which external components or additional devices may be connected and which connection values these external components may have, a qualified electrician must be consulted.

All rights reserved. Reprinting, including excerpts, not permitted without the express consent of ESERA GmbH.
Subject to technical changes. © ESERA GmbH 2023

- Before commissioning a device, it must generally be checked whether this device or the assembly is fundamentally suitable for the application for which it is to be used.
- In case of doubt, it is essential to consult specialists, experts or the manufacturer of the assemblies used.
- We do not accept any liability for operating and connection errors that are beyond our control.
- Kits should be returned with a precise description of the fault and the associated assembly instructions without housing in the event of malfunction. Without error description a repair is not possible. We have to charge extra for time-consuming assembly or disassembly of housings.
- It is essential that the relevant VDE regulations are observed during installations and when handling parts that will later carry mains voltage.
- Devices that are operated at a voltage greater than 35 VDC/ 12mA may only be connected and commissioned by qualified electricians.
- Commissioning may only be carried out if the circuit is installed in a housing so that it is safe to touch.
- If measurements are unavoidable with the housing open, a safety isolating transformer must be connected upstream or a suitable power supply unit must be used for safety reasons.
- After installation, the required test must be performed in accordance with DGUV Regulation 3.

24 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 invoicing applies. The warranty does not cover normal wear and tear. Claims of the customer for damages, e.g. due to non-performance, culpa in contrahendo, breach of ancillary contractual obligations, consequential damages, damages in tort and other legal grounds are excluded. ESERA GmbH shall be liable, however, in the absence of a warranted characteristic, in the case of intent or gross negligence. Claims from the product liability law are not affected by this. If defects occur for which ESERA GmbH is responsible, and if in case of exchange of the goods also the replacement delivery is defective, the purchaser has the right to rescission or reduction of the purchase price. ESERA GmbH assumes no liability neither for the constant and uninterrupted availability of ESERA GmbH nor for technical or electronic errors of the online offer.
We are constantly developing our products and reserve the right to make changes and improvements to any of the products described in this documentation without prior notice. If you need documentation or information on older versions, please contact us by mail to info@esera.de.

25 WARNING

All listed designations, logos, names and trademarks (including those that are not explicitly marked) are trademarks, registered trademarks or other designations protected by copyright or trademark or title law of their respective owners and are expressly recognized by us as such. The mention of these designations, logos, names and trademarks is for identification purposes only and does not constitute any kind of claim by ESERA GmbH to these designations, logos, names and trademarks. Furthermore, the appearance on the web pages of ESERA GmbH does not imply that designations, logos or names are free of industrial property rights.
ESERA and Auto-E-Connect are registered trademarks of ESERA GmbH.

ESERA GmbH is a promoter of the free Internet, free knowledge and the free encyclopedia Wikipedia.
We are a member of Wikimedia Deutschland e.V., the provider of the German site Wikipedia (https://de.wikipedia.org). ESERA membership number: 1477145
Wikimedia Deutschland's purpose is to promote free knowledge.
Wikipedia® is a registered trademark of the Wikimedia Foundation Inc.

26 CONTACT

ESERA Ltd.
Adelinda street 20
87600 Kaufbeuren
Germany
Tel.: +49 8341 999 80-0
Fax: +49 8341 999 80-10
www.esera.de
info@esera.de
WEEE number: DE30249510

All rights reserved. Reprinting, including excerpts, not permitted without the express consent of ESERA GmbH.
Subject to technical changes. © ESERA GmbH 2023