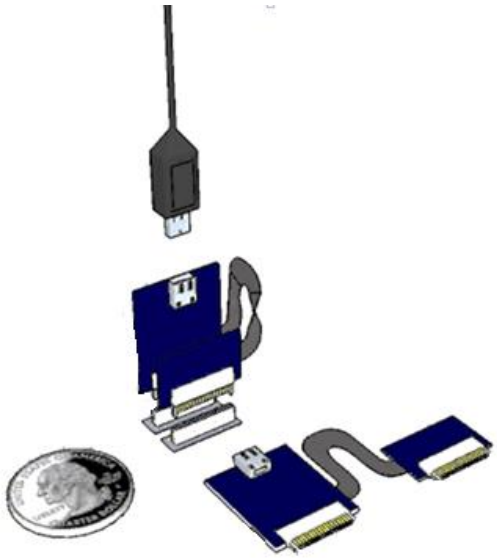
Blackrock NYU Mil-Max Headstage

Instructions for Use

PN-8577



Blackrock Microsystems, Inc.

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Blackrock NYU Mil-Max Cerpelex Headstage
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Table of Contents

1 Warnings, Cautions, and Specifications 3

1.1 Warnings 3
1.2 Cautions 3
1.3 Specifications 3

2 Introduction 4

3 Hardware 5

3.1 Blackrock CerePlex Mini Pin-out 5

4 Instruction for Assembly ..... Error! Bookmark not defined.

5 Warranty 6

5.1 Return Merchandise Authorization (RMA) 6

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630 Komas Drive, Suite 200
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(801) 582-5533

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1 Warnings, Cautions, and Specifications

1.1 Warnings

- Do not touch any exposed electrical conductors when the CerePlex Mini connector is attached to devices on subject's head as this may result in inducing electric charge to the neural tissue. Irreversible damage may occur.
- The headstage is NOT to be used for stimulation.
- The patient/subject should not attempt to remove the connections themselves.
- Use caution when connecting and disconnecting the Cable to the headstage to minimize the risk of the cable being accidently pulled or tugged.
- 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 system.
- Keep the headstage away from liquids. Contact with water, shower spray, or wet surfaces can lead to the patient receiving an electrical shock.
- Connection of external instruments to the headstage may compromise electrical safety.
- Always use antistatic or electrostatic discharge (ESD) safe gloves when connecting the headstage.
- Use only the supplied Blackrock Microsystems components (Cerebus™ system & Digital Hub128 or CerePlex Direct, CerePlex Mini Cable). Substitution of components not supplied by Blackrock Microsystems may affect system performance and patient/ subject safety.
- Do not leave the patient/subject connected to the headstage when the Cerebus™ System is not in use.
- Use caution when placing cables and other connectors to minimize the likelihood of tripping or accidentally pulling on cables. Pulled cables may cause damage to the headstage or any other connected devices.
- When plugging in the LED's and they do not turn on unplug the LED and plug it back in with the leads switched. LED's will only turn on plugged in one way.

1.2 Cautions

- If noise level is too high tie earth ground to system ground on the system.
- This product is for animal research only.

1.3 Specifications

Power Requirements	±3 VDC, 150 mAmps maximum load
Resolution	16-bit
Sampling Frequency	30ksps
Mode of Operation	Continuous
Input Frequency Range	0.03 Hz – 7.5k Hz
Input Impedance Range	5kΩ – 1MΩ
Maximum Input Voltage	± 5mV with respect to reference
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)

2 Introduction

The Blackrock headstage provides an interface between the Cerebus Bio-potential recording system or the CerePlex Direct recording system 36-channel electrode drive with custom Mil-Max connectors for high fidelity transmission and recording of extracellular spikes and local field potentials from the brain. The Blackrock headstage converts analog signals to digital format right at the recording site which dramatically reduces the noise introduced to the signal during transmission. Figure 2-1 below shows an application overview of how the headstage fits into a complete neural recording system when used with the Cerebus Bio-potential recording system..

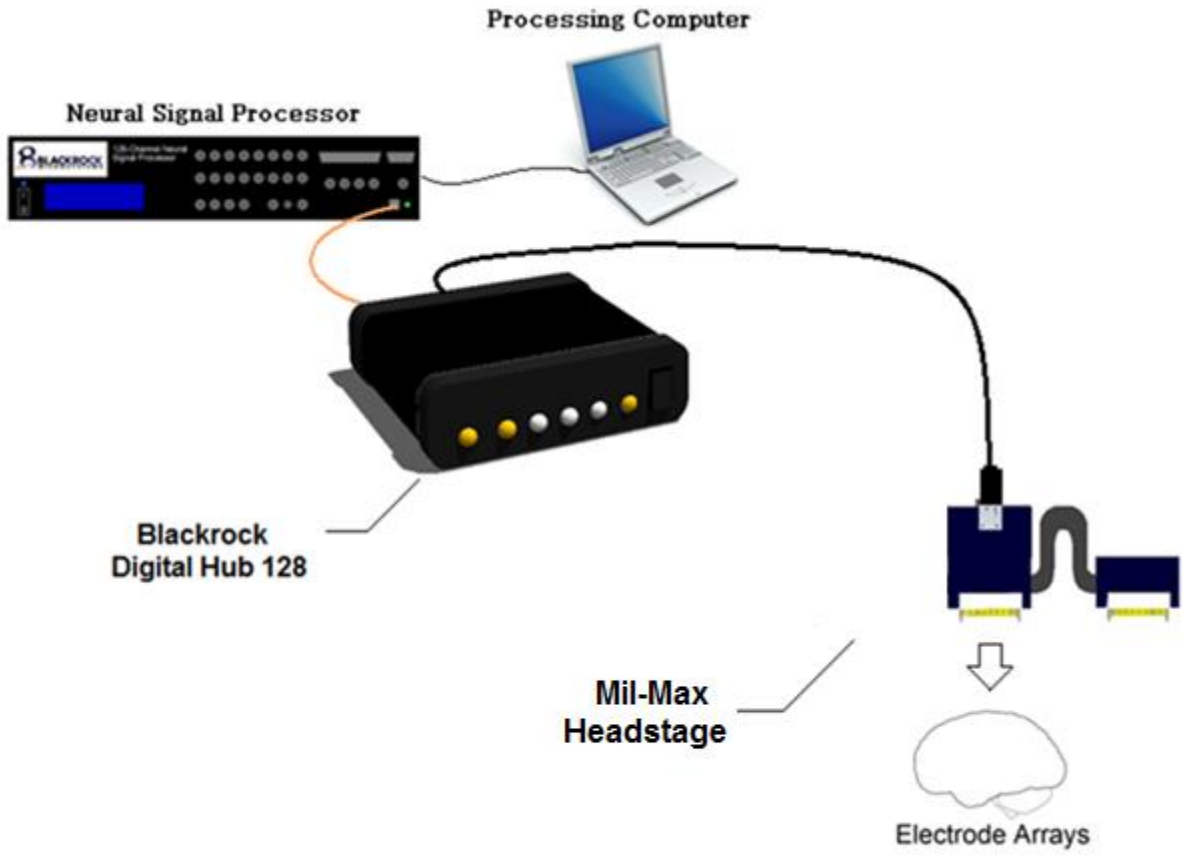


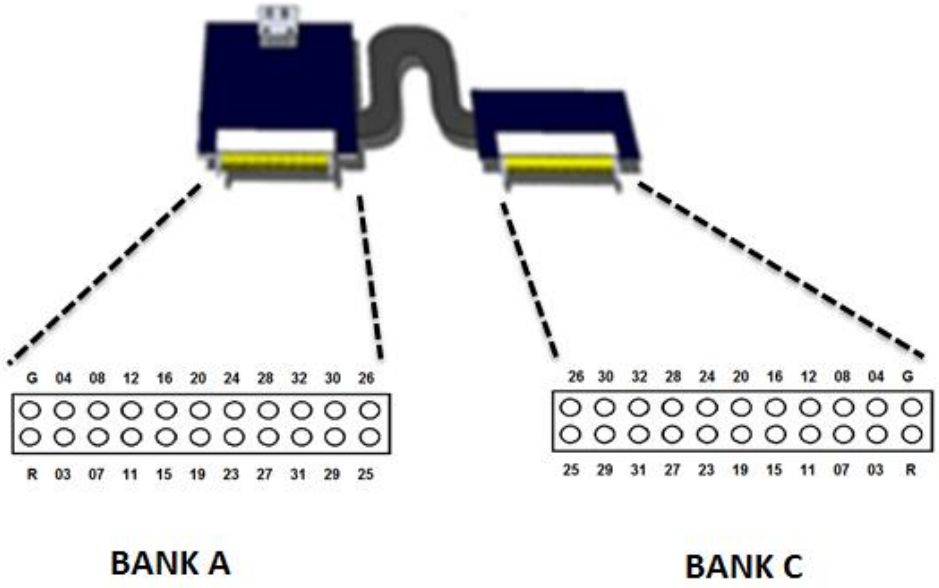
Figure 2-1: Blackrock Mil-Max Headstage Set-up

* Blackrock Digital Hub 128 and Cerebus Acquisition System are each purchased separately.

3 Hardware

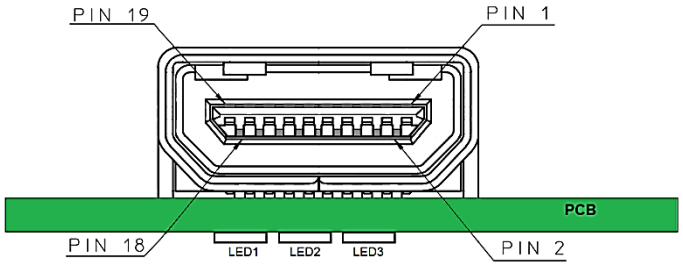
3.1 Blackrock Headstage Pin-out

The input connector pin-outs are shown in Figure 3-1.



* G = Ground, R = Reference
** White dot indicates Reference and first channel location

Figure 3-1: Headstage Input Connector Pin-Out



HDMI/D Pin #	Description
12	Clock+
14	Clock-
16	V-
1, 7	Ground
19	V+
9	Data+
11	Data-
3,5,6,7, 15,17,18	Reserved for Internal use

Figure 3-2: Headstage Output Connector Pin-Out

Figure 3-2 shows the pin-out of the output connector. The three LEDs under the board are Power (LED1), Clock (LED2) and Error (LED3). LED1 will light up constantly after the power is on. LED2 will blink on a one second interval as receiving correct clock cycle. LED3 only lights up when the conversion of analog to digital is saturated.

4 Warranty

Blackrock Microsystems, Inc. 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, Inc. 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, Inc. 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.

4.1 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 (801) 582-5533 or toll free at (866) 806-3692.

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:

Blackrock Microsystems, Inc.
ATTN: RMA#
630 Komas Drive, Suite 200
Salt Lake City, UT 84108 USA
Tel: (801) 582-5533