

OUT SERIES

OUT1	High Fidelity Headphones
OUT1A	Ultra-Wide Frequency Response Headphones
OUT2	BNC Output Adapter
OUT100	Monaural Headphones
OUT101	Tubephone
OUT102	Piezo Audio Transducer
OUT103	LED Cable
40HP	Monaural Headphones

For OUT3, see Stimulators

OUT1 HEADPHONES

These wide response high-fidelity headphones are used for auditory stimulus (short tones or clicks) or to listen to physiological signals (like EMG) directly. The Headphones are comfortable and lightweight (3 ounces) and include a 2-meter cable so the Subject can be seated a comfortable distance from the acquisition unit.

Unlike other Smart Sensors that connect to the MP3X, the OUT1 connects to the “Analog out” port on the back panel of the MP3X.



OUT1 SPECIFICATIONS

Cable Length:	2 meters
Connector Type:	9 Pin DIN (female)

OUT1A

These ultra-wide frequency response headphones connect directly to the headphone port on the MP36 or MP36R data acquisition unit.

Features of these multi-purpose headphones include:

- High dynamic range
- High-resolution capsule
- 1/8" connector plus 1/4" adapter included
- Single-sided cord
- Oval-shaped ear cups
- Comfortable headband
- High-quality components and exceptionally rugged construction



OUT1A SPECIFICATIONS

Connector:	1/8" TRS connector plus 1/4" TRS adapter
Interface:	MP36 or MP36R (not compatible with other MP units)
Frequency response:	20 Hz - 20 kHz
Max. power handling:	100 mW
Impedance:	32 Ohm
Sensitivity:	105 dB @ 1 kHz
Cord length:	2 meters
Dimensions:	11-3/4" x 9-3/4" x 8-1/4"

See also: **SS9L** BNC Input Adapter

OUT2 BNC (M) OUTPUT ADAPTER

This BNC adapter is designed to output signals from the MP3X unit to other devices (such as external amplified speakers and scopes). This 2-meter adapter cable terminates in a male BNC for easy connections.

OUT2 SPECIFICATIONS

Cable Length:	2 meters
Connector Type:	BNC (male)



OUT100

These monaural headphones can be used with the STM100C stimulator module to deliver a tone signal while recording data for startle response or other stimulus-response studies. The headphones can also be used to listen to raw signals (such as EMG), piped through the STM100C from an amplifier output. The OUT100 is a wide response, high efficiency headphone, weighing 85 grams and is equipped with a 1.8 meter cord terminated in a 6.3 mm (1/4") phone plug.

OUT100 SPECIFICATIONS

Weight:	85 grams
Connector Type:	6.3 mm (1/4")
Cable length:	1.8 meter
Speaker:	28 mm dia 32 ohm dynamic Mylaar
Impedance:	16 Ohm @ 1.0 kHz
Power Handling:	100 mW max
Frequency response:	20 Hz - 20 kHz
Average SPL:	108 dB ± 4 dB
Adapter (included):	1/4" mono adapter plug



OUT101 TUBEPHONE

OUT101 Components: one Tubeophone, plastic tube and 50 foam ear inserts

Use the OUT101 tubeophone to deliver clicks and tones in auditory evoked response applications (i.e. ABR).

The tubeophone design consists of a monaural acoustic transducer attached to a short, flexible, plastic tube, which fits into the subject's ear with the aid of a foam tip.

Use of the tubeophone reduces ambient noise and bone conduction problems, which can interfere with auditory response recordings. Furthermore, because the Tubeophone provides a 1 msec acoustic signal delay (due to plastic tube), it automatically separates true response from electromagnetic artifact resulting from speaker activation.

OUT101E Replacement Foam Ear Inserts: pkg. of 50

OUT101T Replacement Plastic Tubes: pkg. of 4

MP36 and MP36R interface options:

- BSL System stimulator (model BSLSTM): use BSLCBL6 and Radio Shack P/N 274-047 ¼" to 1/8" phono adapter
- BSL MP36 data acquisition unit Analog Out port: use OUT3 plus BSLCBL6 and Radio Shack P/N 274-047 ¼" to 1/8" phono adapter
- MP36 headphone port: use Radio Shack P/N 274-047 ¼" to 1/8" phono adapter; note—volume may not reach the same levels as the Analog Out port

OUT101 SPECIFICATIONS

Response:	Compares to TDH-39, 49 or 50 audiometric headphones
Acoustic signal delay:	1 msec
Dimensions:	3.8cm (wide) x 5cm (high) x 1cm (thick)
Cable termination:	6.3mm (1/4") phone plug
Cable length:	1.8 meter
Cable clip:	Yes; clip attaches to fabric or fixtures

CALIBRATION FOR AUDITORY BRAINSTEM RESPONSE STUDIES

To calibrate the OUT101 Tubephone, use an [Etymotic ER-7C Probe Microphone](#)—this microphone provides a calibrated output voltage which is a function of applied Sound Pressure Level (SPL). The sensitivity is 50 mV/Pascal (-46 dB re: 1 V/uBar): 0 dB SPL = 0 dBuV. Place the Probe Microphone insert tube in the auditory canal prior to the insertion of the OUT101 foam tip.

The OUT101 Tubephone sound delivery tube and the Probe Microphone sound input tube will then be exposed to the same auditory chamber. Accordingly, the SPL is recorded, via the Probe Microphone, simultaneously with applied auditory stimulus from the OUT101 Tubephone.

OUT102 PIEZO AUDIO TRANSDUCER

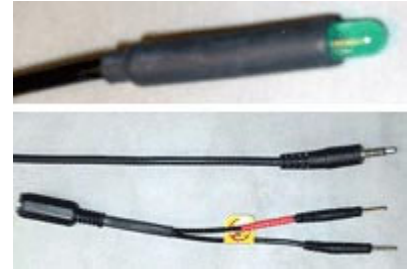
The OUT102 piezo transducer is typically connected directly to the STM100C stimulator module. When the stimulator module output rises above 1.5 volts, the piezo indicator will emit a constant audible signal (3.0 kHz @ 80 dB). Accordingly, the device is very useful for providing an audible stimulus, or alarm, when a physiological signal passes a certain threshold. As such, the OUT102 makes an excellent audible BPM indicator for ECG, blood pressure or respiration signals. The device can also be used to indicate when temperature or other slowly moving variable (e.g. electrodermal response) passes a certain threshold. The threshold for the OUT102 is determined by adjusting the amplitude control on the STM100C module. The specific Biopotential or Transducer amplifier signal monitored can be recorded while simultaneously directed through the STM100C module. The OUT102 also connects directly to the UIM100C digital I/O ports for operation with Control Channel outputs. The OUT102 measures 2.5cm (dia) x 1cm (high) and comes equipped with a 1.8m cable terminated in a 3.5mm phone plug. An adapter is included for connecting the OUT102 to the UIM100C digital I/O ports.

OUT102 SPECIFICATIONS

Dimensions:	2.5cm (dia) x 1cm (high)
Cable Length:	1.8 meter
Connector Type:	3.5 mm phone plug + adapter for the UIM100C digital I/O ports

OUT103 LED CABLE

Use this LED cable to synchronize a light flash. The 3 meter cable makes it easy to use the LED for a variety of protocols. Terminates for connection to Analog OUT 0/1 and includes adapter for connection to Digital I/O. **Media synchronization** - Windows only - AcqKnowledge 4.1 and above



MP150 AND UIM100C SETUP

- Connect the OUT103 2 mm pin adapter to the 3.5 mm plug on the OUT103 cable.
- Connect the red OUT103 2 mm pin to a Digital I/O channel on the rear of the UIM100C and the black pin to GND D on the rear of the UIM100C.
- Use MP150 > Set Up Channels to acquire and plot the Digital I/O channel the OUT103 is connected to.
- Set MP150 > Show Manual Control
 - Set for 'Output'.
 - Enable the 'Set immediately' option.
 - Click the Digital I/O channel the OUT103 was connected to to toggle between 0 and 1.

If necessary, click the 'Set' button to update the manual control and output a digital pulse.

MP36R SETUP - ADDITIONAL ITEMS REQUIRED

- Connect an OUT3 (BNC adapter) to the 'Analog Out' port on the rear of the MP36R.
- Connect a BSLCBL6 (interface cable: BNC to 3.5 mm) to the OUT3.
- Connect the OUT103 3.5 mm plug to the BSLCBL6 3.5 mm socket.
- Set MP36 > Output Control 'Low Voltage Stim' option
 - Set Pulse width to 100 msec.
 - Set Pulse level to 5 volts – set Reference Channel to any digital channel.
 - Click the D'ON' button to output a digital pulse.

CALIBRATION

The OUT series does not require calibration.

40HP MONAURAL HEADPHONES

These monaural headphones are used with Biopac Science Lab MP40 and Biopac Student Lab MP45 for stimulus response experiments and to listen to EMG signals. The 40HP is a wide-response, high-efficiency headphone.

40HP SPECIFICATIONS

Cable Length:	5 meters
Connector Type:	3.5 mm phone plug

