

INTRODUCTION

This document is intended to help in designing hearing instruments with Gennum's FOUNDATION™ Digital hybrid. It outlines steps that should be taken during that process. Please note that relevant information is contained in a number of documents available from Gennum Corporation. Hyperlinks to those documents as well as the document numbers are provided here.

SOFTWARE

Download the latest version of ARKbase™ from Gennum's web site and install it on your computer. If you have older versions of ARKbase (2.8.2 or earlier) it is recommended you uninstall your old version before installing this new one. To do this, follow the instructions at the end of this document. For more information on Gennum's ARK software architecture, refer to the [Getting Started with ARK software](#) information note, document #27217.

IMPLEMENTATION GUIDE

1. Familiarize yourself with the data sheet for the [FOUNDATION Digital hybrid, GA3216](#), document #24501. It contains all the features and product specs associated with the FOUNDATION Digital hybrid along with detailed descriptions.
2. Based on the schematic in Fig. 1 assemble the GA3216 based hearing instrument.
3. Launch the Interactive Data Sheet from the Start Menu under Programs/Gennum/Development Tools. Select the Foundation (GA3216) Demo Library [Cfg] and the '1 Channel Linear [Trimmer]' product.
4. To better understand the GA3216's functionality, adjust the sliders on all the tabs and observe their affect on the I/O and frequency response graphs.

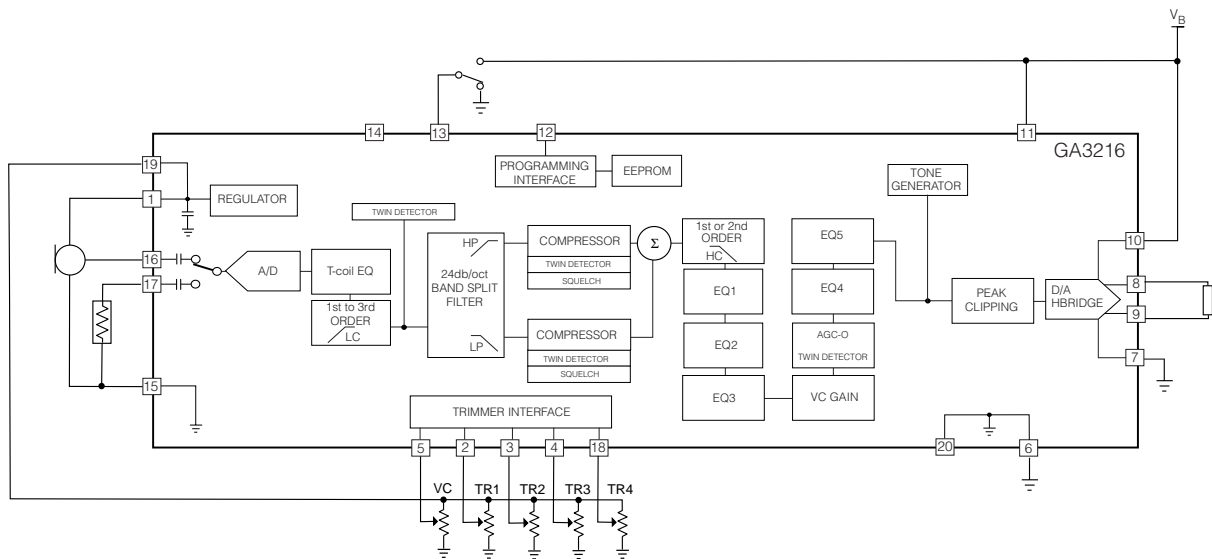


Fig. 1 GA3216 Schematic

- To begin, connect the GA3216 up to a programming box (i.e. HIPro or Gennum's DSP programmer). With the above library and product selected (See step 3) click on the Programmer tab and select the Open, Which Chip, Init option. (See Fig. 2). If a dialog box appears, select the Burn Current option. This will configure the GA3216 with the default settings from the Demo Library.

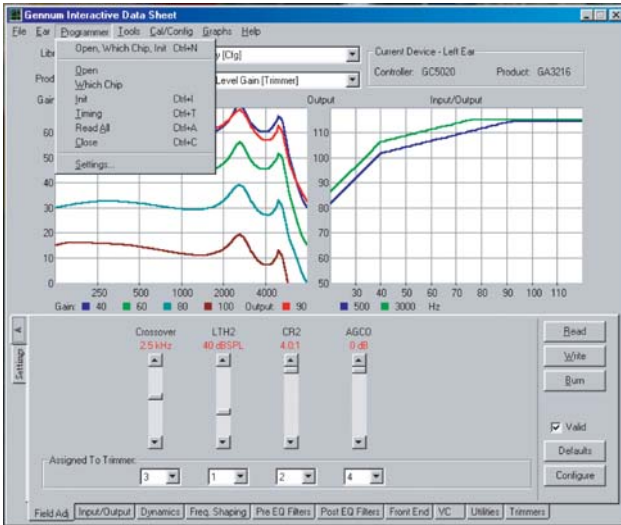


Fig. 2 IDS screen shot.

- Now that communication has been established, the GA3216's settings can be changed by adjusting the sliders for any of the parameters and either writing or burning to the device.
- To set the device up for Trimmer evaluation, set all the non-field adjustable parameters to a desired value. To use the GA3216 in programmable mode, proceed to Step 10. Once you configure the device these will not change. The 'Field Adj' tab is where you can assign the field adjustable parameters to trimmers. Each field adjustable parameter may be assigned to a trimmer up to a maximum of four trimmers.
- The next step is to configure the device, which can be done by pressing the 'Configure' button in IDS. This will set the GA3216 into Trimmer mode. A text box will appear once this is completed stating that the device is now locked (See Fig. 3) and can no longer be communicated with. At this point the trimmers are now active and any adjustments can now be made with them.

NOTE: the slider configuration in the Field Adj tab no longer reflects the device settings at this point. The device is now controlled by the trimmer settings on the hearing instrument itself, and as such, wherever the trimmer sliders are located is where the settings will be set to.

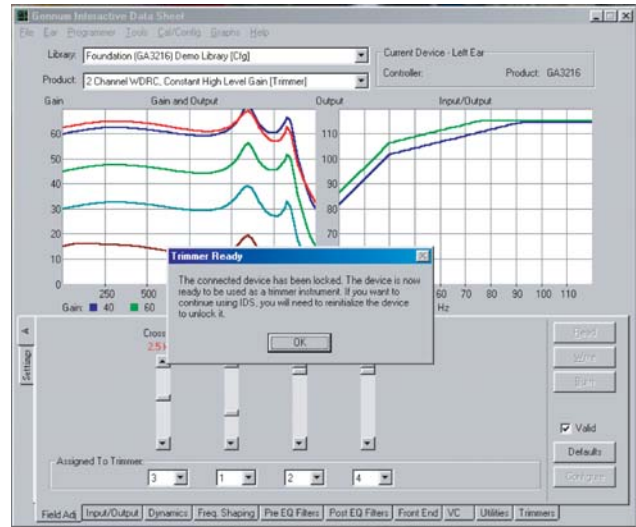


Fig. 3 Locking the device as a trimmer product.

- In order to reconfigure the device, it must be reinitialized with IDS. A text box will appear stating that the device is locked in trimmer mode (Fig. 4). Click 'OK' to unlock the device. This will enable communication with IDS once again.

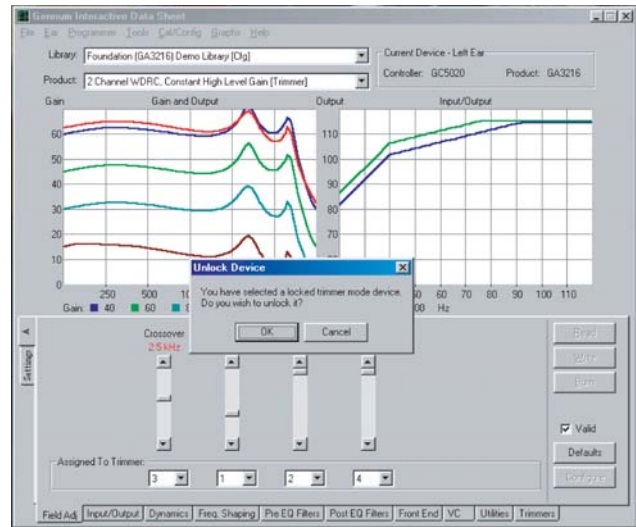


Fig. 4 Unlocking a locked trimmer device.

- To configure the GA3216 as a programmable select the Foundation (GA3216) Demo Library then select the 2 Channel WDRRC, Constant High Level Gain [Prog] product. Initialize the device and when the dialog box comes up select the 'Burn Current' option.
- Adjust all the settings which are not field adjustable to a desired value in each memory, these can not be adjusted after the device has been configured.

12. The next step is to configure the device into Programmable Mode, which is done by pressing the 'Configure' button in IDS. This will set the GA3216 in programmable mode. A text box will appear during configuration stating that the device is now programmable ready, press OK to switch to the corresponding field DLL.

13. The field DLL is what would be distributed with the fitting software. It allows for quicker communication with the HiPro during customer fitting. The only parameters that may be adjusted with the field DLL are the ones that are set up as field adjustable. To unlock the device, select the corresponding configuration DLL or a different library and product and re-initialize the device, select the 'Unlock' option when the dialog box appears.

NOTE: Moving some sliders in the field DLL will not adjust the I/O curves until communication has been established with a device.

14. After product functionality is well understood using the Demo Libraries, use the ARKonline web tool to create a manufacturer specific library. Apply for a password to ARKonline in order to have access to the ARKonline Library Manager. Refer to [The ARKonline Quick Start Guide](#), document #17931 for detailed instructions.

15. If the desired transducer is not available in the ARKonline database, or a more accurate transducer model is required (for tubing and faceplate effects), use the Modeler software installed with ARKbase. Detailed information about the Modeler software is available in [Modeler Software Guide](#), document #17810. It is necessary to run the Frye FONIX 6500 Configuration tool to configure the FONIX on your computer prior to using the Modeler software.

16. The next step is to create a map using the GA3216 Wizard. Choose Library Manager, Maps, Create New Map, and select the GA3216_S01_Wizard. (See Fig. 5) For more detailed information, read the [ARKonline Quick Start Guide](#), document #17931.

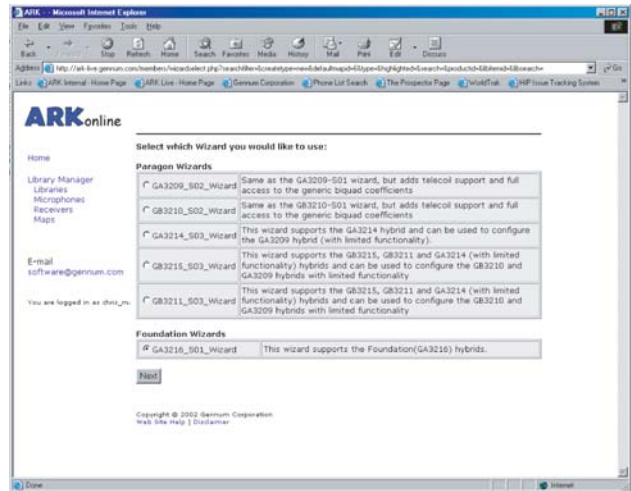


Fig. 5 Selecting a Wizard in ARKonline.

17. Step through the pages of the Wizard, customizing the GA3216 for the desired application.

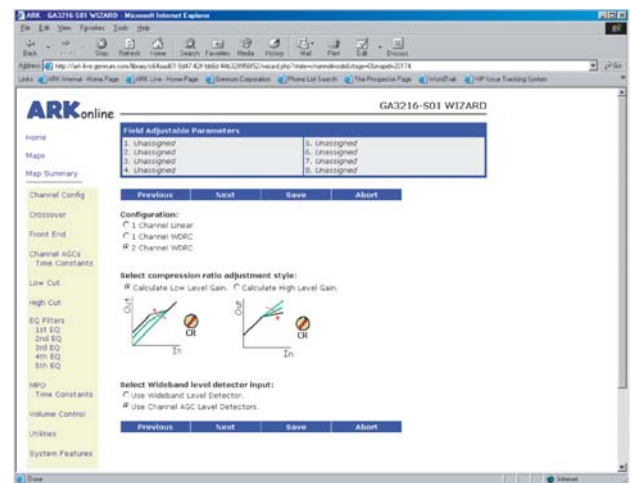


Fig. 6 Screen Shot from GA3216 Wizard.

18. Use the ARKonline Library Manager to fine-tune products by selecting the desired Map and microphone/receiver models. (See Fig. 7)

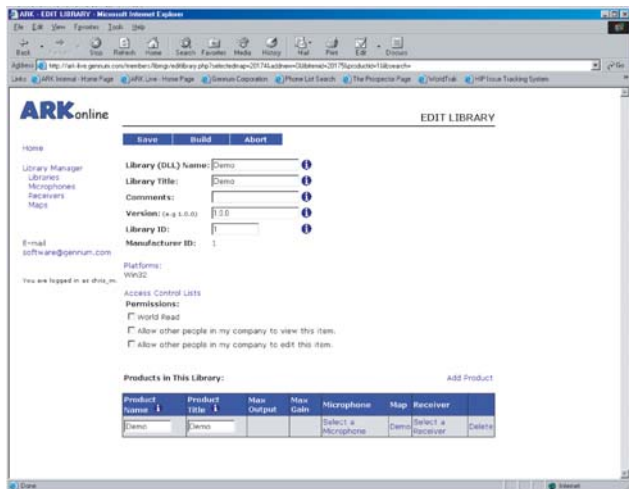


Fig. 7 Editing Library.

19. Once all of the fields are filled out, build the library by selecting 'Build' at the top of the page. (See Fig. 7). Refresh the page using the reload button (or by pressing F5) periodically until the word 'Download' appears in blue.

20. Download the newly created library. For trimmer products there will be one DLL. If the library is for a programmable product, there will be two DLLs, a configuration DLL and a field DLL. The configuration DLL is used to configure the FOUNDATION Digital product in IDS and Cal/Config. The field DLL is smaller in size and is used in the manufacturer's fitting software.

21. Use the ARK Component Manager, from the Tools menu in IDS, to register the new configuration DLL library in the Windows environment. For instructions, refer to [The ARKonline Quick Start Guide](#), document #17931.

22. Start the Interactive Data Sheet and select the newly created library. If using the GA3216 in Trimmer Mode, assign the trimmers here on the trimmer assignment page. Once the product has been configured, save the configuration as an .ids file using the "File/Save Configuration As" function. Cal/Config settings should also be updated here using the Cal/Config pull down menu.

23. Open the Cal/Config software. Select the newly saved .ids file. See the [mARK2 Cal/Config User's Guide](#), document #27350 for detailed information.

24. The device is now ready to be calibrated and configured.

25. Copy field DLLs to your specific fitting software (if using the GA3216 in programmable mode) and modify your software interfaces to accommodate the designed functionality.

If you are using the GA3216 FOUNDATION Digital hybrid in a high power application, it is recommended that you read the [Using the GB3211 Paragon™ Digital in High Power Applications](#) information note, document #24561, as a reference. It provides guidelines for designing high gain, high power circuits based on the GB3211 hybrid, but the same practices should be used for the GA3216 hybrid.

The information contained in this document provides techniques for properly designing a high power hearing aid, such as ensuring impedance matching between the receiver and battery.

HOW TO UNINSTALL ARKBASE

To uninstall ARKbase, run Add/Remove Programs from the control panel. Select ARKbase and Add/Remove.

If after installing the new version of ARKbase there are some problems, please contact software@gennum.com for assistance.

DOCUMENT IDENTIFICATION
APPLICATION NOTE
 The product is in a development phase and specifications are subject to change without notice. Gennum reserves the right to remove the product at any time. Listing the product does not constitute an offer for sale.

REVISION NOTES:
 Updated based on ARKbase 3.4.4 release.

GENNUM CORPORATION

MAILING ADDRESS:
 P.O. Box 489, Stn. A, Burlington, Ontario, Canada L7R 3Y3
 Tel. +1 (905) 632-2996 Fax. +1 (905) 632-5946

SHIPPING ADDRESS:
 970 Fraser Drive, Burlington, Ontario, Canada L7L 5P5

GENNUM JAPAN CORPORATION

Shinjuku Green Tower Building 27F, 6-14-1, Nishi Shinjuku,
 Shinjuku-ku, Tokyo, 160-0023 Japan
 Tel. +81 (03) 3349-5501, Fax. +81 (03) 3349-5505