

## 1. Introduction

This information note describes programming system option currently available for communicating with Sound Design Technologies' DSP hybrids. These programming options can be used for engineering evaluation of the hybrids and provide alternatives for development of commercial applications. The minimum circuit configuration consists of a programming system and a Sound Design Technologies hybrid assembled in the configuration described in the appropriate data sheet.

## 2. Hi-PRO

The Hi-PRO system (see [Figure 1](#)) option requires the following components:

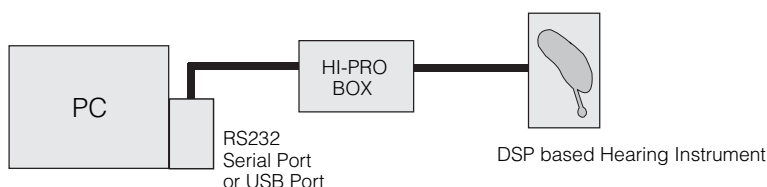
- Hi-PRO system box
- Programmable or DSP hybrid
- Programming software with appropriate drivers
- Connecting cable

The type of driver used to control the Hi-PRO system is called a Dynamic Link Library (DLL). These drivers are distributed to HIMSA members with the Hi-PRO box and are periodically updated. Sound Design Technologies ARK is compatible with USB Hi-PRO system.

To address communication requirements of the DSP hybrids, visit Sound Design Technologies' software support site at: <http://sounddesigntechnologies.com/software/>.

Further information on Hi-PRO is available from:

GN Otometrics A/S  
Dybendalsvænget 2  
P.O. Box 119  
DK-2630 Taastrup  
Denmark  
Tel.: +45-45-755-555  
Fax: +45-45-755-559  
Email: [info@gnotometrics.dk](mailto:info@gnotometrics.dk)  
Internet: <http://www.otometrics.com>



**Figure 1: Hi-PRO System**

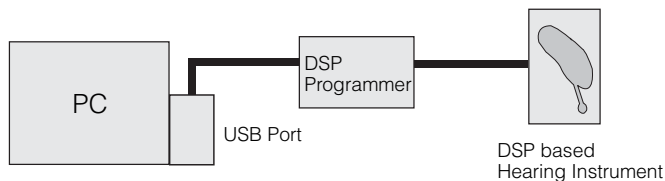
### 3. Sound Design Technologies DSP Programmer (GenUSB)

The Sound Design Technologies DSP Programmer (see [Figure 2](#)) is intended to be used in a production environment for high-speed communication with Sound Design Technologies DSP hybrids. The DSP Programmer does not have galvanic isolation and is specifically designed to program Sound Design Technologies' DSP hybrids in manufacturing environment.

To program DSP hybrids, this system requires the following components:

- Sound Design Technologies DSP Programmer box
- Installation of an ARK component with a USB port available on the computer
- Connecting cables

To obtain appropriate software and DLL's, visit Sound Design Technologies' software support site at: <http://sounddesigntechnologies.com/software/>.



**Figure 2: Sound Design Technologies DSP Programmer**

### 4. NOAHlink

The NOAHlink support is available to NOAHlink licenses only. To program DSP hybrids, the following components are required:

- NOAHlink system
- Bluetooth interface device in your computer
- ARK controller component installed
- Connecting cables

Further information on [NOAHlink](http://www.himsa.com) is available from: <http://www.himsa.com>.

For more detailed information on ARK compatibility, contact Sound Design Technologies at [software@sounddes.com](mailto:software@sounddes.com).

## 5. Communication Protocol

The communication protocol for analog programmable and DSP hybrids is based on a three-wire interface using asynchronous data communication. In principle, the communication protocol describes how to transfer a single bit of information between the hearing instrument and the programmer box. The protocol is described in the *Communication Standard for Programmable Devices* document (Spec. #30381-000).

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**Note:** The information included in this document is not needed if the ARK DLL drivers distributed by Sound Design Technologies are used.

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For communication protocol examples, contact Sound Design Technologies at [software@sounddes.com](mailto:software@sounddes.com).

## 6. Data Structure

The data structure defines the string of bits transferred to or from the hearing instrument to achieve certain objectives (e.g., read, write or burn). To obtain information on the data structure, refer to the appropriate information notes.

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**Note:** Knowledge of the data structure is not necessary if the DLL drivers or ARK components Sound Design Technologies distributed are used.

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## 7. Software Support

Sound Design Technologies offers several software solutions for communication between programmers and programmable hybrids. For more information, visit Sound Design Technologies' software support site at: <http://sounddesigntechnologies.com/software/>.

## 8. Programming Cables

There are several possible options to interface programmable hybrids with existing programming boxes. Some of the options, available from Sonion, include the following:

- CS43, CS44 and CS45 plugs and sockets
- CS43, CS44 and CS45 programming cables
- CS53, CS54, CS63 and CS64 flex interconnect systems
- CS73 and CS74 insert socket module

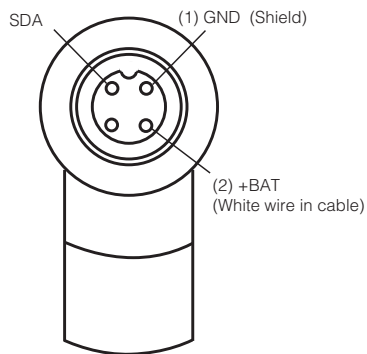
Further information on the above options is available from Sonion at: <http://www.sonion.com>.

Programming cables and connector systems are also available from Knowles Electronics, and include the following:

- 0009 connector socket and cover
- 009P programming cable
- 9200 programming flex strip
- 9201 programming flex strip

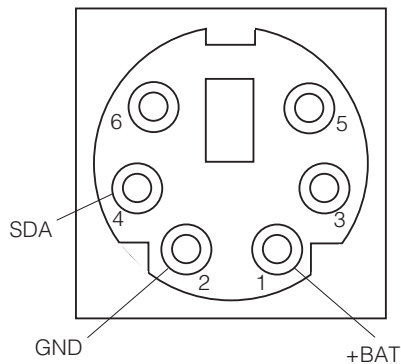
More information about these systems is available on Knowles' website: <http://www.knowles.com>.

One of the most popular cables – CS44 model – has pin assignment as shown in [Figure 3](#).



**Figure 3: CS44 Pin Assignment**

The pin assignment of the Hi-PRO connector is defined by the Hi-PRO drivers. Current pin configuration of the Hi-PRO socket is shown in [Figure 4](#). The Sound Design Technologies USB programmer adheres to the Hi-PRO socket configuration standards.



**Figure 4: Hi-PRO Pin Assignment**

Sonion and Knowles offers several types of Hi-PRO compatible cables. Refer to their websites for more information.

Sound Design Technologies's USB programmer adheres to Hi-PRO socket configuration standard.

## 9. Revision History

Version	ECR	Date	Change Description
11	142812	May 2007	Updates to all paragraphs. Layout update.
12	148636	April 2008	Document conversion to new template and editing.

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