

Acoustic Interface Gluing Procedure for Chirp Ultrasonic Sensing Modules

1 INTRODUCTION

This document provides information on gluing an acoustic interface on to a Chirp sensor module assembly. Recommendations are included for adhesives, gluing instructions and basic verification after installation of horn to the module. The scope of this document includes the following ultrasonic transceiver products:

- CH101
- CH201
- ICU-10201
- ICU-20201

Figure 1. Chirp sensor module with acoustic horn



TABLE OF CONTENTS

1	INTRODUCTION	2
2	HORN GLUING INSTRUCTIONS	4
3	VERIFY ACOUSTIC HOUSING	5
4	REVISION HISTORY	6

LIST OF FIGURES

Figure 1. Chirp sensor module with Acoustic Housing	2
Figure 3. UV Cured Adhesives	4
Figure 4. UV Cured Glue Applied to Horn	4
Figure 5. Physical Alignment of Horn	5
Figure 6. Acoustic Interface Alignment	5

2 HORN GLUING INSTRUCTIONS

It is recommended to use the adhesive listed, or similar non-gassing and non-expanding UV cured adhesive. Care must be taken when gluing an acoustic interface to the sensor module. The glue may have too thin of viscosity or adhesive outgassing that could wick into the device and damage the transceiver.

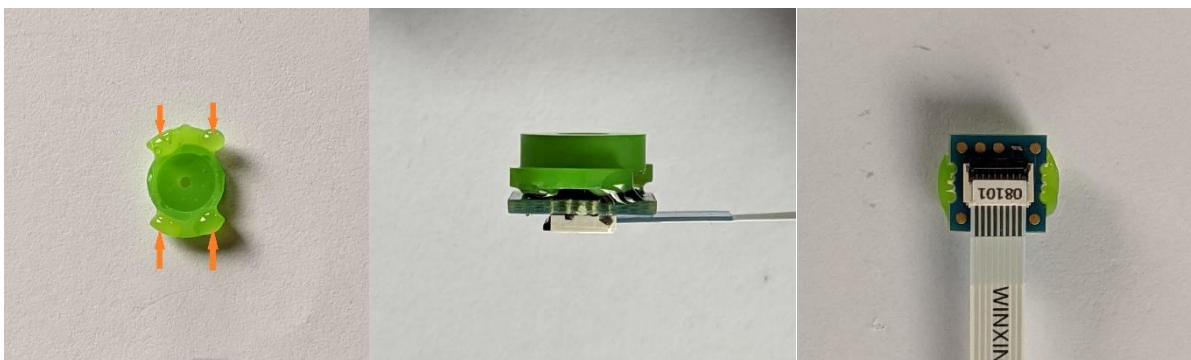
- Dymax 9-911-REV-A Ultra-Light Weld
- Solarez Thick, Hard Formula

Figure 2. UV Cured Adhesives



- To mount horn, place 0.6ml dots of adhesive on each corner of acoustic interface horn flanges as shown in the left image of the picture in Figure 3 below.
- The prescribed amount of adhesive will provide enough strength for standard handling of the module.
- Place the horn over the sensor and check to ensure the horn is seated perfectly flat in relation to the PCB. Cure the adhesive with a UV light source.
- Verify the horn is seated parallel to the PCB and test horn for functionality.

Figure 3. UV Cured Glue Applied to Horn

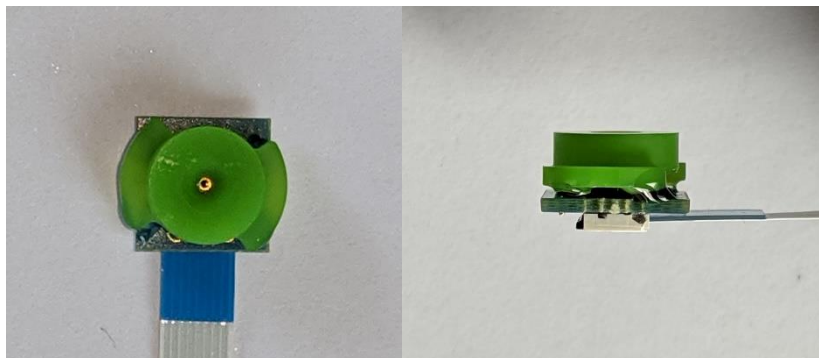


3 VERIFY ACOUSTIC HOUSING

Physical check for cap alignment

- Poor placement will result in a long ring-down which will be visible as an elevated second peak on the A-Scan. It can also trigger false positives on the target detection.

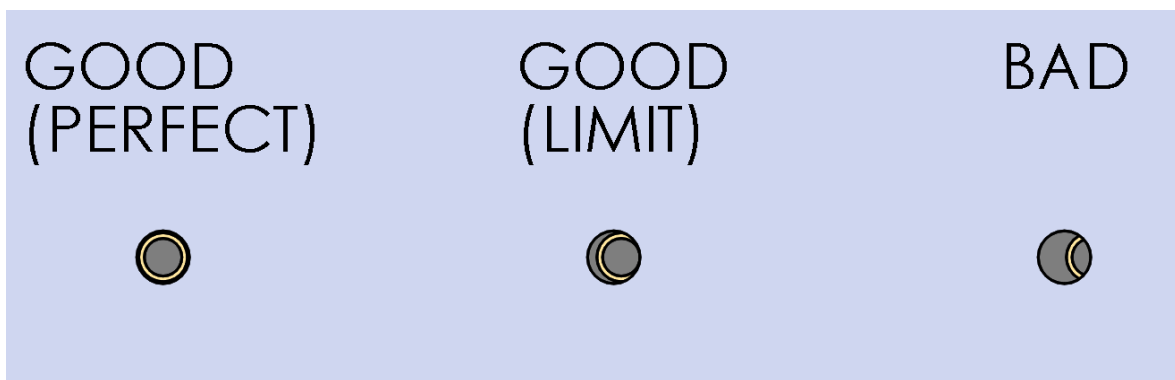
Figure 4. Physical Alignment of Horn



Sensor to Acoustic Interface

- Chirp recommends a sensor-to-Acoustic Interface assembly concentric tolerance of 0.1 mm or better such that the sensor port is not blocked or occluded by the Acoustic Interface (see Figure 5).

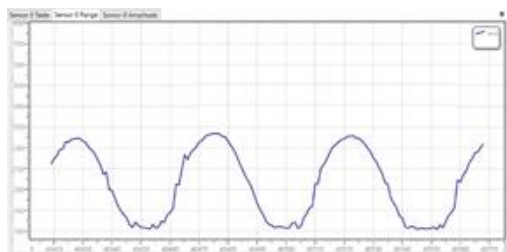
Figure 5. Acoustic Interface Alignment



Signal amplitude check

- Check the intensity of a target (e.g., a hand). The hand should be high intensity on axis and should be able to track range to your hand movements using the Range plot in the SonicLink GUI as shown in figure below.

Figure 6. Example of output range plot



4 REVISION HISTORY

Revision Date	Revision	Description
7/14/2020	1.0	Initial release
10/6/2021	1.1	Updated document scope to include ICU-10201 and ICU-20201.

This information furnished by InvenSense, Inc. ("InvenSense") is believed to be accurate and reliable. However, no responsibility is assumed by InvenSense for its use, or for any infringements of patents or other rights of third parties that may result from its use. Specifications are subject to change without notice. InvenSense reserves the right to make changes to this product, including its circuits and software, in order to improve its design and/or performance, without prior notice. InvenSense makes no warranties, neither expressed nor implied, regarding the information and specifications contained in this document. InvenSense assumes no responsibility for any claims or damages arising from information contained in this document, or from the use of products and services detailed therein. This includes, but is not limited to, claims or damages based on the infringement of patents, copyrights, mask work and/or other intellectual property rights.

Certain intellectual property owned by InvenSense and described in this document is patent protected. No license is granted by implication or otherwise under any patent or patent rights of InvenSense. This publication supersedes and replaces all information previously supplied. Trademarks that are registered trademarks are the property of their respective companies. InvenSense sensors should not be used or sold in the development, storage, production or utilization of any conventional or mass-destructive weapons or for any other weapons or life threatening applications, as well as in any other life critical applications such as medical equipment, transportation, aerospace and nuclear instruments, undersea equipment, power plant equipment, disaster prevention and crime prevention equipment.

©2021 Chirp Microsystems. All rights reserved. InvenSense, MotionTracking, MotionProcessing, MotionProcessor, MotionFusion, MotionApps, DMP, AAR, and the InvenSense logo are trademarks of InvenSense, Inc. The TDK logo is a trademark of TDK Corporation. Other company and product names may be trademarks of the respective companies with which they are associated.