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MagRes Headstage

Instructions for Use



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What this Manual Covers

Blackrock Microsystems offers a wide range of headstages for recording distortion-free spikes and field potentials from high impedance microelectrodes. The MagRes 16-channel headstage (PN: 10556) provides an isolated low-impedance output that guarantees signal integrity, minimizes noise pickup by cables, and ensures maximum common-mode noise rejection by the CerePlex A. It has been designed to be MRI-safe and provide little distortion to imaging.

Intended Use and Indications for Use

The MagRes headstage is designed for use in MRI and allow for recording of action potentials and local field potentials from MRI-safe electrodes implanted in animal models.

The MagRes Headstage has been evaluated for safety and compatibility in the MRI environment. The MagRes Headstage has been successfully tested for heating, migration, and image artefact in the MRI environment up to 16.4T.

Warnings and Precautions

The electrode connection end of the MagRes headstage should be sent through the pass-through into the MRI room. All other recording equipment should remain outside of the MRI room.

Only the electrode connection end of the MagRes headstage should be brought near the MRI magnet.

When plugging in the MagRes device to its mating electrode connector, please make sure the orientations of the connectors are matched, then carefully align the pins and plug-in gently. Excessive force during connection and disconnection can damage the connectors and cause harm to the subject.

Use antistatic or ESD safe gloves when using the MagRes.

The MagRes device is only approved for use with Blackrock Microsystems data acquisition systems.

Do not use the MagRes device with non-Blackrock approved electrodes.

Not for use in human subjects.

Specifications

MagRes 16-channel Headstage (PN: 10556)	
Input Impedance	2.6pF
Input Range	+64mV
Number of Channels	16
Gain	1x
Cable Length	10m
Dimensions	19x8x2 mm
Cable Shielding Type	Coax

Product/System Specific Content

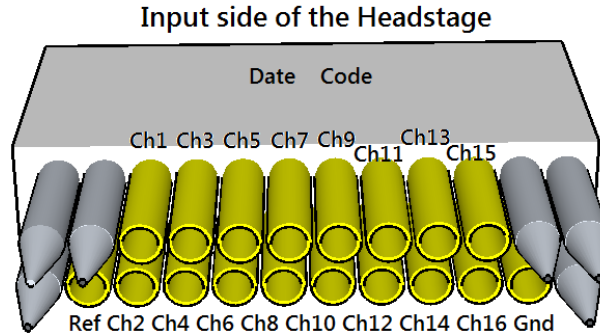
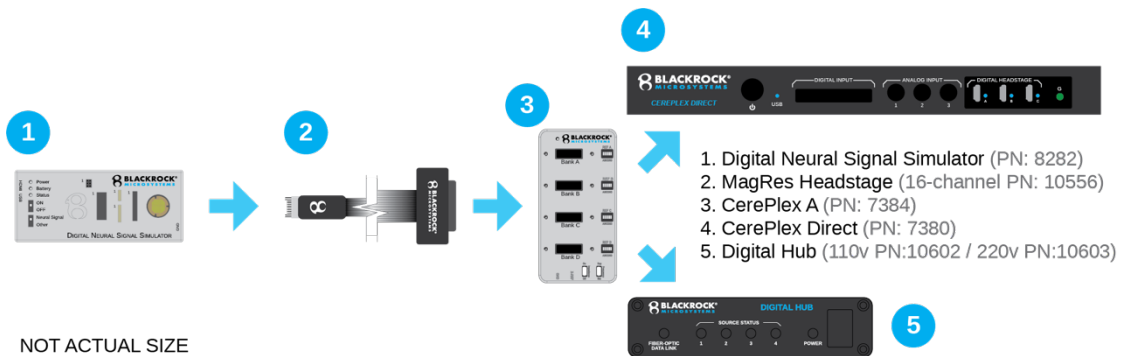


Figure 1–Pin-Out of the MagRes Headstage

The MagRes

Headstage has been designed to be used with Blackrock approved MRI-safe electrodes, and with the Blackrock Microsystems CerePlex A connected to either the CerePlex Direct or the Digital Hub. The Headstage may alternately be connected to the Blackrock Digital Neural Signal Simulator to simulate connection to an electrode. For detailed instructions for use of other devices refer to the device specific IFU.

Below is an example of how to bench test the MagRes Headstage outside of the MRI room, with the electrode side plugged into a Digital Neural Signal Simulator and the other end plugged into a CerePlex A. Note that the headstage channels are mapped to odd channels in Central (i.e. 1, 2, 3, ..., 16 correspond to 1, 3, 5, ..., 31).



Cleaning, Disinfection, Maintenance, and Disposal

This headstage is not intended to be submerged in fluid. It may be cleaned with mild detergents, disinfecting wipes, deionized water, and/or isopropanol.

MagRes may have incidental contact with bodily fluids. Follow institutional procedures for disposing of potentially infectious or biohazardous implantable devices when disposing the MagRes.

Troubleshooting

The MagRes headstage is used in an environment with electromagnetic radiation that can produce noise in the system. Care should be taken to ensure good connection, especially to ground and reference for the electrodes. In addition, if noise levels are unusually high it may be helpful to connect a ground wire from the MRI machine to the safe-lead ground on the CerePlex A.

Return Merchandise Authorization

In the unlikely event that your device needs to be returned to Blackrock for repair or maintenance, do not send any equipment back without a Return Merchandise Authorization Number (RMA). 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) 582 5533 or by emailing support@blackrockmicro.com.

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, LLC
ATTN: RMA#
630 S. Komas Dr., Suite 200
Salt Lake City, UT 84108 USA
Tel: +1 (801) 582-5533

Warranty

Blackrock warrants its products are free from defects in materials and manufacturing for a period of one-year from the date of shipment. At its option, Blackrock will 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; or (3) any sale or other transfer of the product by the original purchaser.

Except for the warranty set forth in the preceding paragraph, Blackrock provides no warranties of any kind, either express or implied, by fact or law, and hereby disclaims all other warranties, including without limitation the implied warranties of merchantability, fitness for a particular purpose, and non-infringement of third-party patent or other intellectual property rights.

Blackrock shall not be liable for special, indirect, incidental, punitive, exemplary, or consequential damages (including without limitation, damages resulting from loss of use, loss of profits, interruption, or loss of business or other economic loss) arising out of non-compliance with any warranty. Blackrock's entire liability shall be limited to providing the remedy set forth in the previous paragraph.

Support

Blackrock prides itself in its customer support. For additional information on this product or any of our products, you can contact our Support team through the contact information below:

Manuals, Software Downloads, and Application Notes

www.blackrockmicro.com/technical-support

Complaints

When filing a complaint, please provide the product description, product number, software version, lot number, complainant's name and address, and the nature of the complaint.

Issues or Questions

www.blackrockmicro.com/technical-support

support@blackrockmicro.com

Tel: +1 (801) 582-5533

Notice to the user and/or subject that any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the member state in which the user and/or patient is established.