Dual Channel- FOMRI

Noise Canceling Fiber Optical Microphone System for MRI

- Clear speech from patient during MRI scan
- Elimination of EPI acoustic noise
- High-end microphone for ‘Voice-Key’ solution
- Real-Time adaptive noise canceling
- No effect on MR imaging, EMI/RFI immunity
- Headset or flexible boom mounting configurations
- Stand-alone or integrated to your existing MRI communication system

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Where voice and light converge

Magnetic Resonance Imaging (MRI) is a medical diagnostic imaging system which provides valuable information in a non-invasive manner without exposing the patient to fields of harmful radiation. One drawback of the method is that intense acoustic noise is generated due to the altering Lorentz forces, which are exerted on the coils of the gradient magnet. The noise levels can be in excess of 130 dB(A), especially in functional Magnetic Resonance Imaging (fMRI) methods, which use the popular Echo planar Imaging (EPI) technique in studying the human brain in response to external stimuli.

Communication with the patient in such cases is problematic for two reasons: conventional microphones might distort the MR imaging and the distance of the microphone from the mouth can result in low SNR and poor quality speech signals. The dual channel FOMRI is a one-way communication system that provides high quality speech signals together with strong attenuation of the ambient noise.

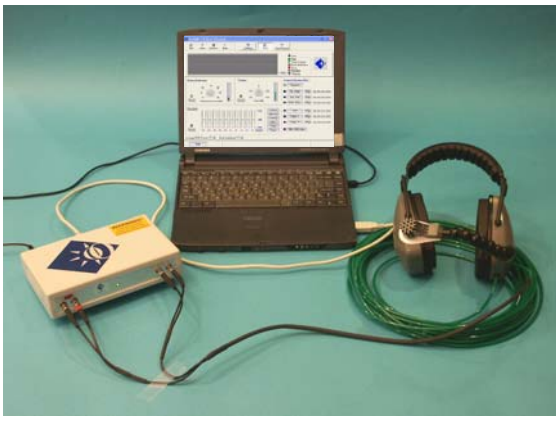
The dual-channel system encapsulates two complementary technologies developed at Phone-Or: two orthogonal and matched pressure gradient, noise canceling optical microphones, integrated into a single housing, plus a tailor-made adaptive algorithm that operates on these two channels.

Phone-Or[1]s unique optical microphone is based on the following core technology: a beam of light is sent through an optical fiber to a sound sensitive MEMS membrane. Sound signals cause the membrane to vibrate and modulate the intensity of the light reflected off the membrane, which is then translated into an electrical signal. Since the optical microphone does not contain any metal parts or electrical wires, it has no effect on the MR image.

Two configurations of this system are available: optical microphones integrated into an ear-defenders headset or into a flexible boom that can be attached to the MRI bed. Phone-Or also offers customized solutions using the customer's existing two-way communication headset.

Technical Specifications

Noise Reduction (Vs. omni)	15÷40 dB
Sensitivity: (@ 1KHz)	50 mV/Pa
Microphones Output	Digital USB
Latency:	96 msec
Supply Voltage:	9-12 V DC
THD	<1% at 94 dB SPL
Max. ambient SPL	140 dB
Power Consumption:	2.5 W
Operating Temperatures:	+10° C to +50° C
Storage Temperatures:	+ 0° C to +60° C
Humidity	Up to 95% RH @ 40°C
Optical Fiber Length:	10 m (or longer)



System includes:dual-channel microphone and fiber optics (in MR room), electro-optic unit and software (in the control room)

Microphone mounting configurations: headset (above), or flexible boom attached to base (bottom)

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