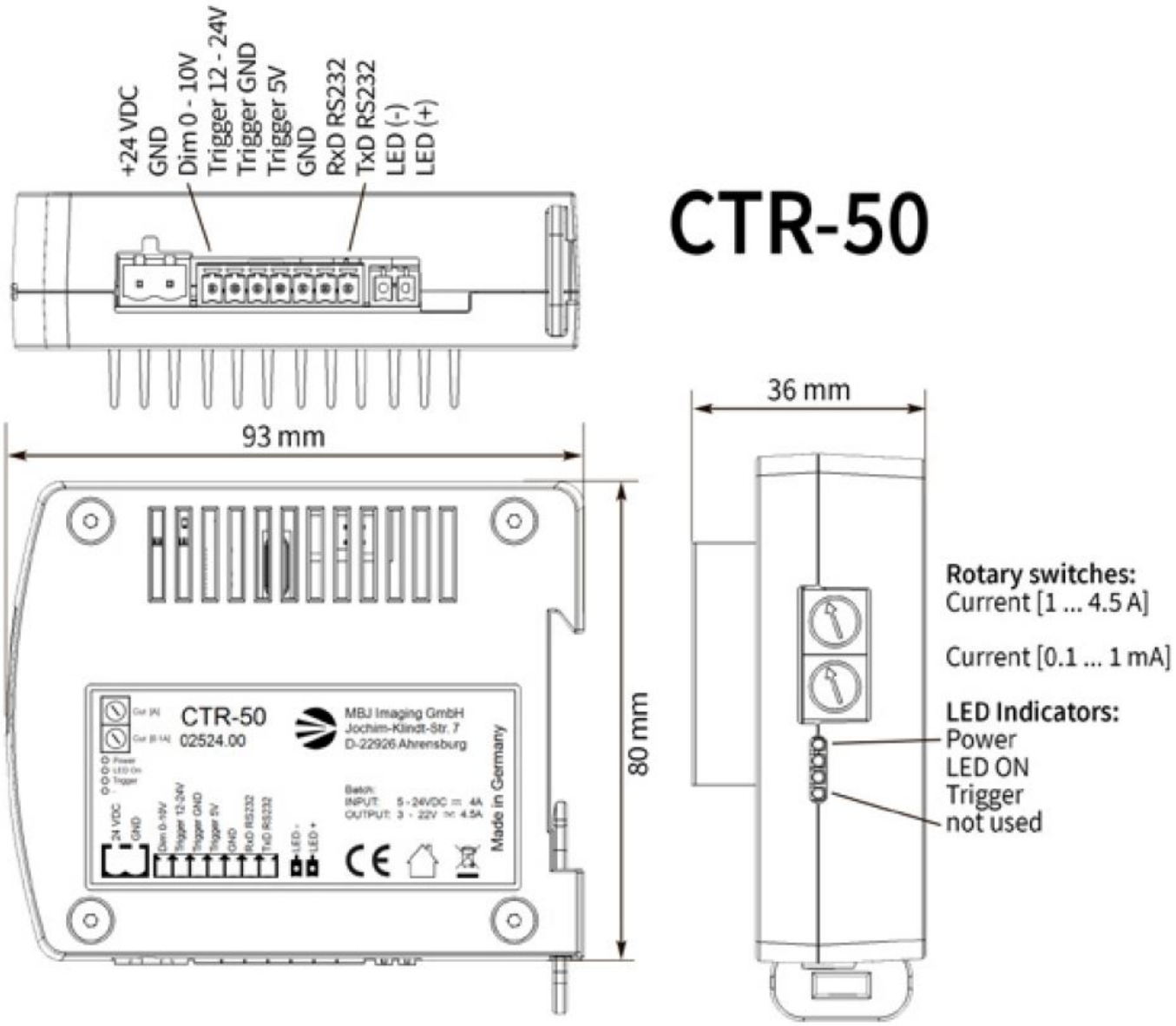
MBJ CTR-51 Controller Instruction Manual

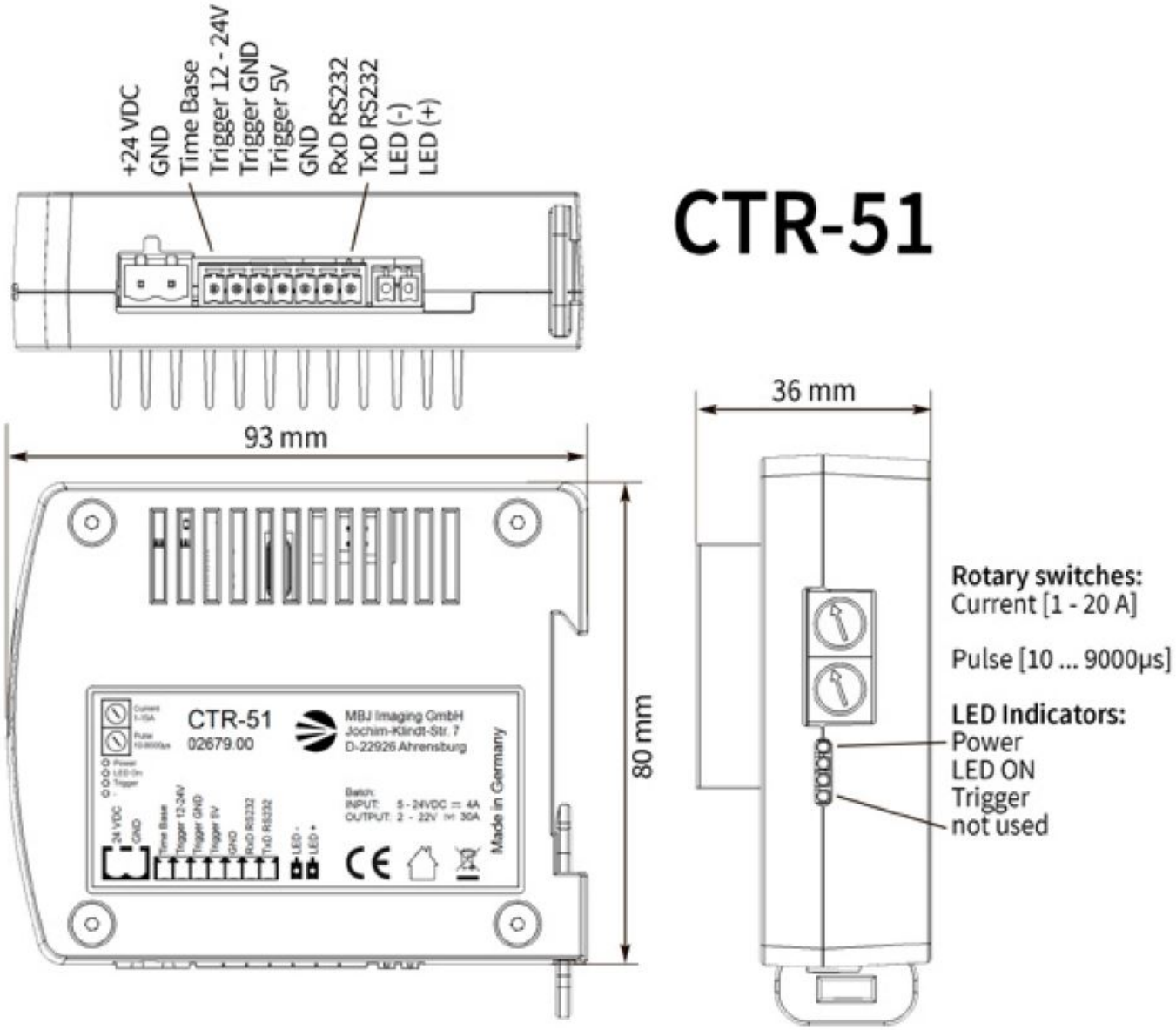
Contents

MBJ CTR-51 Controller

Mechanical Integration

The CTR controllers are supplied with plug-contacts for the LED light, control signals, RS232 interface and input power. The controller is made for top hat rail mounting, a clip locks the unit to the top hat rail.





More 2D and 3D drawings can be found online: www.mbj-imaging.com

Safety Notes

Before working with this unit, read the warning and application instruc-tions 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	**Status**	**Meaning**
LED	Status	Meaning
1 Power	OFF ON	Controller power input – off Power input – on
2 Status1)	OFF ON	LED light switched off LED light switched on
	s-s-l-l	No current, no LED connected
	s-l-l-l	Trigger received while still in IRQ2) (Flash + gap zone), trigger lost
	s-l-s-l	max allowed temperature reached
	s-s-s-s	check serial RS232 status in logs

3 Trigger	OFF ON FLASH	Trigger low state Trigger high state 4x: system boot sequence
4 MBJ	OFF	Not in use

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

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 precise and high-power LED flashes, precise flash pulses from 1µs to 100ms
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	24V DC		Controller power input
2	GND		Device ground
Pin	**Function**	**Function**	**Comment**
3	Dimmer 0V … 10V1) 0V= 0% of sel. current 10V=10 0% of sel. current	Time base multiplier for rotary swit ch2) Ground: 10 – 90µs Not connected: 100 – 900µs 24V: 10.000 – 90.000µs	On CTR-51 pin 3 has three stat us: connected to ground, left u n- connected (open) or connected to 24V.
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 RS232, int. connected to device GND
8	RxD		Receive data RS232
9	TxD		Transmit data RS232
Pin	**Wire4)**	**Wire4)**	**Output to light**
105)	black + blue		LED (-)
11	white + brown		LED (+)

1. Dimmer switched off by factory default. Needs to be enabled via RS232. Without con-nection to pin 3, when dimmer is activated, intensity is like 0V = 0% of selected current
2. Longer flash times can be set via RS232
3. Input voltages above 5.5V 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 mode

Mode CTR-50 Function		Mode CTR-51 Function	
STEADY	Continuous light, LED always on	–	no support for continuous light, use CTR-50
AUTO1)	LED-output follows the trigger	AUTO	LED-output follows the trigger
FLASH	Manual set-up for flash, delay and duration (via RS232 only)	FLASH2)	Flash-on-trigger with set flash duration (RS232)
OFF	LED outputs switched off	OFF	LED outputs switched off

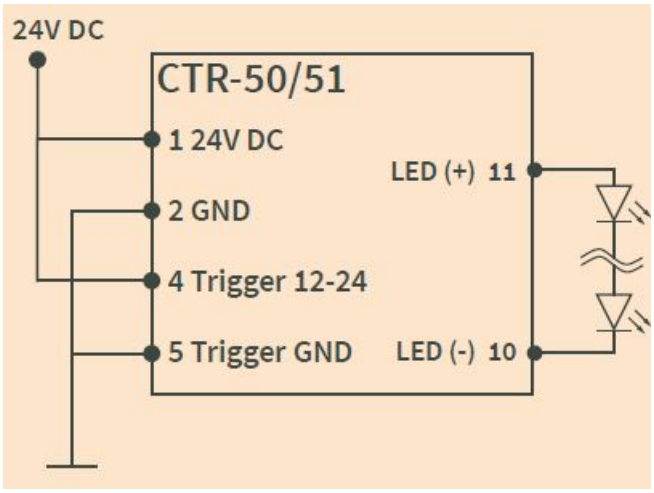
1. The CTR-50 factory setting of the operation mode is AUTO. Other operating modes are selectable via the RS232 interface.
2. The CTR-51 factory setting of the operation mode is FLASH. Other operating modes are selectable via the RS232 interface.

Detection of the light source

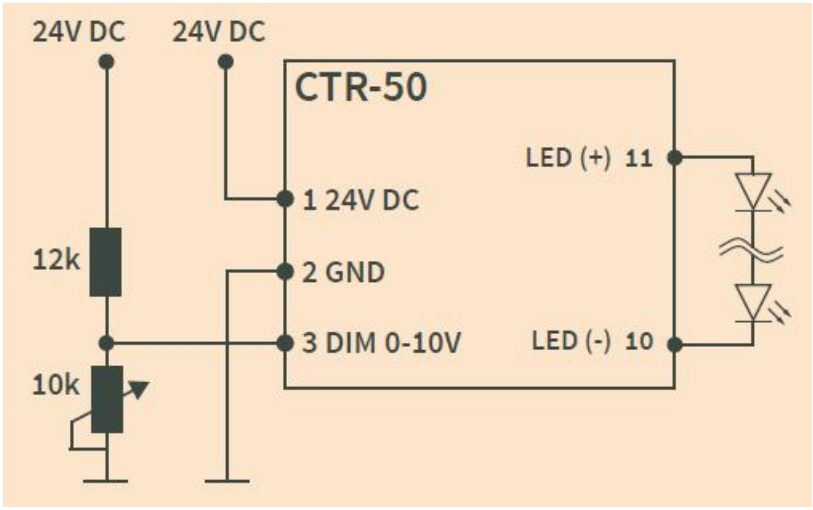
After the CTR is supplied with voltage, it remains in Detect Mode until an illu-mination has been detected. Then the CTR changes to the selected mode.

Application Samples for CTR controller

Steady light



Steady light with brightness control (CTR-50 only)



RS232

The serial interface allows changing the operation mode and setup of individ-ual timings and currents. The control commands are described in a separate RS232 manual.

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 1A steps	Flash current 2)
01)	0A (to 0.9A)	Controlled via RS232 (0 – 30A)
1	1A (to 1.9A)	1.0A
2	2A (to 2.9A)	1.5A
3	3A (to 3.9A)	2.1A
4	4A (to 4.0A)	3.1A
5		4.5A
6		6.5A
7		9.4A
8		13.7A
9		20.0A

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

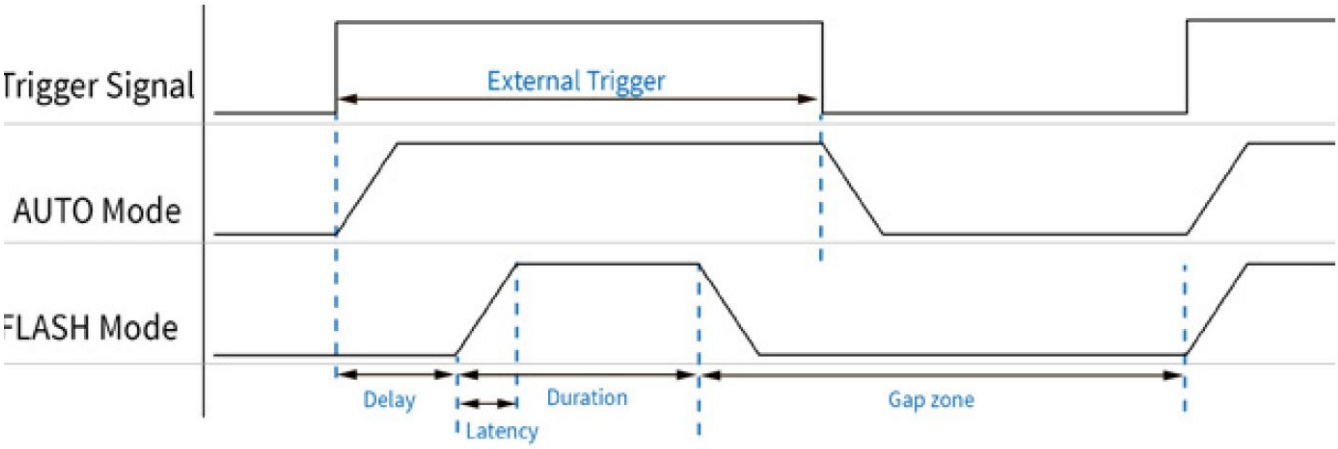
50mA

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

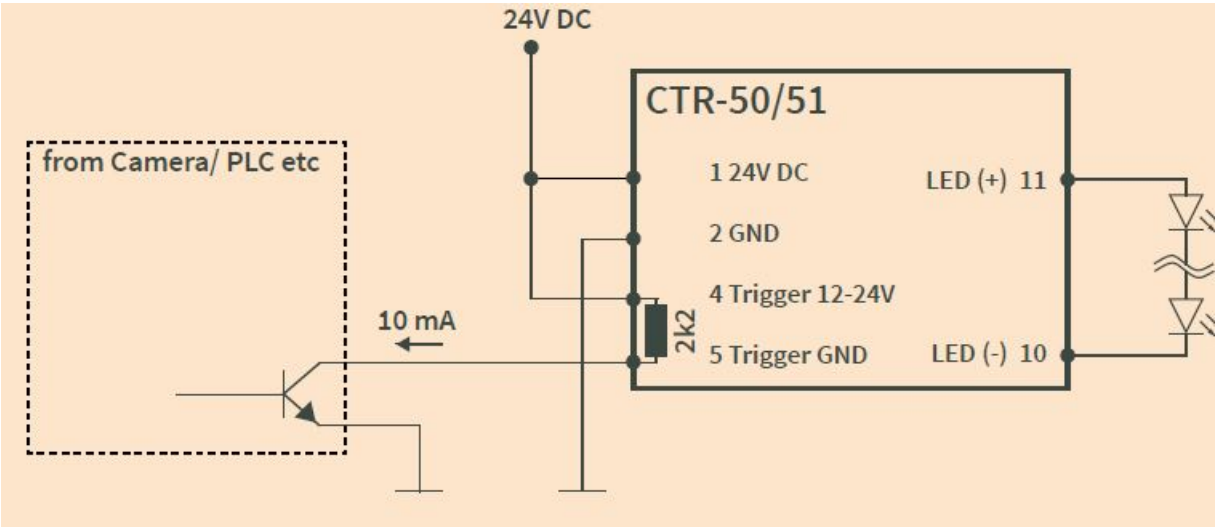
Lower rotary switch

Position	**CTR-50**	**CTR-51**		
	LED current 0.1A steps1)	Flash duration 2)		
		Pin 3 on GND	Pin 3 – open	Pin 3 on 24V
0	add 0mA	Controlled via RS232 (0 – 30A)		
1	add 100mA	10µs	100µs	1ms
…	…	…	…	…
9	add 900mA	90µs	900µs	9ms

1. CTR-50: If both rotary switches are set to ‘0’, the current is 50mA, the factory setting for the current is 50mA
2. CTR-51: Shorter and longer flash times (1µs – 100ms) can be set via RS232.



Triggered light with NPN sinking output (inverted strobe signal, open collector)



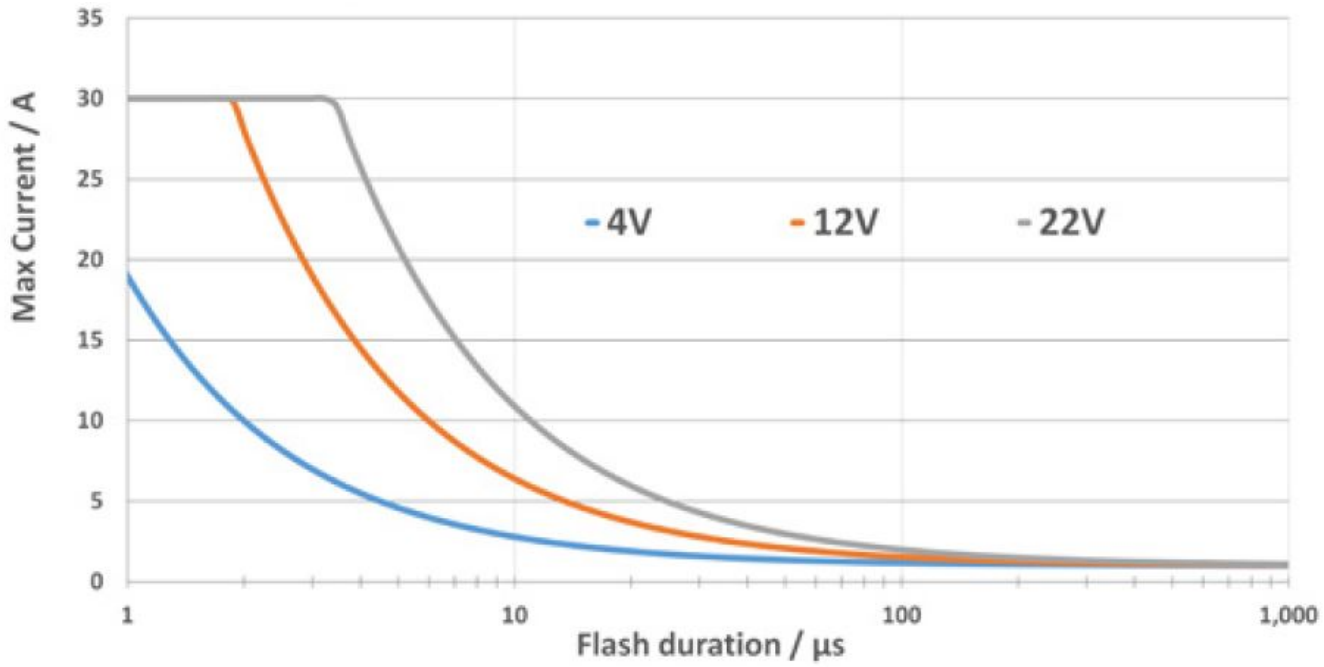
Specification	**CTR-50**	**CTR-51**
Electrical parameter		

Operating Voltage	24V DC/ 4.5A 5V – 26V, min. 2V above the forward voltage of the LED light source	
LED steady current1) (ON & AUTO mode)	50mA … 4000mA	150mA … 1000mA (AUTO mode only)
LED flash current2)	50mA … 4000mA	150mA … 30A
Min flash duration	2ms depending on LED work- ing p oint and duty cycle	1µs depending on LED work- ing po int and duty cycle
Max. flash duration	59s	
Max. flash latency3)	<500µs	<1µs

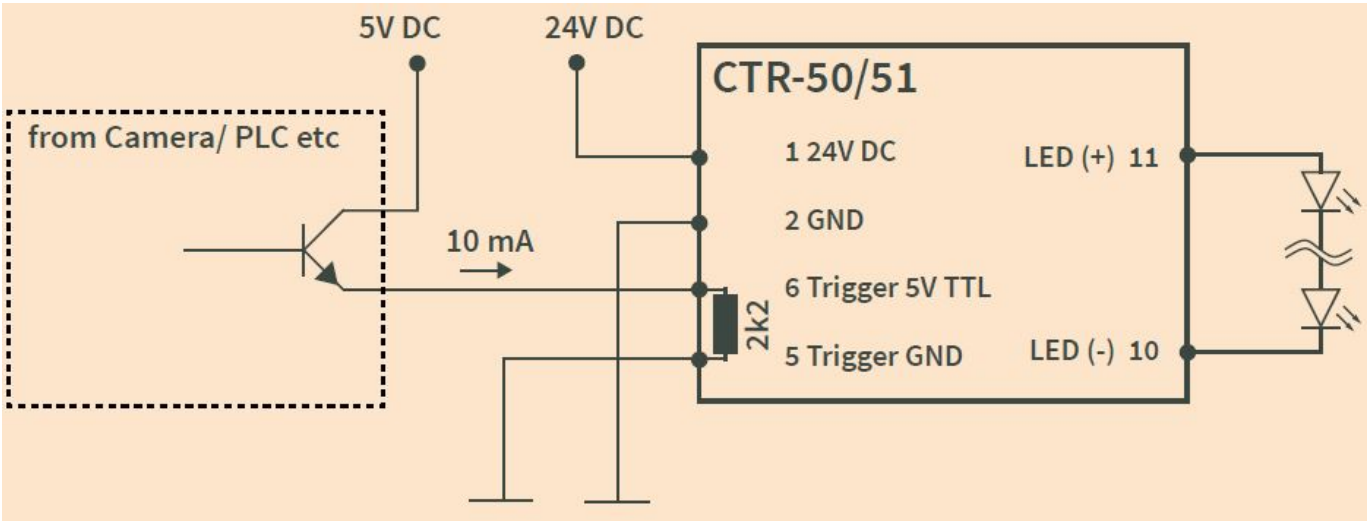
Flash duration & delay: smallest adjustable step	10µs	1µs
Voltage range for LED modules	approx. 2.5V to 22.0V	
Mechanical parameter		
Dimension (H x W x D)	36mm x 80mm x 93mm	
Weight	350g	
Connectors	2 Pin plug contact (RM5.08), 7 Pin plug contact (RM3.81), 2 Pin inv. plug contact (RM3.81)	
Certifications	CE, RoHS, EN61000-6-2, EN61000-6-4	

Degree of protection	IP20 (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 www.mbj-imaging.com

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.



TTL triggered light with PNP sourcing (open emitter)



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Manual CTR50/51 Controller: Revision 05 – 18 Mai 2021. INDD file Rev09.

Documents / Resources

	**MBJ CTR-51 Controller** [pdf] Instruction Manual CTR-50, CTR-51, CTR-51 Controller, Controller

References

- **imaging.com is for sale | www.brandforce.com**
- **MBJ - LED Beleuchtungen für industrielle Bildverarbeitung**