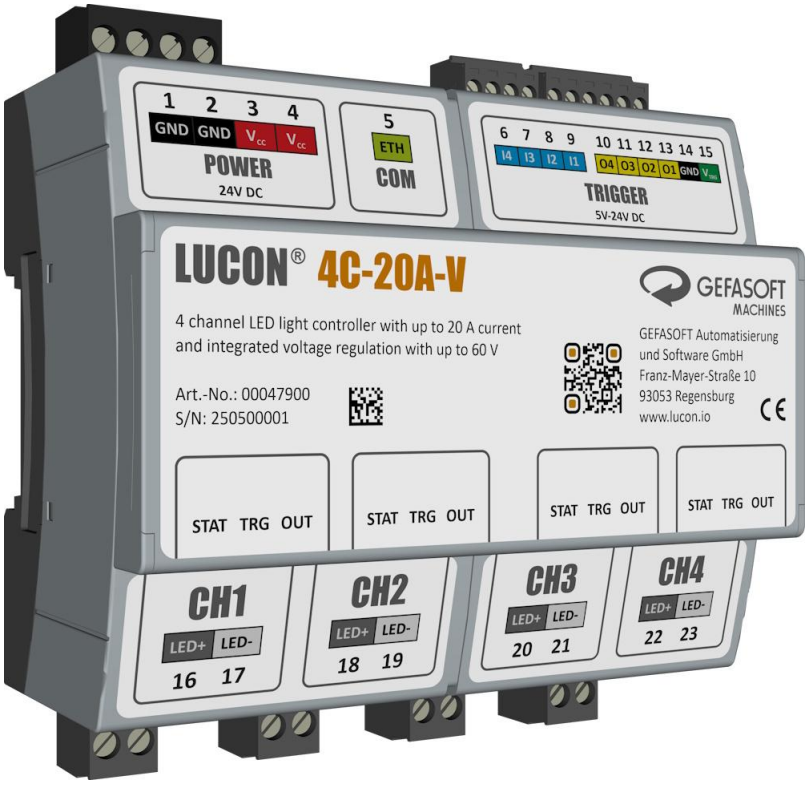
GEFASOFT
MACHINES



LUCON® 4C-20A-V

PRODUCT MANUAL

(original instructions)

Issue date: February 11, 2026
Revision: 1.0

Keep for future reference!

Short description

The LUCON® 4C-20A-V is a precision light controller with current and voltage control for LED lighting for industrial image processing applications. The lighting can be controlled in both continuous and flash mode. Currents from 1 mA to 20 A are possible.

By regulating current and voltage, a high degree of efficiency and thus lower heat generation is possible.

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table of contents

1 Revision History

- February 2026, Initial release Revision 1.0

2 General

2.1 Identification data

2.1.1 Product

Producer	GEFASOFT Automatisierung und Software GmbH Regensburg
Article No.	00047900 LUCON® 4C-20A-V

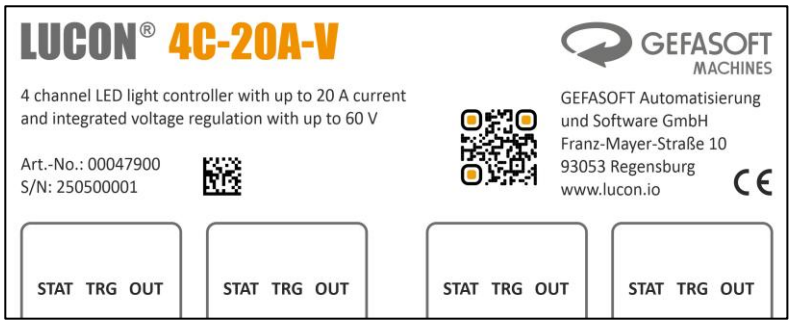
2.1.2 Product manual

Revision	1.0
Issue date	February 11, 2026

2.2 Indicators on the light controller

2.2.1 Type plate

In addition to the type of designation, the type plate contains the article number and the serial number. Among other things, it contains the EU conformity mark, which indicates that the product complies with European safety standards.



2.2.2 Warning signs

Warning of dangerous electrical voltage!
Work on the electrical system may only be carried out by a qualified electrician.

Warning of hot surface!
Workpieces and system parts can become very hot.

Failure to observe this warning may result in minor or slight injuries, including burns!

2.2.3 Note

Please also observe other equipment labels!

2.2.4 Software Licensing Information

The software in the Light controller includes the lwIP TCP/IP implementation. The copyright information for this implementation is as follows:

The software in the Light controller includes software components from STMicroelectronics. The copyright information for this implementation is as follows:

3 How to use this guide

First of all, read this manual completely so that you can use all the functions correctly and safely.

3.1 Symbols

The following pictograms and key words are used for the information and warnings:

HAZARD

This symbol warns you of an immediate danger to life and human health.

Serious injury or death may result.

WARNING

This symbol warns you of a hazard for life and human health.

Serious injury or death may result.

CAUTION

This symbol warns you of a possible hazard for human health and/or material damage.

Injury or material damage may result.

Information
Tips and information on the operation of the product!

Note
Commitment to a particular behaviour or activity for the safe handling of the equipment.

Supplementary instructions
Reference to GEFASOFT Automatisierung und Software GmbH supplementary instructions.

Click

4 Safety

4.1 General safety information

The product has been designed and built-in accordance with the applicable standards and other technical specifications. It corresponds to the state of the art and therefore guarantees safety during operation.

The requirements and instructions provided here regarding the work and operational safety of the product apply both to operation by operating staff and to servicing (comprising setting, adjustment, maintenance, care and repair that typically require that the group of people performing these types of work have higher qualifications). It is the responsibility of the user to convey the safety-relevant information in this document to his staff to ensure that the persons entrusted with operation and servicing attain a full understanding of the material. Further written instructions may need to be added to the company's work procedures based on operational conditions.

In the event that these fundamental requirements cannot be guaranteed, life-threatening hazards, risks for the product and other assets owned by the user and possible impairment of the effective performance of the product may result.

In the event of damage, destruction or insufficient functionality of the protective devices, the product is to be deactivated until its functionality has been fully restored. If any of the protective devices need to be disassembled or deactivated for maintenance, repair or another reason, their full functionality is to be restored before recommissioning them.

The risk of accidents is very high during service or maintenance. For this reason, this work is to be performed only when the machine is not in operation. During work on electric and electronic system components, the power cord must also be unplugged, and the system is to be guarded against being turned on again by unauthorized persons.

The product may only be operated and maintained by staff who have been authorized and instructed by the user. The user of the product is responsible for the safety of the operator!

The product may only be operated in accordance with these instructions for use. Ensure that everyone who works with the system has read this guide and also understood it. Persons who are authorized for operation and maintenance must be selected under consideration of the aspects of a high degree of reliability and the equivalent specialist knowledge.

4.2 Intended use

The product is intended exclusively for use as a power source for the control of LED lighting in industrial image processing. For this purpose, mounting in a control cabinet is intended. Furthermore, use on a public DC supply network is not supported.

Make sure that the cables used (power supply, lighting, trigger and Ethernet) do not exceed a length of ten metres.

The product is not intended for use in potentially explosive atmospheres. Furthermore, the unit is only intended for use in closed and dry rooms.

If the product is to be used in other environments or for other purposes as described in the operating instructions, the manufacturer GEFASOFT Automatisierung und Software GmbH must be contacted and express permission obtained. Necessary changes and adjustments to the product may only be carried out by the manufacturer.

It must be ensured that the product is only used in a technically perfect condition and in accordance with

its intended use and in a safety-conscious and hazard-conscious manner. Furthermore, the product must be used by authorized personnel in accordance with the specifications in these operating instructions.

4.3 Improper use

A use other than that described under "Intended use" or that goes beyond such use is considered to be improper!

4.4 Residual risks

Electric current

Observe the following safety instruction:

Safety notice

HAZARD *Electric shock!*

Defective electrical components may be live. Danger to life when touching these components.

- Defects found in electrical components and equipment must be rectified immediately.
- The system must be taken out of operation and secured against being switched on again as long as any defects found have not been rectified.
- The system must not be put back into operation until any defects found have been reliably rectified.
- For all work, work according to the circuit diagram!
- Before starting the system, check whether all electrical connections are connected. According to their design, the electrical connections may have to be screwed or locked.

5 Design and function

The LUCON® 4C-20A-V is a precision light controller with current and voltage control for LED lighting for industrial image processing applications. The lighting can be controlled both in continuous operation and in flash mode. Currents of up to 20 A are possible.

By regulating current and voltage, a high degree of efficiency and thus lower heat generation is possible.

The LUCON® 4C-20A-V is suitable for a wide range of applications. Up to four lights can be connected to each controller. These lights can be used completely independently of each other.

The number of channels can be increased by using bus connectors. This enables multiple LUCON® 4C-20A-V units to be connected together as one. This means that only one network interface is required for operation. See sections 5.3.1 and 5.4.1 for details. todo

5.1 Device views

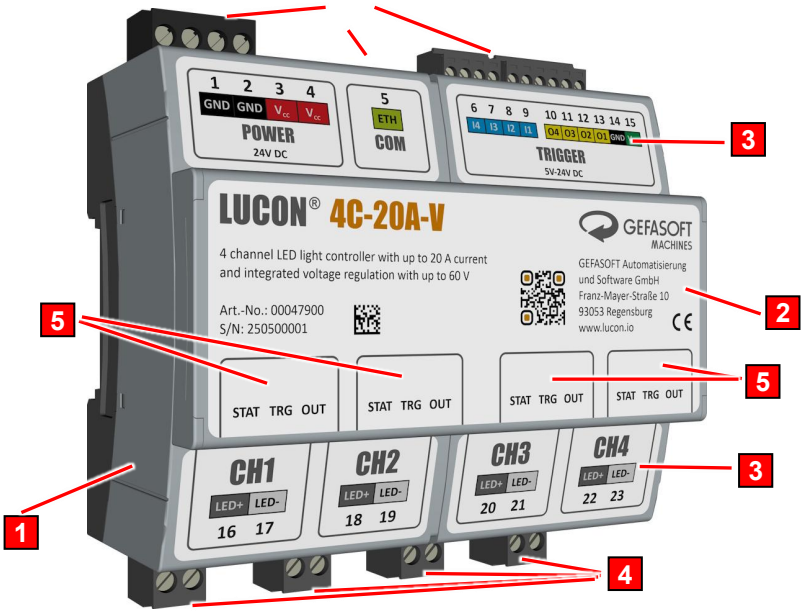


Figure 1: Device views LUCON® 4C-20A-V

1	Housing	4	Interfaces
2	Sticker with type plate	5	Status LED display
3	Sticker with interface assignment		

5.2 Status LED-display

Each channel has three status LEDs.

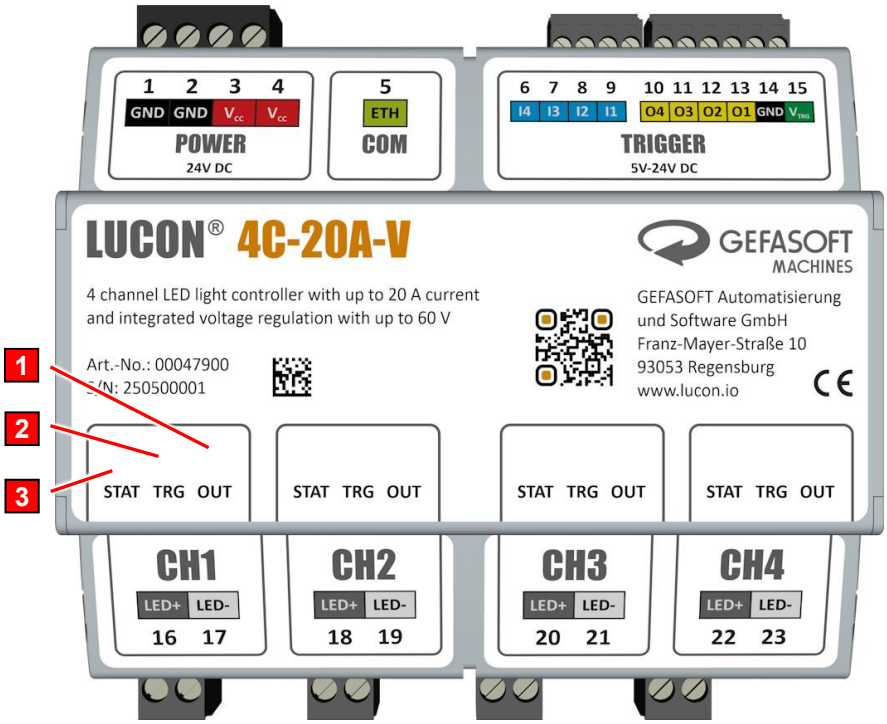


Figure 2: Front views LUCON® 4C-20A-V

1 LED-Out-LED

2 Trigger-LED

4 Status-LED

LED	Color	Status	Description
Status	red	on	A "small" error has occurred (e.g. voltage limit too small => output still switched)
		flashes (250 ms)	A "major" error has occurred (if status, trigger and LED-OUT LED flash simultaneously) => no operation possible
	green	on	Channel is configured in continuous mode
		flashes (500 ms)	Channel is ready but not configured (if status, trigger and LED-OUT LED flash simultaneously)
	pink	on	Channel is configured in pulse mode
	yellow	on	Channel is configured in switch mode
	blue	flashes (500 ms)	Device updates firmware (when status, trigger and LED-OUT LED flash simultaneously)

LED	Color	Status	Description
Trigger	red	flashes (250 ms)	A "major" error has occurred (if status, trigger and LED-OUT LED flash simultaneously) => no operation possible
	green	on	Device is ready for trigger (in pulse and switch mode)
		flashes (500 ms)	LUCON® 4C-20A-V device is ready, but not configured (if status, trigger and LED-OUT LED flash simultaneously)
	blue	on	Trigger is on
		flashes (500 ms)	Device updates firmware (when status, trigger and LED-OUT LED flash simultaneously)

LED	Color	Status	Description
LED-Out	red	flashes (250 ms)	A "major" error has occurred (if status, trigger and LED-OUT LED flash simultaneously) => no operation possible
	green	on	Device is ready (in Continuous mode)
		flashes (500 ms)	Channel is ready, but not configured (if status, trigger and LED-OUT LED flash simultaneously)
	blue	on	Lighting is switched on
		flashes (500 ms)	Device updates the firmware of the power module (if status, trigger and LED-OUT LED flash simultaneously)

5.3 Interfaces and connections

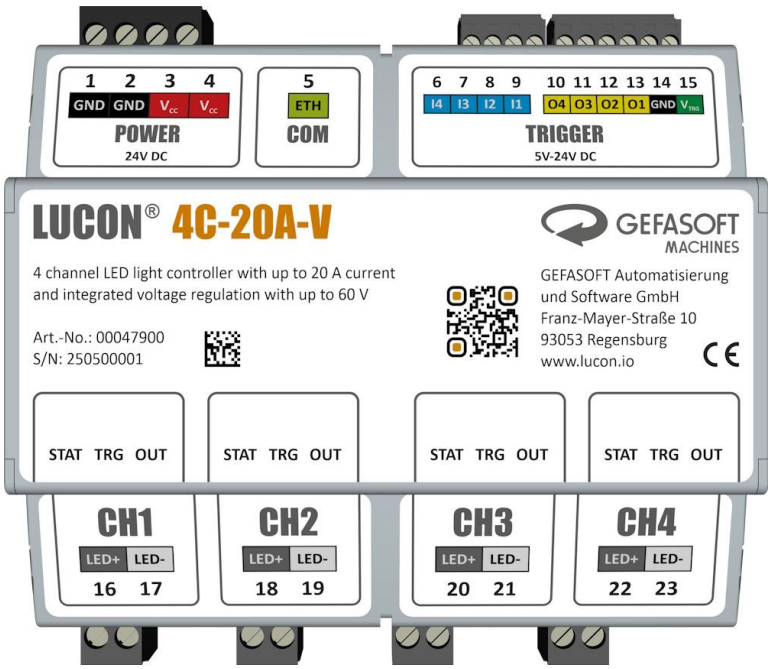


Figure 3: Interfaces LUCON® 4C-20A-V

Type	Terminal	Assignment	Description
Power Supply	1	GND	Supply GND
	2	GND	Supply GND [1]
	3	V_{CC}	Supply +24 V_{DC}
	4	V_{CC}	Supply +24 V_{DC} [1]
Network	5	Ethernet	Network interface RJ45
Trigger Input	6	I4	Trigger Input 4
	7	I3	Trigger Input 3
	8	I2	Trigger Input 2
	9	I1	Trigger Input 1
Trigger Output	10	O4	Trigger Output 4
	11	O3	Trigger Output 3
	12	O2	Trigger Output 2
	13	O1	Trigger Output 1
	14	GND	GND for Trigger Outputs
	15	V_{TRG}	Supply for Trigger Outputs +5 V_{DC} bis +24 V_{DC}
Channel 1	16	LED+	Output for lighting +
	17	LED-	Output for lighting -
Channel 2	18	LED+	Output for lighting +
	19	LED-	Output for lighting -
Channel 3	20	LED+	Output for lighting +
	21	LED-	Output for lighting -
Channel 4	22	LED+	Output for lighting +
	23	LED-	Output for lighting -

[1] required if the continuous current over all channels exceeds 6 A

5.3.1 Trigger-Interfaces

The LUCON® 4C-20A-V has four trigger inputs (camera triggers lighting controller) and four trigger outputs (lighting controller triggers camera). The trigger inputs are compatible with EN 61131-2 Types 1 and 3. A voltage between 5 V_{DC} and 24 V_{DC} can be used for the trigger outputs. Currently, each trigger input and output is permanently assigned to a channel, but this is planned to change in future firmware versions.

5.3.1.1 Trigger input

The trigger input can react to both a rising or a falling edge. This can be configured by means of parameters (see chapter 7.4.2) or with the integrated website (see chapter 7.4.3).

The electrical limitations and limits are described in the table below.

Parameter	Min.	Typ.	Max.
Input voltage Low	- 3 V_{DC}	0 V_{DC}	+ 5 V_{DC}
Input voltage High	+ 11 V_{DC}	+ 24 V_{DC}	+ 30 V_{DC}
Input current	0,5 mA	7,5 mA	15 mA
Input pulse duration	1 µs		
Input delay (hardware-related)[1]			300 ns

There are various options for connecting a camera system to the LUCON® 4C-20A-V input trigger.

Camera output as NPN or PNP line

Camera outputs are designed as either NPN or PNP lines. The two connection options are shown in Figure 4 and Figure 5.

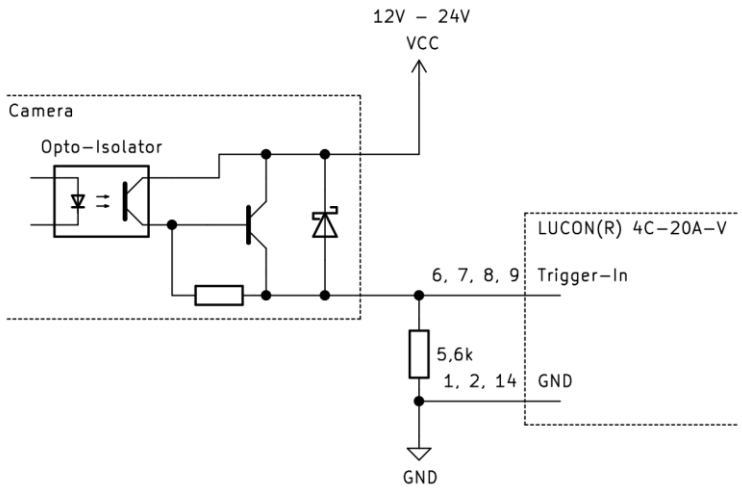


Figure 4: Connection between camera and LUCON® 4C-20A-V - PNP variation

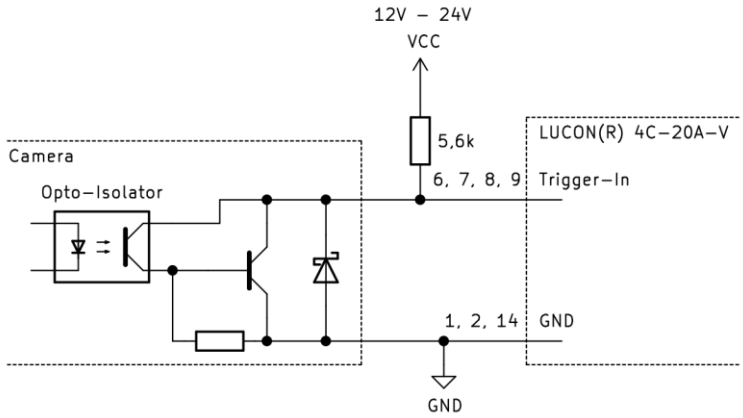


Figure 5: Connection between camera and LUCON® 4C-20A-V - NPN variation

Not all camera systems offer both connection options. If both options are supported, the PNP connection is recommended.

The resistance in parallel to the trigger input of the LUCON® 4C-20A-V must not be less than 5,6 kΩ. Larger resistance values are OK but have a negative impact on the timing behaviour of the trigger circuit.

Camera with output driver

Some camera systems are alternatively designed with an output driver. These can be connected to the trigger input of the LUCON® 4C-20A-V as shown in the schematic Figure 6.

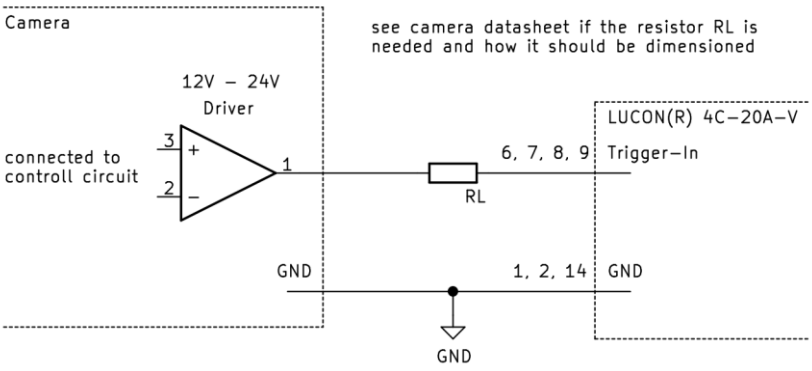


Figure 6: Connection between camera with output driver and LUCON® 4C-20A-V

For some cameras, it is not necessary to insert the series resistor between the camera and LUCON® 4C-20A-V (labelled RL in Figure 6). The camera data sheet indicates whether the resistor RL is required and how it should be dimensioned.

In this case, a common ground connection between the camera and the LUCON® 4C-20A-V is essential. Otherwise, the trigger signals may not be detected, or they may be detected incorrectly.

5.3.1.2 Trigger output

The trigger output can be used optionally and can be triggered by adjustable events (trigger input, lighting activated). In addition, a delay and the duration of the trigger can be set between this event and the setting of the trigger.

The trigger output is a push-pull circuit. This makes it very easy to establish trigger connections. The high level can be determined by the user. To do this, the desired voltage must be connected to pin 15 V_{TRG}. The trigger output has an internal current limit, which means that no external series resistor is required.

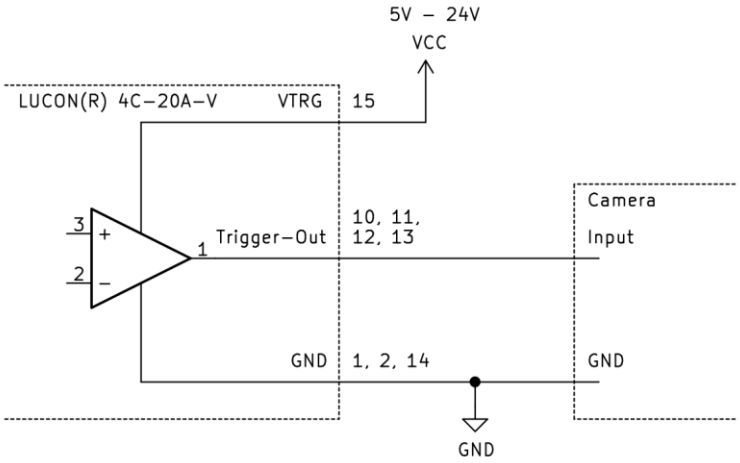


Figure 7: Wiring of the trigger output

Parameter	Min.	Typ.	Max.
Trigger voltage	+ 5V		+ 24 V
Trigger current	8 mA		40 mA
Output pulse duration			
Output delay (hardware-related)[1]			

In this case, a common ground connection between the camera and the LUCON® 4C-20A-V is essential. Otherwise, the trigger signals may not be detected, or they may be detected incorrectly.

5.4 Technical drawing

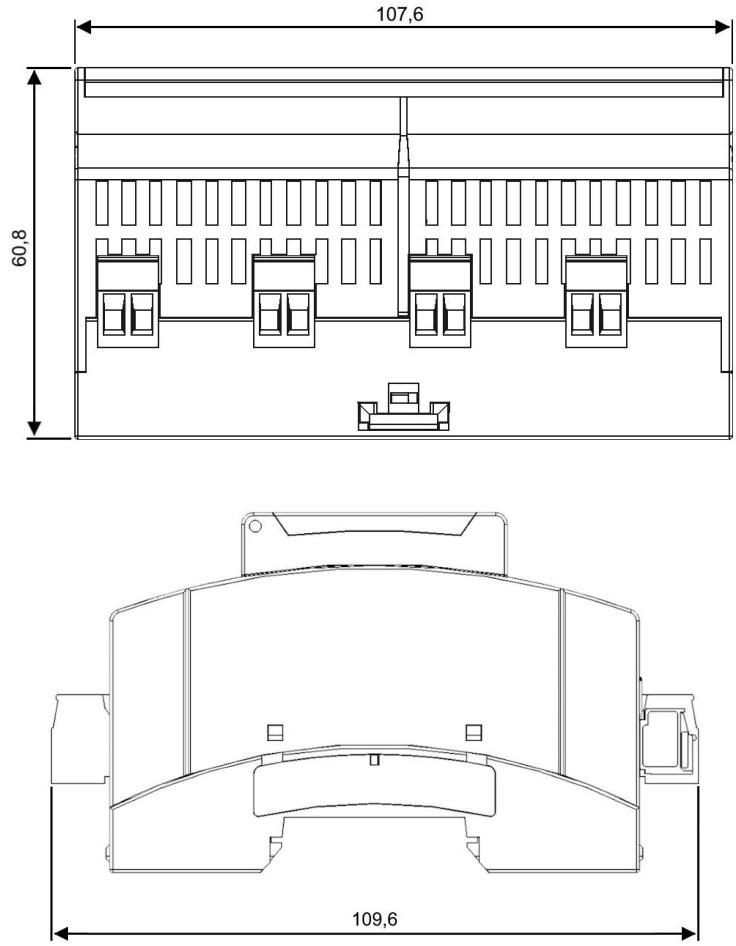


Figure 8: Technical drawing - specifications in mm

6 Commissioning

One LUCON® 4C-20A-V controller can operate up to four lights. If more channels or lights are required, up to 24 controllers can be connected using cross-connector modules. One of these controllers is configured as the master. All the connected controllers can then be configured via the network interface of the master.

If using only one LUCON® 4C-20A-V, follow the installation instructions in Section 6.1. For installing multiple controllers with cross-connect modules, follow the instructions in Section 6.2.

Safety notice

HAZARD *Electric shock!*

Only install the light controllers and connect the cables when the power is switched off and disconnected from the mains.

6.1 Installation of a single LUCON® 4C-20A-V

Place the LUCON® 4C-20A-V light controller at an angle from above onto the DIN rail. Then press lightly against the light controller to snap the mounting clip onto the DIN rail.

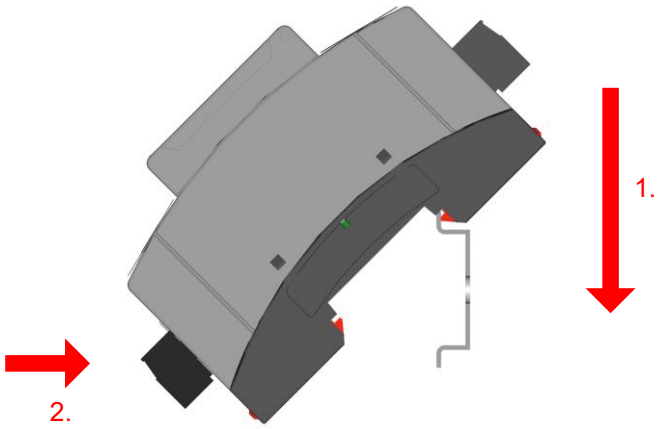


Figure 9: LUCON® 4C-20A-V mounted on top-hat rail

6.2 Installation of multiple LUCON® 4C-20A-V units in a network

With the separately available cross-connector modules (GEFASOFT item no.: 00048281), up to 24 LUCON® 4C-20A-V units can be connected together. These then work in a network and can be configured via one single Ethernet interface on the master.

One cross-connector module is required per LUCON® 4C-20A-V.

First, mount a cross-connector module in the top-hat rail. Ensure that the connection block (marked yellow) is aligned to the left (see Figure 9):

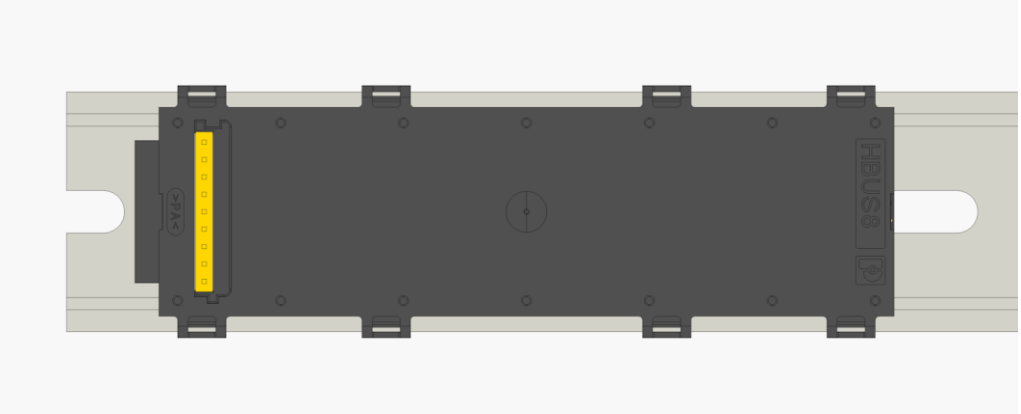


Figure 10: A cross-connector module in the top-hat rail (the connection block is marked in yellow)

Before installing the light controller, all cross-connector modules must first be mounted. To do this, insert the next connector into the DIN rail at a slight distance from the previous connector. Once the connector has snapped into place, it can be easily pushed into the DIN rail toward the first connector (see Figure 11).

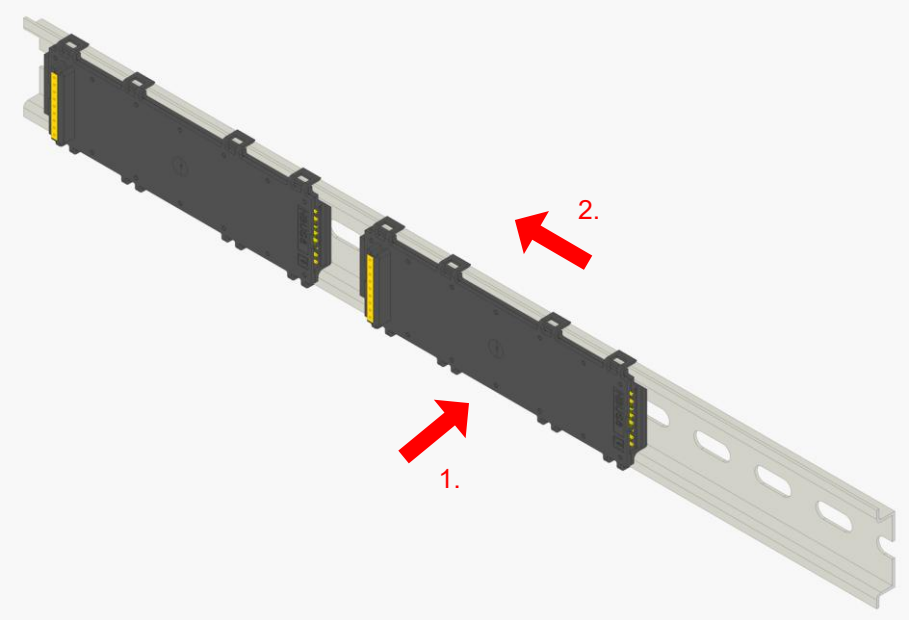


Figure 11: Connecting multiple cross-connect modules together

The LUCON® 4C-20A-V light controllers are then plugged into the cross-connector modules one after the other, evenly spaced from the front.

There is a small opening with contacts on the back of the light controller. Make sure that these contacts are connected to their counterparts on the cross-connector module.

6.3 Connecting the light controller

Safety notice

HAZARD *Electric shock!*

Only install the light controllers and connect the cables when the device is switched off and de-energised.

Safety notice

CAUTION *Damage to the cables!*

- Observe minimum bending radii.
- Provide strain relief for cables.
- Observe the specification of the cables.

When connecting, first connect the lights, then the trigger and communication interfaces and finally the power supply to the LUCON® 4C-20A-V light controllers.

Care should be taken to use twisted cables for the lighting. In addition, the cables to the lighting should not be longer than necessary to reduce parasitic line losses.

A maximum cable length of ten metres must not be exceeded. This applies to all interfaces.

The operation of multi-segment lighting with a common anode or common cathode is not possible with the LUCON® 4C-20A-V light controller. This can cause irreparable damage to both the controller and the lighting.

Safety notice

CAUTION *Wrong wiring!*

Always connect the lights to the designated contacts (see Figure 3). Never connect the lighting directly to VCC or GND. This can damage both the lighting and the light controller.

6.3.1 Connection of multiple LUCON® 4C-20A-V units in a network

If several LUCON® 4C-20A-V controllers are operated in a network, each controller must be supplied with power individually. The cross-connector modules are only used to establish a communication link between the controllers.

It is not possible to supply the first controller via terminals 1 and 3 and at the same time bridge terminals 2 and 4 to the second controller. Each controller requires its own supply line (see section 5.3 for pin assignment).

The controllers can be powered from different power supplies. However, care must be taken to ensure that the reference potential (GND) of all power supplies is connected to each other.

6.4 Initial commissioning

Once all cables have been connected, initial commissioning can take place. To do this, supply power to the LUCON® 4C-20A-V module. The LEDs in the LUCON® 4C-20A-V module will flash green after a short time (see section 5.2).

6.4.1 Master/Slave operation with multiple LUCON® 4C-20A-V units

For the combined operation of several LUCON® 4C-20A-V units, the configuration of the so-called controller offset is essential. Each controller must be assigned a unique offset. The channel numbers for each individual controller can then be derived from this offset. The respective offsets can be assigned to the channel numbers as follows:

Offset	Channel
0	1
	2
	3
	4
1	5
	6
	7
	8
…	
23	93
	94
	95
	96

Each offset may only be used once in a composite.

Below is a step-by-step guide to setting up a network of three LUCON® 4C-20A-V controllers. This allows up to twelve channels to be controlled via a network interface. First, the offsets must be configured on each device. The offset is set to 0 by default.

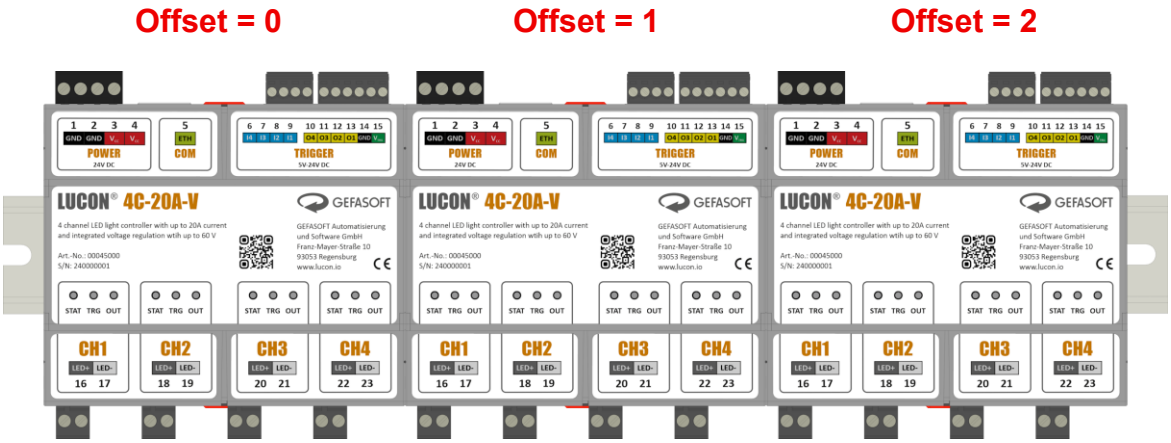


Figure 12: Assembly of three LUCON® 4C-20A-V on a DIN rail

In the first step, all controllers are supplied with power and the network connection to the second controller (marked with offset = 1 in Figure 12) is established.

The offset can then be set via UDP (command CO, see section 7.4.2) or via the configuration website (see section 7.4.3). The controller offset can be found under the menu item “Common Settings”:

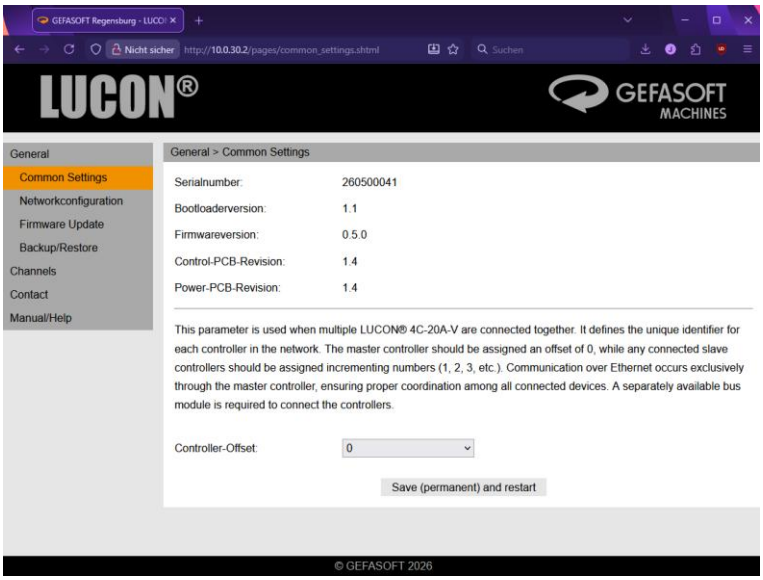


Figure 13: Set controller offset via website

Set the offset to “1” on the second controller. Then click on “Save permanently and restart” or use the command “SR” to save the value permanently and restart the controller.

Now disconnect the network cable from the second controller and connect it to the third controller. Here, configure the offset to “2,” save it permanently, and restart.

If more controllers are connected, simply repeat the steps and assign a higher offset one after the other.

Finally, the network cable can be connected to the first controller. This controller still has the offset 0 and now functions as the master. To ensure that the newly configured slaves are recognized, the master controller must be restarted once. This can be done either by using the “R” command, via the website, or by disconnecting the power supply.

If the light controllers are supplied with multiple power supplies, the controller with offset 0 must be switched on last. Otherwise, automatic detection of the other controllers will not work.

If automatic detection does not work, manual detection can also be initiated using the “RT” command.

7 Operating

The parameters are configured either via commands (UDP, see chapter 7.4.2) or via the integrated configuration website (see chapter 7.4.3).

The commands are backward compatible with LUCON® and LUCON® 2, meaning that the light controllers can be replaced in existing applications without any software adjustments.

7.1 Operational readiness

After connecting the supply voltage, the units need a moment to fully boot up. As soon as it is ready, the communication module in the LUCON® 4C-20A-V sends a message via the UDP interface. The message looks like this:

```
:S RUNNING...\r\n>
```

In order to be able to send a message via Ethernet using the UDP protocol, it is absolutely necessary to know the IP address and the UDP port of the remote station. When starting for the first time, this remote station is not known, which is why no message can be sent here either. However, as soon as commands are received via UDP for the first time, the IP address and the UDP port of the sender are saved. If the LUCON® 4C-20A-V receives messages from another remote station, the saved parameters are overwritten. After a restart, the message is sent to the last known remote station.

7.2 Operating modes and control modes

7.2.1 Operating modes

Each channel is independent of the other channels and can be configured separately so that it can be assigned to one of the following operating modes.

7.2.1.1 Continuous Mode (Software Mode)

The connected lighting is switched on and off by software via a PC or PLC using the corresponding command. The lighting is operated with the current value contained in the command until a command to switch it off is received (exception: temperature limit is exceeded). Currents of up to 3 A can be used in this mode.

7.2.1.2 Pulse Mode

In this mode, the desired current value is first set via command or web interface. Then the corresponding channel reacts to an edge change at the trigger input (rising, falling or both => configurable). The lighting is then switched on for a previously set time. Currents of up to 20 A can be used in this mode.

7.2.1.3 Switch Mode

In this mode, the desired current value is first set via command or web interface. Then the corresponding channel reacts to the trigger input. The lighting is switched on as long as a trigger signal is present (or not present, depending on the desired setting) (exception: temperature limit is exceeded). Currents of up to 20 A can be used in this mode.

7.2.1.4 None mode (Idle)

In this mode, the output for lighting is permanently deactivated and the triggers are also not evaluated (default state during initial commissioning). This mode is useful if the set parameters are to be stored in the permanent memory, but not a specific operating mode or state.

7.2.2 Control Methods

In principle, there are two different operating modes available, which can be selected and used depending on the application.

7.2.2.1 Command-based operation

The LUCON® 4C-20A-V controller is connected to a control system (e.g. PC or PLC) via a communication interface. Commands are used to switch the lighting on the various channels on and off, change their brightness or switch between operating modes.

7.2.2.2 Stand-alone operation

If an operating mode (switch or pulse mode) including all parameter settings is permanently stored in the respective channel, this operating mode is automatically restored after renewed power-up. Thus, connection and communication with a PC is only required during initial start-up.

7.2.3 Limitations in switch and pulse mode

The LUCON® 4C-20A-V lighting controls work with capacitors at the output, which are discharged into the lighting with a regulated current. The capacitors must be recharged after a pulse. For currents below 3 A, charging is as fast as discharging. This allows the pulses to be (theoretically) infinitely long (provided that no thermal limitation occurs).

Furthermore, it should be noted that 100% thermal compensation is not possible in the light controller. This means that in the cold state the current is minimally higher than in the warm state. If the image processing is set up for the cold state, the result image could be too dark in the warm state. Therefore, to get an optimal result, the light controller should first be "flashed" warm by triggering it a few hundred times.

When a current value for a pulse or a length for a pulse is entered, the light controller automatically determines whether this combination is permissible and also calculates the necessary cooling time (command: PCD, see chapter 7.4.2.3).

Figure 12 shows the relationship between pulse length and pulse current.

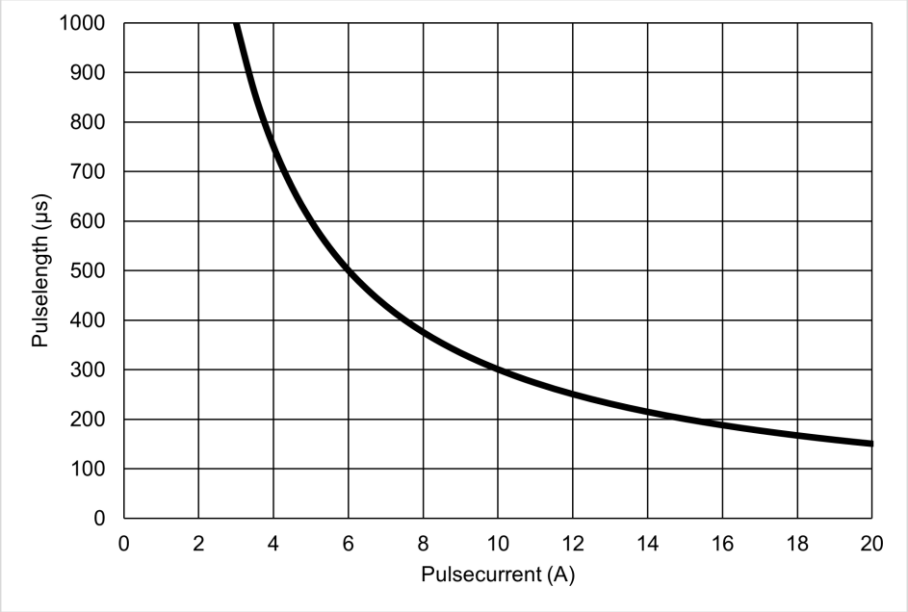


Figure 14: Pulse length as a function of pulse current

The maximum possible pulse length (in seconds) can be determined from the following equation (I = current in A):

$$t_{max} = \frac{0{,}003}{I}$$

Figure 15 provides an overview of the necessary cooling time.

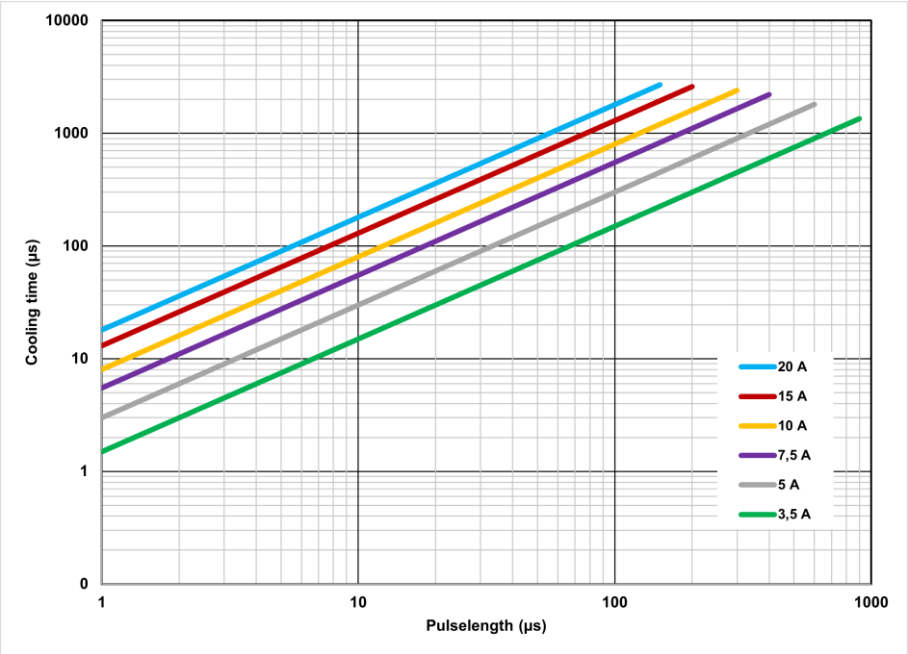


Figure 15: Necessary cooling times depending on pulse length and pulse current

The following formula can also be used for exact calculation (I = current in A, t_{Pulse} = pulse length in µs, result in µs):

$$t_{Pause} = (I - 2) * \quad t_{Pulse}$$

7.2.4 Special timing considerations for power control

Internally, the LUCON® 4C-20A-V light controllers have different measuring ranges to achieve the highest possible precision in current control. Due to circuitry reasons, there are differences in the times required until the current is regulated. Figure 16 shows the relationship between current and delay time graphically.

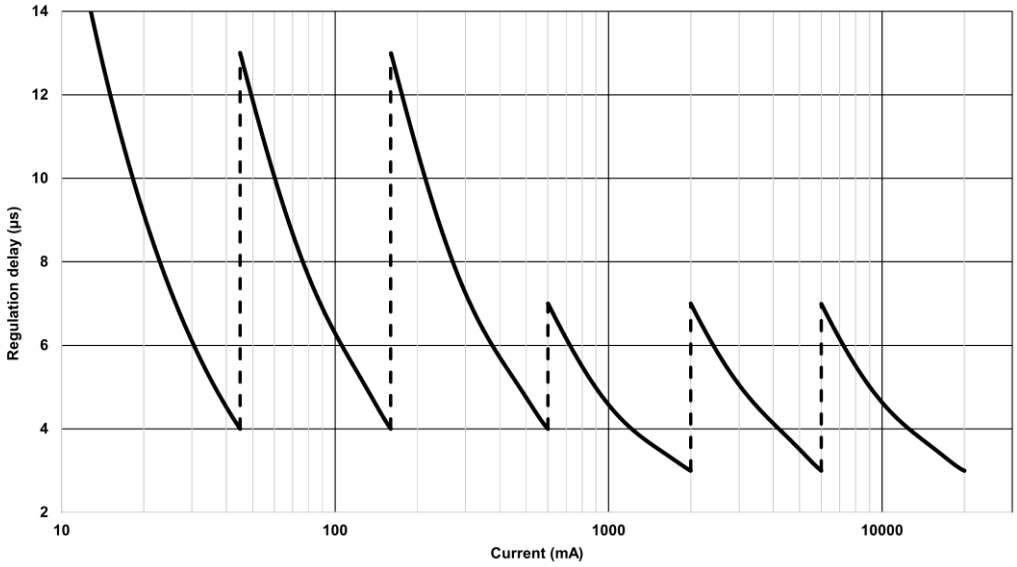


Figure 16: Control delays for different currents

In the lower current range up to 45 mA, the delay is slightly greater, which is why it is shown separately in Figure 17 below:

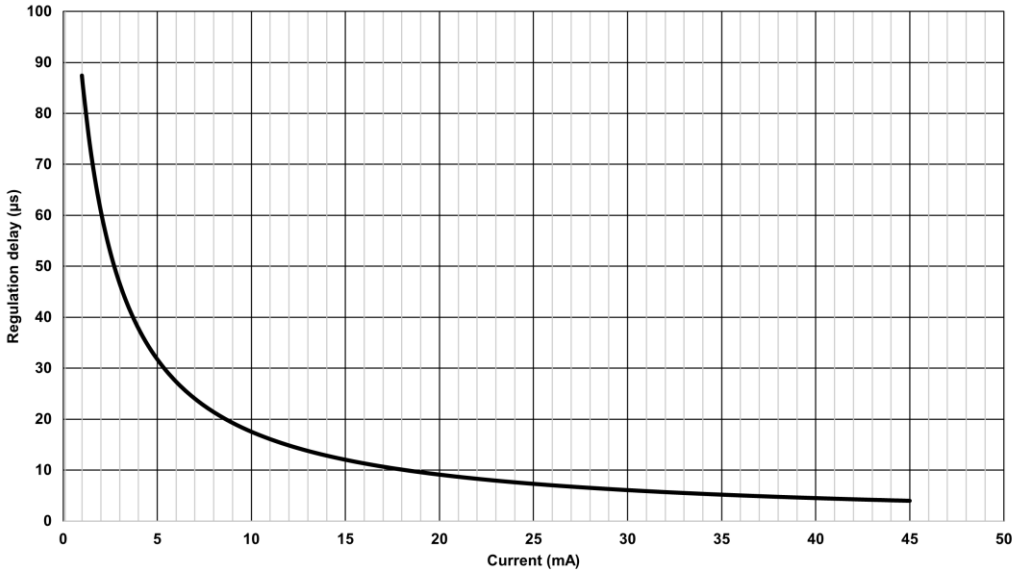


Figure 17: Control delays for small currents up to 45 mA

The exact delay is calculated by the light controller. To do this, the desired current must first be set (either via the website or via UDP command). Set the delay to 0 µs. The controller then provides feedback on the minimum delay for the desired current (e.g., at 2000 mA):

:E Pulse delay invalid! Allowed values are: 3 us <= t <= 59000000 us.

In pulse mode, this delay is taken into account so that the length of the pulses is always constant, regardless of the current.

7.3 Communication interfaces

7.3.1 Ethernet

Type	Ethernet interface (RJ45)
IP	10.0.30.2
Subnet	255.255.255.0
Protocol	UDP
Port	50 000

When using the network interface, make sure that both the light controller and the remote station (e.g. PC) are in the same subnet, otherwise no connection can be established. The LUCON® 4C-20A-V light controller can be connected to a switch (see Figure 18) as well as directly to a remote station, since the light controller supports Auto-MDI-X.

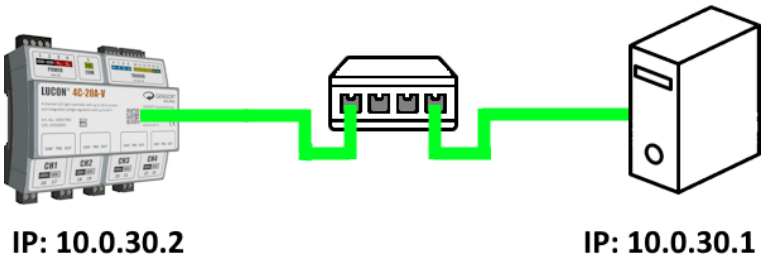


Figure 18: Network setup with LUCON® 4C-20A-V light controller

A direct point-to-point connection without a switch or similar device is always preferable.

7.4 Parameterisation

The LUCON® 4C-20A-V light controllers can be configured and operated with a variety of parameters and settings. The parameters can be set using commands (see chapter 7.4.2) or using the integrated web interface (see chapter 7.4.3). An overview of all possible parameters is provided in chapter 7.4.2.2 and chapter 7.4.2.3.

The two most important parameters, the limits for current and voltage, are explained in more detail below.

7.4.1 Setting the current and voltage limits

Limits for current and voltage can be set to protect the connected lighting and the light controller. The current limit primarily serves to protect the lighting, the voltage limit is intended to reduce the thermal load on the LUCON® 4C-20A-V light controller.

7.4.1.1 Determining the current limit

Depending on the lighting used, information on the maximum permissible current can be found directly on the housing. Often a distinction is made between continuous operation and flash operation. The value for flash operation can be many times higher than the value for continuous operation. However, these are only intended for flashes with a duration of a few milliseconds or even microseconds. If there is no value for flash mode, the existing value usually refers to continuous mode.

If there is no value for flash operation on the housing of the lighting device or in the data sheet, the lighting device may not be suitable for flash operation. In this case, contact the manufacturer of the lighting.

If instead of the maximum current there are only values for the voltage and the power on the lighting, the current limit can be calculated with the following equation (P = power in W, U = voltage in V, result in A):

$$I = \frac{P}{U}$$

The current limit is then entered in mA. Multiply the value calculated above by 1000.

7.4.1.2 Determining the voltage limit

As a first indicator, the voltage value from the housing or data sheet of the lighting can be taken. However, if the lighting is to be operated close to the current limit, this voltage limit is often too low and the desired current and thus the desired brightness cannot be achieved. The deviation stems from manufacturing and production-specific deviations in the manufacture of LED lighting.

In the following, the necessary steps to determine the correct voltage limit are shown using channel 01 as an example. If another channel is used instead, the channel number must be exchanged with the desired number in the commands.

To find the correct value for the voltage limit, the lighting should first be operated in continuous mode. To do this, use the command S01MC|xx (see chapter 7.4.2.3) or the sliders on the website (see chapter 7.4.3.2) (xx stands for the desired current in mA).

Then some voltages have to be determined:

- the voltage across the illumination V_{LED} (Voltage over LED, *R01UL*)
- the voltage at the anode of the lighting V_{OUT} (LED-Output-Voltage, *R01ULO*).
- and the voltage at the cathode of the lighting V_{IN} (LED-Input-Voltage, *R01ULI*).

The values can also be conveniently displayed in the web interface (see chapter 7.4.3.2).

The following table provides an explanation of how to proceed in which situations:

State	Cause	Solution
V_{IN} < 500 mV	Voltage limit too low	Increase voltage limit by 100 mV and measure again
V_{OUT} ≈ 60 000 mV und V_{IN} < 500 mV	Lighting voltage too high	Ligthing voltage already at the limit. Lighting unsuitable for LUCON® 4C-20A-V light controller

The displayed values are subject to certain measurement tolerances. They therefore only serve as a rough guide.

In flash mode with currents below 3000 mA, the voltage limit is unfortunately not so easy to set. Here, the voltage limit should first be set about 5000 mV higher than indicated on the lighting. Then test whether the desired brightness has been reached. Now gradually reduce the limit by 100 mV and test whether the brightness is still achieved. If the brightness decreases, increase the limit by 500 mV. Now the optimal voltage limit should be reached.

If the lighting is operated in flash mode above 3000 mA, voltage regulation no longer takes place. In this case, the entered value for the voltage limit is ignored. For this reason, pulses above 3000 mA are also limited in time, as otherwise there is a risk of the light controller overheating.

7.4.2 Parameterisation via commands

Basically, all settings and parameters are initially only stored in the temporary memory. This means that they are lost after a restart (power failure or software restart). The configuration must also be stored in the permanent memory (commands: S00S, S01S, ...).

When it comes to channel numbers, a distinction must be made between general commands (00) and channel-specific commands (01-99). Both general and channel-specific parameters are stored in separate permanent memories.

General parameters include, for example, the serial number, IP address, or firmware version of the controller. Channel-specific parameters, on the other hand, include things such as mode, voltage limit, or output trigger configuration.

7.4.2.1 Command structure

Each command consists of the following structure:

'S' or 'R' + channel number + command + (| + *values* +) delimiter

e.g.: `R00F\r\n`, `R01T\r\n`, `S00BS|57600\r\n`, `S01MC|100\r\n`

'S' or 'R'	'S' describes a SET command, 'R' describes a READ command
Channel number	Channel number of the module from 00 to 99; 00 addresses general parameters 01 to 99 addresses channel-specific parameters
command	Command consisting of one to three characters describing the command
values	Depends on the command: READ commands do not require a value; SET commands can be given one to sixteen values. Each value is introduced with a pipe character "|".
Delimiter	The delimiter terminates the telegram. For increased compatibility of the communication, different delimiter configurations are accepted: \r\n (Carriage Return: 0x0D, Line Feed: 0x0A) \r (Carriage Return: 0x0D) \n (Line Feed: 0x0A)

If the SET command is successful, the command sent is sent back as a reply and a > is appended. If an error occurred, an error message is displayed. If, for example, the command S01MC|100\r\n is sent, the response looks like this:

`S01MC|100\r\n>`

Be In the case of a READ command, the command sent is returned as the answer, followed by the requested value with delimiter and >. For example, the answer to R01T\r\n can look as follows:

`R01T\r\n`

`31\r\n>`

7.4.2.2 Command overview general commands (address: 00)

SET-command		
Command	**Description**	**Example**
S	Save all parameters in permanent memory	S00S
IP	Set IP-address (is only taken over after a restart)	S00IP|10.0.30.2
SM	Set subnetmask (is only taken over after a restart)	S00SM|255.255.255.0
FR	Restore factory settings 0 = Only the general parameters of this LUCON® 4C-20A-V are reset; 1 = The general and channel-specific parameters of this LUCON® 4C-20A-V are reset; 2 = The channel-specific parameters of this and all connected LUCON® 4C-20A-V (master/slave) are reset;	S00FR|0 S00FR|1 S00FR|2
R	Restart LUCON® 4C-20A-V modul All connected slaves are also restarted.	S00R
S	Save all parameters to permanent memory 0 = Only the general parameters of this LUCON® 4C-20A-V are saved to permanent memory; 1 = The general and channel-specific parameters of this LUCON® 4C-20A-V are saved to the permanent memory; 2 = The channel-specific parameters of this and all connected LUCON® 4C-20A-V (master/slave) are saved to the permanent memory;	S00S|0 S00S|1 S00S|2
SR	Save all parameters in permanent memory and restart module 0 = Only the general parameters of this LUCON® 4C-20A-V are saved in permanent memory and only this LUCON is restarted; 1 = The general and channel-specific parameters of this LUCON® 4C-20A-Vare saved to the permanent memory and this LUCON is restarted; 2 = The channel-specific parameters of this and all connected LUCON® 4C-20A-V (master/slave) are saved to permanent memory and all LUCONs are restarted;	S00SR|0 S00SR|1 S00SR|2
SIP	Set IP address with serial number check;	S00SIP|123456789,10.0.30.2

	syntax: |"serial number", "IP address" (will only be taken over after a restart)	
CO	Set controller offset The first LUCON® 4C-20A-V (=master module) always has an offset of 0. The next LUCON that is connected (= 1st slave) has an offset of 1).	S00CO|0 S00CO|1

READ command		
Command	**Describtion**	**Example / Response** (without delimiter)
F	Firmware version	R00F Response e.g.: '1.0.2'
IP	IP address	R00IP Response e.g. '192.168.123.10'
SM	Subnetmask	R00SM Response e.g. '255.255.255.0'
UDP	UDP-port	R00UDP Response: '50000‘
MAC	MAC address	R00MAC Response e.g.: '54:10:EC:9A:A7:11'
SN	Serial number	R00SN Response e.g.: '200320001'
BLV	Bootloader version	R00BLV Response e.g.: '1.0'
EQ	Are the parameters in the permanent memory identical to those in the non-permanent memory?	R00EQ Response: '0' (not identical) or '1' (identical)
RT	Query which channels are connected	R00RT Response e.g.: 'Online: 01, 02, 14'
M	Error-Message Buffer	R00M Response e.g.: 'Currently no error message, everything is OK'
RCP	Revision Control-PCB	R00RCP Response e.g.: '1.4'
RPP	Revision Power-PCB	R00RPP Response e.g.: '1.4'
USU	Supplyvoltage in mV	R00USU Response e.g.: '36000'
CO	Controller Offset	R00CO Response e.g.: '1'

7.4.2.3 Command overview of channel-specific parameters (address: 01 to 99)

SET command		
Command	**Description**	**Example**
MC	Continuous mode (software mode) Set current value (mA) in continuous mode. For current values <= 45 mA, input to 1/10 mA is possible (e.g. 35.4 mA). Max.: 3000 mA	S01MC|10.9 S01MC|1230
MT	Switch mode Set current value (mA) in switch mode (current is output while trigger is active/inactive). For current values <= 45 mA, input to 1/10 mA is possible (e.g. 35.4 mA). Max.: 20 000 mA (with auto. switch-off)	S01MT|4500 S01MT|5.9
MD	Pulse mode (delay in ms) Set current value (mA) in pulse mode (current is set when trigger rises/falls). Syntax: |"current (mA)"|"delay (ms)"|"duration (µs)" For current values <= 45 mA, input to 1/10 mA is possible (e.g. 35.4 mA). Max.: 20 000 mA (with auto. switch-off)	S01MD|10|0|100000 (current: 10 mA, delay: 0 ms, duration: 100 ms)
MDU	Pulse mode (delay in µs) Set current value (mA) in pulse mode (current is set when trigger rises/falls). Syntax: |"Current (mA)"|"Delay (µs)"|"Duration (µs)" For current values <= 45 mA, input to 1/10 mA is possible (e.g. 35.4 mA). Max.: 20 000 mA (with aut. switch-off)	S01MDU|10|100|100 (current: 10 mA, delay: 100 µs, duration: 100 µs)
MN	None mode The output and the trigger interface are deactivated.	S01MN
L	Set current limit for continuous mode (mA) To protect the lighting from incorrect inputs	S01L|3000
LP	Set current limit for pulse/switch mode (mA) To protect the lighting from incorrect inputs	S01LP|12400
V	Set voltage limit (mV) To protect the light controller from overheating	S01V|30000

ST	Set input trigger polarity in switch mode. 0 = output active when trigger low 1 = output active when trigger high	S01ST|0 S01ST|1
SC	Set current value for switch mode in mA For current values <= 45 mA, input to 1/10 mA is possible (e.g. 35.4 mA). Max.: 20 000 mA (with aut. switch-off)	S01SC|100 S01SC|23.5
I	Set input trigger polarity in pulse mode. 0 or R = activate pulses when trigger rises 1 or F = activate pulses when trigger falls 2 or B = activate pulses when trigger rises or falls	S01I|R S01I|1 S01I|2
O	Activate/deactivate output trigger 0 = output trigger disabled 1 = output trigger enabled	S01O|0 S01O|1
OTE	Set output trigger polarity 0 or R = output trigger should rise 1 or F = output trigger should fall	S01OTE|R S01OTE|0 S01OTE|F
OTS	Set output trigger source 0 = Input trigger (output trigger is triggered as soon as an input trigger is present) 2 = Activate lighting (output trigger is activated as soon as the lighting is activated)	S01OTS|0 S01OTS|1
OTT	Set output trigger type 0 = Output trigger length is time-limited (see OTL command) 1 = Output trigger remains active as long as the lighting is active	S01OTT|0 S01OTT|1
OTD	Set output trigger delay (µs) 0 - 1,000,000 µs	S01OTD|500
OTL	Set output trigger length (µs) 20 - 1,000,000 µs	S01OTL|5000
FR	Restore factory settings on the selected channel	S01FR
S	Save all channel-specific parameters of the selected channel to permanent memory	S01S

READ command		
Command	**Describtion**	**Example / Response** (without delimiter)
T	Temperature (°C) of the channel	R01T Response e.g.: '45'
PC	Pulse-Current (mA) Outputs the set value for the current in pulse mode. Below 45 mA in 1/10 steps.	R01PC Response e.g.: '4500'
SC	Switch-Current (mA) Outputs the set value for the current in switch mode. Below 45 mA in 1/10 steps.	R01SC Response e.g.: '5000'
CA	Current flow through the lighting in mA Only valid in continuous mode. Below 45 mA in 1/10 steps.	R01CA Response e.g.: '2000'
L	Current limit (mA) To protect the lighting from incorrect inputs. Below 45 mA in 1/10 steps.	R01L Response e.g.: '2000'
LP	Stromlimit für den Pulse-/Switch-Modus (mA) Zum Schutz der Beleuchtung vor Fehleingaben. Unterhalb von 45 mA erfolgt die Einstellung in 1/10-Schritten.	R01LP Response e.g.: '13300'
V	Voltage limit (mV) To protect the light controller from overheating	R01V Response e.g.: '24000'
D	Read pulse width (µs) How long should the current pulse be active?	R01D Response e.g.: '100'
Y	Pulse delay (ms) How long should be waited between the occurrence of the input trigger and the pulse activation?	R01Y Response e.g.: '100'
PDU	Pulse delay (µs) How long should be waited between the occurrence of the input trigger and the pulse activation?	R01PDU Response e.g.: '100'
PCD	Cooling time after a pulse Value is automatically calculated from pulse current and pulse length. No further pulses are possible during this time.	R01PCD Response e.g.: '1005'
UL	Voltage across the illumination (mV)	R01UL Response e.g.: '24000'
USU	Supply voltage (mV)	R01USU Response e.g.: '36000'

ULI	Voltage at the cathode of the illumination (mV)	R01ULI Response e.g.: '2000'
ULO	Voltage at the anode of the lighting (mV)	R01ULO Response e.g.: '36000'
LPV	Voltage across the lighting during the last pulse (mV)	R01LPV Response e.g.: '16500'
LPC	Current above the illumination during the last pulse (mA). Below 45 mA in 1/10 steps.	R01LPC Response e.g.: '515'
I	Input trigger polarity (for pulse mode) 0 = pulses when trigger rises 1 = pulses when trigger falls 2 = pulses when trigger rises or falls	R01I Response e.g.: '0'
ST	Input trigger polarity (for switch mode) 0 = output active when trigger low 1 = output active when trigger high	R01ST Response e.g.: '0'
O	Output trigger status 0 = output trigger deactivated 1 = output trigger activated	R01O Response e.g.: '0'
OTE	Output trigger polarity 0 = Rising edge 1 = Falling edge	R01OTE Response e.g.: '0'
OTS	Output trigger source 0 = Input trigger 1 = Activate lighting output	R01OTS Response e.g.: '0'
OTT	Output trigger type 0 = Output trigger length is time-limited (see OTL command) 1 = Output trigger remains active as long as the lighting is active	R01OTT Response e.g.: '0'
OTD	Output trigger delay (µs)	R01OTD Response e.g.: '500'
OTL	Output trigger length (µs)	R01OTL Response e.g.: '50'
EQ	Are the parameters in the permanent memory identical to those in the non-permanent memory?	R01EQ Response: '0' (not identical) or '1' (identical)

CM	Current mode 0 = Idle mode 2 = Continuous mode 3 = Switch mode 4 = Pulse mode 7 = Error mode	R01CM Response e.g.: '0'

7.4.3 Parameterisation via configuration website

In addition to configuration via commands, the LUCON® 4C-20A-V controller offers the possibility of parameterising the light controller via a web interface. The prerequisite for this is the use of the Ethernet interface (see chapter 7.3.1).

To access the web interface, the IP address of the LUCON® 4C-20A-V module must be entered as the target address in a browser (default: 10.0.30.2, see 7.4.2.2, command: R00IP). After successful entry, the web interface should appear as shown in Figure 19.

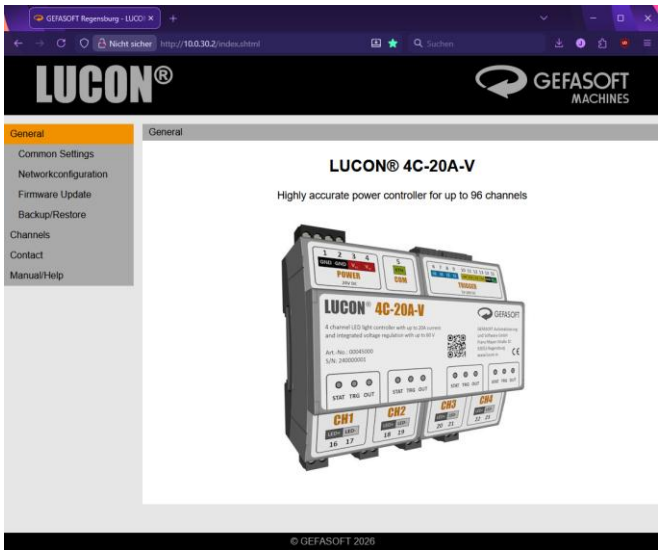


Figure 19: Start page of the configuration website

The menu on the left-hand side contains various sub-items, such as the network configuration, the option for a firmware update and the configuration of the individual channels.

7.4.3.1 Network configuration

The network settings will only be applied after restarting the LUCON® 4C-20A-V. However, after restarting, the temporary parameters (“Save temporary”) will be deleted again.

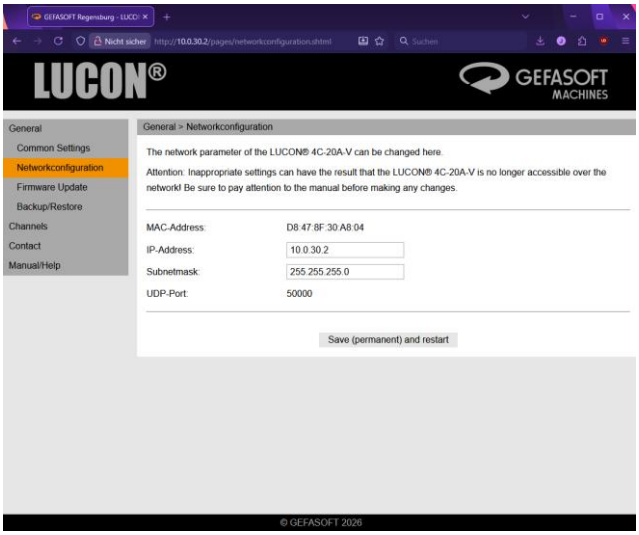


Figure 20: LUCON® 4C-20A-V network configuration (1)

In the “Backup/Restore” menu item, you can save the network configuration to a file (“Backup”) and restore it from a file (“Restore”). In addition, you can restart the lighting controller under ‘Restart’ and restore the factory settings for the network configuration under “Factory Settings.”

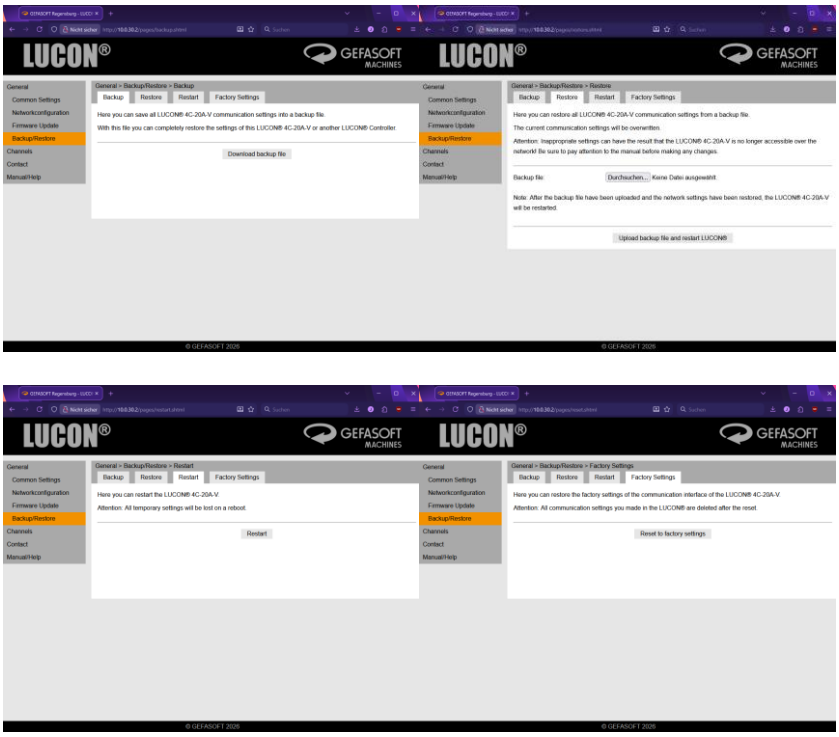


Figure 21: LUCON® 4C-20A-V network configuration (2)

7.4.3.2 Firmware- and Webseite-Update

A firmware update is always associated with a risk. For example, a power failure during the process may mean that the module can no longer be used and must be replaced.

The subpage for updating the firmware can be accessed via the “Firmware Update” menu items. This distinguishes between “Firmware Update” and “Website Update.” The latter refers to the configuration website.

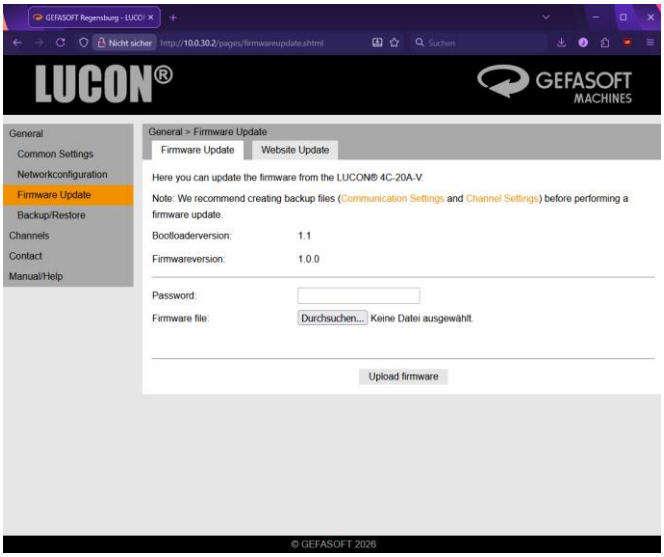


Figure 22: Firmware Update

7.4.3.3 Channel configuration

In the main menu on the left, the channels can be configured under the item "Channels". First, the main page of the channels appears with sliders for the current outputs (see Figure 23, the respective channels must be configured for use). In addition, configuration files for all channels can be created and restored here.

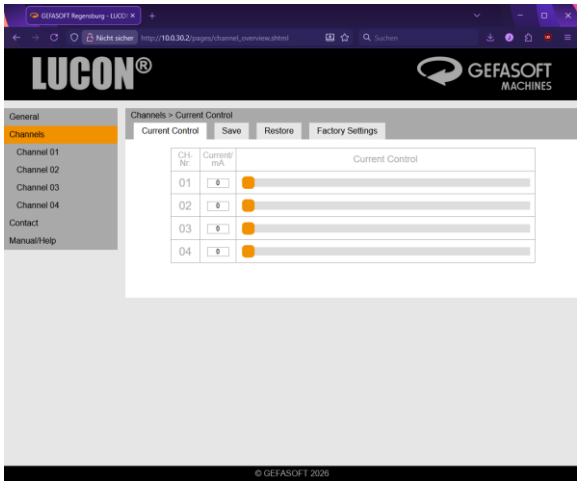


Figure 23: LUCON® 4C-20A-V Channel overwiev

In the "Channels" menu, all connected and available channels are displayed as sub-items. The "Status" page contains some general information about the selected channel (see Figure 24).

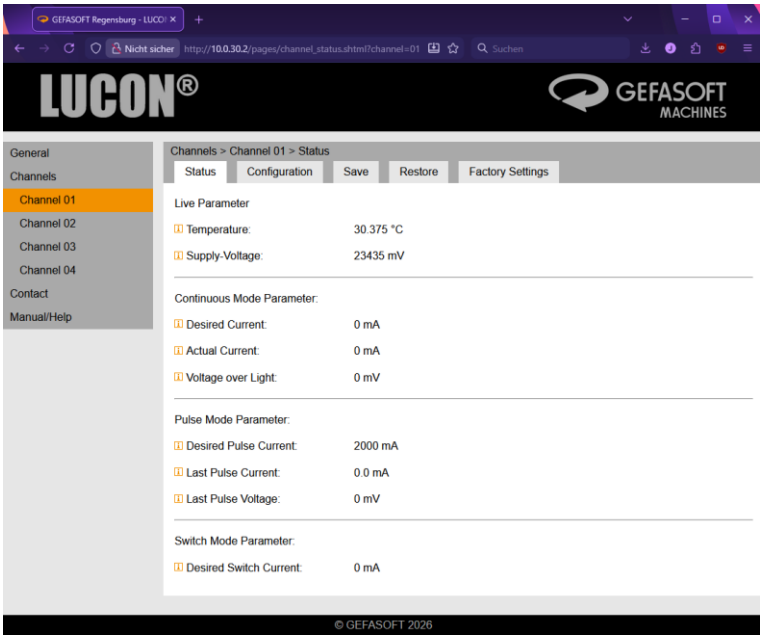


Figure 24: Status page of a channel

The main configuration of the channel is done under the "Configuration" tab (see Figure 25).

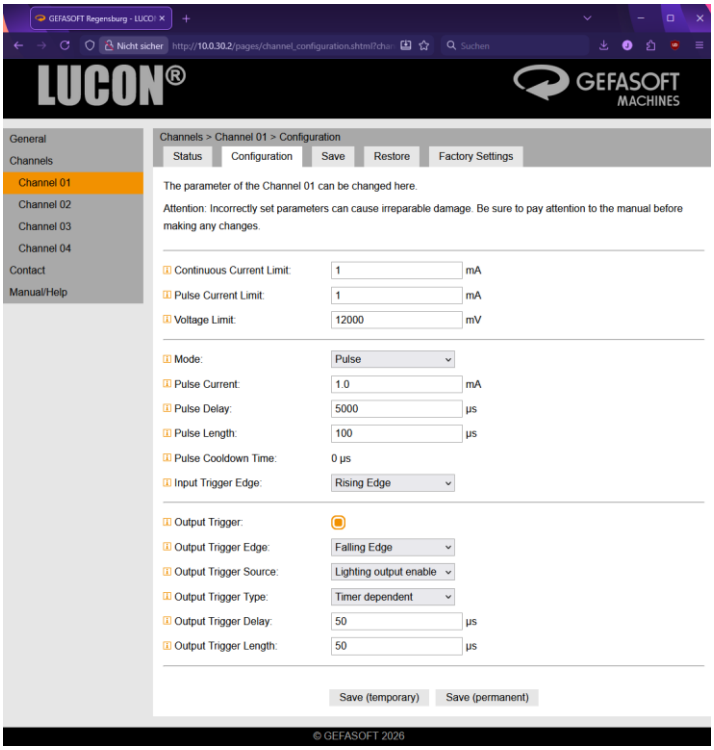


Figure 25: Channel configuration

Furthermore, there are the tabs "Save", "Restore", "Restart" and "Factory Settings". Here you can create and restore individual configuration files for each channel, restart the channels and restore the factory settings.

7.5 Error handling

LUCON® 4C-20A-V has an integrated error handling. If an error occurs, the communication module in the LUCON® 4C-20A-V sends a message to the connected communication partner (e.g. a computer).

The error message is always preceded by `:E` and is structured as shown below:

```
:E [error message]r\n>
```

There are two types of error:

- Errors due to incorrect inputs:

  Each parameter sent to LUCON® 4C-20A-V is checked by the device for plausibility. If the parameter or value is invalid, an error message is returned. The value is not saved in the controller. In the case of a command with several parameters, none of the parameters will be saved if at least one value is invalid.

  Example of error message (current entered for software mode exceeds current limit set):

  ```
  :E Value is bigger then the current-limit! Max: 1000 mAr\n>
  ```

- Errors during operation:

  The most important system parameters are permanently monitored in the LUCON® 4C-20A-V lighting controller. These include, for example, the temperature. To protect the device, the current flow to the lighting (= heat source) is interrupted if the limit temperature is exceeded. The corresponding channel then switches to error mode (LEDs on the front of the housing flash red, "major" error, see chapter 5.2) and sends an error message. No parameters can be configured in error mode. When the channel has cooled down sufficiently, parameterization is possible again (LEDs on the front of the housing stop flashing red).

  The error message when the temperature limit is exceeded may be as follows::

  ```
  :E Overtemperature on Channel 01r\n>
  ```

  As there is no direct input for this type of error, the error is sent to the last interface used for successful communication. This could be UDP or RS-232.

  Other sources of error during operation include:

  - A controller offset occurs more than once (When the controllers are switched on, the set offsets are checked. Correct operation is only possible if each controller offset is unique. If an offset occurs more than once, an error message is displayed and the affected devices flash red. The devices must then be disconnected from the power supply and the numbers set correctly).

  - The voltage limit set for the lighting is too low (the current flow and the voltages are monitored by the lighting controller. Depending on the configuration, the desired current flow cannot be achieved, e.g. because the voltage limit is set too low (see also section 7.4.1).

8 FAQ

What can I do if I cannot communicate with the LUCON® 4C-20A-V light controller?

1) First of all, it should be determined whether the communication between the LUCON® 4C-20A-V and the remote terminal (computer) is working. It is a good idea to test this with a read command (e.g. R00F, see chapter 7.4.2.2). If this is successful, please continue with point 3).

2) The next step is to check the wiring.
   a) To check whether the cabling is correct, use the status LEDs on the RJ45 socket on the LUCON® 4C-20A-V controller. If one LED lights up and the other flashes, the cabling is OK. If none of the LEDs are lit or both are flashing, there is a problem with the cabling.
   b) For Ethernet, correct IP addresses and suitable subnet masks are essential. Both the remote station and the LUCON® 4C-20A-V must be in the same subnet, but must not have the same IP address (e.g. computer IP: 10.0.30.1, subnet: 255.255.255.0 and LUCON® 4C-20A-V IP: 10.0.30.2, subnet: 255.255.255.0). Important! After changing the LUCON® 4C-20A-V IP address, the device must be restarted.
   c) For a simple connection test, the LUCON® 4C-20A-V can also be pinged. If the ping is successful but communication is still not possible, there is a problem with the stream pools (e.g. the port could be blocked => use another port).
   d) If communication is still not possible, briefly disconnect the LUCON® 4C-20A-V controller from the power supply and restart it.

3) If an error message is displayed, restarting all devices will usually help. To do this, briefly disconnect all connected LUCON® 4C-20A-V light controllers from the mains. If an error message is still displayed after a restart, please continue with point 5).

4) If, on the other hand, no error message is issued, check whether the numbering of the channels is correct (each number used only once) and whether there really is a channel with the desired number (if necessary, try which channels are connected with R01F, R02F, R03F, ..., R16F) => correct the channel numbers on the outside of the respective device => fix controller offsets.

5) If all channel numbers are set correctly and communication is still not possible after restarting all devices, please contact GEFASOFT Automatisierung und Software GmbH for further assistance.

Can I damage my LUCON® controller if the output polarity is wrong?

No, the LUCON® 4C-20A-V light controller will not be damaged if the polarity of the connected LED light source is reversed. It will also survive a short circuit at the output terminals.

Note, however, that you may damage your LED light source, depending on the specific model and power limits set for the LUCON® 4C-20A-V module.

Can I damage my LUCON® controller if my input voltage is wrong?

No, the LUCON® 4C-20A-V LED light controller has an internal protection circuit that prevents damage to the device if the input voltage supply is inverted. Too high an input voltage, on the other hand, can permanently damage the LUCON® 4C-20A-V LED light controller.

I don't know my exact LED specifications - how do I set the LUCON® 4C-20A-V parameters?

You do not need to know the exact specifications of your light source. It is sufficient to have approximate values for the operating current and the supply voltage. An explanation of how to set the values can be found in chapter 7.4.1.

Can I use more than 20 000 mA current on the output side?

The standard LUCON® 4C-20A-V system is designed for a maximum output current of 20 000 mA.

As the electronics design and system engineering are developed and operated by GEFASOFT Automatisierung und Software GmbH, you can contact our experts to discuss your specific requirements.

We have supplied customised versions of the LUCON® light controller with modified performance specifications in the past, including higher current output in flash mode.

LUCON® 4C-20A-V displays an error during operation

Even without changing the parameters, the LUCON® 4C-20A-V may suddenly no longer drive the set current for the connected light source. This may be due to the voltage limit being too low (the LED characteristics may change slightly during operation due to thermal effects). ***Make sure that the voltage limit is set to at least 500 mV higher than the nominal voltage*** so that the driver circuit can set the correct output current. See also section 7.4.1.

The LUCON® 4C-20A-V light controller no longer reacts to the trigger input

First, check whether a trigger signal actually occurs at the input, what voltage level it has and how long the trigger occurs (for necessary trigger specifications, see chapter 5.3.1). Then check whether the polarity of the trigger is set correctly. Furthermore, check whether the light controller is in the correct mode (see chapter 7.2.1).

If all parameters are correct, it could be that the light controller is in the cooling time after a pulse (see chapter 0). During this time, trigger signals are ignored, otherwise damage to the light controller could occur.

9 Technical data

Power Supply	
Voltage (V_{IN})	24 V_{DC} (+/- 10 %)
Current use (Idle)	100 mA
Lighting Outputs	
Number of Channels	4 (completely independent)
Voltage (V_{OUT})	1 V_{DC} to 60 V_{DC}
Operating Modes	Continuous, Pulse, Switch
Output Current	
Continuous	up to 3 A
Pulse	up to 20 A
Accuracy	
Step size current	0,1 mA (1,0 mA to 45,0 mA) 0,5 mA (45,5 mA to 100,0 mA) 1 mA (101 mA to 500 mA) 5 mA (505 mA to 1500 mA) 10 mA (1510 mA to 3000 mA) 25 mA (3025 mA to 10000 mA) 50 mA (10050 mA to 20000 mA)
Trigger Inputs	
High-Level:	+ 11 V_{DC} to + 30 V_{DC}
Low-Level:	-3 V_{DC} to + 5 V_{DC}
min. trigger length	1 µs
Compliant	EN 61131-2 Type 1 and Type 3
Number of Inputs	4
Trigger Outputs	
min. trigger length	1 µs
Trigger-Level:	+ 5 V_{DC} bis + 24 V_{DC}
Number of Outputs	4

Timings	
Pulse Duration	5 µs bis 59.000.000 µs
Pulse Delay	3 µs bis 59.000.000 µs
Trigger-Frequency	up to 50 kHz
Parameterization	
Commands	UDP
GUI	Integrated configuration website
Interfaces	
Ethernet	RJ45
Default-IP	10.0.30.2
Default-Port	50 000
Expansion	cross-connector bus
Mounting	
Installation	35 mm DIN rail, EN50022; cooling slots facing upwards
Mechanical Data	
Dimension (W x D x H)	107,6 mm x 111,0 mm x 60,6 mm
Weight	304 g
Environmental Conditions	
Operating Temperature	+ 10 °C bis + 60 °C
Over Temperature	80 °C
Ordering Information	
Item Number	00047900

10 Disposal

Disposal of electrical appliances of this type in household waste is not permitted!

Please observe the country-specific regulations.

Systems or parts of systems should not be handed in at public collection points for further disposal. In the case of systems and system parts that are not marked with a waste bin, the owner is obliged by law to dispose of them properly. However, even then we are happy to help and can give you information on where and how you can dispose of these systems and system parts.

If requested, GEFASOFT Automatisierung und Software GmbH can be of assistance on **+49(0)941 / 788300**.