

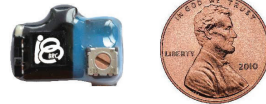
Teleopt^o

Wireless Optogenetic Stimulator

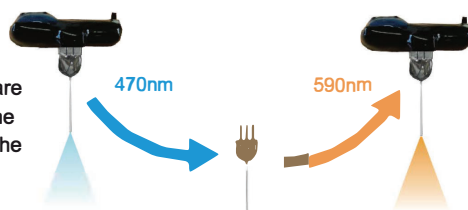


Best Solution in Optogenetic Stimulation for Freely Moving Animals !

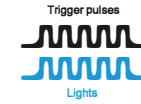
In optogenetics experiment, an optic fiber connected to the head of an animal restricts animal behavior especially in test cages with high walls, gates and other obstacles. Teleopto breaks this wall by enabling complete wireless environment for optogenetic stimulation, using very light receivers sitting perched on animal's head.



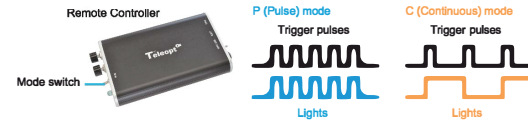
Extra small, extra light receivers even suitable for mice.



High brightness LED and optic fiber cannula are coupled to achieve mW order light power at the tip. Colors can be changed just by swapping the LED cannula component.



Remote controller accepts trigger signals from a stimulator, and sends the signals to the receiver. Synchronized light pulses are generated from the tip of the LED cannula (in pulse mode).



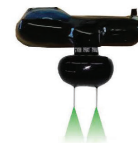
Receiver has two types, pulse and continuous, each for high frequency and continuous stimulation. The remote controller is compatible for both receivers, by switching the mode switch. Pulse receiver flashes at the same timing with trigger pulses, whereas continuous receiver alternates on and off upon a new pulse.



Some opsins are activated by blue light and inactivated by yellow light. Together with the 2 channel receiver and two color LED cannula, you can stimulate by two different colors at the same position. The remote controller accepts two independent triggers.



Receiver can be charged and re-used repeatedly, by a dedicated charger.



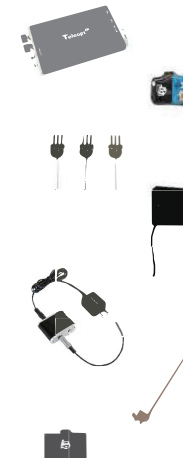
Bilateral stimulation is possible. If you want to stimulate both hemisphere simultaneously please use 1ch receiver. If you want to stimulate each hemisphere one by one, please use 2ch receiver.



Two color LED probe for surface stimulation

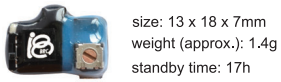
Teleopto Standard Set model: **Teleopto-set**

- 1x Teleopto remote controller
- 1x Teleopto receiver
*Please specify receiver type.
2g/pulse will come without specifying.
- 3x LED cannula
*Please specify cannula type.
Blue/10mm/φ250 will come without specifying.
- 1x Infrared emitter
- 1x Teleopto charger
- 1x Cannula insertion tool
- 1x Dummy receiver
- 1x Trigger Cable



Specifications	
Communication	Infrared
Transmission Range	Controller: 1m, directional Infrared Emitter: 3m, directional
Receiver	
1g Receiver	approx. 1.4g, standby time: 17h
2g Receiver	approx. 2.0g, standby time: 28h
3g Receiver	approx. 3.0g, standby time: 49h
Controller I/O	
Trigger Input	3-5V TTL, 2ch
	P1/P2 mode: On@Hi, Off@Lo C mode: Toggle On/Off@rising
Ext Port	For extending Infrared emitter or TeleHub8
LED Cannula Size	φ250, 500 or 750μm
Power Source	Controller: DC5V Charger: DC5V

Teleopt[®] Receivers



size: 13 x 18 x 7mm
weight (approx.): 1.4g
standby time: 17h



size: 17 x 19 x 7mm
weight (approx.): 2.0g
standby time: 28h

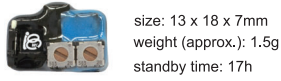


size: 18 x 22 x 8mm
weight (approx.): 3.0g
standby time: 49h

Teleopto receiver 1g / pulse
model: **TeleR-1-P**

Teleopto receiver 2g / pulse
model: **TeleR-2-P**

Teleopto receiver 3g / pulse
model: **TeleR-3-P**



size: 13 x 18 x 7mm
weight (approx.): 1.5g
standby time: 17h



size: 17 x 19 x 7mm
weight (approx.): 2.1g
standby time: 28h

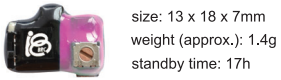


size: 18 x 22 x 8mm
weight (approx.): 3.1g
standby time: 49h

Teleopto receiver 1g / 2ch pulse
model: **TeleR-1-2P**

Teleopto receiver 2g / 2ch pulse
model: **TeleR-2-2P**

Teleopto receiver 3g / 2ch pulse
model: **TeleR-3-2P**



size: 13 x 18 x 7mm
weight (approx.): 1.4g
standby time: 17h



size: 17 x 19 x 7mm
weight (approx.): 2.0g
standby time: 28h



size: 18 x 22 x 8mm
weight (approx.): 3.0g
standby time: 49h

Teleopto receiver 1g / continuous
model: **TeleR-1-C**

Teleopto receiver 2g / continuous
model: **TeleR-2-C**

Teleopto receiver 3g / continuous
model: **TeleR-3-C**



size: 17 x 19 x 7mm
weight (approx.): 2.1g
standby time: 28h

Teleopto receiver 2g / 2ch continuous
model: **TeleR-2-2C**

typical power (tested with TeleR-2-P, TeleLC, LPM-100)	
Blue / ϕ 250 μ m	5.5mW (=121.6mW/mm ²)
Blue / ϕ 500 μ m	16.0mW (=88.5mW/mm ²)
Green / ϕ 250 μ m	2.0mW (=40.8mW/mm ²)
Green / ϕ 500 μ m	4.0mW (=22.1mW/mm ²)
Yellow / ϕ 250 μ m	2.0mW (=40.8mW/mm ²)
Yellow / ϕ 500 μ m	4.0mW (=22.1mW/mm ²)

Red / ϕ 250 μ m	6.5mW (=144.3mW/mm ²)
Red / ϕ 500 μ m	16.0mW (=88.5mW/mm ²)

LED Cannulas



LED cannula
model: **TeleLC-c-l-d**

Single cannula.
Hard enough for insertion
without a guide.



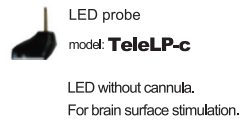
Bilateral LED cannula
model: **TeleLCD-c-l-d-i**

For bilateral stimulation.



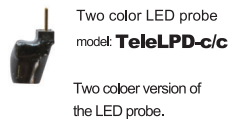
Two color LED cannula
model: **TeleLCT-c-c-l**

Two 250 μ m cannulas are
bundled like one cannula.



LED probe
model: **TeleLP-c**

LED without cannula.
For brain surface stimulation.



Two color LED probe
model: **TeleLPD-c-c**

Two color version of
the LED probe.



LED Ferrule
model: **TeleLF-c-d-f**

Universal ferrule for
connection with
ferruled cannula.

Note: how to identify specifications from the model number:

c: color, **B** (blue 470nm) / **G** (green 530nm) / **Y** (yellow 590nm) / **R** (red 630nm) ... for other colors please contact us.

l: Length. Specify in mm.

d: Fiber diameter. **250** (ϕ 250 μ m) / **500** (ϕ 500 μ m) / **750** (ϕ 750 μ m)

i: Fiber interval. Specify in mm. **-Glass**: Glass fiber instead of the regular plastic fiber. Only available for ϕ 250 μ m Fiber.

f: Ferrule OD (LED ferrule only). **1.25mm** / **2.5mm**

Accessories



Teleopt Charger
model: **TeleCharger**
TeleCharger-4 (4ch)
Additional chargers would be
useful if you use several receivers.



Infrared Emitter
model: **TeleEmitter**
Longer transmission, 3m.



Infrared Emitter (Clip type)
model: **TeleEmitter-C**
1m transmission.



Cannula Insertion tool
model: **TeleTool**
For use with a steleotaxic
for insertion. ϕ 1.3mm.



Dummy Receiver
model: **TeleDummy**
For habituation.

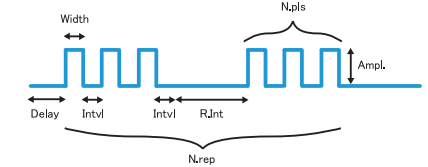


Specification	
Stim Channel	2ch (Independent)
Trigger In	2ch (Independent)
Parameter	
Delay	100 μ s - 9990s
Width	100 μ s - 9990s
Interval	100 μ s - 9990s
Pulse number	1 - 999
Repeat interval	100 μ s - 9990s
Repeat number	1 - 999
Amplitude	0.1 - 5.0V
Memory	Yes
Endless Repeat	Yes
Power	DC5V

Stimulator for optogenetics

model: **STOmk-2**

STO mk-II is a pulse generator developed for optogenetics. By connecting the STO mk-II to TRG port on the Teleopto Remote Controller via a trigger cable, you can control the timing of light stimulation by TTL pulses. Pulses are defined by the parameters illustrated below.



Specification	
Wavelength	470nm (blue) 530nm (green) 590nm (yellow) 630nm (red)
Display	Liquid crystal
Resolution	0.01mW
Analog out	0 - 5V
Power	2x AA batteries

Light power meter

model: **LPM-100**

In optogenetics, it is important to measure the light power at the tip of optic fiber cannula, and the LPM-100 is best suited for this purpose. LPM-100 covers three colors, blue, green, yellow and red which are commonly used in optogenetics.

Easy to use, mobilable by the battery-powered design.

6 channel Hub

model: **TeleHub6**



By connecting the TeleHub6 to the EXT port on the Teleopto Remote controller, you can use up to 6 infrared emitters at the same time so that you can increase the throughput of your experiment. This device is also useful if you use a maze with many branches or high walls which block infrared signal and prevent a good transmission. By putting several infrared emitters at several positions, it ensures more stable light stimulation.

Note: All infrared emitters send a signal at the same timing.

