

New Products

3D Acceleration Sensor MR*

by Alexander Svojanovsky

A three dimensional Acceleration Sensor (see Figure 1) has been added to the range of sensors available for acquiring peripheral physiological signals in MRI scanners.

Every additional sensor opens up new possibilities, but at the same time it demands that the user is conscious of all the safety aspects and takes careful note of the instructions for use.

The 3D Acceleration Sensor captures movements in three dimensions. The module is made up of the sensor and a preamplifier.

Two sensors with cables of different lengths are supplied as standard. This is intended to ensure that the cables are routed in the best possible fashion.

It allows the sensor to be combined with other recording modules and the ExG AUX input box to best meet the needs of the experimental design and comply with the particular conditions in the scanner.



Figure 1: 3D Acceleration Sensor

The primary application of the acceleration sensor is to detect and record movement/acceleration of the extremities.

It is, however, also possible to detect blood pulse and breathing, technical artefacts such as vibrations of the scanner as well as identifying positions.

The sensor is designated „MR-conditional“. This designation indicates that the Operating Instructions must be observed when using it in a scanner.

In addition to the instructions for use that are typical for recording EEG inside the MRI (such as only using approved sequences e.g. GE-EPI, MPRAGE, ensuring the cables are laid straight and without any loops, etc.), it should be noted that it is not permitted to use the acceleration sensor inside the gradient coil in conjunction with gradient switching as well as inside the body transmit coil.

Figures 2 & 3: Diagram showing an example for the positioning of the BrainAmp ExG and the Acceleration Sensor in the MRI scanner.

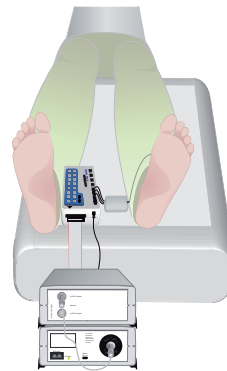


Figure 2: Positioning for leg movement

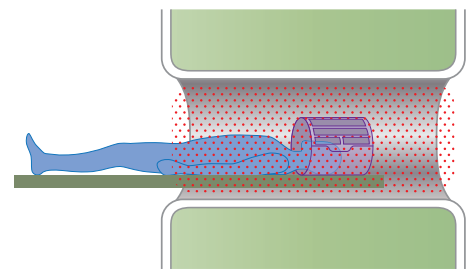


Figure 3: Red dots mark unsafe area

The sensor is currently being further developed to allow it to be used for recognizing changes in position and detecting the pulse inside the gradient coil during gradient switching.

Technical data:

Supply voltage	± 5 Volts DC
Range	± 2 g
Output	1400 mV (neutral position)
Sensitivity	420 mV/g
Gain:	3.5
Dimension	22 x 14 x 8 mm
Weight	8 g
Cable length	30 / 70 cm
Connector	BINDER series 719 (5-pole male)



* A non-MR compatible version of the 3D Acceleration Sensor is also available