MBJ CTR-50 Controller Instruction Manual

imaging starts with light

Operating Manual
Technical Data
Controller CTR-50/51

Contents

CTR-50 Controller

Models in Series

CTR-50	CTR-51
Current controlled 1-channel operation for steady LED light and simple LED flash light applications	Voltage controlled 1-channel operation for short, very p recise and high-power LED flashes, precise flash pulse s from 5 µs to 100 ms
Easy set-up of LED current via rotary switches	Easy set-up of LED flash duration and cur- rent via rot ary switches
Straight flash control via the camera's 'exposure' or 'strobe' signal or manual flash set-up	

Electrical Connections

Pin…….. CTR-50 Function …….. CTR-51 Function …… Comment			
1	24 VDC		Controller power input
2	GND		Device ground
3	Dimmer 0 V … 10 V1) 0 V= 0 % of sel. current 10 V=1 00 % of sel. current	Time base multiplier for rotary swit ch2) Ground: 10 – 90 µs Not connected :100 – 900 µs 24V: 10.000 – 90.0 00 µs	On CTR-51 pin 3 has three stat us: connected to ground, left u n- connected (open) or connected to 24 V.
4	Trigger 12-24V		
5	Trigger GND		Trigger ground, isolated
63)	Trigger 5V – TTL		Signal low ≤ 0.8V Signal high ≥ 2.0V
7	GND		Ground RS-232, int. connected to device GND
8	RxD		Receive data RS-232
9	TxD		Transmit data RS-232
Pin	**Wire4)**		**Output to light**
105)	black + blue		LED (-)
11	white + brown		LED (+)

1. Dimmer switched off by factory Needs to be enabled via RS-232.
2. Longer flash times can be set via RS-232
3. Input voltages above 5 V will destroy the trigger input circuit!
4. for MBJ connecting cable and MBJ LED light (-x) without integrated controller
5. Do **NOT** connect to the external ground of the power supply or the ground of the trigger signal! This might destroy connected lights or devices.

Operating modes

Mode……CTR-50 Function ……CTR-51 Function		
STEADY	Continuous light, LED always on	–
AUTO1)	LED-output follows the trigger	LED-output follows the trigger
FLASH	Manual set-up for flash, delay and duration (via RS-232 only)	Flash-on-trigger with set flash duration via rotary sw itches or RS-2322)
OFF	LED output switched off	

1. The CTR-50 factory setting of the operation mode is AUTO. Other operating modes are selectable via the RS-232 interface.
2. The CTR-51 factory setting of the operation mode is FLASH. Other operating modes are selectable via the RS-232 interface.

Detection of the light source
After the CTR is powered on, it remains in detection mode until an LED illumination has been connected and detected.
Afterwards the CTR starts operation.

RS-232
The serial interface allows changing the operation mode and set-up of individual timings and currents. The control commands are described in a separate RS-232 manual which can be found at:
www.mbj-imaging.com/en/products/led-controller.
Rotary Switches
Use the rotary switches to set-up the allowed current for the connected LED.
Please check the LED light manufacturer's manual to make sure not to exceed the maximum LED current.
Upper rotary switch

Position	CTR-50	CTR-51
	LED current 1 A steps	Flash current
0	0 A (to 0.9 A)1)	Controlled via RS-232 (0 – 30 A)2)
1	1 A (to 1.9 A)	1.0 A
2	2 A (to 2.9 A)	1.5 A
3	3 A (to 3.9 A)	2.1 A
4	4 A (to 4.0 A)	3.1 A
5	–	4.5 A
6	–	6.5 A
7	–	9.4 A
8	–	13.7 A
9	–	20.0 A

1. CTR-50: If both rotary switches are set to 0 the factory default setting for the current is 50 mA

2. CTR-51: The factory default setting is 150 mA

Lower rotary switch

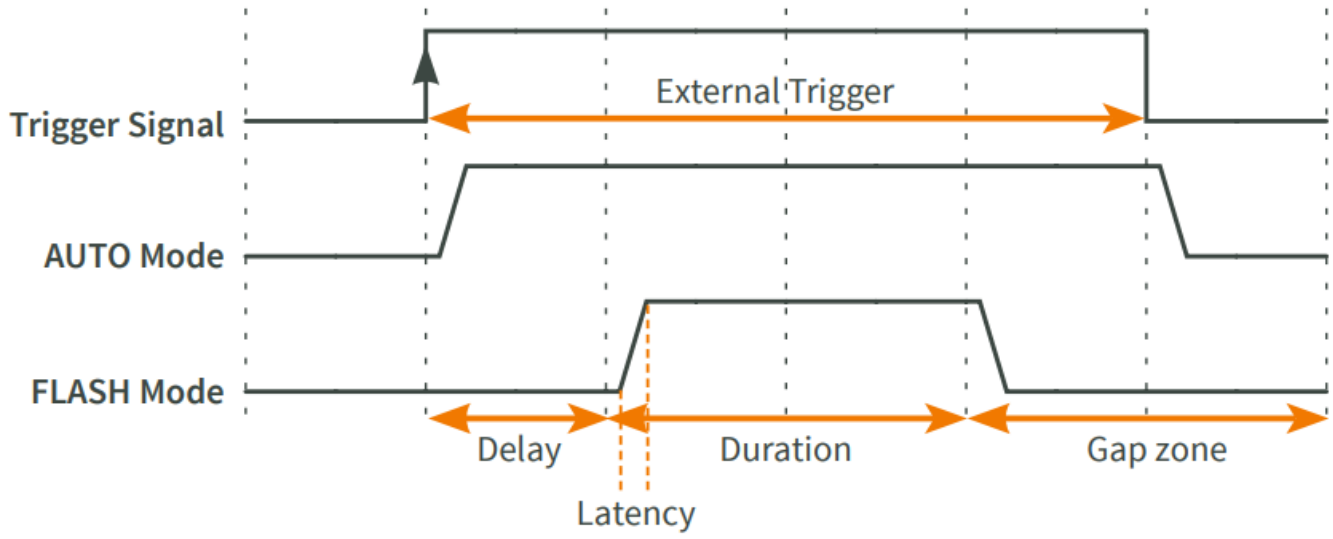
Position	**CTR-50**	**CTR-51**		
	LED current 0.1 A steps1)	Flash duration 2)		
		Pin 3 on GND	Pin 3 – open	Pin 3 on 24 V
0	add 0 mA	Controlled via RS-232 (0 – 30 A)		
1	add 100 mA	10 µs	100 µs	1 ms
…	…	…	…	…
9	add 900 mA	90 µs	900 µs	9 ms

1) CTR-50: If both rotary switches are set to 0 the factory default setting for the current is 50 mA
2) CTR-51: Shorter and longer flash times (5 µs – 100 ms) can be set via RS-232.

Specification	**CTR-50**	**CTR-51**
Electrical parameter		
Operating Voltage	min. 2 V above the forward voltage of the LED light source	
LED steady current1) (ON & AUTO mode)	50 mA … 4000 mA	150 mA … 1000 mA (AUTO mode only)
LED flash current2)	50 mA … 4000 mA	150 mA … 30 A
Min flash duration	2 ms depending on LED work- ing point and duty cycle	5 µs depending on LED work- ing p oint and duty cycle
Max. flash duration	59 s	60 ms
Max. flash latency3)	< 500 µs	< 1 µs
Max. flash frequency	< 500 Hz	25 kHz
Flash duration & delay: smallest adj ustable step	10 µs	1 µs
Voltage range for LED modules	approx. 2 V to 22 V	

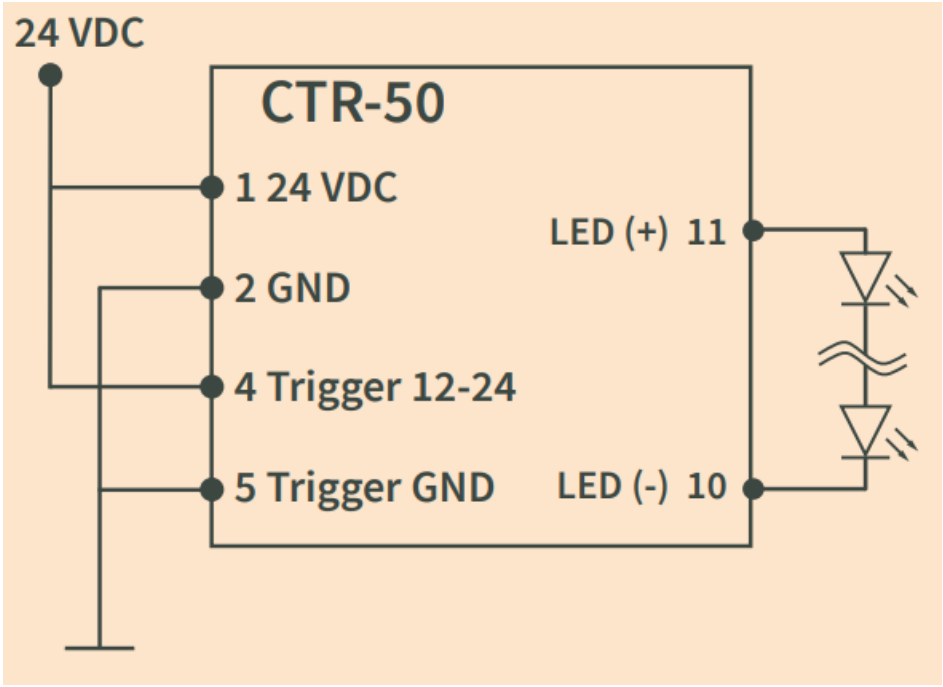
Mechanical parameter	
Dimension (H x W x D)	36 mm x 80 mm x 93 mm
Weight	350 g
Connectors	2 Pin plug contact (RM5.08), 7 Pin plug contact (RM3.81), 2 Pin inv. plug contact (RM3.81)
Certifications	CE, RoHS, EN61000-6-2, EN61000-6-4
Degree of protection	IP20
Humidity	30% to 70%
Operating temperature	Max. 45°C (duty cycle < 50 %)
Accessories	Top rail mounting clip and plugs (scope of delivery). For cable, mounts and lighting modules please check www.mbj-imaging.com

1. LED current less than 100 mA may cause LED light flickering
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.

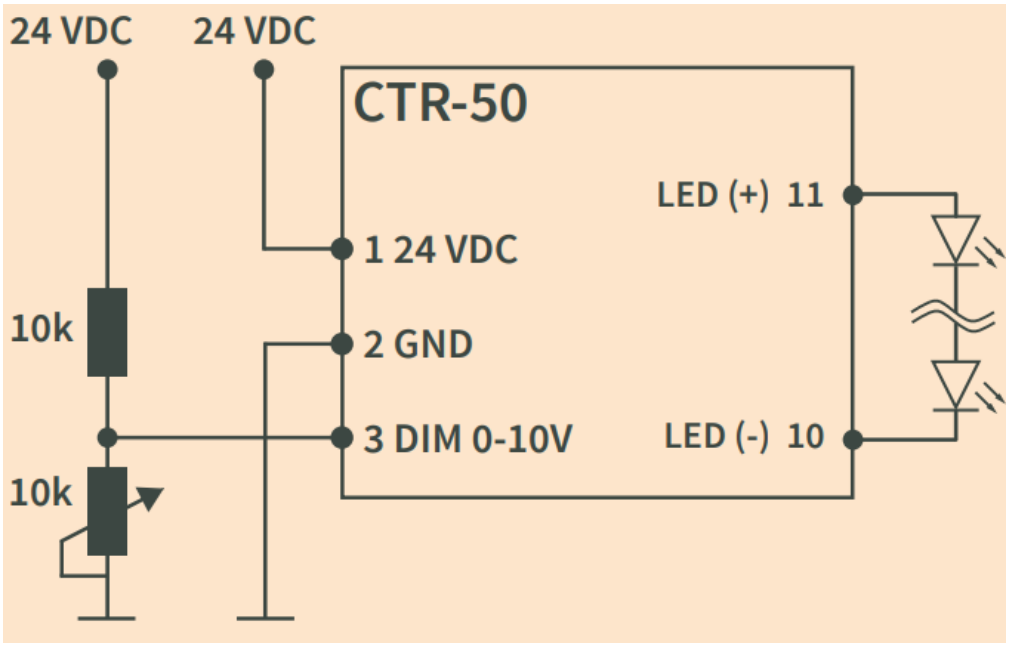


Application Samples for CTR controller

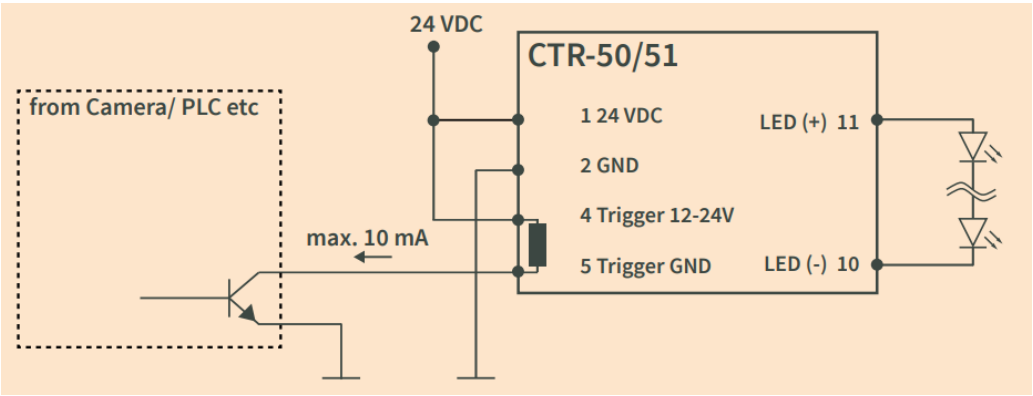
Steady light



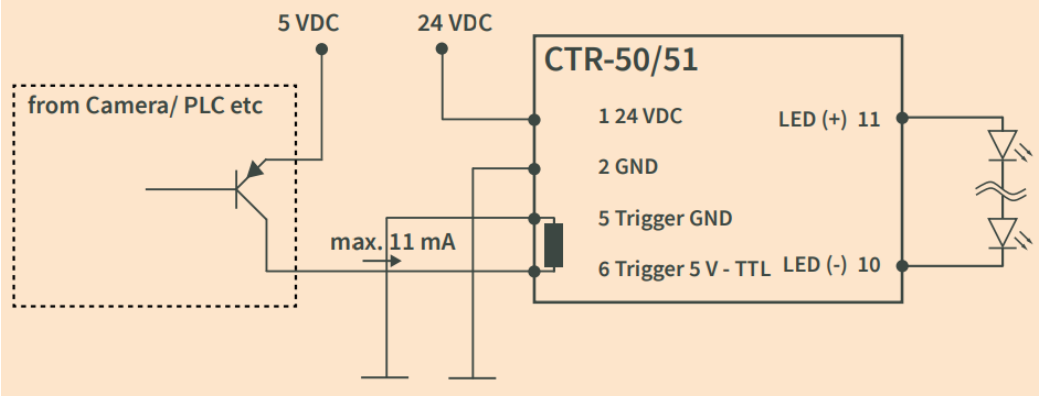
Steady light with brightness control (CTR-50 only)



24 VDC triggered light , Common emitter, sinking (NPN) Inverted strobe signal

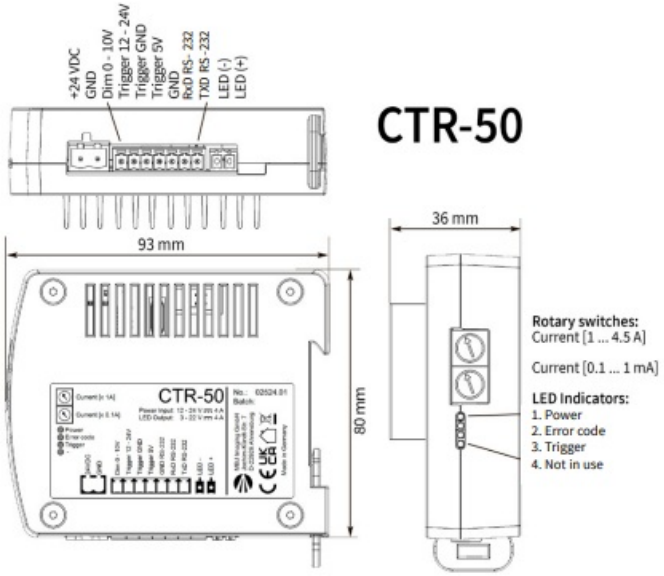


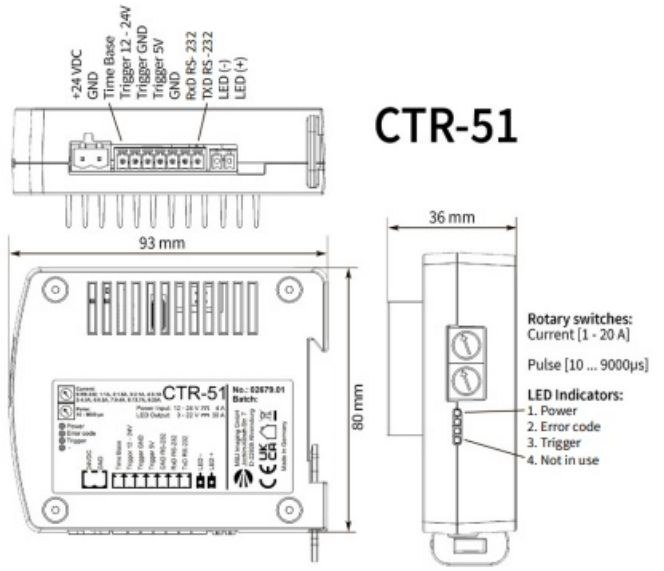
5 V triggered light, Common collector, sourcing (PNP)



Mechanical Integration

The CTR controllers are supplied with screwable plug-contacts for power supply, control signals, RS-232 interface and the LED light. The controller is made for top hat rail mounting, a clip locks the unit to the top hat rail.





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 a 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-50/51

LED	Name	Status	Meaning
1	Power	OFF ON	Power input off Power input on
2	Status1)	OFF ON s-s-l-l s-l-l-l s-l-s-l s-s-s-s	LED light switched off LED light switched on No current, no LED connected Trigger received while still in IRQ2) (Flash + gap zone), trigger lost Max allowed temperature reached Check serial RS-232 status in logs
3	Trigger	OFF ON	Trigger low state Trigger high state

1) s = short flash, l = long flash
2) IRQ = interrupt request

imaging starts with light
MBJ Imaging GmbH
Jochim-Klindt-Straße 7 +49 41 02 77 89 0 – 31
22926 Ahrensburg, Germany
sales@mbj-imaging.com
www.mbj-imaging.com

03736.07 Manual MBJ Controller CTR-50/51, Juni 2023

Documents / Resources

MBJ CTR-50 Controller [pdf] Instruction Manual
CTR-50 Controller, CTR-50, Controller

References

- imaging.com is for sale | www.brandforce.com
- MBJ - LED Beleuchtungen für industrielle Bildverarbeitung
- LED Controller - MBJ Imaging
- User Manual