



# SonicLink Software Quick Start Guide

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# **1 OVERVIEW**

This document is a guide for installing and using the SonicLink software tool in combination with the TDK/Chirp SmartSonic board. Users will gain hands-on experience with the unique ultrasonic sensing technology of the Chirp CH101 and CH201 sensors, which provides accurate range measurements in a compact, low-power device.

### 1.1 REQUIREMENTS

- 1. PC with Windows OS. (Tested on Windows 8 64-bit, and Windows 10 64-bit.)
- 2. TDK/Chirp Microsystems SmartSonic evaluation board.
- 3. Two Micro USB cables.
- 4. Atmel Studio 7.0 IDE.
- 5. Internet connection (if the .NET framework and Atmel/FTDI drivers/tools are not previously installed on the target PC).



# 2 HARDWARE CONFIGURATION

The SmartSonic board is used with an external evaluation board as shown below. For initial hardware setup and programming of the Atmel chip, two micro USB cable connections are required but once the MCU is flashed then only the UART/USB Data connection is required. The board jumpers should be set in their default configuration as shown in the figure below.



To connect an external sensor to the daughterboard, the flex cable will be inserted silver side up at the SmartSonic board and external sensor board. You can see in the pictures below that the blue side of the flex cable faces downward, away from the sensor. When connected properly, an external sensor should lie flat on the work surface, facing upwards.



For best performance, external CH101 sensor modules that have the omnidirectional housing (part number MOD\_CH101-03-01) should be mounted in a flat plate of at least 100 mm (4") diameter with the sensor's acoustic housing flush with the surface of the plate. Consult the MOD\_CH101 module datasheet for more information.





## **3** INSTALLATION

1. Run the **SonicLink\_X.X.X\_Installer.exe** installer. It will prompt for the installation directory. Once the desired installation directory is selected, click **Next**.



2. Check the Install FTDI drivers box, then click Next.



3. Verify the destination folder and start the installation by clicking on Install.

Setup - SmartSonic Platform version	x.x.x	_		×
Ready to Install Setup is now ready to begin installing S	SmartSonic Platfor	n on your comp	uter.	
Click Install to continue with the installa change any settings.	ation, or click Back	if you want to re	eview or	
Destination location: C:\TDK-InverSense\SmartSonic F Additional tasks: External USB drivers Install FTDI drivers	Platform 1.10		^	
<			>	
	< Back	Install	Can	cel





4. Wait for the installation to complete, and then click **Finish**.

🛃 Setup - SmartSonic Platfo	orm version x.x.x	-	□ ×
Installing Please wait while Setup ir	nstalls SmartSonic Platform on	your computer.	
			Cancel
🔀 Setup - SmartSonic Platfo	orm version x.x.x	-	
	Completing the Platform Setup Setup has finished installing computer. The application m installed shortcuts.	e SmartSo Wizard	onic orm on your y selecting the
	Click Finish to exit Setup.		

#### 3.1 INSTALLING ATMEL STUDIO 7 AND FTDI DRIVER

Connect the SmartSonic evaluation board to the computer using the two USB ports (**Note:** A sensor daughter card should first be installed on the SmartSonic board). Install the following tool to allow Flash MCU Firmware:

ATSAMG55 (web installer) If you haven't installed Atmel Studio 7, you can download the installer here: <u>https://www.microchip.com/mplab/avr-support/atmel-studio-7</u>

## **4** STARTING THE SONICLINK APPLICATION

1. Navigate to the installation directory and run the **SonicLink.exe** executable or the SonicLink icon on the desktop.

V I -	me Share View	Manage Application Tools	SmartSonic Pla	tform x.x.x			- 🗆	× ~ 0
blick Cog	h Cut ₩ Copy path py Paste Paste shortcut	Move Copy to * to *	Delete Rename	New folder	New item *   Easy access *	Properties	<ul> <li>Select all</li> <li>Select none</li> <li>Invert selection</li> </ul>	an
	Clipboard	Orga	nize	1	Vew	Open	Select	
$\rightarrow -\mathbf{v}$	1 🕺 👋 Local Disk (C)	> TDK-InvenSense	> SmartSonic P	Platform xxx	x v	<ul> <li>Ø Search Sma</li> </ul>	rtSonic Platform x.	. <i>p</i>
^ N	ame		Date modified	Тур	e	Size		
	data		9/6/2019 6:06 P	PM File	folder			
11	driver		9/6/2019 6:06 8	PM File	folder			
	EMDIools		9/6/2019 6:06 (	PM File	tolder			
8	aardvark.dll		4/21/2017 4:50	PM App	lication extens	. 61 KB		
3	cheetah.dll		4/21/2017 4:50	PM App	lication extens	. 233 KB		
3	DynamicDataDisplay.dll		9/6/2019 1:35 8	PM App	lication extens.			
1 1	SmartSonic_Firmware.elf		7/11/2019 4:29	PM ELF	File	590 KB		
3	SmartSonicTools.dll		9/6/2019 1:35 P	PM App	lication extens.			
0	SonicLink		9/6/2019 1:35 P	PM App	lication	3,216 KB		
9	SS_flash_atmel		2/22/2019 3:13	PM Win	dows Batch File	e 1.KB		
9	SS reset atmel		3/25/2019 3:21	PM Win	dows Batch File	e 1 KB		
	unins000.dat		9/6/2019 6:06 P	PM DAT	í File	38 KB		
1	unins000		9/6/2019 6:02 P	РМ Арр	lication	1,182 KB		
3	Koeed.Wpf.AvalonDock.c	111	9/6/2019 1:35 P	РМ Арр	lication extens.			
~								



# 5 CONNECTING THE SMARTSONIC BOARD

1. If no SmartSonic boards are connected to the USB/COM ports, the Serial Port and **Connect** button will be grayed out. If you do not observe a connected SmartSonic board in the serial port list, close and restart the SonicLink application as hardware discovery only occurs during launch of the app.

SonicLink File Help	Config Sensors	– 🗆 X
- Firmware	Connect	

2. If a SmartSonic board is connected through a COM port it will appear in the **Serial port** list. Select the SmartSonic board from the list and click **Connect**.

If the board needs to be initialized with firmware click **File** drop down menu and select **Flash Firmware** to program the MCU. Otherwise go to the next step.

SonicLink		
File Help		
Flash Firmware	$\sim$	
Exit		
Firmware		
Serial port	$\sim$	Connect

3. Add a configuration to match the sensor(s) by clicking **Config Sensors**. Configure the sensor(s) in the order set on the next page.



**Note:** CH101 and CH201 sensors cannot be run at the same time on a single SmartSonic board. All sensors attached must all be either CH101 or CH201.

In addition, DO NOT try to run CH101 firmware configuration on CH201 hardware or CH201 firmware configuration on CH101 hardware.

SonicLink File Help			- 🗆 ×
Firmware Serial port COM	/82 Y Connect	Config Sensors Sensors	
]	Config Sensors		X
	Tr_Rx v	Sensor Type CH 101 ~ Sensor Mode Narrow_FOV ~ FSR (mm): Normal Sampling Rate (hz): ShortRange STR Narrow_FOV A-Scan Narrow_FOV_SR	Not-Selected
	Sensor 2 (/8) Not,Selected ~	Done	Sensor 3 (/9) Not_Selected

- 1. First select **Sensor Type**: CH101 or CH201.
- 2. For CH101 sensors, select Normal, Short Range, Narrow FOV, or Narrow FOV SR operating mode under Sensor Mode
  - a. Normal mode: allows detection of targets from 10 cm to 120 cm
  - b. Short-Range mode: allows detection of targets from 4 cm to 25 cm
  - c. **Narrow\_FOV** mode: allows detection using the 45 degree narrow FoV horn. Thresholds are increased in Narrow FOV mode to accommodate the higher amplitude signal from horns narrower than the omnidirectional cap.
  - d. **Narrow\_FOV\_SR** mode: allows detection using the 45 degree narrow FoV horn from 4 cm to 25 cm. Thresholds are increased in Narrow\_FOV\_SR mode to accommodate the higher amplitude signal from horns narrower than the omnidirectional cap.
- 3. Select the full-scale range in millimeters, **FSR (mm)**.
- 4. Select Sample Rate.
- 5. Select Sensor 0 through Sensor 3 configuration settings from the following
  - a. Not Selected: sensor not used



- b. **Tx\_Rx**: Transmit and Receive Mode
- c. **Rx Only**: Receive Only Mode
- 6. Optional selections can be made by checking the box for the following features:
  - a. Static Target Rejection (STR)
    - i. This feature is available for both CH101 and CH201.
    - ii. The STR mode is used to reject echoes from stationary objects that are in the sensor's field-of-view. In this mode, only the range of moving targets will be reported in the sensor's range output. This feature is useful when the sensor must operate in a cluttered environment.
  - b. Amplitude-scan (A-scan)
- 7. This feature is available for both CH101 and CH201.
- 8. Sample Rates are limited to 30 S/s for CH101 and 10 S/s for CH201 when A-scan is enabled. This limitation is due to the additional time required to read the A-scan data from each measurement over the I<sup>2</sup>C bus.

Once you have the connected sensor(s) configured appropriately, click **Done**.

SonicLink . File Help			×
		Config Sensors	
Firmware Serial port COM82	V Disconne	Sensors	^
Config Sensors			×
Sensor 0 (/ Tx_Rx	s/U15) v	Sensor Type CH-101 Sensor Mode FSR(mm): 600 Sampling Rate: 30 STR ✓ A-Scan	<ul> <li>Sensor 1 (J7)</li> <li>Not_Selected </li> <li>V</li> <li< th=""></li<></ul>
Sensor 2 (J Not_Selected	3)	Done	Sensor 3 (J9) Not_Selected ~





## 5.1 REMOVING A SENSOR CONFIGURATION

To remove a sensor configuration, click the 🗱 button.

		-		×
Config Sensors				
Sensors				
CH-101 0 (Tx_Rx)	() III 🕨 😪 🦷			
	Config Sensors Sensors CH-101 0 (Tx_Rx)			

# 6 ADDING SENSORS TO THE CONFIGURATION

- 1. To add sensor(s) to an existing configuration, press the solution in the main sensors window to remove any current configurations.
- 2. Next, press **Disconnect** to end the serial port connection and allow the board to be reset and firmware loaded to the new sensors connected to the SmartSonic board.
- 3. Additional sensors can be connected to the daughterboard using flex cables



1. The on-board sensor U15 shares the same bus with Sensor 0 at connector J6. To use an off-board sensor that is connected to the flex connector Sensor 0 / J6, you will need to select **J6** using the switch on the edge of the daughterboard, as shown circled in red below.



2. Next press the physical **Reset** button on the SmartSonic host board to clear the configurations.



- 1. Click **Connect** on the SonicLink GUI.
- 2. Add a configuration to match the sensor(s) by clicking **Config Sensors**.
- 3. Once you have the sensor(s) connected to the SmartSonic board configured appropriately, click **Done**.

# 7 STARTING THE DATA CAPTURE

After a configuration has been added, click on the button to initialize the board and sensor you want to launch. After the initialization completes, a set of tabs will open in the main window, and data collection will begin

as shown below. Click on the 🕑 button for each sensor you want to collect data from. You will note that each sensor initialized will light a blue LED next to the corresponding connector on the daughterboard. In the example below, sensor 0 and sensor 2 have been initialized. The Blue LED next to J6 will illuminate when the onboard sensor is initialized.



As the sensor module receives echoes from a target, the table displays the target's range and the echo amplitude. Depending on how many sensors are connected to the evaluation kit board (1 to 4) the software will generate the corresponding range data table and graph tabs.

🗇 Sm	artSonic	:						-	[		×
File I	lelp										
				Config	Sensors						
Firmw	are			Sensors							
Serial	port	COM82 V	Disconnect	CH-101 0 (Tx_	Rx)	U I	i 🕨 🗶				
Oper Samp Rang	ating Mo ling Rat e = 600r	ode = Normal e = 30Samples/Se nm	20								
Sensor	0 Table	Sensor 0 Range	Sensor 0 Amplitude	Sensor 0 AScan							;
Log fil	e Ser	isor_0_Table_log.c	sv							Enat	le
Index	Range m	nm Amplitude									^
340	168.81	1351									
341	168.41	1405									
342	168.91	1377									
343	168.84	1276									
344	168.88	1242									
345	168.75	1385									
346	168.34	1455									

## 8 VIEWING THE DATA

- 1. Once the data capture has started, click on the tabs to view the data from the sensor. Each tab is labeled with the corresponding sensor number (sensor 0 through 3). The following shows an example with one CH101 sensor connected as sensor 0.
  - a. The **Sensor 0 Table** tab shows the live range (in mm) and amplitude values as they are returned from sensor 0. You can choose to log the captured range and amplitude data to a text file see **Storing the Data** in the next section.

SmartSonic       -       -       ×         File       Help       Config Sensors       File       File         Firmware       Sensors       Sensors       Sensors         Ch-101 0 (Tx_Rx)       Image: Sensor 0 Range       Sensor 0 Range       Sensor 0 Range         Operating Mode = Normal       Sampling Rate = 30Samples/Sec       Range = 600mm       The Enable         Sensor 0 Table       Sensor 0 Ascan       Image: Sensor 0 Range       Image: Sensor 0 R									
File       Help         Firmware       Sensors         Serial port       COM82         Operating Mode = Normal       Sensor 0         Sampling Rate = 30Samples/Sec       Range = 600mm         Sensor 0 Table       Sensor 0 Ascan         Log file       Sensor_0_Table_log.csv         Index Range mm Amplitude	💿 Sm	nartSonic						_	) X
Firmware   Serial port   COM82   Disconnect     CH-101 0 (Tx_Rx)     Operating Mode = Normal   Sampling Rate = 30Samples/Sec   Range = 600mm     Sensor 0 Table   Sens	File	Help							
Firmware       Sensors         Serial port       COM82       Disconnect         Operating Mode = Normal       Sampling Rate = 30Samples/Sec       Range = 600mm         Sensor 0 Table       Sensor 0 Amge       Sensor 0 AScan         Sensor 0 Table       Sensor 0 Amge       Sensor 0 AScan         Index Range mm       Amplitude       m         340       168.81       1351         341       168.41       1405         342       168.91       1377         343       168.84       1276         344       168.81       1242         345       168.75       1385         346       168.74       1478					Config Se	ensors			
Serial port       COM82       Disconnect         Operating Mode = Normal       Sampling Rate = 30Samples/Sec         Sampling Rate = 30Samples/Sec       Range = 600mm         Sensor 0 Table       Sensor 0 Ascan         Log file       Sensor_0_Table_log.csv         Index Range mm Amplitude         340       168.41         141       184.41         141       184.41         142       344         145       1385         344       168.81         1455       1385         347       168.81         1478	Firmw	are			Sensors				
Operating Mode = Normal Sampling Rate = 30Samples/Sec Range = 600mm       Sensor 0 Range       Sensor 0 Amplitude       Sensor 0 AScan       Totable       Totable       Sensor 0 Range       Sensor 0 Amplitude       Sensor 0 AScan       Totable       Totable       Sensor 0 Range       Sensor 0 Amplitude       Sensor 0 AScan       Totable       Sensor 0 Range       Sensor 0 Amplitude       Sensor 0 AScan       Totable       Sensor 0 Range       Sensor 0 Range       Sensor 0 Amplitude       Sensor 0 Range       Sens	Serial	l port C	OM82 V	Disconnect	CH-101 0 (Tx_R)	()	🔱 🖩 🕨 🕽	<b>(</b>	
Sensor 0 Range         Sensor 0 Amplitude         Sensor 0 AScan         Image: Control of the control of	Oper Samı Rang	rating Moo pling Rate ge = 600m	de = Normal = 30Samples/Se im	c					
Log file         Sensor_0_Table_log.csv	Sensor	r 0 Table	Sensor 0 Range	Sensor 0 Amplitude	Sensor 0 AScan				
Index Range mm         Amplitude	Log fil	e Sens	or_0_Table_log.cs	ïV					 Enable
340     168.81     1351       341     168.41     1405       342     168.91     1377       343     168.84     1276       344     168.88     1242       345     168.75     1385       346     168.34     1455       347     168.81     1478	Index	Range mi	m Amplitude						^
341     168.41     1405       342     168.91     1377       343     168.84     126       344     168.88     1242       345     168.75     1385       346     168.34     1455       347     168.81     1478	340								
342     168.94     1377       343     168.84     1276       344     168.88     1242       345     168.75     1385       346     168.34     1455       347     168.81     1478		168.81	1351						
343     168.84     1276       344     168.88     1242       345     168.75     1385       346     168.34     1455       347     168.81     1478	341	168.81 168.41	1351 1405						
344     168.88     1242       345     168.75     1385       346     168.34     1455       347     168.81     1478	341 342	168.81 168.41 168.91	1351 1405 1377						
345         168.75         1385           346         168.34         1455           347         168.81         1478	341 342 343	168.81 168.41 168.91 168.84	1351 1405 1377 1276						
346 168.34 1455 347 168.81 1478	341 342 343 344	168.81 168.41 168.91 168.84 168.88	1351 1405 1377 1276 1242						
347 168.81 1478	341 342 343 344 345	168.81 168.41 168.91 168.84 168.88 168.75	1351 1405 1377 1276 1242 1385						
	341 342 343 344 345 346	168.81 168.41 168.91 168.84 168.88 168.75 168.34	1351 1405 1377 1276 1242 1385 1455						



b. The **Sensor 0 Range** shows live range data in a graphical representation.

Johncenik						_	· 🗆	×
ile Help								
				Config Sens	ors			
irmware			Senso	ors				
Serial port	сом79 у	Disconnect	CH-	101 0 (Tx_Rx)		<b>U</b>		
			CH-	101 2 (Tx_Rx)		<b>(</b> ) <b>II</b>		
Operating Mo	ode = Normal							
Sampling Rat Range = 600r	e = 10Samples/Se mm	с						
ensor 0 Table	Sensor 0 Range	Sensor 0 Amplitue	de Sensor	0 AScan				
000							ſ	_ mr
550								- 111
500								
_								
450								
450								
450								
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450								
450								
450 400 350 300 250								
450 400 350 250 200								
450 400 350 250 200								

The chart displays the measured range to the closest target over time. Depending on how many sensors are connected to the evaluation kit board (1 to 4), the software will generate the corresponding range display windows.



c. The **Sensor 0 Amplitude** shows the live Amplitude data in graphical format.



The Amplitude tab shows amplitude of the received echo over time. The units of this display are least-significant bits (LSBs) of the sensor's on-chip ADC. The full-scale value is 32,768. The amplitude varies based on the object's size, surface texture and shape. As the object moves further away from the sensor the amplitude diminishes.



d. The **Sensor 0 A-scan** tab shows the live Amplitude scan (A-scan) data in graphical representation.



While the range and amplitude tabs display the range and amplitude of the nearest target, the A-scan tab displays the ultrasound amplitude at all range points for the current pulse-echo measurement, commonly known as an A-scan. In this plot, the vertical axis represents the echo (received signal) amplitude (in LSBs) and the horizontal axis represents the range in mm. The distance to a given object can be determined by the position of the corresponding echo on the horizontal range axis. The size, orientation, and surface texture of the object will affect the echo's amplitude.

For CH201 sensors, A-scan graphs will also show a pink line that corresponds to the detection thresholds set for the sensor. The user can change the detection thresholds by clicking on **Thresholds** button (circled in red in the picture above).





#### 8.1 VIEWING MULTIPLE DATA WINDOWS

1. You have the option to open multiple window tabs to view in either horizontal or vertical tabs as shown in example below. To open a second data tab either horizontally or vertically, right click your mouse cursor on the tab you wish to tile and a drop-down menu will open. Select either **New Horizontal Tab Group** or **New Vertical Tab Group**.



#### Example of Vertical Tab Group for Range and A-scan







#### Example of Horizontal Tab Group for Range and A-scan





## 9 STORING THE DATA

1. You can choose to save the time-stamped Range and Amplitude data by entering a path/filename in the

**Log file** field. You may set the directory for the log file by clicking the button and browsing for the desired directory. Once the file and directory settings are correct, click **Enable** to begin logging the data to the file.

SonicL	Link							-		$\times$
File Help	0									
					Config Sens	sors				
Firmware				Se	nsors					
Serial por	rt COM86	~	Disconnect	C	CH-101 0 (Tx_Rx)		C	ש	*	
Sampling Range =	g Rate = 30Sam 600mm	nples/Se	C Cancor O Dava	e Sensor (	Amplitude					~
Sampling Range = Sensor 0 A	AScan Sensor	0 Table	c Sensor 0 Rang	e Sensor (	) Amplitude				$\sim$	~
Sampling Range = Sensor 0 A Log file	g Rate = 30Sam 600mm AScan Sensor Sensor_0_Tab	0 Table le_log.cs	c Sensor 0 Rang v	e Sensor (	) Amplitude					inable
Sampling Range = Sensor 0 A Log file Index Ran	g Rate = 30San 600mm AScan Sensor Sensor_0_Tab ge mm Amplit	0 Table le_log.cs	c Sensor 0 Rang v	e Sensor (	) Amplitude			(		inable
Sampling Range = Sensor 0 A Log file Index Ran 192 242	g Rate = 30San 600mm AScan Sensor Sensor_0_Tab ge mm Amplit 2.62 1211	0 Table le_log.cs ude	c Sensor 0 Rang v	e Sensor (	) Amplitude					inable
Sampling Range = Sensor 0 A Log file Index Ran 192 242 192 244	Ascan Sensor Sensor_0_Tab ge mm Amplit 2.62 1211 4.31 1147	0 Table le_log.cs ude	c Sensor 0 Rang v	e Sensor (	) Amplitude			(		inable
Sampling Range = Sensor 0 A Log file Index Ran 192 242 192 244 192 243	g Rate = 30San           600mm           AScan         Sensor           Sensor_0_Tab           ge mm         Amplit           2.62         1211           4.31         1147           3.72         1221	0 Table le_log.cs ude	c Sensor 0 Rang v	e Sensor (	) Amplitude			(		inable
Sensor 0 A Log file Index Ran 192 242 192 243 192 243 192 243	g Rate = 30San           600mm           AScan         Sensor           Sensor_0_Tab           ge mm         Amplit           2.62         1211           4.31         1147           3.72         1221           3.94         1321	0 Table le_log.cs	c Sensor 0 Rang v	e Sensor (	) Amplitude			(		inable
Sensor 0 A Log file 192 242 192 243 192 243 192 243 192 244	Ascan         Sensor           Ascan         Sensor_0_Tab           ge mm         Amplit           4.31         1147           3.72         1221           3.94         1321           4.44         1267	0 Table le_log.cs ude	c Sensor 0 Rang v	e Sensor (	) Amplitude			(		inable



2. To stop saving the data to a file, press the **Disable** button.

Sonic	Link				-		×
File He	р						
-Firmware Serial po	ort Ci	DM86 V	Disconnect	Config Sensors Sensors CH-101 0 (Tx_Rx)		*	
Operati Samplir Range =	ng Moo g Rate : 600m	de = Normal = 30Samples/Se m	2C				
Sensor 0	AScan	Sensor 0 Table	Sensor 0 Range	Sensor 0 Amplitude			Ŧ
Log file	Sens	or_0_Table_log.c	SV				bisable
Index Ra	nge mr	n Amplitude					^
166- 24	1.59	1290					
166 24	1.81	1215					
166 24	1.31	1169					
166 24	1.38	1145					
166- 24	0.81	1135					
100 0	0.00	1000					
166: 24	0.62	1093					

#### 9.1 PAUSING OR RESUME THE DATA CAPTURE

- 1. To Pause the data capture for a given sensor, press the button in the main Sensors Window
- 2. To Resume the data capture for a given sensor, press the button in the main Sensors Window.



# 10 SETTING DETECTION THRESHOLDS (CH201 ONLY)

The CH101 and CH201 sensors use an on-chip algorithm to detect the time-of-flight to the nearest target. The algorithm identifies the time-of-flight of the first echo that is above a pre-programmed amplitude threshold. For CH101, these thresholds are hardcoded within the sensor firmware. For CH201, the user can configure six different range-dependent thresholds. Close targets produce much larger echoes than distant targets, so the close-range thresholds will usually be much higher than the far-range threshold. Using higher thresholds at close range allows targets of interest to be detected while rejecting "clutter" - echoes arising from close-range objects that may be outside the sensor's desired field-of-view. A rule-of-thumb is that the echo amplitude will scale with range-squared – when a target is moved from 1m range to 5m range, the echo will decrease by a factor of 25.

In the A-scan plot, the thin pink line indicates the threshold level corresponding to the pre-programmed amplitude threshold. The blue amplitude trace shows the received signal from objects in the sensors field-of-view. To change the Threshold levels, open the dialog window by clicking on the **Thresholds** button (circled in red) at the top left above the data plot tabs.



The threshold setting dialog is shown below.

ThresholdSetti	ing		_	0 X
	Threshhold upto range(mm)	Range index	Amplitude	
Load File	416	26	5000	
	624	39	2000	
	896	56	800	
Done	1264	79	400	
	1424	89	250	
	4800	300	175	

**Threshold upto range** and/or **Amplitude** can be adjusted to suit the settings that work for a given HW design and the sensors field-of-view. After you have entered the desired values in the **Threshold upto range** and **Amplitude** fields, click **Done** for the changes in settings to be loaded to the device and close the dialog box.





The new threshold range and amplitude values will be automatically saved to a file, **Sensor\_0\_thresholds** in the SmartSonic directory. If you want to load the saved values to a sensor, open the **Threshold** dialog box and click on the **Load File** button.

Name	Date modified	Туре	Size
📕 data	7/14/2019 8:41 AM	File folder	
📜 driver	7/14/2019 8:41 AM	File folder	
EMDTools	7/14/2019 8:41 AM	File folder	
aardvark.dll	4/21/2017 4:50 PM	Application extens	61 KI
cheetah.dll	4/21/2017 4:50 PM	Application extens	233 KI
DynamicDataDisplay.dll	7/12/2019 5:12 PM	Application extens	304 KI
Sensor_0_thresholds	7/18/2019 11:24 PM	Text Document	1 KI
SmartSonic	7/12/2019 5:12 PM	Application	19,377 KI
SmartSonic_Firmware.elf	7/11/2019 4:29 PM	ELF File	590 KI
SmartSonicTools.dll	7/12/2019 5:12 PM	Application extens	48 KI
SS_flash_atmel	2/22/2019 3:13 PM	Windows Batch File	1 KI
SS_reset_atmel	3/25/2019 3:21 PM	Windows Batch File	1 KI
unins000.dat	7/14/2019 8:41 AM	DAT File	39 KI
🛃 unins000	7/14/2019 8:41 AM	Application	1,182 Ki
Xceed.Wpf.AvalonDock.dll	7/12/2019 5:12 PM	Application extens	401 KI





## **REVISION HISTORY**

Revision Date	Revision	Description
03/31/2020	1.0	Initial release

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