AND9106/D

SU6701-E DSP Programmer Guide

ON Semiconductor®

www.onsemi.com

APPLICATION NOTE

Description

The DSP Programmer (SU6701−E) is a programming unit that interfaces between a computer and a hearing aid with ON Semiconductor DSP hybrid and can be used as a fast speed alternative to the Hi-Pro. Software in conjunction with the DSP Programmer makes up the whole programming unit. The DSP Programmer sends and receives data to/from the hearing aid to program the correct end-user configuration.

The ON Semiconductor DSP Programmer is intended to be used in a production environment for high-speed communication with ON Semiconductor DSP hybrids and is intended for faster calibration and configuration of these products (see Figure 1). This unit does not have galvanic isolation. To program DSP hybrids, this system requires a DSP Programmer box, installation of an ARK™ component with a USB port available on the computer and the appropriate connecting cables (see Figure 2).

The connection between the DSP Programmer and the PC is a USB specific cable supplied by ON Semiconductor. The connection between the DSP Programmer and the hearing aid is a cable identical to the one used in HiPro applications. These connections are located on the front panel with a pin configuration as shown in Figure 3. The front panel also provides power, as well as left and right communication LEDs.

Software and drivers for the DSP Programmer are included in the ARKbase distribution package.

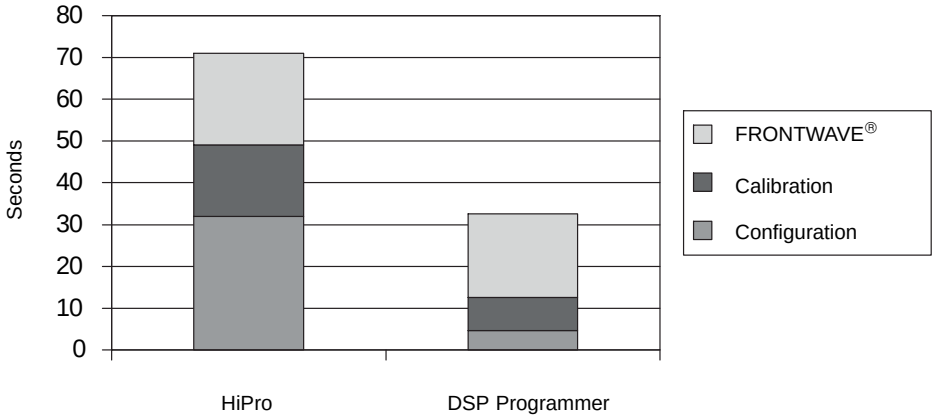

Figure 1. Speed Comparison Hi−PRO vs. DSP Programmer

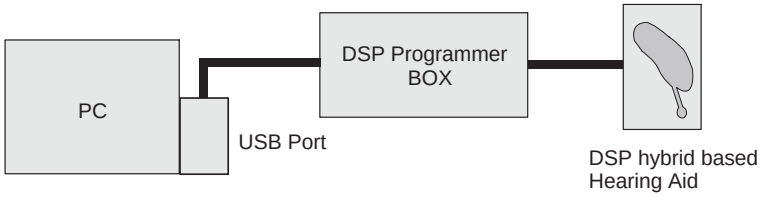

Figure 2. ON Semiconductor DSP Programmer

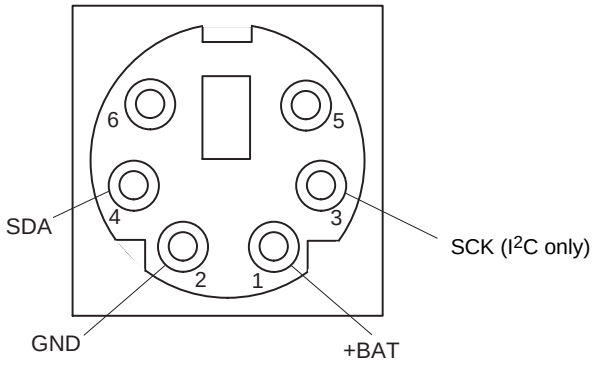

Figure 3. Hi−Pro/ON Semiconductor's DSP Programmer Pin−out

Sonion (http://www.sonion.com) and Knowles Electronics (http://www.knowles.com) offer several types of Hi-Pro compatible cables. Please refer to their catalogues for details.

ON Semiconductor DSP Programmer adheres to the Hi-Pro socket configuration standard.

Software Installation

The ARKbase™ installation program installs the USB Controller Component DLL and the DSP Programmer drivers to the default locations on the computer and registers the Controller Component for immediate use with ARK-based applications.

System Requirements

The DSP Programmer is compatible with Windows versions 2000 and higher. The DSP Programmer requires ARKbase version 5.4.0 or higher.

Installing GenUSB on a Windows System

1. Download ARKbase to a known location on the hard drive. The installation file, along with the release notes, is located at http://ark.onsemi.com/support_Downloads.php
2. Run the executable by double-clicking on the icon. Accept all default options.
3. After the installation has finished, connect the DSP Programmer to the computer's USB port and wait for the system to set up the device. The power light will turn on when the device is ready for use.
4. To communicate with a hearing aid, ensure that the hearing aid cable is firmly inserted in the left or right port on the programmer.

Additional Notes for Windows® XP

1. After running the executable and connecting the programmer, a series of dialog boxes will appear. In the Found New Hardware Wizard screen, ensure that the **Install software automatically** option is selected and then click **Next**.
2. If the Windows Logo Testing warning appears, click **Continue Anyway**.

NOTE: The Found New Hardware Wizard may appear again, in which case repeat the above procedure.

DSP Programmer Specification

The ON Semiconductor DSP Programmer connects to the computer over full speed (12 Mbits) USB. The unit is capable of communicating with ON Semiconductor's DSP hybrids at speeds up to 42 kbit/s (SDA) or 400 kbit/s (I^2C). Communication with legacy analog parts is unsupported because the programmer is unable to provide a high voltage programming pulse.

Two connections are provided for connection to hearing aids: left and right 6-pin Mini DIN sockets (similar to Hi-Pro). The programmer is approximately 5 in (127 mm) long, 3.75 in (95.3 mm) wide, and 1.65 in (41.9 mm) tall.

Electrical Specifications

Pin 1: Fixed Supply

Table 1. PIN 1 DESCRIPTION

Parameter	Min	Typical	Max	Units
Output Voltage @ 100 mA	1.28			V
Output Current (Total sum of left and right ports)			100	mA

Pin 2: Analog Ground

This pin is low impedance Ground.

Pin 3: I^{2}C Clock

This pin is the I^{2}C clock line (SCK) in I^{2}C mode. It is unused in SDA mode.

Pin 4: SDA Data / I^{2}C Data

This pin is the bidirectional data line in both SDA and I^{2}C mode.

Table 2. PIN 4 DESCRIPTION (SDA mode)

Parameter	Min	Typical	Max	Unit
Output Voltage Low: [Vol] @ 2.5 mA	-	-	0.14	V
Output Voltage High: [Voh] @ 2.5 mA	1.0	-	-	V
Input Threshold (Rising Edge)	-	0.56	-	mV
Input Threshold (Falling Edge)	-	0.37	-	mV
Sync. Pulldown Resistor	-	3	-	kΩ
Communication Pulldown Resistor	-	562	-	kΩ

Pin 5: Floating

Pin 6: Reserved

Do not connect to this pin.

Cable Capacitance

The maximum cable capacitance recommended for use with the ON Semiconductor DSP Programmer is 500 pF. This refers to capacitance from the communication pin to any other pin or to the shield. The limitation is that the hearing aid is not capable of a fast enough slew rate to run at high speed while driving a capacitance larger than 500 pF.

If you have any questions or comments, please contact ON Semiconductor via email at: dsp.support@onsemi.com

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