

SU6701-E DSP Programmer Guide



ON Semiconductor®

www.onsemi.com

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.

APPLICATION NOTE

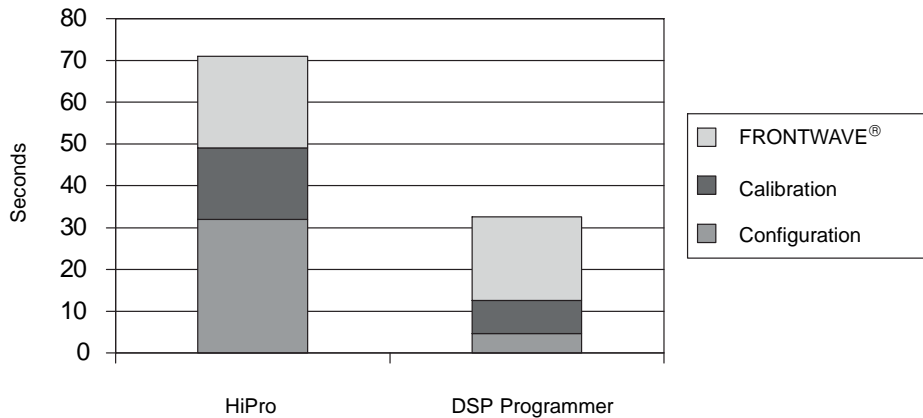


Figure 1. Speed Comparison Hi-PRO vs. DSP Programmer

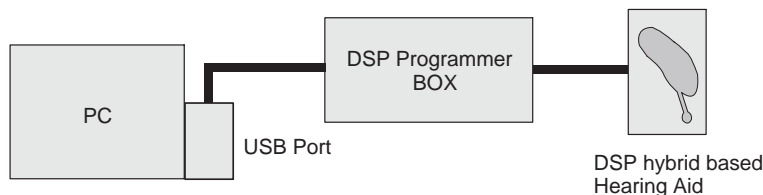


Figure 2. ON Semiconductor DSP Programmer

AND9106/D

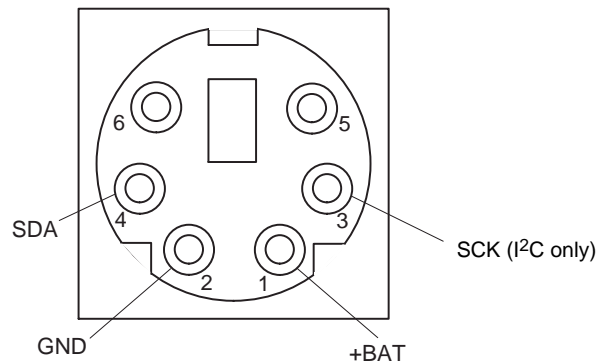


Figure 3. Hi-Pro/ON Semiconductor's DSP Programmer Pin-out

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 (I²C). 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: I²C Clock

This pin is the I²C clock line (SCK) in I²C mode. It is unused in SDA mode.

Pin 4: SDA Data / I²C Data

This pin is the bidirectional data line in both SDA and I²C 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

ARKbase are trademarks of Semiconductor Components Industries, LLC.
FRONTWAVE is a registered trademark of Semiconductor Components Industries, LLC.
Windows is a registered trademark of Microsoft Corporation.

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>
For additional information, please contact your local Sales Representative