MED64

The most sensitive microelectrode array system for *in vitro* extracellular electrophysiology

Product Manual

MED Multi-well Connector

P/N: MED-C11

ALPHA MED SCIENTIFIC

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1. MED Multi-well Connector Components and Functions

The MED Multi-well Connector (MED-C11) is the Connector for the MED64-Allegro System. It connects the MED Multi-well Probe to the MED64 Head Amplifier (MED-A64HE1S) allowing recording extracellular signals from 4 (or 8) cultured samples in a MED Multi-well Probe.

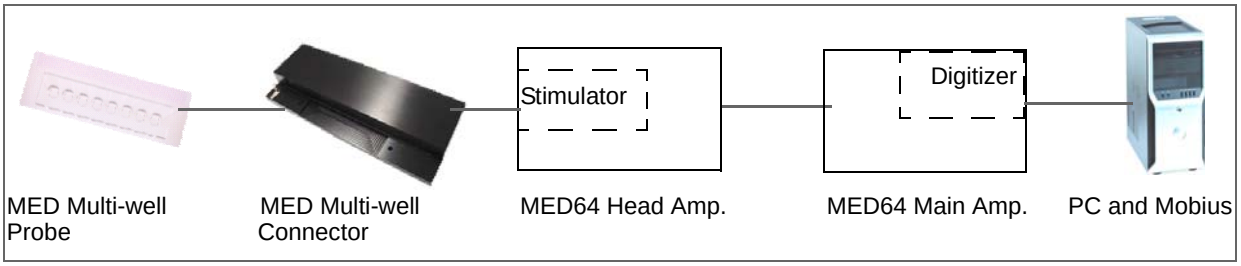


Figure 1. System diagram for the MED64-Allegro System.

1-1. Components and their functions

MED Multi-well Connector unit

Figure 2. MED Multi-well Connector. Front view (left) and back view (right).

(1) Ground terminal
Connect to the GND terminal on the MED64 Head Amplifier with the green grounding wire.

(2) Screw hole
Use these hole to install the Connector onto the MED64 ThermoBase.

(3) Probe port
Install the MED Multi-well Probe here.

(4) Output terminal
Connect to the INPUT 1-16CH, 17-32CH, 33-48CH, 49-64CH on the MED64 Head Amplifier with the MED Connector Cable (20 pins).

Accessories

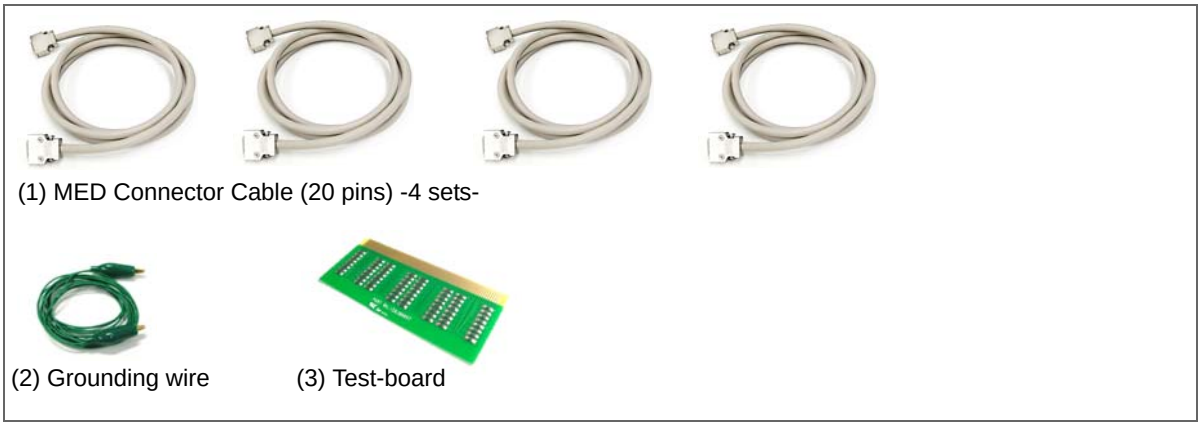


Figure 3. Accessories for the MED Multi-well Connector.

(1) MED Connector Cable (4 sets)
Connects the Output terminals to the INPUT terminals on the MED64 Head Amplifier (MED-A64HE1S).

(2) Grounding wire
Connects the Grounding terminal to the SIGNAL GND of the MED64 Head Amplifier (MED-A64HE1S) for grounding.

(3) Test board
Install into the Probe port. Use it to check the MED64 Allegro System is working appropriately.

2. Installation

2-1. Connecting the MED Multi-well Connector to the MED64 Head Amplifier

• Read product manuals for all other components of the MED64-Allegro System prior to installation.

1. Place the MED Multi-well Connector on a stable table and AWAY from any equipment which generates an electric or magnetic filed (e.g. power supply unit, peristaltic pump, heater, refrigerator, etc.).

2. Connect the 4 output terminals of the MED Multi-well Connector to the INPUT terminals of the MED64 Head Amplifier with the MED Connector Cables. Make sure that the terminals with same numbers are connected. (e.g. 1-16CH to INPUT 1-16CH).

3. Place all cables AWAY from any equipment that generates and electric or magnetic filed.

    • The MED Connector Cable is very sensitive to noise and vibration. Make sure that the cable stays away from any equipment that generates electric or magnetic filed, and sits on a stable table where it cannot be disturbed (i.e. bumped into or displaced during recording).

4. Connect the Ground terminal to the SIGNAL GND in the MED64 Head Amplifier (MED-A64HE1S) with the green grounding wire to properly ground the Connector.

CAUTION:

Make sure to ground the MED Multi-well Connector to the Head Amplifier. Otherwise considerable exogenous noise could be introduced.

Figure 4. Connecting the MED Connector cables (20 pins) to the MED Multi-well Connector.

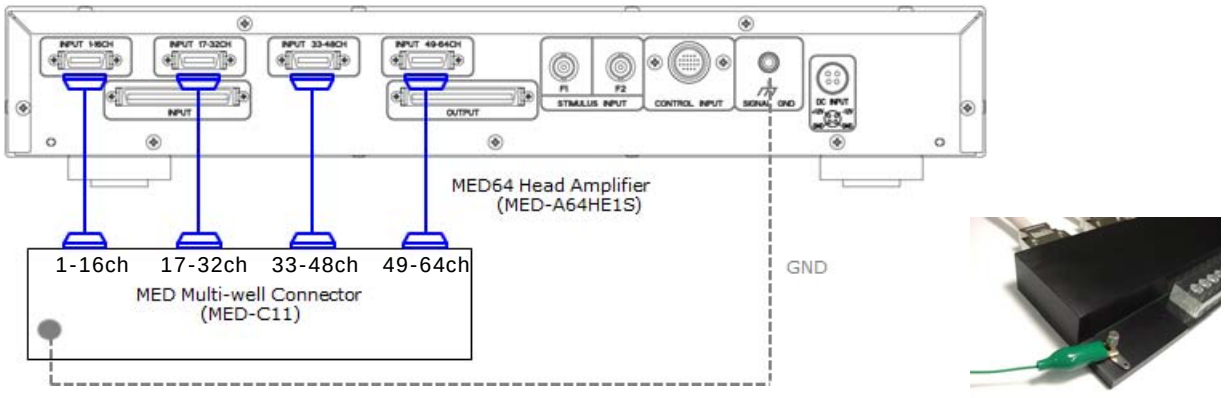


Figure 5. Connection of the MED Multi-well Connector to the MED64 Head Amplifier (left) and Ground terminal on the MED Multi-well Connector connected with the grounding wire (right).

2-2. Running the MED64-Allegro System and checking the noise

Install the Test board to the MED Multi-well Connector and check the noise. The baseline noise should be around several microvolts at all 64 channels as seen in the Figure 6. If noise is larger than a few microvolts, check the followings:

1. All equipment are grounded correctly.

2. Amplifiers, MED Multi-well Connector, and all Connector cables are placed AWAY from any equipment which generates electric or magnetic field. (e.g. power supply unit, peristaltic pump, heater). Pay particular attention for the amplifiers' power supply unit.

3. All cables are firmly connected.

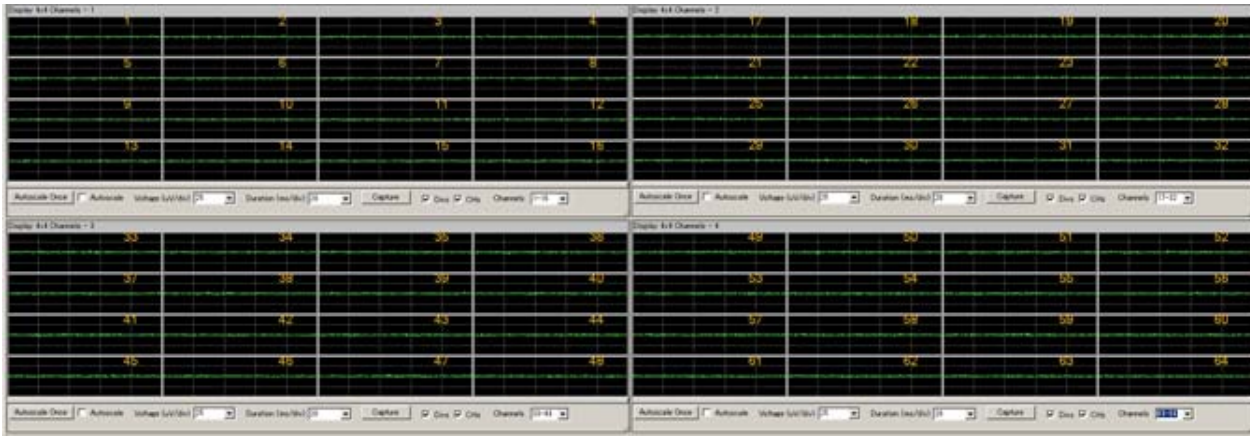


Figure 6. Appropriate noise level for the MED64-Allegro System

3. Instruction for use

3-1. Installing the MED Multi-well Probe onto the MED Multi-well Connector

1. Clean the MED Multi-well Probe with kimwipe soaked with 70% ethanol before sliding into the Connector.

    - The leads in the MED Multi-well Probe contact with gold pins of the MED Multi-well Connector. (Refer to Figure 15 in the page 11) Salt residue, or even finger print can cause the contact pins to rust or accumulate residue build up.

2. Slide in the MED Multi-well Probe (the side with the terminals) gently and horizontally to the Probe port. Firmly press to make a secure connection.

CAUTION:

- Spilling liquid onto the pins will cause rust and adversely affect conduction. Be extremely careful not to get the pins wet, especially with saline solution.

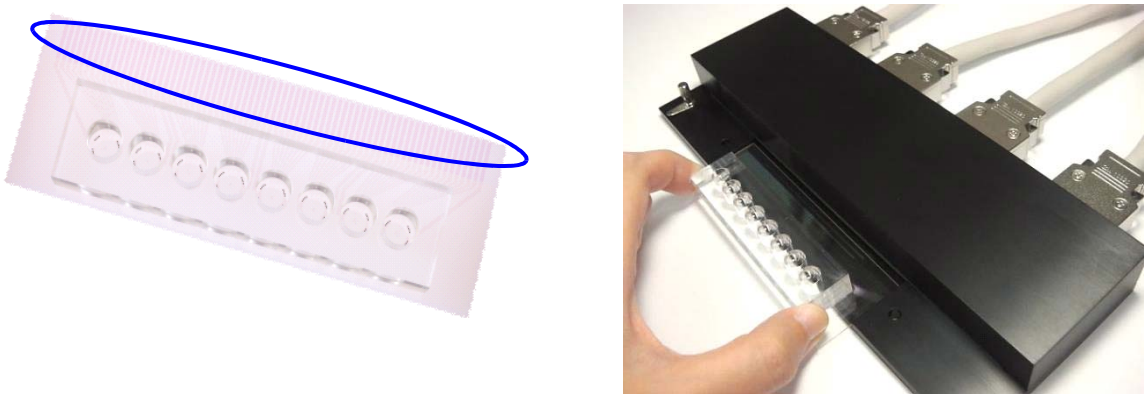


Figure 7. MED Multi-well Probe (MED-5N811) with its terminals on the top (left) and installing the MED Multi-well Probe onto the MED Multi-well Connector (right).

Figure 8. MED Multi-welll Connector where Probe is installed.

3-2. Electrode orientation in the MED Multi-well Connector

The Figure 9 and 10 shows the electrodes's orientation when the MED Multi-well Connector is installed with its terminal oriented towards the right side. Each well in the MED Multi-well Probe has 8 (or 16) reference electrodes as well as 16 (or 8) recording electrodes, those are connected independently to the terminal.

MED 4well Probe [MED-P5NF30]

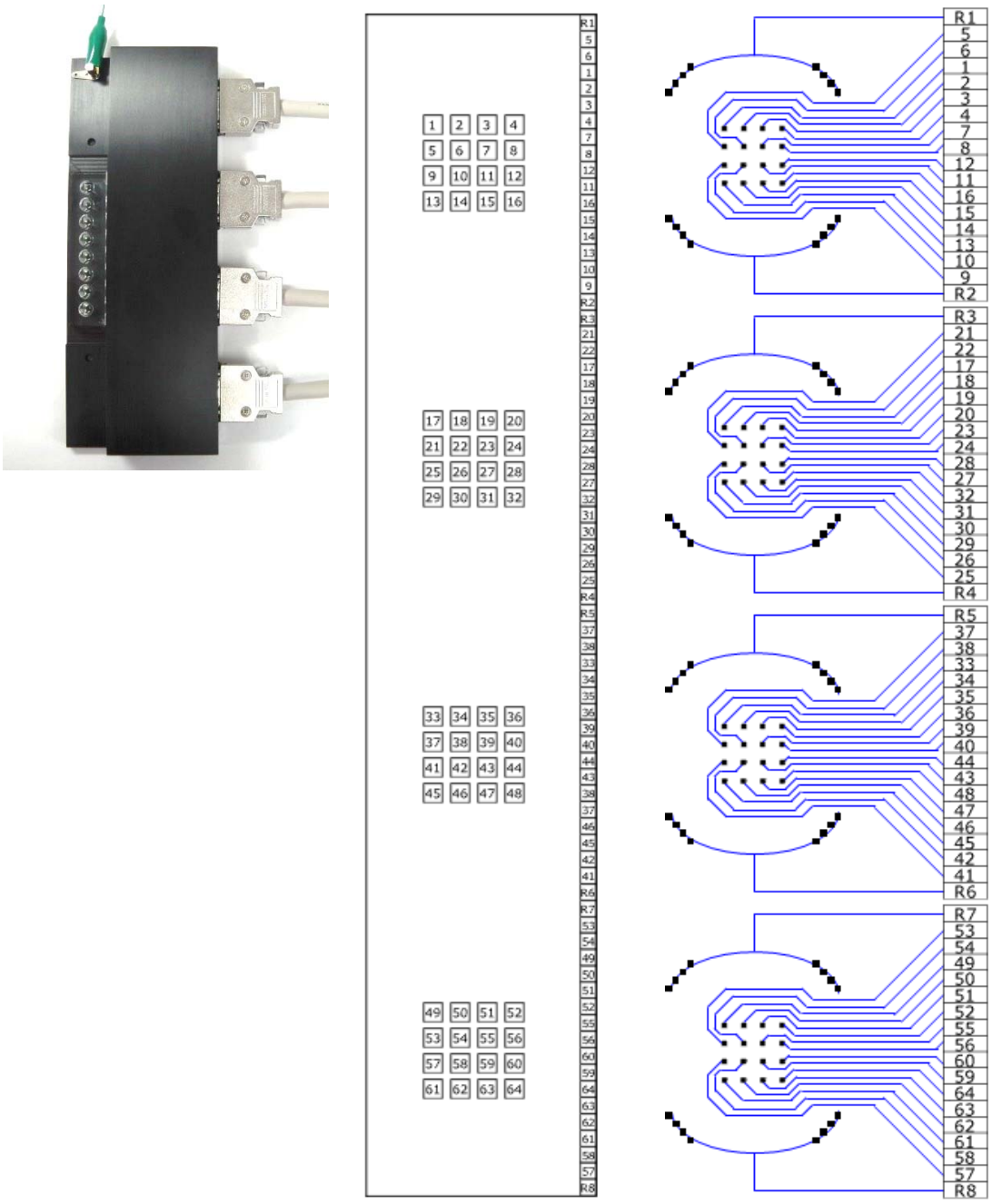


Figure 9. Electrode orientation for the MED-P5NF30 (4 well) in the MED Multi-iwel Connector and terminal assignment.

MED 8well Probe [MED-P5N801 / MED-P5N811]

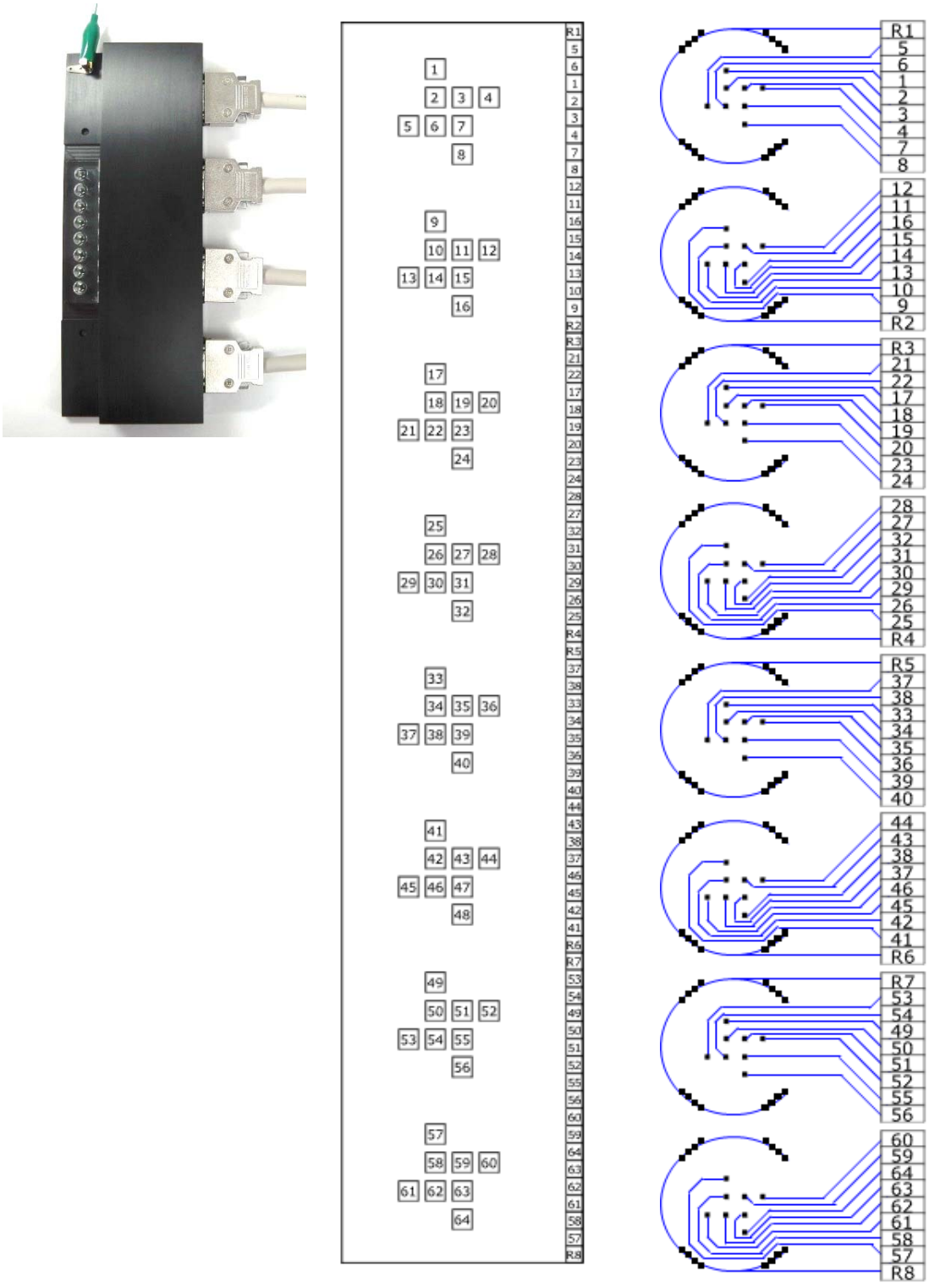


Figure 10. Electrode orientation for the MED-P5N801/811 (8 well) in the MED Multi-well Connector and terminal assignment.

3-3. Running the MED64-Allegro System

Signals acquired through the MED Multi-well Connector is displayed in the Mobius as following:

4 Well Probe

Channel #	Well #	Channel #	Well #
Ch1-16	1	Ch33-49	3
Ch17-32	2	Ch50-64	4

8 Well Probe

Channel #	Well #	Channel #	Well #
Ch1-8	1	Ch33-40	5
Ch9-16	2	Ch41-48	6
Ch17-24	3	Ch49-56	7
Ch25-32	4	Ch57-64	8

Modules [Display 4x4 Channels], [Display 2x4 Channels] are also available to display signals acquired through the MED Multi-well Connector.

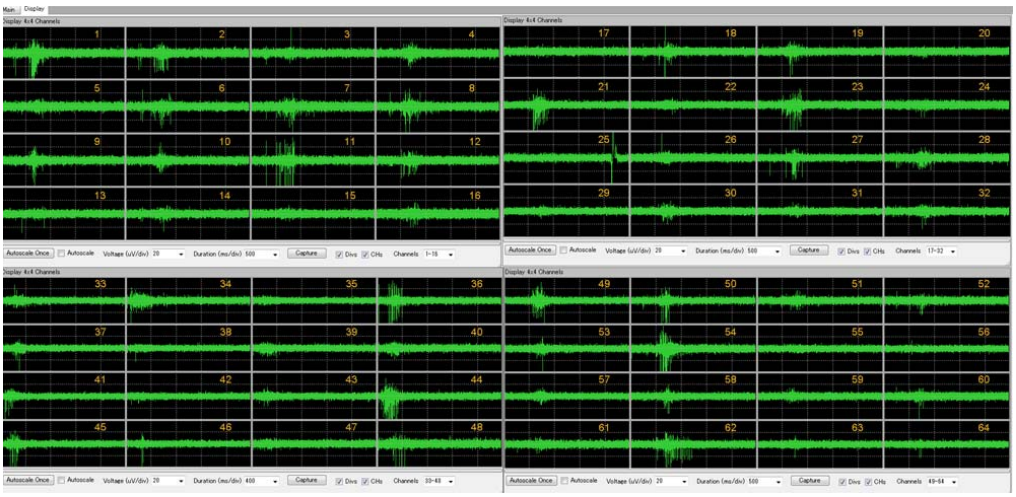


Figure 11. Displaying signals for each well with the [Display 4x4 Channels].

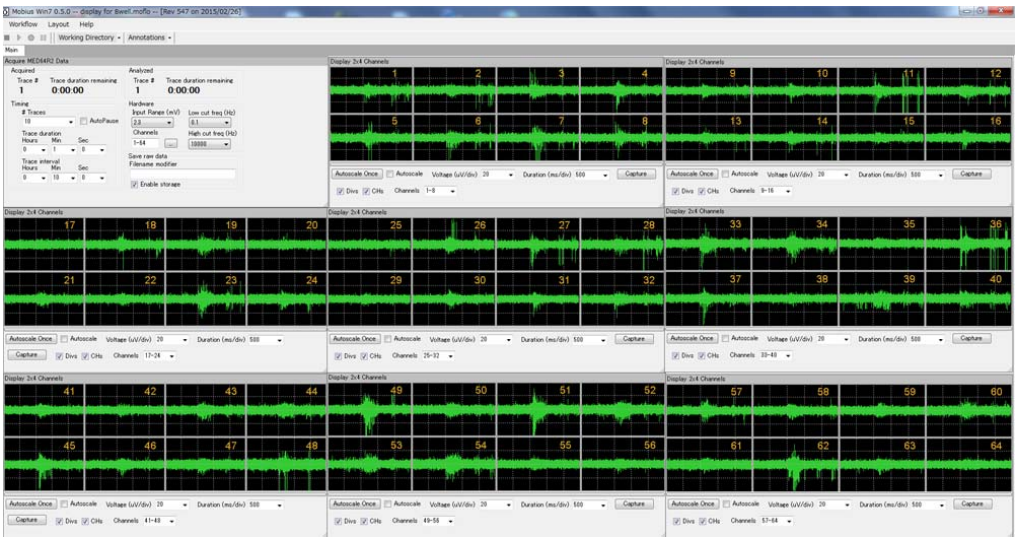


Figure 12. Displaying signals for each well with the [Display 2x4 channels].

3-4. Stimulation with the MED64-Allegro System

The MED64-Allegro System allows you to stimulate each well sequentially. Use Mobius Acquire MED64R2 Data w/Stim's Step1-8 to stimulate one (or 2 channels) per well (sample) sequentially. Inactivate the Step 5-8 when the 4 Well Probe is used.

Set the Trace interval (stimulus interval) for longer than 5 seconds since the amplifiers need at least 5 seconds to recover after stimulation.

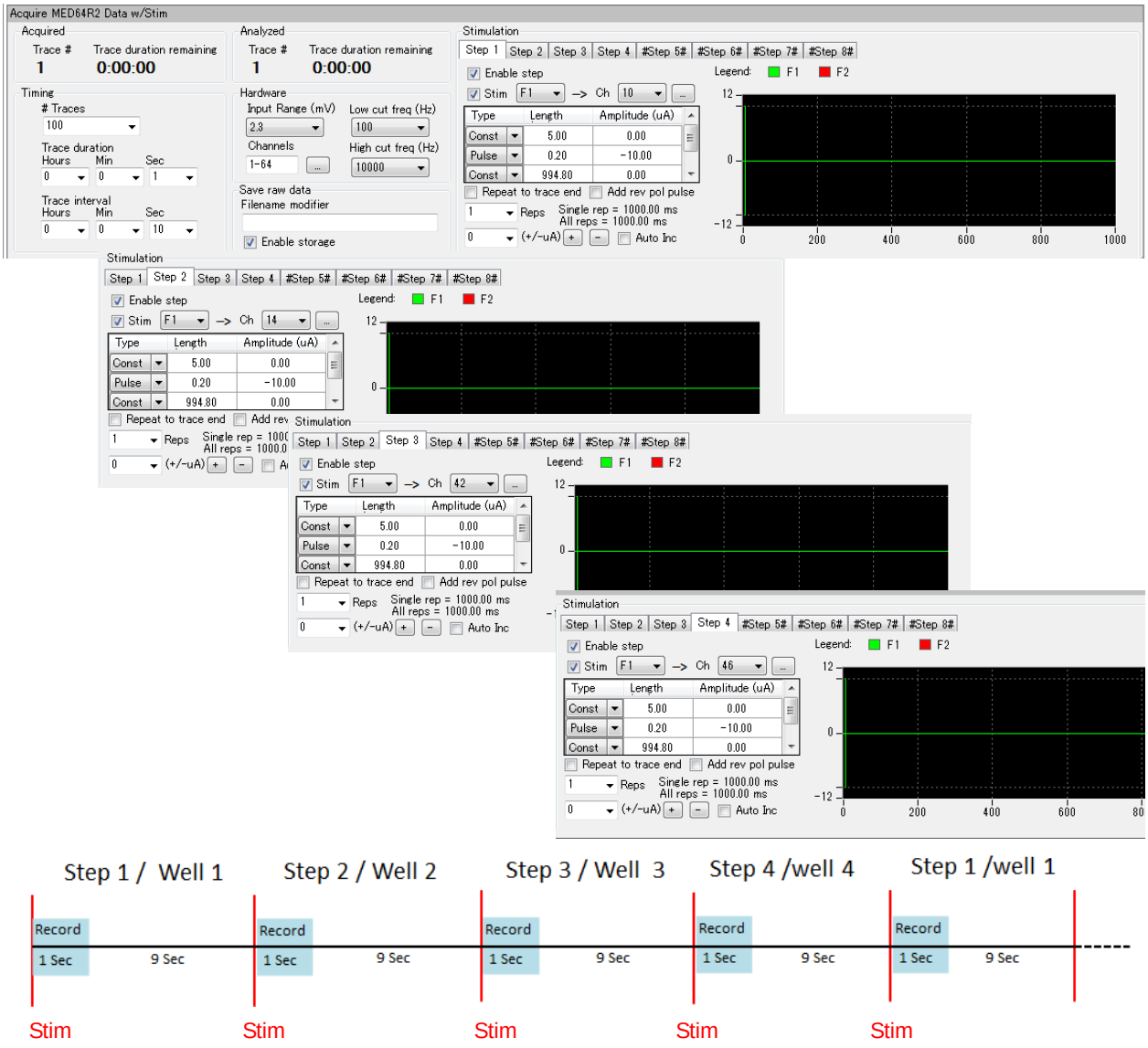


Figure 13. An example for stimulation to the 4 Well Probe. Stimulation is applied to Well#1-4 with interval of 10 seconds.

4. Troubleshoot

When noise appears during your experiments, it is important to identify the source of the noise. Likely reasons are:

- Damaged electrodes of the MED Probes
- Uncleaned and/or damaged contact pins in the Connector.
- Loosely connected the cables.
- Improper grounding.
- Equipment that generates and electric or magnetitic field (e.g. power supply, peristaltic pump, heater).
- Environment

Poor contacts caused by damaged or uncleaned contact pins can cause problems such as noises or/and faulty recording. Identify this problem by using the Test board following this procedure:

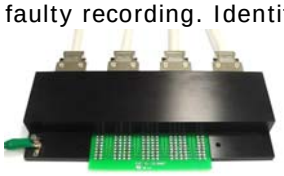
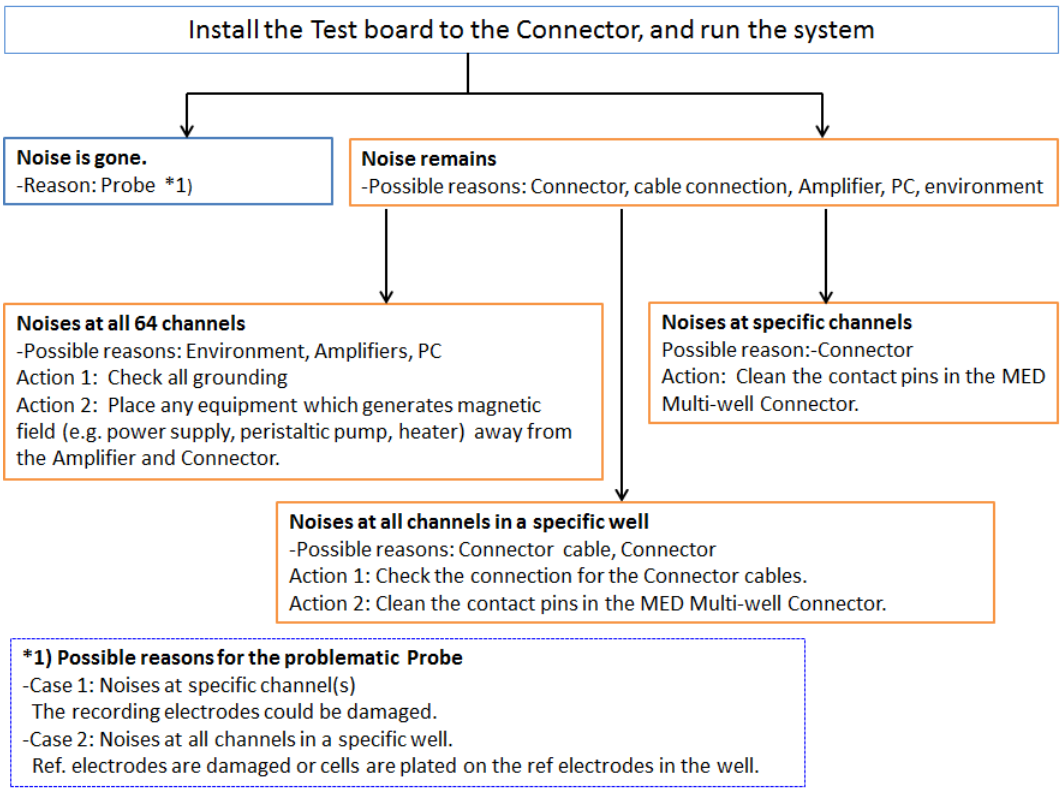


Figure 14. The Test board installed in the MED Multi-well Connector.

Trouble shooting flow chart



5. Maintenance

5-1. Cleaning of the contact pins

The 64 leads of a MED Multi-well Probe connect to the Connector via small contact pins. Clean the gold contact pins with following procedure if you observe noise from dirty pins.

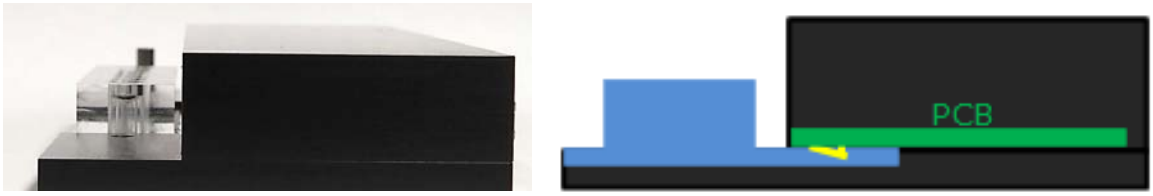


Figure 15. MED Multi-well Probe. View from side (left) and its structural scheme (right).

1. Loosen the 4 screws at the bottom of MED Multi-well Connector to remove the upper “Connector unit from the bottom “Base unit.

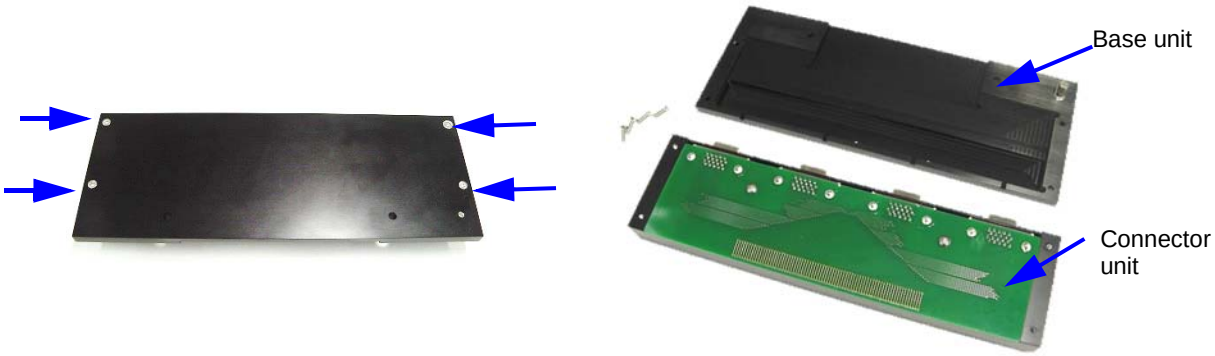


Figure 16. MED Multi-well Connector, bottom view (left) and reassembled Connector (right).

2. Clean the contact pins of the printed circuit board with a kimwipe soaked in 70% ethanol. Clean the 64 pins one by one vertically. Do NOT clean the pins laterally, as it may damage the contact pins. (See Figure 17.) Do not touch the contact pins with bare hands.

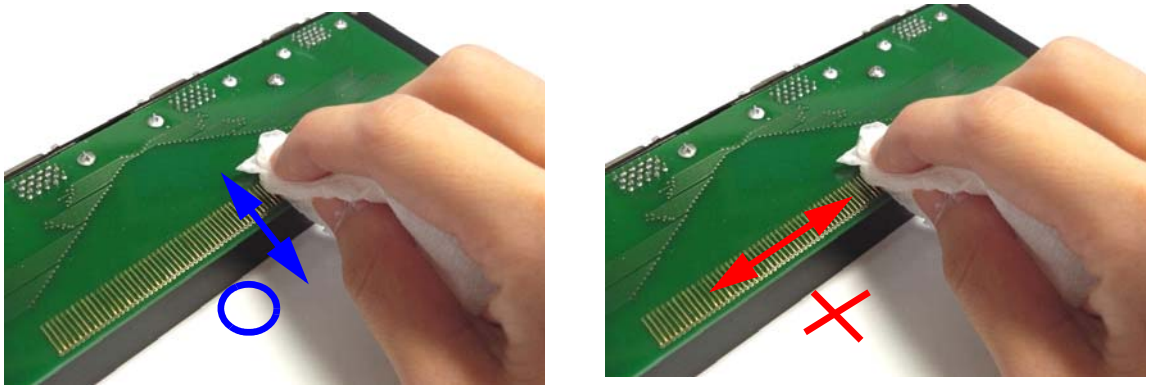


Figure 17. Cleaning the contact pins. Clean them vertically.

3. Reunite the Base unit and Connector unit.

5-2. Sterilization

Wipe the Multi-well Connector with a lint-free cloth soaked in 70% ethanol, and allow to dry.

CAUTION:

- Do NOT autoclave as it may damage the MED Multi-well Connector.

5-3. Storage

Store in a cool dry area. Avoid exposure to high temperatures or humidity.

6. Cautions

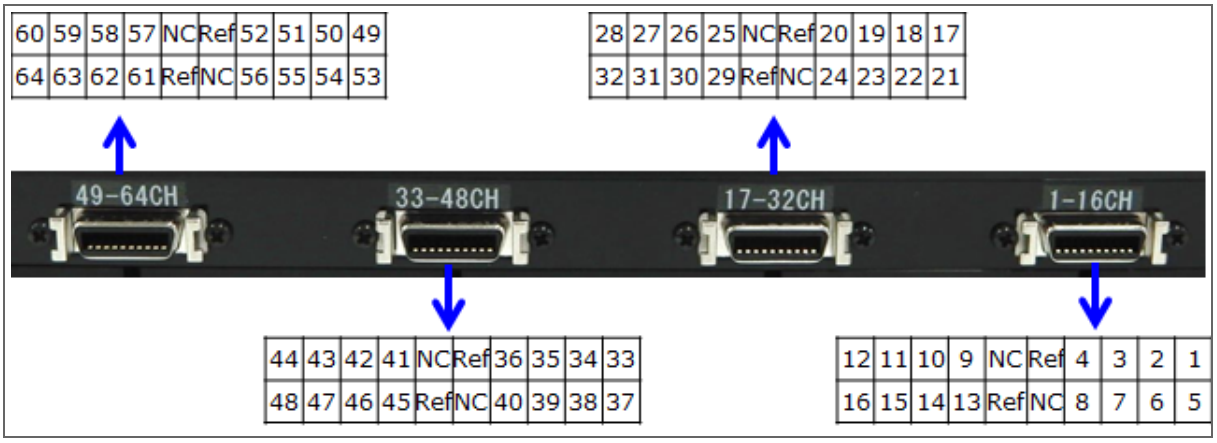
- DO NOT spill medium or any other liquid on the contact pins.
- DO NOT give strong mechanical shock by putting heavy material on the unit or dropping the unit.
- DO NOT touch the contact pins on the connector unit with bare hands or fingertips when they are cleaned. This may cause rust and adversely affect conduction.

What should I do if medium is spilled onto the contact pins?

Stop your experiment immediately. Disassemble your Connector and clean the contact pins with kim-wipe soaked in 70% ethanol, and allow to dry.

7. Terminal assignment

Figure 18 shows terminal assignment for the MED Multi-well Connector.



Ref: Reference electrode
NC: No assignment

Figure 18. Terminal assignment for the MED Multi-well Connector.

8. Warranty

This product will be repaired with new or refurbished parts, free of charge, for one (1) year from the date of original purchase in the event of a defect in materials or workmanship.

The product warranty covers failures due to defects in materials or workmanship which occur during normal use. It does NOT cover damage incurred during shipment or problems which are caused by products not supplied by Alpha MED Scientific. In addition, this warranty does not cover problems resulting from alteration, accident, misuse, neglect, faulty installation, maladjustment of user controls, improper maintenance, modifications or service by anyone other than AMS or damage attributable to acts of God.

9. Specifications

Connector unit

MED Probe securing mechanism	Slide in
Out put	20-pin MDR system connector x 4
Material	Aluminum (Gold for contact pins)
Weight	700g
Dimensions	210 x 83 x 34 (mm)

MED Connector Cable

Plug	20-pin MDR
Plug cover	Metal
Length	2 m

Specifications may not be satisfied depending upon the type of computer or operating environments used. Only for use in animal studies research. Specifications and external appearance are subject to change without notice. ThermoClamp™-1 is a trade mark for AutoMate Scientific, Inc.

April 1, 2016

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