bhi

DSP noise cancellation products

DSP Noise Cancellation

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NEIS-RM

Noise Eliminating Intercom System
Remote Microphone Version

Installation
and
Operating Manual

1080-100D
Issue C

Important Information

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Packing List:

Please check the contents of the box.
• Operating manual
• NEIS-PSU - Medical power supply with worldwide adapters
• NEIS-MIC - Remote microphone
• NEIS-DU - Desk console
• NEIS-SPKR - Loudspeaker unit

Note: We recommend that installation be carried out by qualified personnel.
Please study this manual before attempting to install the intercom.

To install this intercom you will need the following additional items:

• CAT5 network cable/connections (straight-through).
• Suitable fixings for mounting the loudspeaker
• Suitable tools for installation of the above

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Contents

Level	Tone Reduction	White Noise Reduction
1	4dB	9dB
2	5dB	11dB
3	6dB	13dB
4	8dB	15dB
5	16dB	17dB
6	21dB	20dB
7	25dB	24dB
8	65dB	35dB

Table 1. Tone and noise reduction levels.

The DSP levels are set by the following combination of jumpers.

Level	J5 (5 - 6)	J5 (3- 4)	J5 (1- 2)
1	On	On	On
2	On	On	Off
3	On	Off	On
4	On	Off	Off
5	Off	On	On
6	Off	On	Off
7	Off	Off	On
8	Off	Off	Off

Table 2. Preset DSP levels using on board jumpers.

4. Operation.

4.3   Noise cancellation level.

The noise cancellation filter level is set to the optimum position (level 7). However the noise reduction may be changed to suit the specific requirements of the installation. The unit has a choice of 8 levels of noise reduction, these are set by 3 jumper plugs accessible from the bottom of the desk unit, underneath the serial number label. The jumpers can be changed using a small pair of snipe nosed pliers or similar tool
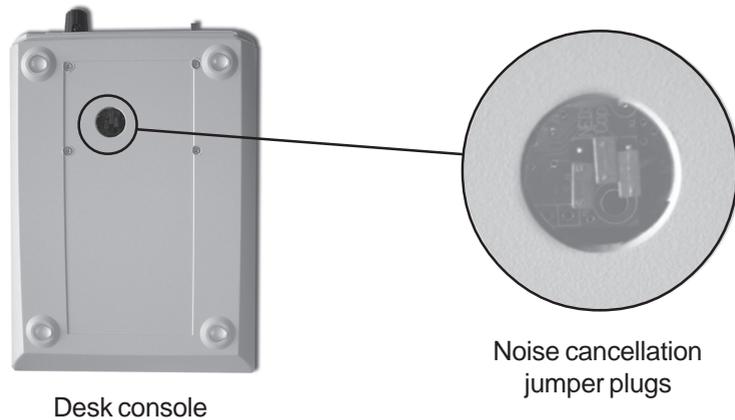
Desk console

Noise cancellation jumper plugs

Figure 9. Bottom view of desk console.

When the jumper is placed over the two pins the jumper is ON. When the jumper is connected to one pin only , or removed from the board it is OFF. To reduce the risk of losing the jumper it is advised to place it on one pin when using the OFF position.
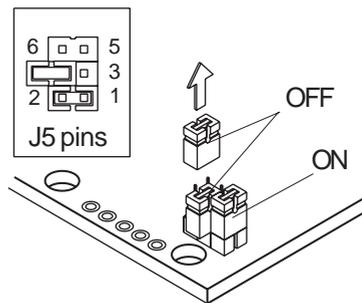
J5 pins

OFF

ON

Figure 10. Jumper details.

Weee Statement for correct disposal of this product
(Applicable in the European Union and other European countries with separate collection systems). This marking shown on the product or its literature, indicates that it should not be disposed of with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources. Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling. Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.

4. Operation.

1. Introduction.

1.1 System overview:

The bhi **NEIS N**oise **E**liminating **I**ntercom **S**ystem enables clear voice communications from within noisy environments. Using unique Digital Signal Processing (DSP) technology, unwanted noise and interference picked up by the microphone in the communication can be removed from the signal to leave clear intelligible speech.

The **NEIS** is suitable in a wide range of noisy applications, where the sounds of fans, motors, engines, air-conditioning, traffic etc., give rise to poor voice communications. The system is particularly useful for improving the voice quality in medical and industrial environments, where noisy machines can make voice communication difficult.

The **NEIS** consists of a stylish, robust, desktop speaker control unit, with a "push-to-talk" button, connected to a remote "hands free" speaker unit, with a remote microphone attached. This allows the noisy location to be constantly monitored, an important feature for safety critical environments.

Using minimal hardware components, the installation and operation of the bhi intercom system is very easy, connections being made via a single cat 5 data cable. The **NEIS** is pre-configured for optimum noise cancelling, and is fully adaptive to changing environmental conditions. It is suited to a variety of applications, where clear "noise free" two-way voice communications are important, including: Hospital radiotherapy/radiology treatment rooms, mines, railway and transport depots, customer help points, factories & office communications. In fact the **NEIS** provides a simple effective solution for anyone trying to communicate from within a noisy environment. Simply plug in the power and the system is ready to go.

Push To Talk
The desk console unit default mode is to listen to the remote speaker, all speech at the remote speaker will be heard when the unit is switch on. Press and hold the Push-to-talk (ptt) switch to enable communication to the remote speaker, release the button to hear a response back from the user.

Remote Privacy
For privacy at the remote speaker end, turn the system off using the Volume ON / OFF control on the desk console unit.

Note: Using this function will mean that the user will no longer be monitored.

4.2 Loudspeaker control.

The volume of the loudspeaker can be adjusted by the rear mounted control.

Figure 8. Rear view of loudspeaker unit

4. Operation

4.1 Desk console controls.

Power on/off
volume control

Noise cancellation
on/off switch

CAT 5 Loudspeaker
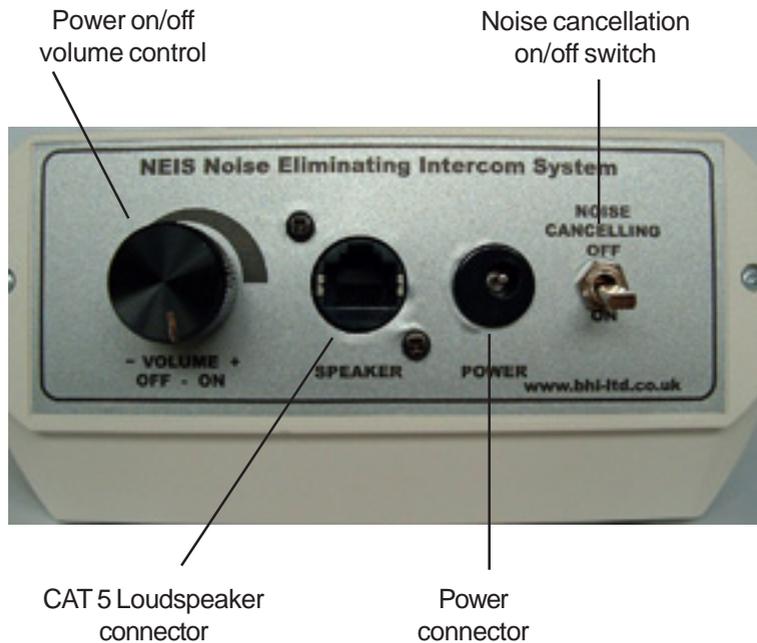connector

Power
connector

Figure 7. Rear view of desk unit

Power On Off
Ensure the power supply is plugged in at the wall socket and the
wall socket is turned on. Using the on/off Volume control knob on
the rear of the desk unit, turn on the unit.

Noise Cancellation
The desk unit is pre-set for optimum noise reduction and adjustment
is not normally necessary. The noise cancellation switch on the rear
of the unit can be used to momentarily disable the noise cancellation
system, hold the switch up in the off position and all noise will be
heard from the remote speaker. Release the switch and the noise
will be removed. Adjust the volume control for a comfortable listening
level.

1.2 Features:

- Up to 98% noise reduction
- Clear two-way voice communications
- Superb audio quality using bespoke audio circuits
- Easy to install modular system
- Simple connection via single cat 5 computer cable
- Stylish desktop speaker console with "push to talk" function
- Robust speaker unit with remote microphone & separate volume control
- Noise filter Monitor switch
- On/off volume control switch
- Medical power supply 12 VDC (1.25A)
- Dims (WxDxH) Speaker unit 180 x 160 x 240mm
- Dims (WxDxH) Control unit 150 x 220 x 70mm

2. Intercom description.

2.1 Intercom components.

The **NEIS** consists of the following components:
- Loudspeaker unit
- Desk console
- Power supply
- Remote microphone

Loudspeaker unit

Desk console

DC power supply

Remote "plug-in" microphone assembly

Figure 1. Intercom components.

3.5 Desk console.

Site the desk console unit in the quiet area. Connect the other end of the CAT5 cable to the loudspeaker socket, and the power supply into the power connector.
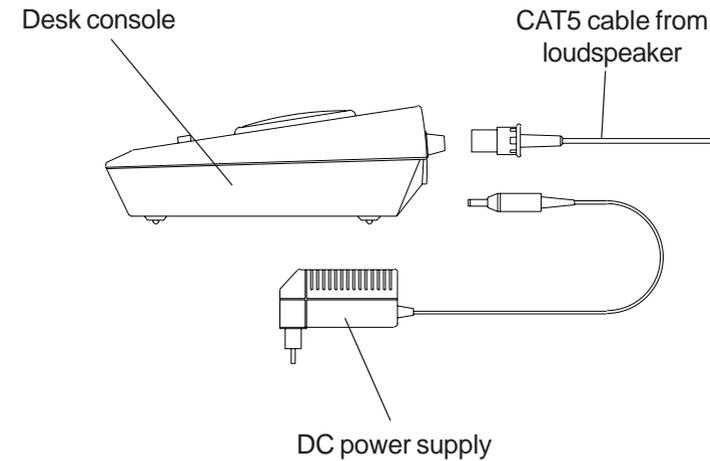
Desk console

CAT5 cable from loudspeaker

DC power supply

Figure 6. Desk console connections.

Connections:
Connections are made using standard CAT 5 straight-through twisted pair RJ45 cables

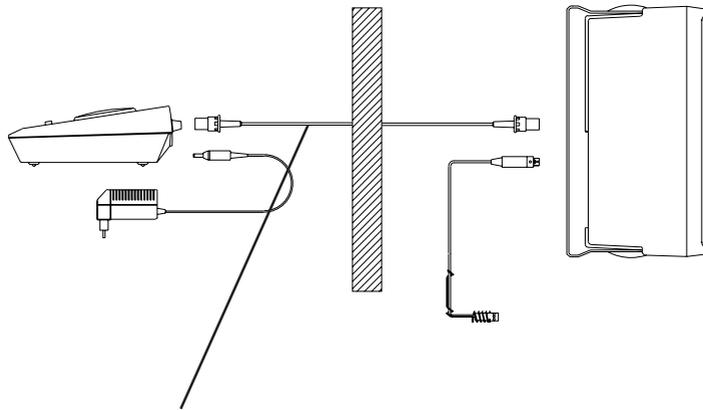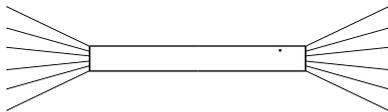*Figure 5. CAT5 cable connections.*

NEIS-DU

1= White/Orange
2 = Orange
3 = White/Green
4 = Green
5 = White/Blue
6 = Blue
7 = White/Brown
8 = Brown

NEIS-SPKR

1= White/Orange
2 = Orange
3 = White/Green
4 = Green
5 = White/Blue
6 = Blue
7 = White/Brown
8 = Brown

3. Installation.

2.2 Intercom component description.

2.2.1 Loudspeaker unit.
The loudspeaker unit mounts in a suitable location in the noisy area to give optimum voice quality to the user. The unit features a separate volume control, enabling the speaker output volume to be set up to suit the surrounding conditions and environment. The cat 5 cable connects at the rear of the unit.

2.2.2 Remote microphone.
The remote microphone connects to the rear of the loudspeaker unit, and is best placed as near to the user as possible to obtain optimum audio performance. The most common routing of the microphone cable is through the ceiling and suspended down in-line with the patients face and as near to their mouth as possible. It can also be clipped inside the gantry using a standard plastic cable holder or ty-rap.

2.2.3 Desk console unit.
The desk console unit is best located in a quiet area (normaly the equipment control room), and receives audio from the user in the noisy area through its small loudspeaker. It has a push-to-talk (ptt) button on the front to enable speech back to the user. The unit has a power on/off switch with volume control, a separate noise filter monitor switch on rear of the unit, a noise filter level select switch on the bottom of the unit. This unit contains the noise cancellation electronics to enable the removal of any noise that is present with the voice signal. The unit connects to the cat 5 cable via the connector on the rear of the unit.

2. Intercom description.

3. Installation
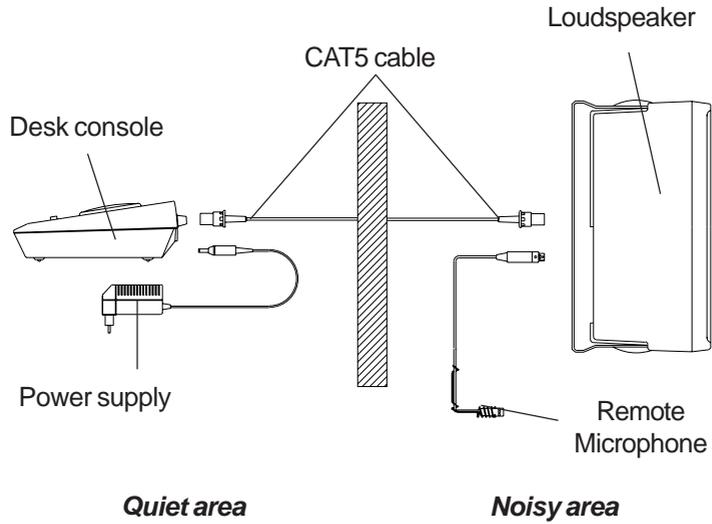
3.1 Basic installation diagram.

Figure 2. Basic block diagram.

3.2 Power supply.

The medical power supply used for the **NEIS** is a modular unit, and consists of a modular pin unit and the power supply so as to accommodate the different types of voltage and connections around the world. Before the power supply can be used, plug the pin unit supplied onto the power supply body until it clicks into place.
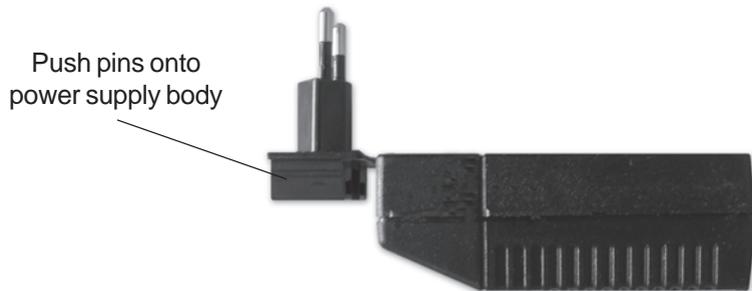

Figure 3. Power supply.

3.3 Loudspeaker mounting.

Mount the wall bracket supplied with the speaker unit in a suitable location in the noisy area, so that it optimizes the audio for the user. The microphone and cat 5 cable should be connected at the rear of the speaker before the speaker is secured into the bracket, and the microphone should be mounted at least 1 metre away from the speaker.
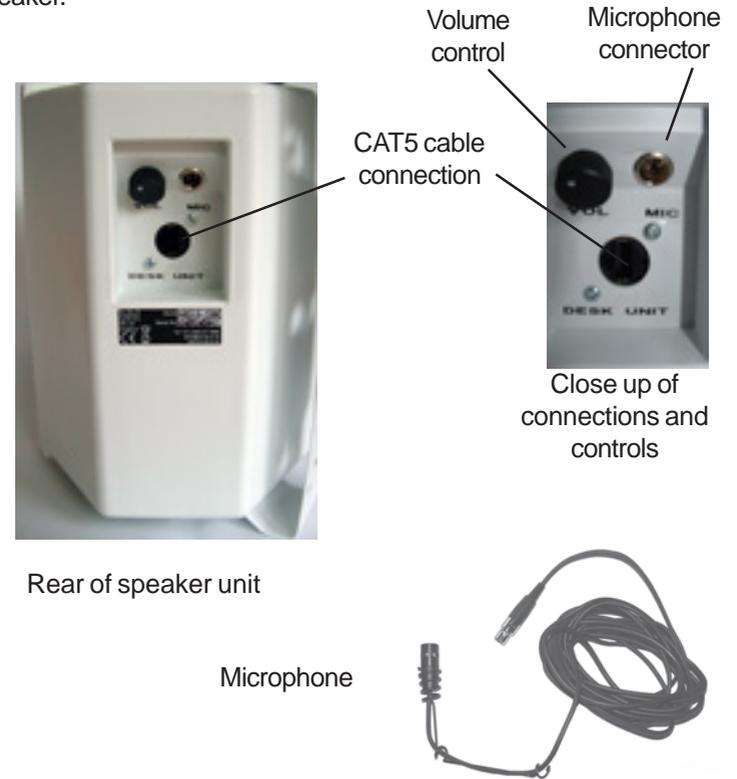

Figure 4. Loudspeaker connections.