

# **MultiAmp**

## **Multichannel Biological Amplifier System**

User's Manual

**SUPERTECH**

## **Comparison, and general features of the MultiAmp system**

In our choice there are three different amplifier systems. This booklet describes the MultiAmp amplifier family. Our other amplifier products are BioAmp, and LinearAmp families. All of them are up-to-date, easy to use, highly reliable, microprocessor-controlled constructions. We manufacture three different amplifier families, because the three product lines are optimized for different application fields. Please read through the appropriate descriptions at the website of Supertech for the details.

MultiAmp is a modular, expandable, multichannel biological amplifier.

MultiAmp amplifier family is especially powerful in multichannel applications, since such a level of reliability and flexibility is unthinkable in other analogue amplifiers. And the top of all that, our MultiAmp amplifier system offers a very reasonable price level in comparison to the number of channels.

The MultiAmp system must not be used in human experiments, because it has not got European permission for human applications.

MultiAmp's main fields of applications:

- EEG Brain Mapping
- Current-Source Density
- Cortical Depth Mapping
- Chronic multichannel recording

## **The modular structure of the MultiAmp system**

The number of the amplifier channels can be configured in multiples of 8. Actually there are two different amplifier units in our choice. One of the amplifier units is an 8-channel equipment, and the other amplifier unit is a 16-channel equipment, where the 16 channels are divided into two 8-channel parts, and they can be programmed independently. In the future there will be introduced a 32-channel amplifier unit, too. The Power Supply unit is a separate equipment. From one Power Supply unit a maximum number of 64 amplifier channels can be powered. Certainly, more than 64 amplifier channels are also can be installed in one recording system, but for higher (more than 64) channel numbers, more than one Power Supply unit should be installed. The following list shows the necessary elements to order according to the number of the amplifier channels:

8-channel system:

one Power Supply unit, and one 8-channel MultiAmp amplifier unit

16-channel system:

one Power Supply unit, and one 16-channel MultiAmp amplifier unit

24-channel system:

one Power Supply unit, one 16-channel, and  
one 8-channel MultiAmp amplifier unit

32-channel system:

one Power Supply unit, and two 16-channel MultiAmp amplifier units

48-channel system:

one Power Supply unit, and three 16-channel MultiAmp amplifier units

64-channel system:

one Power Supply unit, and four 16-channel MultiAmp amplifier units

128-channel system:

two Power Supply units, and eight 16-channel MultiAmp amplifier units

MultiAmp is a programmable amplifier, but it has no sampling circuits in the signal path at all. In other words, it is controlled by a built-in microcontroller, or a remote computer, but it has got only high-performance, low noise, low distortion analogue amplifier circuits. This feature is indispensable when you use averaging techniques to process its output signals. The internal microcontroller, and the optional digital port (which offers remote control facility from a PC) are optically isolated from the amplifier stages. In this way we could connect all the advantages of high accuracy analogue amplifier circuits, and easy usage of digital control.

Although MultiAmp is a programmable equipment, it does not need a separate computer to work. According to this fact, it can be used as a stand-alone amplifier (while possessing an optional serial port to communicate with a PC). This stand-alone feature is very comfortable, because the computer is always given, but it should be used to collect, and to process the experimental data. MultiAmp's microcontroller on the front panel has got a 3-button keypad, and menu-driven internal software, so it is very friendly to use.

## **Technical data**

In the MultiAmp system the High Pass Filter has got 4 possible positions, and the Gain have got 8 possible positions. The Low Pass Filter is fixed at 10 kHz in the analog circuitry. Other Low Pass Filter settings can be realized in the data acquisition software, not in the amplifier. The actual High Pass Filter, and Gain values, realized during the manufacturing process can be ordered with the default parameters, but they can be requested with special values, to meet any special requirements, as well. The default values for the Filter and Gain sections are listed below.

#### High Pass Filter settings:

0.07 Hz (2.2 s)

0.16 Hz (1 s)

1 Hz

100 Hz

#### Gain settings:

200

500

1,000

2,000

5,000

10,000

20,000

50,000

## Headstages

All MultiAmp amplifiers have got multi-purpose connectors for external headstages. This method gives an opportunity to use various types of input modules to meet all the future demands. Actually there are monopolar (single-ended) preamplifiers for MultiAmp in our standard choice, but we have been continuously working on new circuit versions to support more sophisticated applications, as well. We have developed 8-channel, and 16-channel interfaces to connect the popular Plexon headstages to the MultiAmp. It is a good choice for very small animals, because the Plexon headstages are more expensive, but smaller in size, than our headstages.

If you can not find the appropriate model for your special task in our actual choice, we will develop a special headstage especially for you. It is our method, how we can improve the features of our equipments. We collect all the notices and feedbacks of our customers, and we implement their knowledge into the features of MultiAmp.

## Connectors

The pin assignment of the 20-pin, 2.00 mm wire connector, what is used to connect the 8-channel headstage to the MultiAmp, and the 37-pin SUB-D connector, what is used between the Power Supply unit, and the MultiAmp amplifier units are not published here. The user must not connect any other equipment into these connectors, only the appropriate products (manufactured by Supertech) should be connected. However, if you are interested to know them, please call, or email us.

The pin assignment of the 10-pin, 2.00 mm input wire connector of the 8-channel monopolar headstage of MultiAmp amplifier is shown in the Appendix.

The pin assignment of the 20-pin, 2.54 mm output wire connector of each 8-channel output sections of the MultiAmp amplifier is shown in the Appendix.

## **Warranty**

We give you full warranty service, including rest parts for the period of 3 years by default. Longer warranty periods can also be defined and agreed (the actual conditions should be discussed before placing the order).

International technical hotline by phone: (36) (20) 9234-386

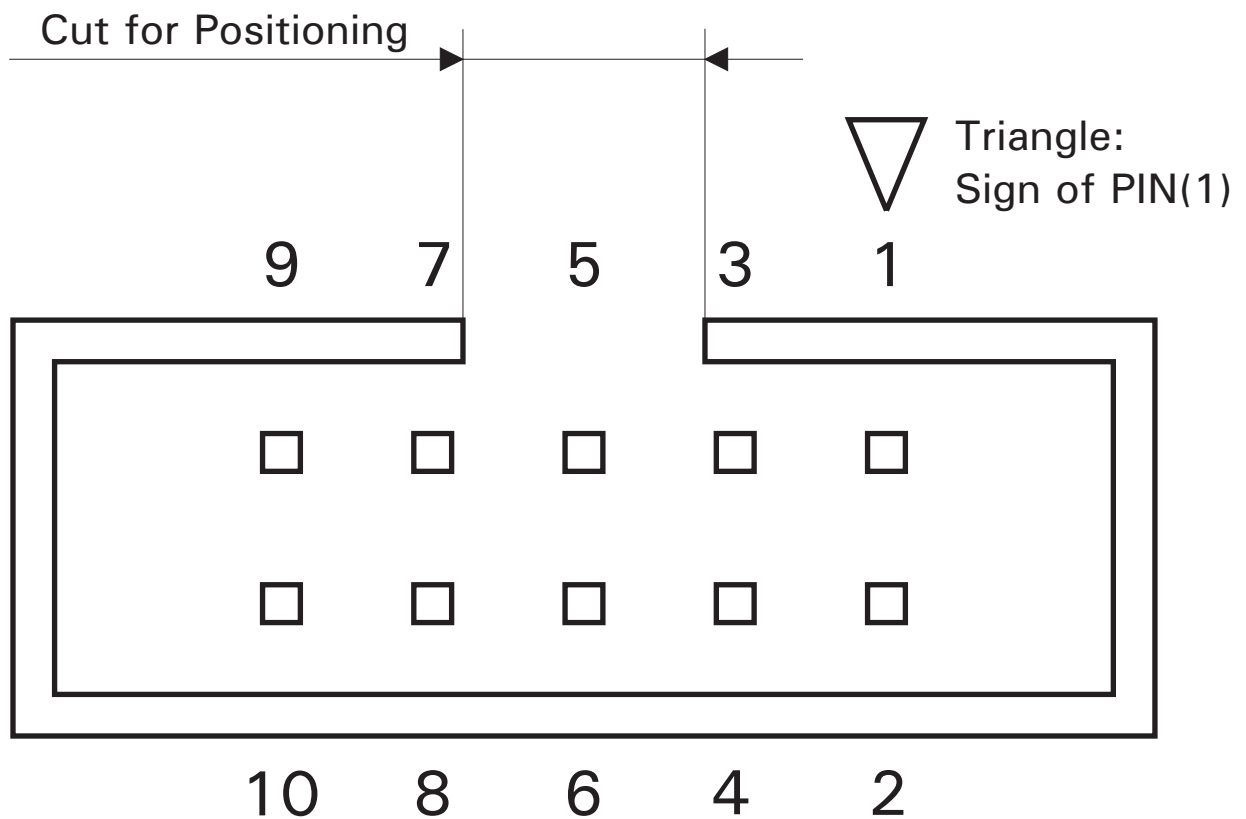
Technical hotline by email: [office@superte.ch](mailto:office@superte.ch)

For further technical information please visit our website. Supertech continuously uses two websites with the same content. Please use that one, which is easier for you to remember:

[www.superte.ch](http://www.superte.ch)                      and the other:                      [www.super-tech.eu](http://www.super-tech.eu)

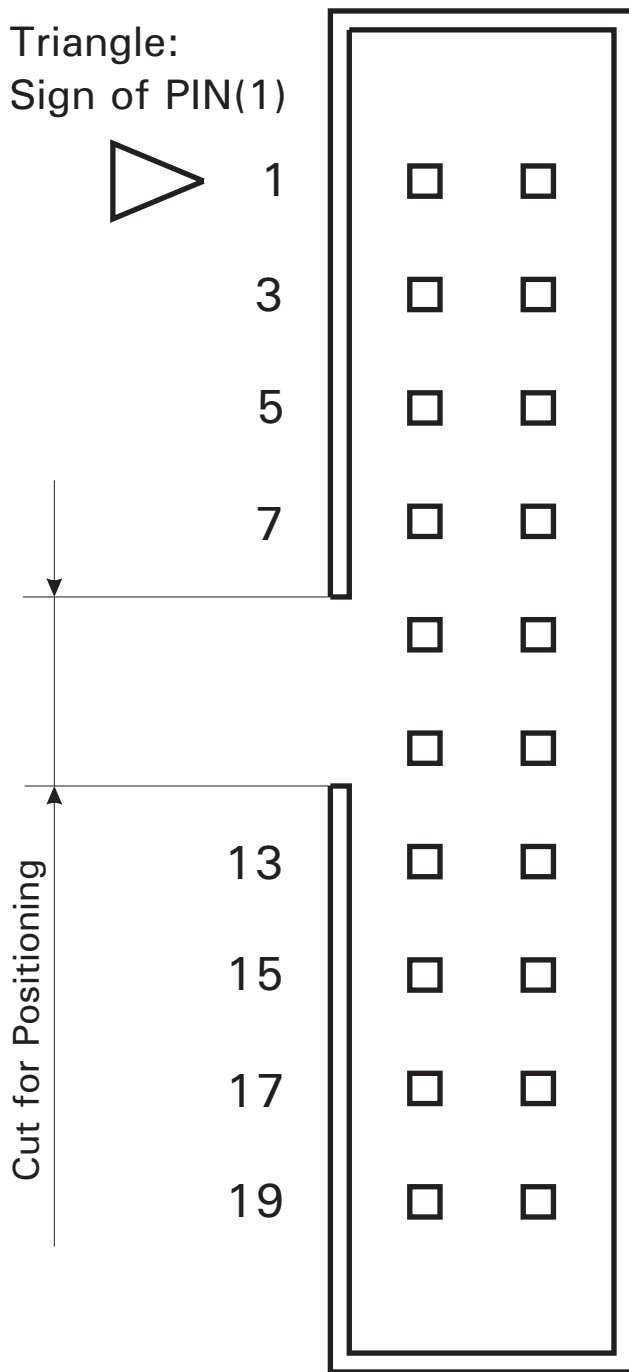
PIN(1): Input 1  
PIN(2): Input 2  
PIN(3): Input 3  
PIN(4): Input 4  
PIN(5): Input 5  
PIN(6): Input 6  
PIN(7): Input 7  
PIN(8): Input 8  
PIN(9): GND  
PIN(10): GND

The appropriate 10-pin, 2.00 mm female plug compatible with this input connector is IDS-010-W200-01/P manufactured by E-tec Corp.



Input Connector of the  
8-channel Monopolar Headstage  
of MultiAmp, V.3

Triangle:  
Sign of PIN(1)



- |    |                          |
|----|--------------------------|
| 2  | PIN(1): Out GND          |
|    | PIN(2): Output 1, or 9   |
|    | PIN(3): Out GND          |
| 4  | PIN(4): Output 2, or 10  |
|    | PIN(5): Out GND          |
| 6  | PIN(6): Output 3, or 11  |
|    | PIN(7): Out GND          |
| 8  | PIN(8): Output 4, or 12  |
|    | PIN(9): Out GND          |
| 10 | PIN(10): Output 5, or 13 |
|    | PIN(11): Out GND         |
| 12 | PIN(12): Output 6, or 14 |
|    | PIN(13): Out GND         |
| 14 | PIN(14): Output 7, or 15 |
|    | PIN(15): Out GND         |
| 16 | PIN(16): Output 8, or 16 |
|    | PIN(17): Out GND         |
|    | PIN(18): Out GND         |
| 18 | PIN(19): Out GND         |
|    | PIN(20): Out GND         |

The appropriate 20-pin, 2.54 mm female plug compatible with this output connector is IDS-020-S100-01/P manufactured by E-tec Corp.

## Output Connector of each 8-channel sections of MultiAmp, V.2