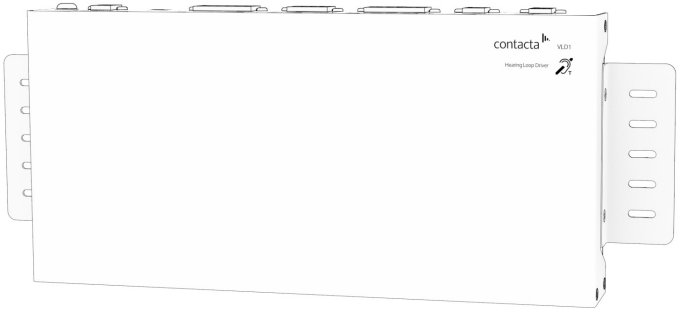
contacta

Large Area Vehicle Hearing Loop Driver Software

VLD1



Software and Setup Guide

July 2024

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Product Overview

The Contacta Large Area Vehicle Hearing Loop Driver [VLD1] enhances communication for passengers with hearing loss throughout transport vehicles such as buses and coaches. This dual-output driver powers phased array hearing loops with an Class-D amplifier output stage and an audio subsystem built around an advanced DSP core.

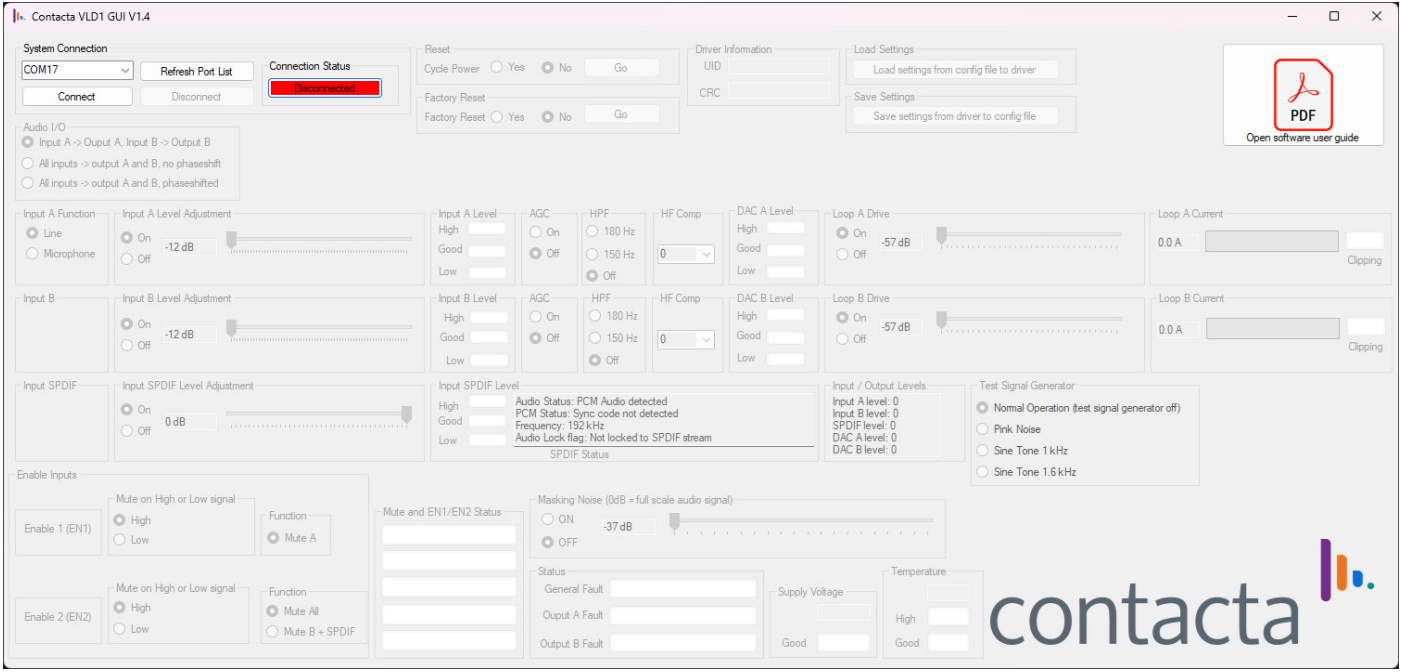
This user guide provides instructions on how to setup and adjust the Contacta VLD1 using the provided software, available for download via the Contacta website at **www.contacta.co.uk**.

The operating software requires the following:

- PC running **Windows 7 o**r a more recent version.
- **.NET Framework 4.8 Runtime**. This is already installed on most Windows machines, but is also included with this software. It can be downloaded from Microsoft's website if necessary.
- **Device driver for handling the communication with the VLD1**. This device driver will be installed automatically once a connection is made from the PC to the VLD1. This driver can optionally be downloaded from FTDI's website: **www.ftdichip.com**
- **USB type A to USB type B cable** to connect the Windows PC to the VLD1.
- **Screen resolution** set to **at least 1920x1080** with resolution scaling set to 100%.

Installation

The software is provided as a standalone executable file. No installation is required. Once loaded, the following screen will appear:



The only controls available at this point are “Refresh Port List” and “Connect”. Select the COM port to which the VLD1 driver is connected and click “Connect” to make a connection attempt.

Software Operation

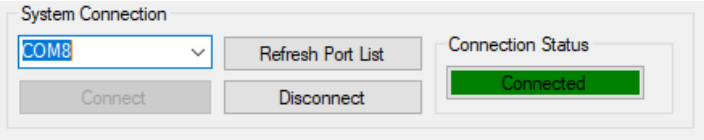
Once connected to the VLD1, the screen will be populated with the driver's current settings and status. All functions become available. Any settings that are altered are immediately applied on the driver and will be kept even after disconnecting the GUI or power cycling.

System Settings

The main categories on the software's GUI (displayed and labelled on the previous page) are as follows:

1. **System Connection** [see page 7]
2. **Power Reset and Factory Reset** [see pages 7-8]
3. **Driver Information** [see page 8]
4. **Load / Save Settings** [see page 8-9]
5. **Audio I/O Mode [see page 10]**
6. **Input A / B / C (SPDIF) Settings and Indications** [see page 11]
7. **Output A / B / C (SPDIF) Settings and Indications** [see page 13]
8. **Enable Inputs Settings and Indications** [see page 14-15]
9. **Masking Noise** [see page 15]
10. **Test Signal Generator** [see page 16]
11. **Driver Status and Health Information** [see page 17]

System Connection



This section handles the USB connection.

- After connecting and powering up the VLD1, click “Refresh Port List” to display available COM ports.
- Select the correct port and click “Connect” to establish a connection.
- Pressing disconnect disconnects the USB connection.

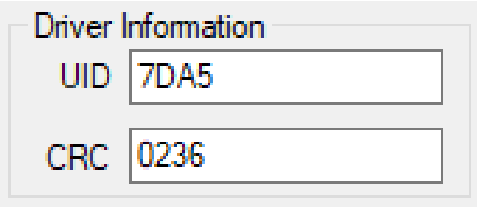
If the incorrect COM port is selected, an error message appears. In this case, verify you have selected the correct port and try again. “Connection Status” indicates the state of the connection.

Reset and Factory Reset

The Reset and Factory Reset section allows the VLD1 to be power cycled or restored to factory settings.

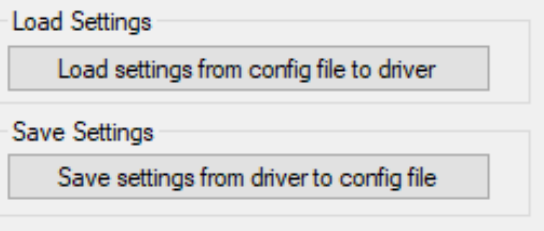
- To power cycle the VLD1, select “Yes” in Cycle Power then press “Go”. The serial connection will be disconnected.
- To restore the VLD1 to its factory default settings, select “Yes” in the corresponding section followed by “Go”. The serial connection is disconnected.

Driver Information



The driver’s unique ID (UID) and the firmware’s CRC is displayed in this section.

Load / Save Settings



The software can save all settings stored on the driver to a config file. This can then be used to load these

settings to the same or another driver without the need to manually change all settings.

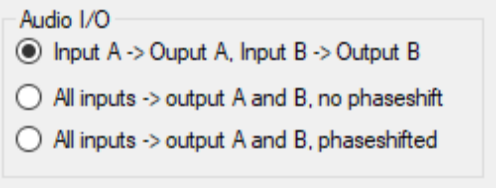
- To save settings, select "Save settings from driver to config file". Choose a name and location for the config file.
- To load settings, select "Load settings from config file to driver". Choose a config file to apply these settings to the driver.

The following settings are stored in the config file:

- Audio I/O Mode
- Input A Function
- Input A/B/C Level Adjustment
- AGC A/B
- HPF A/B
- HF Comp A/B
- Loop A/B Drive Level
- EN1/EN2 Mute on High or Low
- EN2 Function
- Masking Noise Setting and Level

The config file cannot be manually edited to change settings and all settings need to be changed using the software instead.

Audio I/O



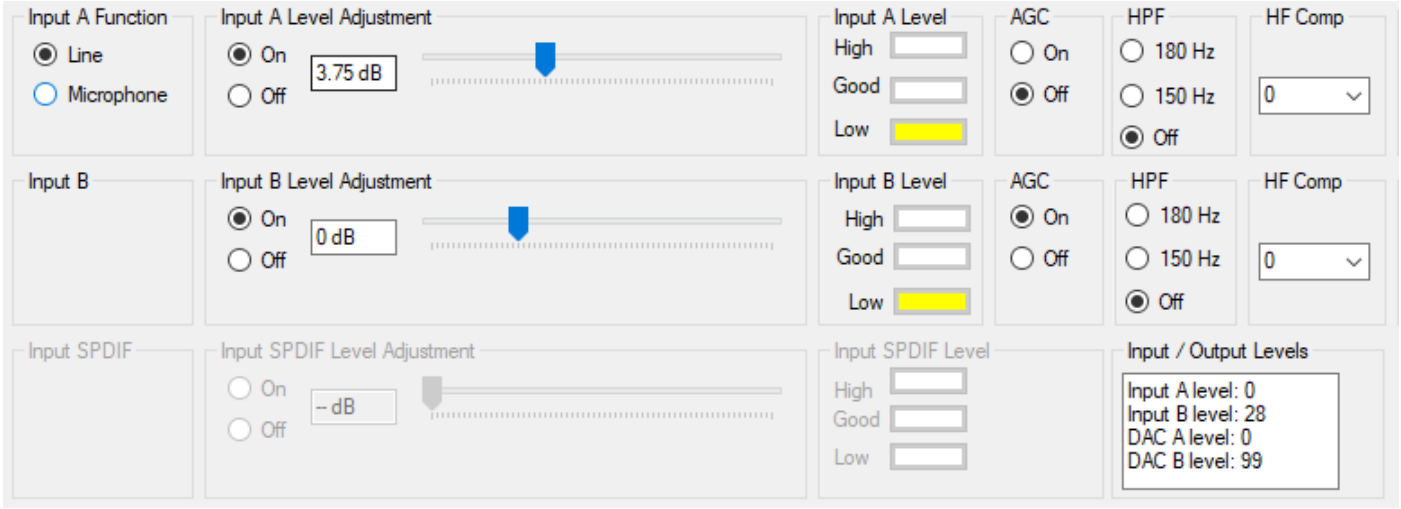
There are three modes to choose from.

1. **Input A -> Output A, Input B -> Output** – This mode routes Input A to Output A, and Input B to Output B. AGC, HPF, HFC are controlled individually.

2. **All inputs -> Output A and B, no phaseshift** – All inputs are routed together to both output A and B, with no phase-shift added. Since all inputs are added together, AGC A, HPF A, and HFC A is now disabled, and all inputs are now controlled using only AGC B, HPF B, and HFC B.

3. **All inputs -> Output A and B, phaseshifted** – All inputs are routed together to both output A and B, with a phase-shift added. Since all inputs are added together, AGC A, HPF A, and HFC A is now disabled, and all inputs are now controlled using only AGC B, HPF B, and HFC B.

Input A/B/C (SPDIF)



This section controls all input adjustments.

If a VLD1 with SPDIF input is connected, the GUI will detect that the driver has SPDIF functionality and the slider will become available. It will then be possible to change the SPDIF gain with the same options as Input A and B.

Input A Function – Choose "Line" for a line level signal, and "Microphone" for a microphone input which enables the microphone bias.

Input A/B/C Level Adjustment – The slider controls each channel's pre-amp gain, from -12 dB to 35.25 dB.

- Select "On" for normal operation.
- Selecting "Off" mutes the corresponding channel.
- Selecting "On" again restores the previous level.

If the connection to the driver is lost for some reason (for instance if the USB cable gets disconnected), the input will remain muted upon connecting to it again and will have to be manually set to a correct level.

Input A/B/C Level – Three different level indicators are shown: "Low", "Good", and "High". For the AGC to work properly, the pre-amp gain must be adjusted so that the signal stays in "Good".

AGC A/B – Turns the Automatic Gain Control on and off. Ensure the input signal is indicated to be "Good".

HPF A/B – This feature removes low-frequency sounds from the hearing loop when background noise such as air conditioners might impact users. Select either 150Hz or 180Hz if required, or "Off" to turn off.

HF Comp A/B – Turns on the High Frequency Compensation, providing a selection of 7 predefined filters.

Input / Output Levels – Provides diagnostic information for input and output levels. These values are the internal raw values on the VLD1's DSP chip. For normal operation, they can be ignored. Instead, the level indicators (Low, Good, or High) should be used.

Output A/B

DAC A/B Level – Indicates the level of the audio signal being fed to each output channel's DAC. This is the signal level after pre-amp gain, processed by AGC, HPF, HFC, but before any Output drive level has been applied. Make sure to keep it in the "good" range.

Loop A Drive & Loop B Drive – Sliders which control the drive level for each output stage. If a slider is all the way to the left, the drive is at -57 dB which effectively mutes that channel. The output can be adjusted from -26 dB to 6 dB.

- Select "On" for normal operation.
- Select "Off" to mute and turn the corresponding output channel off.
- Select "On" again to restore the previous level and turns the corresponding output channel on.

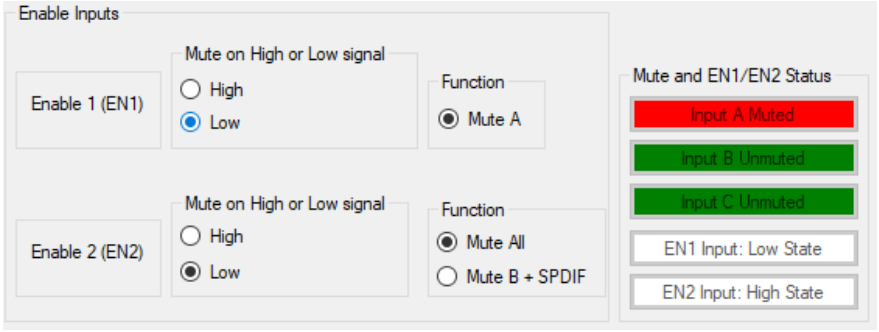
Under some circumstances (such as surveying) it may be necessary to use only a single loop output. If a loop output is left unconnected with the Loop output set to "On" the VLD1 will correctly detect that there is no loop connected (open circuit) at startup and display a fault and lockout. To prevent this from happening, select "Off" on the unused output before the power is removed. The VLD1 will remember this setting at start up and ignore testing on the selected output.

If the connection to the driver is lost for some reason (for instance if the USB cable gets disconnected), the output will remain muted upon connecting to it again and will have to be manually set to a correct level.

Loop A Current & Loop B Current – Indicates how many amps each loop output produces, both visually and numerically. If voltage clipping is detected, the "clipping" box changes from the green to red.

If you have a channel's DAC level in "good", and the Drive slider high enough to expect a normal loop current, but instead you have a very low loop current, this could indicate that the loop is open circuit.

Enable Inputs



EN1 and EN2 inputs can be set to mute if the signal connected to these ports are logic high or logic low (24V or 0V). EN2 can also change function to either Mute All or to only Mute B + C (SPDIF).

In the “Mute and EN1/EN2 Status” the mute status of each input channel can be seen, as well as high or low state for both EN1 and EN2.

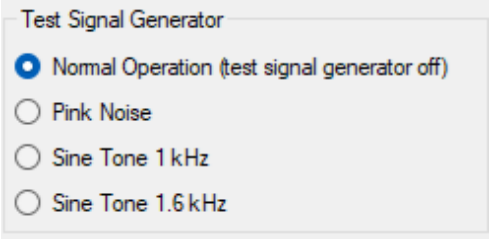
In the picture above, EN1 is set to mute channel A on a Low signal, and since we can see that EN1 is in a low state, Input A is now muted. EN2 on the other hand is set to Mute All, but is in a High state, so channels B + C stay unmuted. In the case when EN1 might say “don’t mute”, but EN2 says “mute”, EN2 takes priority and mutes all channels.

Masking Noise

This feature allows a pink noise signal to be added to the output signal. This **may** be helpful in masking background noise at low level (less than -32dB). It is not a cure for background noise and does not make levels above -32dB acceptable.

To use this feature, select 'on' and adjust the slider to the desired level.

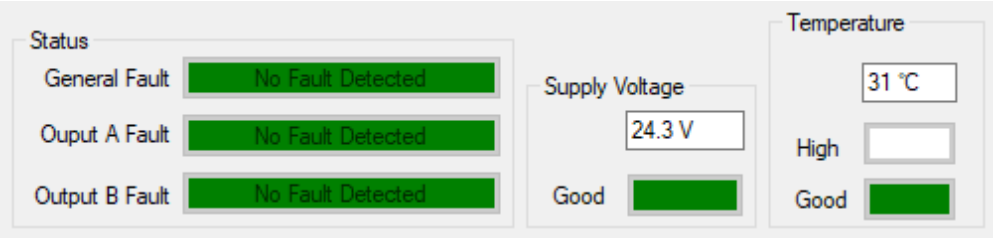
Test Signal Generator



This feature provides the required signals needed for setting up a loop, negating the need for an external signal generator. Selecting any of these settings bypasses the signal from the audio inputs.

The test signal generator will stay on until "normal operation" is selected or the driver is power cycled.

Driver Status and Health



This section displays any potential faults, as well as the internal power supply's voltage and internal temperature. If no faults are detected (as in the image above) all indicate "no fault detected" on a green background. If, however, a fault is detected, the colour changes to red and the fault is presented.

General Fault – Indicates that there is a general fault in the system. Contact your dealer if the problem persists, noting any error codes.

Output A/B Fault – This indicates one of the following faults:

- Ground Fault. See VLD1 Installation & User Guide for more information.
- Loop Open Fault. See VLD1 Installation & User Guide for more information.
- Output Stage Fault. A fault has been detected with the output stage. See VLD1 Installation & User Guide for more information.

In all these conditions, the fault must be corrected, and the driver must be power cycled either by the GUI or by disconnecting and reconnecting the power.

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