Commutators for Electrical and Optical Cable Management

Neuroscience research involving behavioral tests may require animals to move freely within the confines of the experimental field often while tethered to research equipment via various cables. A commutator is a swivel that keeps those cables untangled as the animal perform the tasks. Plexon offers a several specialty commutators supporting optogenetics as well as neural recording with low or high channel count systems using analog or digital headstages.

PlexBright® Compatible Commutators

Plexon offers three commutators designed to support optogenetic research, of which two also support simultaneous neural recording. All three have the following in common:

- Easily facilitates unilateral or bilateral stimulation
- Light-weight, low torque design for experiments with animals as small as mice
- Passive actuation mechanism
- Compatible with all PlexBright® Compact LED Modules
- Compatible with PlexBright 4 Channel Optogenetic Controller or PlexBright LD-1 Single Channel Driver

Features	PlexBright Dual LED Commutator	PlexBright Dual v+ 16 Channel Commutator	Carousel Commutator	Motorized Carousel Commutator
Ideal Application	Experiments in which the only tethered cables are as a result of the optogenetic stimulation	Experiments in which optogenetic stimulation is performed simultaneously with low channel count neural recording using analog headstages	Experiments in which optogenetic stimulation is performed simultaneously with neural recordings using digital headstages	Experiments in which optogenetic stimulation is performed simultaneously with neural recording using digital headstages
Plexon data acquisition system compatibility	None	- OmniPlex® D System with a DigiAmp™ or MiniDigi™ digitizing amplifier, - OmniPlex System with an analog amplifier, or - MAP System	OmniPlex D System utilizing a Digital Headstage Processor (DHP)	OmniPlex System utilizing a Digital Headstage Processor (DHP)
Headstage compatability	None	Analog	Up to 2 digital	Up to 4 digital
Electrical channels	Experiments in which the only tethered cables are as a result of the optogenetic stimulation	Experiments in which the only tethered cables are as a result of the optogenetic stimulation	Depends on channels per headstage (any combination of 16 or 32 channel headstages, up to 64 channels)	N/A
Total Lines	4	25	20	40

Standard Commutator

Plexon's Standard Commutators are robust, highly effective, compact, lightweight and engineered for applications involving small animals utilizing 32 channels or less when recording with analog headstages.

- Unique slip ring design ensures signal integrity from headstage to data acquisition system

- Optional torque arm for enhancing effectiveness in large enclosures

Standard Motorized Commutator

Plexon's Motorized Standard Commutators are highly sensitive, electromechanical devices designed to respond to exceptionally low actuation forces – even when research requires high channel counts up to 128 channels. They are best for use in high channel count neural recording with analog headstages.

- Highly sensitive magnetic Hall-effect sensor technology

- Nearly noiseless actuation, both electrically and acoustically

- Three speed step sizes

Technical Specifications

Features	16 Channel Commutator	32 Channel Commutator
Headstage compatibility	Analog	Analog
Data channels	16	32
Total lines	20	36
Input connectors	1	2
Actuation mechanism	Passive	Passive

Technical Specifications

Features	32 Channel Commutator	64 Channel Commutator	96 Channel Commutator	128 Channel Commutator
Headstage compatibility	Analog	Analog	Analog	Analog
Data channels	32	64	96	128
Total lines	52	90	130	170
Input connectors	2	4	6	8
Actuation mechanism	Contactless	Contactless	Contactless	Contactless
Actuation force	300µNm	400µNm	400µNm	1000µNm

Commutator Comparison Table

Features	Dual LED Commutator	Dual LED + 16 Channel Commutator	Carousel Commutator	Standard Commutator	Standard Motorized Commutator
Optogenetics	✔	✔	✔		
Neural Recording		✔	✔	✔	✔
Digital headstages			✔		
Analog headstages		✔		✔	✔