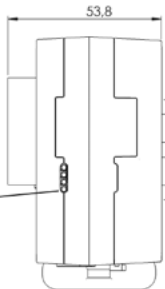
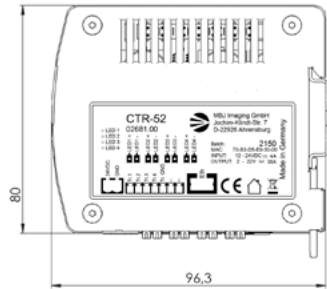


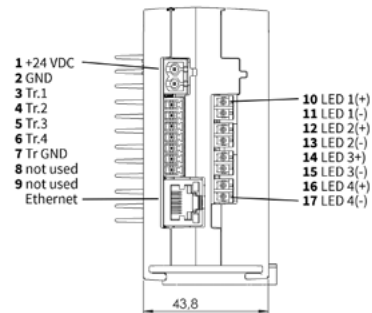
## Mechanical Integration

The CTR-52 controller is supplied with top hat rail mounting and plug-contacts for the LED light, control signals and input power.

CTR-52



LED Indicators:  
LED 1  
LED 2  
LED 3  
LED 4



More 2D and 3D drawings can be found online:  
[www.mbj-imaging.com](http://www.mbj-imaging.com)

## Safety Notes

Before working with this unit, read the warning and application instructions carefully and completely.

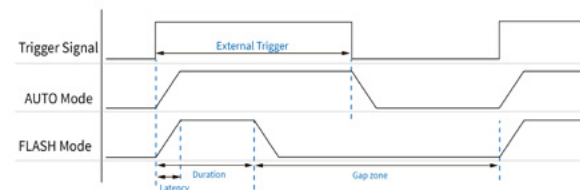


1. The device is designed for indoor use only.
2. **Health** – The device must be disconnected from the power source before the installation and/or maintenance can start. The device must not be used when a failure may cause personal injury.
3. **Electricity** - The housing is electrically isolated from the ground of the power supply. Exceeding the permissible operating voltage or exceeding the maximum allowed switching current per channel can lead to the destruction of the device or to a significant shortening of the lifetime of the connected LED lighting module.
4. **Mechanical integration** – The controller is made for top hat rail mounting. A clip can be used to lock the unit to the top hat rail. For optimal heat flow a left/right distance of 10mm to next unit is recommended.

### Status LED's CTR-52

LED	Status	Meaning
LED 1	OFF	Trigger low state
	ON	Trigger high state
LED 2	OFF	Trigger low state
	ON	Trigger high state
LED 3	OFF	Trigger low state
	ON	Trigger high state
LED 4	OFF	Trigger low state
	ON	Trigger high state

### Trigger Signals



Operating Manual  
Technical Data

## Controller CTR-52



CTR-52
4 channel LED driver
Current controlled operation for continuous and brightness controlled LED light
Voltage controlled operation for short, precise and high-power LED flashes, precise flash pulses from 10µs to 100ms
Full control via Modbus TCP/IP
MS Windows 10 <sup>®</sup> based control software and SDK available
Straight flash control via the camera's 'exposure time', the 'strobe' signal or manual flash set-up
4 individual trigger I/O lines with flexible assignment to the LED channels
Passive cooling and overheat protection

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Manual CTR-52 Controller: Revision 03 - Feb 2022. INDD file Rev09.

## Electrical Connections

Pin	Pin Name	CTR-52 Function	Comment
1	24VDC	24V DC	Power supply input
2	GND	Ground	Power supply ground
Pin Name		Function	Comment
3	Tr.1	Trigger1 12-24V <sup>1)</sup>	Internally opto-coupled
4	Tr.2	Trigger2 12-24V	Internally opto-coupled
5	Tr.3	Trigger3 12-24V	Internally opto-coupled
6	Tr.4	Trigger4 12-24V	Internally opto-coupled
7	Tr. GND	Trigger ground	Common Tr. ground, isolated
8	--	not used	
9	--	not used	
Pin Name		Wire <sup>2)</sup>	Output to light
10	LED1+	black + blue	Channel 1
11	LED1- <sup>3)</sup>	white + brown	Channel 1
12	LED2+	black + blue	Channel 2
13	LED2- <sup>3)</sup>	white + brown	Channel 2
14	LED3+	black + blue	Channel 3
15	LED3- <sup>3)</sup>	white + brown	Channel 3
16	LED4+	black + blue	Channel 4
17	LED4- <sup>3)</sup>	white + brown	Channel 4
Port		Function	Comment
Eth		RJ45 network	Modbus over Ethernet

1) Signal high >=10V, signal low <=5V

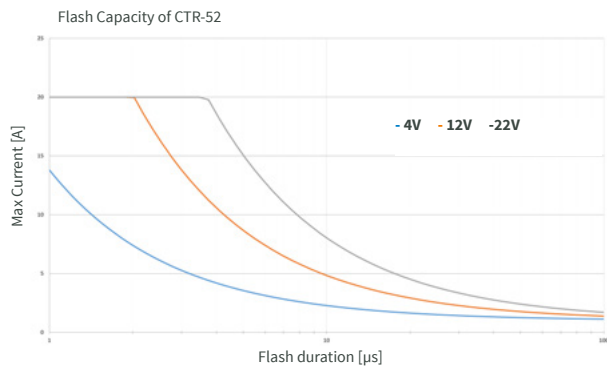
2) For MBJ connecting cable and MBJ LED light (-x) without integrated controller

3) Do NOT connect LED(-) to the external ground of the power supply or the ground of the trigger signal! This might destroy connected lights or devices

## Operating Mode

Mode	CTR-52 Function
STEADY	Continuous light, LED always on
AUTO	LED output follows the trigger status
FLASH <sup>1)</sup>	Manual set-up for flash, delay and duration via Modbus protocol
OFF	LED output is switched off

1) The CTR-52 factory setting of the operation mode is FLASH. Other operating modes are selectable via the Modbus interface



## Modbus Control

### Hardware

The standard fieldbus provided with the CTR LED controller product line is based on Modbus TCP. Modbus is a data communications protocol for use with programmable logic controllers (PLCs).

### Modbus Setup Information

The CTR controller is a Modbus device that allows you to access the light settings via Ethernet. The controller communicates using a master-slave technique in which only one device (the master) can initiate transactions (called queries). The other devices (slaves) respond by supplying the requested data to the master, or by taking the action requested in the query. The CTR light controller is implemented as a Modbus slave. The CTR receives messages from the master, processes them and responds to them. The product does not send messages by itself.

### Modbus Setup Information

Modbus Type:	Slave (Server)
Modbus Format:	Modbus TCP
Output Data Mode:	Auto

### Notes

- The default device IP address is 192.168.0.99. The address can be changed via the command line tool provided with the MBJ software package
- The RESET Button on the back of the device can be used to return to the factory default settings
- Please refer to the fieldbus communication protocol definition for details

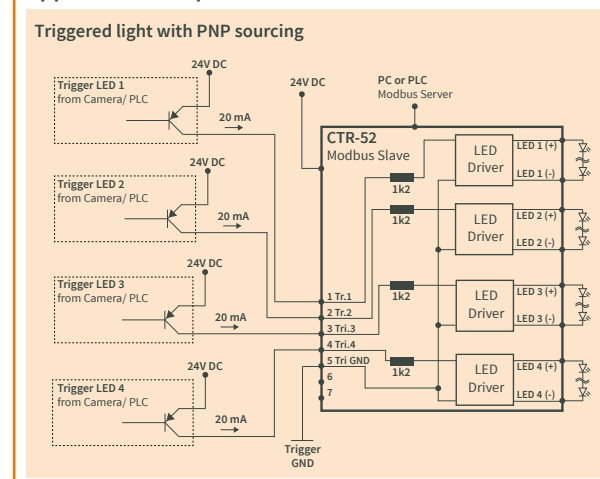
### Software

The CTR-52 can be programmed via different alternative methods:

- Direct Modbus access for which a detailed protocol definition is provided
- SDK library to integrate the communication into your software
- The easy to use MBJ software user interface based on MS Windows 10<sup>®</sup>

For further information and download of the CTR-52 software components visit: [www.mbj-imaging.com/en/products/led-controller](http://www.mbj-imaging.com/en/products/led-controller)

## Application Samples for CTR-52 Controller



Specification	CTR-52
<b>Electrical parameter</b>	
Operating Voltage	24V DC / 4A 12V - 26V, min. 2V above the forward voltage of the LED light source
LED steady current <sup>1)</sup> (ON & AUTO mode)	1 Channel: 1800mA 2 Channels: 1500mA p. Channel 3 Channels: 1200mA p. Channel 4 Channels: 900mA p. Channel
LED flash current <sup>2)</sup>	100mA...21A
Min flash duration	10µs depending on LED working point and duty cycle
Max. flash duration	59s
Max. flash latency <sup>3)</sup>	3µs
Flash duration & delay: smallest adjustable step	1µs
Voltage range for LED modules	approx. 2.5V to 22V
<b>Mechanical parameter</b>	
Dimension (H x W x D)	53mm x 80mm x 93mm
Weight	220g
Connectors	1x 2 Pin plug contact (RM5.08), 1x 7 Pin plug contact (RM3.81), 4x 2 Pin inv. plug contact (RM3.81) 1x RJ45 Ethernet
Certifications	CE, RoHS
Degree of protection	IP20 (made for control cabinet)
Humidity	30% to 70%
Operating temperature	10°C to 30°C
Accessories	Top rail mounting clip and plugs (scope of delivery). For cable, mounts and lighting modules please check <a href="http://www.mbj-imaging.com">www.mbj-imaging.com</a>

1) LED current less than 100mA may cause LED light jitter

2) The flash energy is provided by a capacitor and requires sufficient time for recharging. The flash energy (flash frequency \* flash duration \* current) is limited to 1A. E.g.: 100 flashes/s \* 100µs \* 30A = 0.3A

3) The higher the current and the shorter the cycle time, the greater the latency can be

