

Quick Start Guide

Thank you for acquiring the Cirrus Logic Voice Capture Development Kit for Amazon AVS-Enabled Products. This document aims to get you up and running with the kit.

1 Hardware Set Up

This section lists the hardware you'll need, and how to connect it up.

1.1 Supplied Hardware

The development kit comes with:

- CRD1569-1 voice capture board
- Raspberry Pi and power supply
- ribbon cable (optional use)
- passive speaker, to provide functionality (option your own powered speaker can be used instead)

For the one-time set up of the voice capture board, you'll need to connect the following to the Raspberry Pi directly:

- a USB keyboard and mouse
- an HDMI cable to connect to your monitor
- an Ethernet connection (optional use)

1.2 Connecting the Hardware

To set up the hardware, you can either mount the voice capture board directly on to the Raspberry Pi, or use the supplied ribbon cable to connect the voice capture board to the Raspberry Pi:

• To mount the voice capture board directly on to the Raspberry Pi, position the board over the Raspberry Pi as shown in Figure 1, ensuring that the connector on the underside of the voice capture board aligns exactly with the pins on the Raspberry Pi, and press the two boards together.



Figure 1 Voice Capture Board Plugged Directly into Raspberry Pi

• To use the ribbon cable, plug the cable connector that has a cable key (a plastic bump on it) in to the long connector on the voice capture board. The cable key fits into a notch in the 40-pin connector, ensuring that the





cable is plugged in correctly. The other end of the cable plugs into the parallel row of pins on the Raspberry Pi, with the side of the cable with the red stripe (pin 1) nearest the SD card slot, as shown in Figure 2.



Figure 2 Voice Capture Board Connected by Ribbon Cable to Raspberry Pi

Once the boards are connected, insert the supplied microSD card in to the slot on the underside of the Raspberry Pi, at the opposite end to the USB connectors (the card can be seen protruding at the bottom of Figure 1). Attach the speaker to the screw terminals on the voice capture board (labelled J3), plug in the monitor, connect the USB keyboard and mouse, plug the supplied power supply (with the appropriate regional adapter) in to the micro-USB port on the Raspberry Pi, and power up the Raspberry Pi.

Now you're ready to configure the software.

2 Software Set Up

The software set up is performed from the Raspberry Pi, and has three stages – setting up an internet connection to the Raspberry Pi, registering with Amazon for an AVS account, and configuring the voice capture board. (After set up, the voice capture board software will be accessible from your network.) (For wireless setup, see the CRD1569-1 User Guide.)

2.1 Set Up an Internet Connection

Initial set up of the voice capture board is done from the Raspberry Pi.

• On the Raspberry Pi, start the web browser and enter "https://raspberrypi:3000" in the address bar. The browser should connect to and display the console, as shown in Figure 3. If a security warning is shown, click the *Reload* button and wait for the connection.

	≡
Navigate	Home
A Home	AVS Status: Running
 ➡D Login Configurations 	Stop Clear
	Copyright © 2017 Powered by Unified Computer Intelligence Corporation. All rights reserved. IP: - Voice Interaction on Hardware

Figure 3 Console – Home

You now need to provide a connection to Amazon, to register for and use AVS. This can be via either Ethernet or Wi-Fi.

• To set up access to the internet via Wi-Fi, open the *Configurations* menu on the left side, and select the *WiFi* option. Click on the *Add new* button, then enter your Wi-Fi SSID name and password. Save this connection by



clicking on the Save button, and reboot the Raspberry Pi 3 by clicking on the Connect and Reboot button. After reboot, the Raspberry Pi 3 should be connected to your Wi-Fi network.

Note: the SSID must be visible if you wish to use a Wi-Fi connection.

• To set up access to the internet via Ethernet, plug in an Ethernet cable connected to your network router. Close the browser window.

2.2 Registering for an Amazon AVS Account

To use AVS, you need to register with Amazon for an AVS account. On the Raspberry Pi, start the web browser and enter "https://developer.amazon.com/login.html" in the address bar.

Provide an email address, choose the *I am a new customer* button and click on the *Sign in using our secure server* button, shown in Figure 4.

Sign In			
What is your email (phone	for mobile accounts)?		
E-mail or mobile number: CRD1	569-1@company.com		
Do you have an Amazon.co	m password?		
I am a new customer. (you'll	create a password later)		
I am a returning customer, a	nd my password is:		
Sign in using our secure server			
Forgot your password?			

Figure 4 Amazon Developer Account Login Screen

Provide your name, create a password for the new account and click on the Create account button, shown in Figure 5.

Registration		
New to Amazon.com? Register Below.		
My name is:	CRD1569-1 Developer	
My e-mail address is:	CRD1569-1@company.com	
Type it again:	CRD1569-1@company.com	
Protect your information with a password		
This will be your only Amazon.com password.		
Enter a new password:	••••••	
Type it again:	••••••	
	Create account	

Figure 5 Amazon Developer Account Registration Screen 1



On the registration page, shown in Figure 6, provide the required information and click on the Save and Continue button.

egistration		
1. Profile Information 2. App Distribution Agreeme	nt 3. Payments	
* indicates a required field.		
Country/Region *	United States	
First name *		
Last name *		
Email address *		
Phone number * e.g. 212-555-1212, +44 0161 715 3369		
Fax number		
Developer name or company name * Displayed on your apps at Amazon.com	1	
Developer description Maximum characters: 4000, Remaining: 4000		
Address 1*		
Address 2		
City *		
State *	Please select	
Zip code/Postal code *		
Customer support email address		
Customer support phone		
0		

Figure 6 Amazon Developer Account Registration Screen 2

On the license agreement page, click on the Accept and Continue button.

On the payment screen, shown in Figure 7, choose the appropriate answers to the two questions, and click on the *Save and Continue* button.



Figure 7 Amazon Developer Account Registration Screen 3

On the following webpage, shown in Figure 8, click on the ALEXA tab.



Notificati			Announcements	Jup 9, 2017	Introducing Cloud-Bacad	May 15 2/
No Notifications	Chucai		API	5011 6, 2017	Wake Word Verification for AVS	May 13, 20
			Introducing the All-New Echo Show	May 9, 2017	Introducing the Conexant 4- Mic Dev Kit for Amazon AVS	May 4, 20
			Integrate Skills with Alexa Lists – Now Available as part of the Alexa Skills Kit	May 3, 2017	Introducing New SSML Features for Alexa	Apr 27, 20
Dachbaa	rd					

On the following webpage, shown in Figure 9, click on the big *Alexa Voice Service* button.

< amazon // DEV	ELOPER CONSOLE						CRD1569-1 DEVELOPER	SIGN OUT	ENGLISH -
DASHBOARD	APPS & SERVICES	ALEXA	REPORTING	SUPPORT	DOCUMENTATION	SETTINGS			
Get started v	vith Alexa								
Add new voice-enable	ed capabilities using the Alex	a Skills Kit, or add	voice-powered experie	ences to your connec	ted devices with the Alexa V	oice Service.			
		Y							
Alexa Sk	kills Kit	Alexa Voice Se	rvice						
Easily add new	skills to Alexa	Bring voice capabili your connected de	ties to wice						
Get Sta	inted >	Get Started >							

Figure 9 Amazon Developer Account Registration Screen 5

On the following webpage, shown in Figure 10, click on the orange *Register a Product* dropdown's down arrow and choose *Device*.

< amazon // DE	VELOPER CONSOLE						CRD1569-1 DEVELOPER	SIGN OUT	ENGLISH -
DASHBOARD	APPS & SERVICES	ALEXA	REPORTING	SUPPORT	DOCUMENTATION	SETTINGS			
Building wit	h Alexa Voice Sei	rvice						Register a P	troduct 👻
For information on b	uilding your AVS product, see	the Getting started	guide. Review the AV	/S Terms and Agreen	nent, Program Requirement	is and <u>Content Requir</u>	ements prior to building your pro	Dev Applic	ice ation
Registered Product	Product Metrics								
Product	Display Name	ID		Amazon ID	Туре		Category	Actions	s

Figure 10 Amazon Developer Account Registration Screen 6



On the following webpage, shown in Figure 11, choose proper names for the *Device Type ID* (you'll use this when logging in to AVS) and the *Display Name*, and click on the *Next* button.

< amazon // Deve	ELOPER C	ONSOLE							CRD1569-1 DEVELOPER	SIGN OUT	ENGLISH -
DASHBOARD	APF	PS & SERVICES	ALEXA	REPORTI	ING	SUPPORT	DOCUMENTATION	SETTINGS			
< Back to the list <p>Create a</p>	a new	Device Type * Fields required							Getting started AVS Agreement AVS Program Require AVS Content Require	ements ments	
Device Type Info	0	Company Name The name of the co developer account	e ompany you listed ir profile.	1 your	Compan	ny Name					
Device Details	0	Device Type ID Choose a unique r This name will not only contain letters no spaces.	* name that identifies to be shown to end us s, numbers and under	your device. ers. It may erscores with	Device_	_ID					
		Display Name * Choose a device n end users when th Amazon.	ame that you want ey register their dev	shown to your ices with	Display	Name			×		
											Next

Figure 11 Amazon Developer Account Registration Screen 7

On the following webpage, shown in Figure 12, click on the Select Security Profile dropdown, then click on the Create a new profile option.

< amazon // Deve	LOPER CONSOLE						CRD1569-1 DEVELOPER	SIGN OUT	ENGLISH -
DASHBOARD	APPS & SERVICES	ALEXA	REPORTING	SUPPORT	DOCUMENTATION	SETTINGS			
< Back to the list	new Device Type						Getting started AVS Agreement AVS Program Require AVS Content Requirer	ments nents	
Device Type Info	You need a sec securely identit	urity profile to id y itself to the Ale	entify your device. Yo xa Voice Service. If y	our security profile you are building a w	credentials - client ID and (vebsite, click here to <u>Learn</u>	client secret - allow More. If you are buil	your device to Iding an Android or		
Security Profile		ere to <u>Learn Mor</u>	<u>e</u> .						
Device Details	Security Profile device. General Security Profile Choose a descript Amazon services Security Profile Choose a descript Amazon services Security Profile This ID will dentify services. Client ID ? Client Securet This is a value go you when you reg Contidential	Now Amazon ident Now Amazon ident Not an additional ident Now Amazon ident Now Amazon ident Now Amazon Ident Ident	Iftes your Belect Indroid/Kindle Setting profile for ing with you. : In Amazon ssigned to Amazon.	IS Settings					Next

Figure 12 Amazon Developer Account Registration Screen 8

On the following webpage, shown in Figure 13, choose proper names for the *Security Profile Name* and *Description*, and click on the *Next* button.



< amazon // Deve	LOPER CONSOLE						CRD1569-1 DEVELOPER	SIGN OUT	ENGLISH -
DASHBOARD	APPS & SERVICES	ALEXA	REPORTING	SUPPORT	DOCUMENTATION	SETTINGS			
< Back to the list	new Device Type * Fields required						Getting started AVS Agreement AVS Program Reguin AVS Content Reguin	ements ements	
Device Type Info Security Profile Device Details	Vou need a sec securely identii iOS app, click i Security Profile A security profile device.	curity profile to id fy itself to the Ale here to <u>Learn Mo</u> ? * s how Amazon iden	lentify your device. Yo exa Voice Service. If y re. tifies your Create	our security profile you are building a w e a new profile	credentials - client ID and rebsite, click here to <u>Learn</u>	client secret - allow y <u>More</u> . If you are buil	your device to ding an Android or		
	General Security Profile Choose a name fr Security Profile Choose a descript Amazon services	Veb Settings Pame * or your security profi- tion for your security to use in communic	Android/Kindle Setting le. Profile r profile for ating with you.	iOS Settings _Name Description			x		
									Next

Figure 13 Amazon Developer Account Registration Screen 9

The following webpage, shown in Figure 14, shows the *Client ID* and *Client Secret* strings that are used to configure the voice capture board; you'll return to this webpage later, to allow you to copy-and-paste the strings.

< amazon // DEVE	ELOPER CONSOLE						CRD1569-1 DEVELOPER	SIGN OUT	ENGLISH -
DASHBOARD	APPS & SERVICES	ALEXA	REPORTING	SUPPORT	DOCUMENTATION	SETTINGS			
< Back to the list	a new Device Type	,					Getting started AVS Agreement		
r	* Fields required						AVS Program Require AVS Content Require	ements ments	
Device Type Info	You need a sec securely identi iOS app, click l	curity profile to ide fy itself to the Ale here to <u>Learn Mon</u>	entify your device. Y xa Voice Service. If y <u>e</u> .	our security profile you are building a w	credentials - client ID and (ebsite, click here to <u>Learn</u>	client secret - allow y <u>More</u> . If you are build	our device to ling an Android or		
Security Profile	Converte Drofile								
Device Details	A security profile i device.	is how Amazon identi	Profile	e_Name			Edit		
	General	Web Settings A	Android/Kindle Setting	iOS Settings					
	Security Profile Choose a descrip Amazon services	e Description tion for your security to use in communica	profile for Profile ting with you.	Description					
	Security Profile This ID will identif services.	e ID iy your security profile	in Amazon amzn1	.application.90184f	921be5447b8d2ca1debbc11	197e			
	Client ID ? This is a value sp you when you reg	ecific to you that is as jister with Login with J	ssigned to Amazon.	application-oa2-cli	ent.4ee3020d02f64303a190	58557626b9a9			
	Client Secret (This is a secret sp you when you reg Confidential.	pecific to you that is a jister with Login with /	ssigned to 3642d	1c2468235c3c450f9	d869f9d34e8b2d872f3d58c	a5d71e8cd902835dcc	16		
Successfully created s	security profile.								Next

Figure 14 Amazon Developer Account Registration Screen 10

Click on the Web Settings tab and, on the following webpage, shown in Figure 15, click on the Edit button.



< amazon // DEVI	ELOPER CO	DNSOLE						CRD1569-1 DEVELOPER	SIGN OUT	ENGLISH -
DASHBOARD	APP	S & SERVICES	ALEXA	REPORTING	SUPPORT	DOCUMENTATION	SETTINGS			
< Back to the list Create	a new l	Device Type						Getting started AVS Agreement AVS Program Require AVS Content Require	ements ements	
Device Type Info	0	You need a sec securely identif iOS app, click h	urity profile to id y itself to the Ale ere to <u>Learn Mo</u> r	entify your device. Y exa Voice Service. If y r <u>e</u> .	our security profile you are building a w	credentials - client ID and o ebsite, click here to <u>Learn</u>	client secret - allow y <u>More</u> . If you are build	your device to ding an Android or		
Device Details	©	Security Profile A security profile is device.	? * s how Amazon ident	lifies your Profile	e_Name			Edit		
		General V Allowed Origins Your website origin Amazon.	Veb Settings	Android/Kindle Setting	iOS Settings					
		Allowed Return If you make HTTP redirect_uris, spec	URLs ? s calls to Login with ify them here.	Amazon with						
										Next

Figure 15 Amazon Developer Account Registration Screen 11

Click on the *Add Another* link for both *Allowed Origins* and *Allowed Return URLs*. Enter the following information, as shown in Figure 16:

- Allowed Origins: https://raspberrypi:3000
- Allowed Return URLs: https://raspberrypi:3000/authresponse

Then click on the Next button.

< amazon // Devi	ELOPER CO	DNSOLE						CRD1569-1 DEVELOPER	SIGN OUT	
DASHBOARD	APP	S & SERVICES	ALEXA	REPORTING	SUPPORT	DOCUMENTATION	SETTINGS			
< Back to the list										
? Create	a new l	Device Type						Getting started AVS Agreement AVS Program Require AVS Content Require	ements ments	
Device Type Info	0	You need a sec securely identif iOS app, click h	urity profile to id ly itself to the Ale lere to <u>Learn Mo</u> r	entify your device. Y exa Voice Service. If y <u>'e</u> .	our security profile you are building a w	credentials - client ID and (bebsite, click here to <u>Learn</u>	client secret - allow y <u>More</u> . If you are buil	your device to ding an Android or		
Security Profile Device Details	© ©	Security Profile A security profile is device.	e 🥜 * s how Amazon ident	ifies your Profile	e_Name			Cancel		
		General M Allowed Origins Your website origin Amazon.	Veb Settings	Android/Kindle Setting	gs iOS Settings //raspberrypi:3000					
		Allowed Return If you make HTTP redirect_uris, spec	URLs ? is calls to Login with ify them here.	Amazon with Add A	//raspberrypi:3000/au	thresponse				
										Next

Figure 16 Amazon Developer Account Registration Screen 12

On the following webpage, shown in Figure 17, provide all the required information, then click on the Submit button.



< amazon // Deve	OPER CONSOLE						CRD1569-1 DEVELOPER	SIGN OUT	ENGLISH -
DASHBOARD	APPS & SERVICES	ALEXA	REPORTING	SUPPORT	DOCUMENTATION	SETTINGS			
< Back to the list									
? Create a	* Fields required	•					Getting started AVS Agreement AVS Program Require AVS Content Requirer	ments nents	
Device Type Info	Upload an image	sized 142(width)x130	(height)						
Security Profile	pixels in either Pl displayed on you Content and Dev	NG or JPG format. Thi customer's <u>Manage</u> ces page.	s image is Your						
Device Details	Category *	TTT page.	Cho	ose an image					
	Choose the category how your device	jory that best describe is used.	s where and Choos	se option 🔽					
	Description * Please provide a and its functional	brief description of yo ty.	ur device Voice	command-enabled sp	eaker		×		
	Do you have p available to the	lans to make your e general public? *	product O Yes	s O No					
	Is your device otherwise dire age of 13?* Not sure? Learn	a children's produ cted to children ur more	oct or is it OYes ader the	s O No					
					By s	ubmitting this form, you a	agree to <u>Alexa Voice Service Agre</u>	eement.	Submit

Figure 17 Amazon Developer Account Registration Screen 13

A summary page, similar to that shown in Figure 10 but with the device you just created, is displayed. You'll use the ID when logging in to AVS.

Click the *Edit* button on the right of the new device entry, and then click on the Security Profile tab, as shown in Figure 18, to display again the *Client ID* and *Client Secret* strings, so that they are available for you to copy-and-paste when you configure the voice capture board.

< amazon // Deve	LOPER CONSOLE						CRD1569-1 DEVELOPER	SIGN OUT	ENGLISH -	
DASHBOARD	APPS & SERVICES	ALEXA	REPORTING	SUPPORT	DOCUMENTATION	SETTINGS				
< Back to the list	Display_Name • Fields required						Getting started AVS Agreement AVS Program Require AVS Content Require	ements ments		
Device Type Info Security Profile Device Details	You need a sec securely identif iOS app, click h Security Profile A security profile device.	urity profile to ide ty itself to the Ale: ere to Learn Mor ? * is how Amazon iden	ntify your device. You xa Voice Service. If yo e. ntifies your Profil	e_Name	edentials - client ID and clien osite, click here to <u>Learn M</u> e	nt secret - allow you <u>ore</u> . If you are buildir	ir device to ng an Android or Edit			
Device Capabilities	Conserver a descript Amazon services Security Profile Amazon services	General Web Settings Android/Kindle Settings iOS Settings Security Profile Description Amazon services to use in communicating with you. Profile Description Profile Description Security Profile ID Profile Description Profile Description Profile Description								
	This ID will identify services. Client ID ? This is a value sp you when you reg Client Secret ?	y your security profile ecific to you that is a ister with Login with	ssigned to Amazon.	amzn1.application-oa2-client.4ee3020d02f64303a19058557626b9a9						
	This is a secret sp you when you reg Confidential.	ecific to you that is a ister with Login with	Amazon.	1c2468235c3c450f9c	1869f9d34e8b2d872f3d58ca	a5d71e8cd902835dc	d6		Next	

Figure 18 Amazon Developer Account Registration Screen 14

This completes creating an Amazon developer account.



2.3 Configuring the Voice Capture Board

The voice capture board should be available on your network; to access it, you need to determine its IP address.

• On the Raspberry Pi, open a new browser window and enter "https://raspberrypi:3000" in the address bar (the display may need reloading – click the *Reload* button – and/or refreshing – press *F5* if so)

You now need to enter the AVS configuration information and log in to Amazon.

• To add the AVS configuration details, open the *Configurations* menu on the left side, and select the *AVS* option, as shown in Figure 19. Provide the *Client ID* and *Client Secret* details from the Amazon developer account previously created (shown in Figure 14), and the *Product ID* (the Device ID shown in Figure 11), then click on the *Submit* button at the bottom of the page.

۲	CIRRUS LOG	IC°	=	
			Configuratio	N Make modifications to the properties file
者 Home			AVS	
🔊 Login		<	Client ID	Client ID
🔅 Config	jurations	~	Client ID	Client ID
🗢 WiFi			Client Secret	Client Secret
3. AVS	config		Product ID	Product ID
			Submit	
			Submit	

Figure 19 Console – AVS Configuration

A green banner at the top of the page will confirm that the properties were updated successfully.

To log in to the AVS service, open the Login menu on the left side, and select the AVS Login option, as shown in
Figure 20. Click on the yellow button to sign in to Amazon Voice Services, using the account details you set up
previously and accept the terms of use.



Figure 20 Console – AVS Login

Once signed in, follow the prompts to return to the Raspberry Pi. The browser may issue certificate warnings, which can be ignored. If a privacy warning is shown, click on the SHOW ADVANCED button to continue to your device. You should be returned to the Console AVS Login screen, with a green banner at the top of the page confirming that login was successful.

So that you can subsequently access the Raspberry Pi from any browser connected to your network (headless mode),



you need to know the Raspberry Pi's IP address.

 In the task bar at the top right of the screen, hovering the mouse over the Wired/Wireless Network applet displays the information as shown in Figure 21. The IP address is the four numbers separated by '.'; for example, Figure 21 shows an Ethernet IP address of 198.90.202.35 and a wireless IP address of 192.168.1.179 – note the one appropriate for your connection.



Figure 21 Raspberry Pi Wireless and Ethernet Connections

The software should now be set up correctly; this completes the software set up.

Now you can access the voice capture board via your network.

• On your computer, start a web browser, and enter https://<*IP address*>: 3000/ in the address bar, where <*IP address*> is the IP address noted above. The browser should connect to and display the console again.

3 Testing the Voice Capture Development Kit

The last step in getting the kit up and running is a quick test to ensure that all the basic elements are working.

Eirrus logic	≡	
Navigate	DUET Configuration Modify DUET properties	
🖀 Home	SoundClear – Audio Levels Audio Mode ERLE DTD	EQ
➡ Login <	SoundClear Enabled	On Off
Configurations Y	TX Bypass 0 dB	
Se WiFi a AVS	Gain -10 -10 -10 -10 -10 -10 -10 -10 -10 -10	
DUET config	-20 -30	
	Multi-Mic Parameters +	
	RX Path Gains and EQ + -50	-
	-60 308 310 312 314 316 318	320
	Time(s)	
	AEC Parameters +	
	Output Gain	
	-98.0	
	-98.5	
	භ -99.0	-
	-99.5	
	-100.0 305 310 315	320
	Open Configuration Save Configuration	

Figure 22 Console – Configuration



- In the console, select the Home menu on the left side.
- Restart the AVS application by clicking on the Stop button and then the Start button.

After a short pause, you should hear Alexa saying "Hello". This confirms that the application, speaker and Amazon connection are all working.

To test that the microphones are responding:

• Open the DUET config option in the Configuration menu, shown in Figure 22.

The graphs on the right side show the microphone output. Speaking or making a loud sound near to the microphones (either side of the white 6-pin connector) should show a spike in the graphs.

Finally, to test Alexa:

- Say "Alexa" into the microphones; the voice capture board should respond with a beep to indicate processing.
- Ask Alexa a question. Following a second beep to indicate that she has finished listening, she should respond.

Further details of the Control Console operation can be found in the CRD1569-1 User Guide.

4 Revision History

Revision History					
Revision		Changes			
1.0	First release				
JUN '17					



Contacting Cirrus Logic Support

For all product questions and inquiries, contact a Cirrus Logic Sales Representative. To find one nearest you, go to www.cirrus.com.

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