

Quick Switch Rodent Headstage

Instructions for Use



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Table of Contents

Contraindications	3
Warnings	3
Cautions	3
1 Introduction	4
2 Hardware	5
2.1 Quick Switch Rodent Headstage Pin-out.....	5
2.2 Headstage LED indicators	6
2.3 Small Rodent Headstage Switches	6
3 Instruction for Assembly	6
4 Specifications	7
5 Warranty	8
5.1 Return Merchandise Authorization (RMA).....	8

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Contraindications

- The Quick Switch Rodent Headstage should not be used with any devices that are not directly approved by Blackrock Microsystems.
- The Quick Switch Rodent Headstage should not be used in clinical applications. The headstage is intended for animal research purposes ONLY.

Warnings

- Do not touch exposed electrical conductors when the Quick Switch Rodent Headstage connectors are attached to the subject. Doing so may result in an electric shock to the subject. Irreversible damage may occur.
- Do not connect/disconnect any cables to/from the headstage while the system is in use.
- Use caution when placing cables or other connections to minimize the likelihood of tripping or accidentally pulling on the cables. Pulled cables may cause damage to the headstage or other connected devices.
- Do not use the headstage in the presence of flammable anesthetic agents or any other reagents.
- Avoid strong static discharges from sources like television or computer monitors because it can damage the electrical components of the headstage.
- Keep the headstage away from liquids. Contact with water, shower spray, or wet surfaces can lead to the subject receiving an electrical shock.
- Connection of external instruments to the headstage may compromise electrical safety.
- Always use antistatic or electro static discharge (ESD) safe gloves when connecting the headstage.
- Use only the supplied Blackrock Microsystems components (Cerebus™ system). Substitution of components not supplied by Blackrock Microsystems may affect system performance and subject safety.
- Do not leave the subject connected to the headstage when the Cerebus™ System is not in use.
- Do not use damaged components (i.e. cables, headstage). Damaged components may compromise the safety of the subject.

Cautions

- It is recommended that users read the Cerebus™ Stim Switch 128 Channel User Manual prior to reading this manual.
- Read this entire manual prior to using the device.

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1 Introduction

The Quick Switch Rodent Headstage provides 32 channels for neural stimulation applications and high-quality neural recordings. When connected to the Cerebus™ 128-Channel Stim Switch and Data Acquisition Systems (i.e. Front-End Amplifier, Neural Signal Processor), researchers are able to programmatically switch individual electrode channels between a stimulation source and an amplification/recording system. Each Stim Switch can accommodate up to 4 headstages for a total of 128 electrode channels. Figure 1-1 below shows an application overview of how the headstage fits into a complete neural stimulation/recording system.

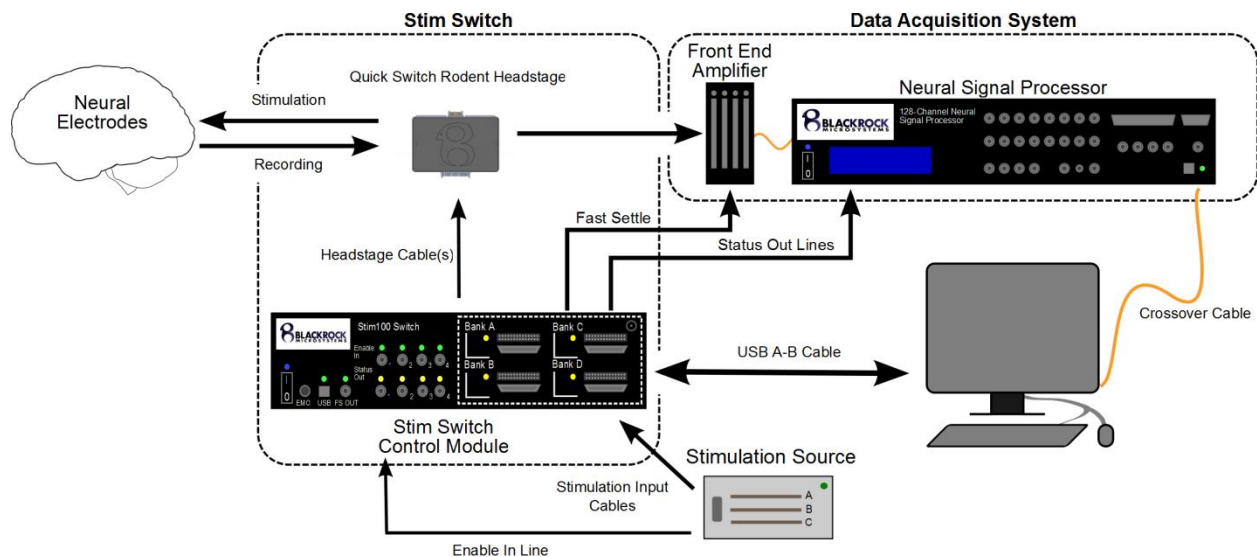


Figure 1-1: StimSwitch Headstage Set-up

The Quick Switch Rodent Headstage is intended for animal research applications ONLY and has been designed to offer a solution for applications which require headstages with a small form factor.

1.1 Packing List

- 1-4 Quick Switch Rodent Headstage(s) - PN 6941
- 1-4 Stim Switch Cable(s) – PN 7187
- 1-4 Front End Amplifier Cable(s) – PN 7188
- 1-4 CHA-32 board(s) – PN 6473

* Please note that the Blackrock Data Acquisition System (Neural Signal Processor, Front-End Amplifier), stimulation source, and PC are not included in the system and must be purchased separately.

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2 Hardware

2.1 Quick Switch Rodent Headstage Pin-out

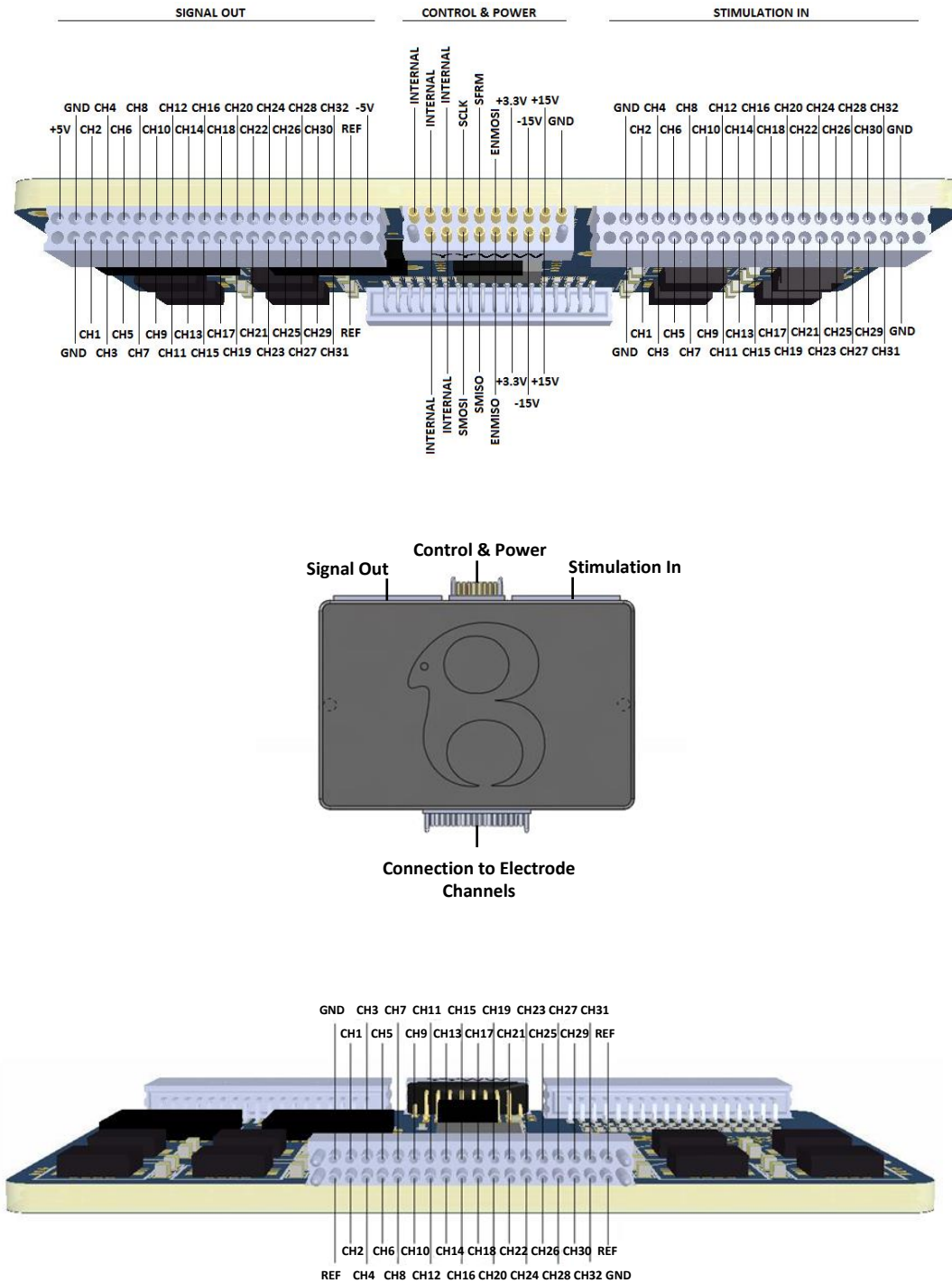


Figure 2-1: Quick Switch Rodent Headstage Pin-Out

2.2 Headstage LED indicators

The Headstage Module provides a connection between the Cerebus Front End Amplifier, the electrodes, and the 128-Channel Stim Switch. LEDs on the back of the headstage indicate power (green), blanking enabled (yellow), and stimulation enabled (blue).



Figure 2-2: Headstage LEDs

2.3 Small Rodent Headstage Switches

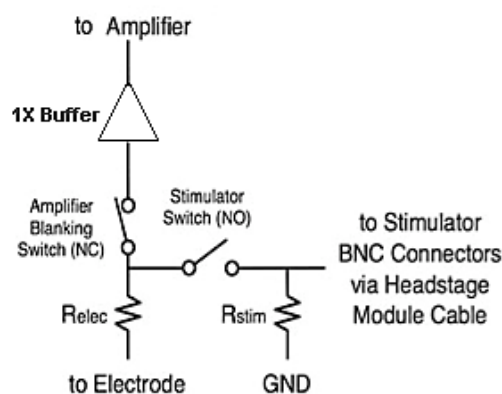


Figure 2-3: Switch Schematic

Each Channel on the Headstage Module is rated for a maximum voltage of ± 15 V with respect to ground and can source or sink a maximum of 30 mA of current. The diagram on the left illustrates the internal connections of a single channel in the Quick Switch Rodent Headstage. The Amplifier blanking switch is closed during read mode and open during stimulation and blanking modes. The stimulator switch is only closed when the headstage module is configured in stimulation mode and the channel has been selected for stimulation using the StimComm software. The table below defines the state of each switch on a single channel for any given set of inputs.

Table 2-1 Small Rodent Headstage Switching Status

Channel State	Amplifier Blanking Switch	Stimulator Switch
Read	Closed	Open
Blanking	Open	Open
Stimulation (channel not set for stimulation)	Open	Open
Stimulation (channel set for stimulation)	Open	Closed

* For more information regarding the use of the 128-Channel Stim Switch and the StimComm software, please refer to the Cerebus™ Stim Switch 128-Channel User Manual.

3 Instruction for Assembly

1. Verify that the Stim Switch and Front-End Amplifier power supply are turned off prior to connecting or disconnecting the Quick Switch Rodent Headstage.
2. Connect the stimulation source to the 'STIM IN' connectors on the front panel of the Stim Switch.
3. Connect the Stim Switch Cable to the Stimulation and Control/Power connectors on the headstage (Figure 3-1). The wording on the connector should face toward the front cover of the headstage (i.e. away from the LEDs).

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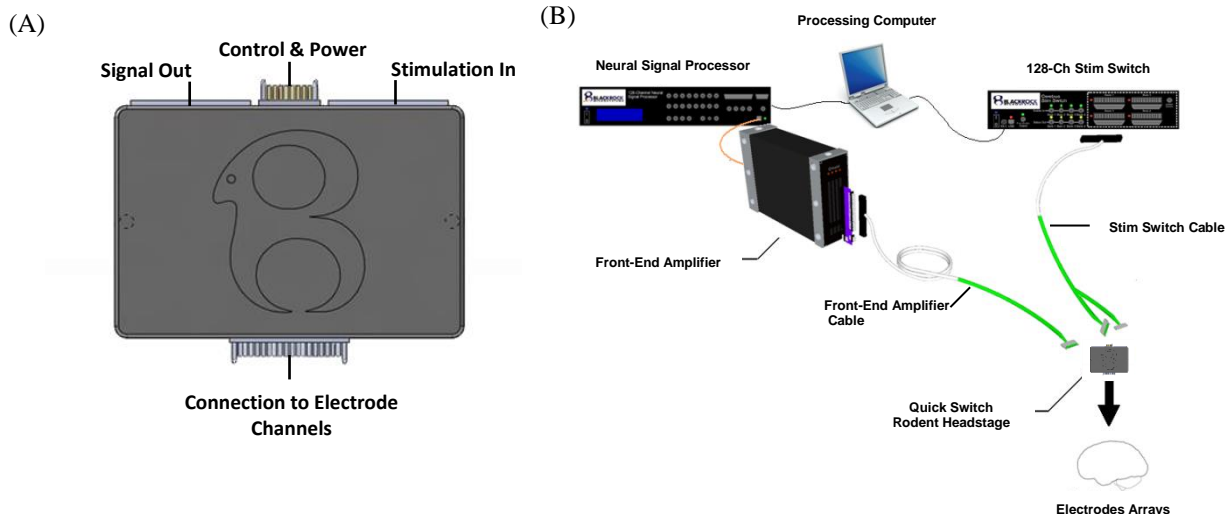


Figure 3-1: (A) Headstage Connections (B) Assembly

4. Connect the other end of the Stim Switch Cable to the Bank A 'HST OUT' connector on the front panel of the 128-Channel Stim Switch. This connection is keyed.
5. Attach a CHA-32 board to Bank A on the Front-End Amplifier.
6. Connect the Front-End Amplifier Cable to the Signal Out connector on the headstage (Figure 3-1). The wording on the connector should face toward the front cover of the headstage enclosure (i.e. away from the LEDs)
7. Connect the other end of the Front-End Amplifier Cable to the CHA-32 board.
8. Attach the headstage to the electrodes.
9. Power on the Stim Switch and verify that the green power LED lights up on the back of the Quick Switch Rodent Headstage.
10. Power on the Front-End Amplifier, Neural Signal Processor and stimulator. The system is now ready for use.

** For further instructions regarding use of the 128-Channel Stim Switch and Data Acquisition System (i.e. Neural Signal Processor, NSP), please refer to their individual user manuals.

4 Specifications

Model Name	Quick Switch Rodent Headstage
Power Requirements	±15VDC, ±5VDC, +3.3VDC
Maximum Stimulation Input Voltage	±15VDC
Maximum Stimulation Input Current	30 mA on any one channel
Water Ingress Protection	Ordinary Equipment, not fluid resistant, IP20
Operating Environment	10°C to 40°C, 5 to 95% R.H. (non-condensing)
Storage Environment	-20°C to 50°C, 5 to 100% R.H. (non-condensing)

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5 Warranty

Blackrock Microsystems, LLC warrants that its products are free from defects in materials and manufacturing for a period of one year from the date of shipment. Blackrock will, at its option, repair or replace any product that does not comply with this warranty. This warranty is voided by:

1. Any modification or attempted modification to the product done by anyone other than an authorized Blackrock employee
2. Any abuse, negligent handling or misapplication of the product.

This constitutes the sole warranty made by Blackrock, LLC. There are no other warranties, expressed or implied, which extend beyond those described herein or to anyone other than the original purchaser, including the implied warranties of merchantability and fitness for a particular purpose. In no event shall Blackrock Microsystems, LLC be liable for any incidental or consequential damages, or for the infringement of any patent rights or third party rights due to the use of its products.

5.1 Return Merchandise Authorization (RMA)

In the unlikely event that your adaptor needs to be returned to Blackrock for repair or maintenance, do not send any equipment back without a Return Merchandise Authorization Number. An RMA number will be issued to you by a Blackrock representative. If you need to obtain an RMA number, you may contact a product support representative at +1 801 839 1062.

Once an RMA number has been issued, it is important to safely pack the returned item for shipping back to Blackrock. It is preferred that you save the original boxes and packing materials that your system arrived in for return shipment. Please address the package as follows:

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