



# PSOC<sup>®</sup> 64 ARROW IOT SECURITY PRESSURE SENSOR

## GUIDE

### Abstract

The intended audience for this document is for someone with knowledge in programming and familiar with the PSoC 64 secure microcontroller. This guide will go over how to provision the PSoC 64 Secure AWS IoT Pioneer Kit (CY8CKIT-064S052-4343W) with the ModusToolbox IDE and Amazon FreeRTOS.

Any questions please contact us at

[psoc64@arrow.com](mailto:psoc64@arrow.com)

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## 1. INTRODUCTION

### MATERIALS

- Workshop Kit:
  - [PSoC 64 Secure AWS IoT Pioneer Kit \(CY8CKIT-064S0S2-4343W\)](#)
  - DPS368XTSA1 Pressure Shield2Go (S2GOPRESSUREDPS368TOBO1)
  - Arrow PSOC6\_IOT\_Sensor\_Shield
  - 1x43 Press Pin Socket
  - (4) 1x10 Press Pin Post
- Software:
  - ModusToolbox IDE (download)
  - AWS Account (online setup)
  - [Tera Term](#) or [PuTTY](#) (download))

### CHECK THE APPENDIX

Please check in Appendix for methods to get around common issues and misunderstandings.

If you have additional tips, tricks, clarifications, or suggestions, please e-mail them to [psoc64@arrow.com](mailto:psoc64@arrow.com)

## 2. PREREQUISITES

In order to run the Secure Pressure Sensor demo you will need to have the “amazon-freertos” AWS demo running on the CY8CKIT-064S0S2-4343W Rev 9 or greater with provisioning and transfer of data to AWS.

### SETUP A PROJECT FOLDER

Create a folder for a new project near the top level of files on your computer, be sure to not use any spaces in the file folder name.

Copy the “amazon-freertos” AWS demo into a new file folder.

### UPDATE FILES IN NEW PROJECT FOLDER

Replace the files from “application\_code.zip” into the file structure below, file structure starts at the level you copied the “amazon-freertos” AWS demo into:

```
\amazon-freertos\vendors\cypress\boards\CY8CKIT_064S0S2_4343W\aws_demos\application_code
```

### OPEN AWS ACCOUNT

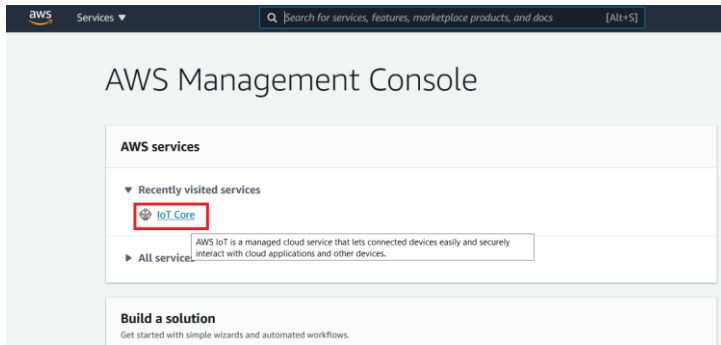
The dev kit board should already be provisioned and ready to run. Open a terminal manager to monitor program loader and interaction.

**Commented [GC1]:** I recommend a little more detail here. Not clear if your making a new copy of the original folder or a copy of the folder used from the running example. Note that the pre-work doesn't require amazon-freertos folder be inside the project folder. If it should, we should clarify that in the pre-work. As I have the amazon-freertos in the project folder for the pre-work, I just made a copy of the entire project folder.

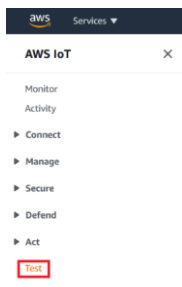
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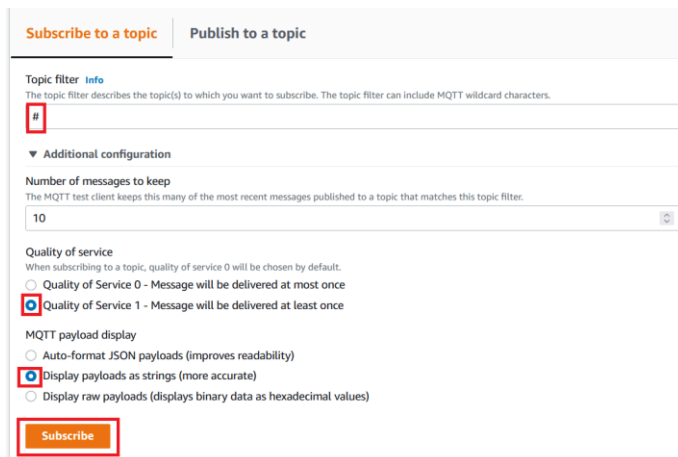
Login to your AWS account and go to the “IoT Core”:



Go to the “Test”



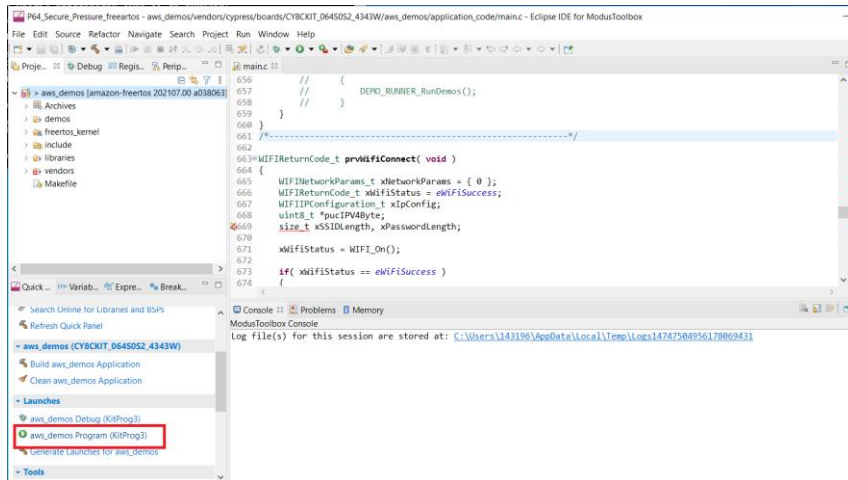
Next type the “#” into the “Topic filter” and select the following “Quality of service” choices below and press the “Subscribe”.



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Connect the dev kit to the PC and download the program:



**Commented [GC2]:** Open MTB into the new Project Folder  
Delete the existing project (Do NOT delete the project from the computer)  
Make sure the "Application\_code" directory is replaced BEFORE importing the project into MTB  
Import the project into MTB  
Build – Program - Celebrate

Once the program is running you will see the something like following in the AWS web window:

Subscriptions		#	Pause	Clear	Export	Edit
#	♡ ✕					
▼ P64_thing1/example/topic		October 07, 2021, 13:25:23 (UTC-0700)				
		{ "pressure" : "97287.648438" }				
▼ P64_thing1/example/topic		October 07, 2021, 13:25:16 (UTC-0700)				
		{ "pressure" : "97287.750000" }				

Typical Output on terminal manager:

```

LAN CLM : API: 12.2 Data: 9.10.39 Compiler: 1.29.4 ClnImport: 1.36.3 C
ation: 2020-01-30 21:30:05
HD VERSION : v1.91.2 : v1.91.2 : GCC 9.3 : 2020-06-25 02:15:47 -0500
1 623 [Imr Svc] Wi-Fi module initialized. Connecting to AP Linksys...

2 2098 [publisher] [INFO] Retry attempt 4 out of maximum retry attempts 5.
3 2098 [publisher] Unexpected error (4294967290) from dns_gethostbyname_addrty
(<) while resolving (a3404dwjfa3gyx-ats.iot.us-west-1.amazonaws.com)!
4 2098 [publisher] [ERROR] Failed to connect to server: DNS resolution failed:
erver=a3404dwjfa3gyx-ats.iot.us-west-1.amazonaws.com.
5 2098 [publisher] [WARN] Connection to the broker failed. Attempting connectio
retry after backoff delay.
6 3321 [publisher] [INFO] Retry attempt 5 out of maximum retry attempts 5.
7 3321 [publisher] Unexpected error (4294967290) from dns_gethostbyname_addrty
(<) while resolving (a3404dwjfa3gyx-ats.iot.us-west-1.amazonaws.com)!
8 3321 [publisher] [ERROR] Failed to connect to server: DNS resolution failed:
erver=a3404dwjfa3gyx-ats.iot.us-west-1.amazonaws.com.
9 3321 [publisher] [WARN] Connection to the broker failed. Attempting connectio
retry after backoff delay.
20 5998 [publisher] [INFO] Retry attempt 6 out of maximum retry attempts 5.
1 9400 [IOT-Wifi-1] Notify application that IP is changed!

2 9419 [Imr Svc] WiFi connected to AP Linksys.
3 9419 [Imr Svc] IP Address acquired 192.
24 10678 [Imr Svc] Write certificate...
..25 29576 [publisher] [INFO] TLS Connection Established

6 29708 [publisher] [INFO] Packet received. ReceivedBytes=2.
7 29708 [publisher] [INFO] CONNACK session present bit not set.
8 29708 [publisher] [INFO] Connection accepted.
9 29708 [publisher] [INFO] Received MQTT CONNACK successfully from broker.
0 29708 [publisher] [INFO] MQTT connection established with the broker.
1 29708 [publisher] [INFO] An MQTT connection is established with a3404dwjfa3gy
-ats.iot.us-west-1.amazonaws.com.
2 29708 [publisher] [INFO] MQTT Connection Established

3 29709 [publisher] [INFO] Attempt to subscribe to the MQTT topic P64_thing1/ex
mple/topic.
4 29709 [publisher] [INFO] SUBSCRIBE sent for topic P64_thing1/example/topic to
broker.
5 29786 [publisher] [INFO] Packet received. ReceivedBytes=3.
6 29786 [publisher] [INFO] Subscribed to the topic P64_thing1/example/topic wi
a maximum QoS 1.
37 30786 [publisher] [INFO] MQTT Subscribe Successful

8 30786 [publisher] [INFO] Publish to the MQTT topic P64_thing1/example/topic.
9 30786 [publisher] [INFO] Publish Successful

0 30786 [publisher] [INFO] Attempt to receive publish message from broker.
1 30872 [publisher] [INFO] Packet received. ReceivedBytes=2.
2 30872 [publisher] [INFO] Ack packet deserialized with result: MQTISuccess.
3 30872 [publisher] [INFO] State record updated. New state=MQTTPublishDone.
4 30872 [publisher] [INFO] PUBACK received for packet Id 2.
5 30897 [publisher] [INFO] Packet received. ReceivedBytes=53.
6 30897 [publisher] [INFO] De-serialized incoming PUBLISH packet: Deserializerr
sult=MQTISuccess.
7 30897 [publisher] [INFO] State record updated. New state=MQTTPubAckSend.
8 30898 [publisher] [INFO] Incoming QoS : 1

9 30898 [publisher] [INFO] Incoming Publish Topic Name: P64_thing1/example/top
matches subscribed topic.Incoming Publish Message : {"pressure": "0.000000"}
ressure 97284.5 Pa Delta P 97284.5 Pa Temp = 81.4 F
all Event
ressure 97284.5 Pa Delta P 0.0 Pa Temp = 81.4 F

```

```

505 286676 [publisher] [INFO] Incoming Publish Topic Name: P64_thing1/example/to
pic matches subscribed topic.Incoming Publish Message : <"pressure" : "97283.257
812">
Pressure 97282.5 Pa      Delta P -0.7 Pa      Temp = 82.4 F
Pressure 97283.0 Pa      Delta P 0.5 Pa      Temp = 82.5 F
Pressure 97282.6 Pa      Delta P -0.4 Pa      Temp = 82.4 F
Pressure 97282.9 Pa      Delta P 0.3 Pa      Temp = 82.4 F
Pressure 97282.9 Pa      Delta P 0.0 Pa      Temp = 82.4 F
Pressure 97282.9 Pa      Delta P -0.0 Pa      Temp = 82.4 F
Pressure 97282.6 Pa      Delta P -0.3 Pa      Temp = 82.4 F
Pressure 97282.3 Pa      Delta P -0.2 Pa      Temp = 82.4 F
Pressure 97282.6 Pa      Delta P 0.2 Pa      Temp = 82.4 F
Pressure 97282.7 Pa      Delta P 0.1 Pa      Temp = 82.4 F
Pressure 97282.8 Pa      Delta P 0.1 Pa      Temp = 82.4 F
506 293237 [publisher] [INFO] Publish to the MQTT topic P64_thing1/example/topi
c.
507 293238 [publisher] [INFO] Publish Successful
508 293238 [publisher] [INFO] Attempt to receive publish message from broker.
509 293375 [publisher] [INFO] Packet received. ReceivedBytes=2.
510 293375 [publisher] [INFO] Ack packet deserialized with result: MQTTSuccess.
511 293375 [publisher] [INFO] State record updated. New state=MQTTPublishDone.
512 293375 [publisher] [INFO] PUBACK received for packet Id 41.
513 293375 [publisher] [INFO] Packet received. ReceivedBytes=57.
514 293375 [publisher] [INFO] De-serialized incoming PUBLISH packet: Deserialize
rResult=MQTTSuccess.
515 293375 [publisher] [INFO] State record updated. New state=MQTTPubAckSend.
516 293375 [publisher] [INFO] Incoming QoS : 1
517 293376 [publisher] [INFO] Incoming Publish Topic Name: P64_thing1/example/to
pic matches subscribed topic.Incoming Publish Message : <"pressure" : "97282.828
125">
Pressure 97282.4 Pa      Delta P -0.4 Pa      Temp = 82.4 F
518 294376 [publisher] [INFO] Publish to the MQTT topic P64_thing1/example/topic
.
519 294376 [publisher] [INFO] Publish Successful
520 294376 [publisher] [INFO] Attempt to receive publish message from broker.
Pressure 97282.3 Pa      Delta P -0.2 Pa      Temp = 82.4 F
521 294466 [publisher] [INFO] Packet received. ReceivedBytes=2.
522 294466 [publisher] [INFO] Ack packet deserialized with result: MQTTSuccess.
523 294466 [publisher] [INFO] State record updated. New state=MQTTPublishDone.
524 294466 [publisher] [INFO] PUBACK received for packet Id 42.
525 294490 [publisher] [INFO] Packet received. ReceivedBytes=55.
526 294490 [publisher] [INFO] De-serialized incoming PUBLISH packet: Deserialize
rResult=MQTTSuccess.
527 294490 [publisher] [INFO] State record updated. New state=MQTTPubAckSend.
528 294491 [publisher] [INFO] Incoming QoS : 1
529 294491 [publisher] [INFO] Incoming Publish Topic Name: P64_thing1/example/to
pic matches subscribed topic.Incoming Publish Message : <"message" : "ending dem
o">
Pressure 97282.3 Pa      Delta P 0.0 Pa      Temp = 82.4 F
530 295491 [publisher] [INFO]
Terminating pressure task...
531 295491 [publisher] [INFO] Unsubscribe from the MQTT topic P64_thing1/example
/topic.
532 295491 [publisher] [INFO] Unsubscribe Successful
533 295575 [publisher] [INFO] Packet received. ReceivedBytes=2.
534 295575 [publisher] [INFO] Unsubscribed from the topic P64_thing1/example/top
ic.
535 296575 [publisher] [INFO] Disconnecting the MQTT connection with a3404dwjfa3
gyx-ats.iot.us-west-1.amazonaws.com.
536 296575 [publisher] [INFO] Disconnected from the broker.
537 296578 [publisher] [INFO] Closed all connections successfully
538 296578 [publisher] [INFO] -----Demo Complete-----

```

## 12. APPENDIX

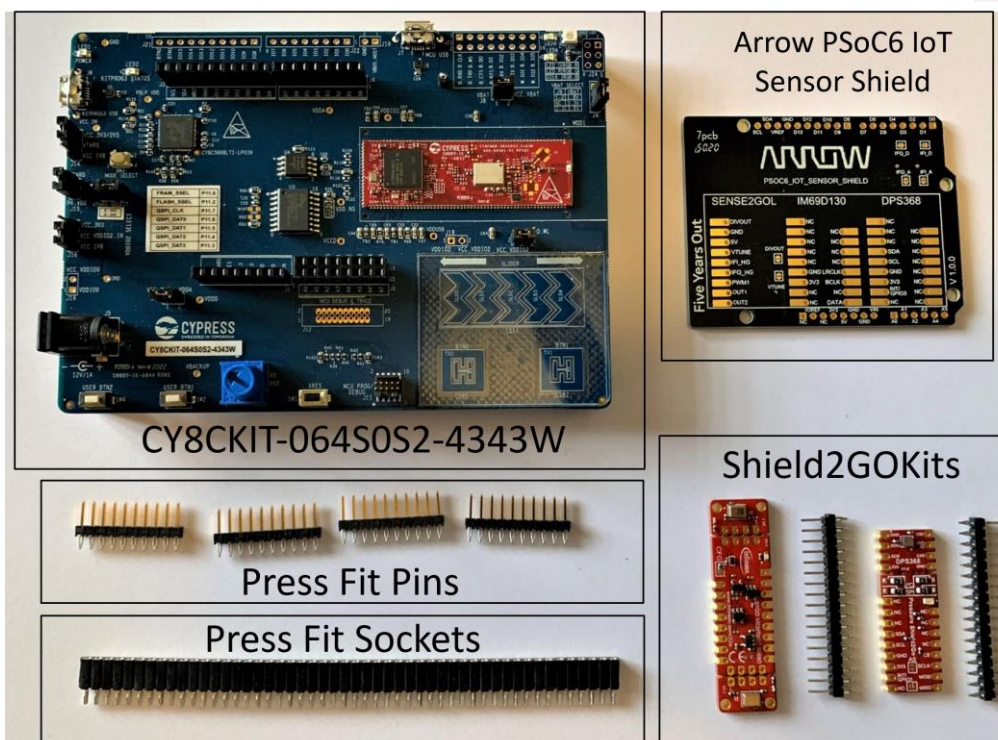
Please check in this Appendix for methods to get around common issues and misunderstandings.

If you have additional tips, tricks, clarifications, or suggestions, please e-mail them to [psoc64@arrow.com](mailto:psoc64@arrow.com)

### ASSEMBLY INSTRUCTIONS FOR THE KIT USED IN THE P64 SECURITY WEBINARS

The kit contains the follow items:

- 1 – CY8CKIT-064S0S2-4343W: PSoC64 Standard Secure – AWS WiFi Pioneer Kit
- 1 – Arrow PSoC6 IoT Sensor Shield
- 1 – DPS386 Shield2Go Kit for reading barometric pressure
- 1 – IM69D130 Shield2Go kit (MEMS Microphone)
- 4 – 10 position press fit pins
- 1 – Strip of press fit sockets

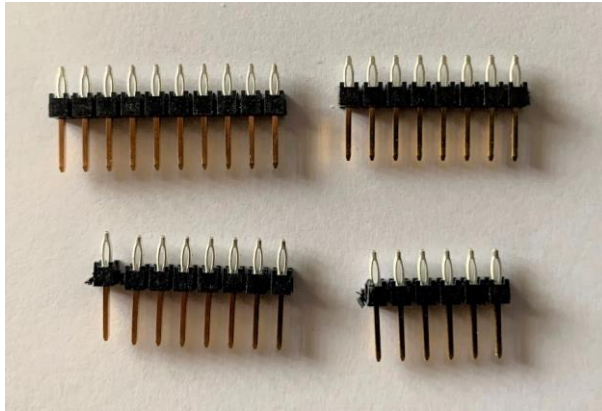




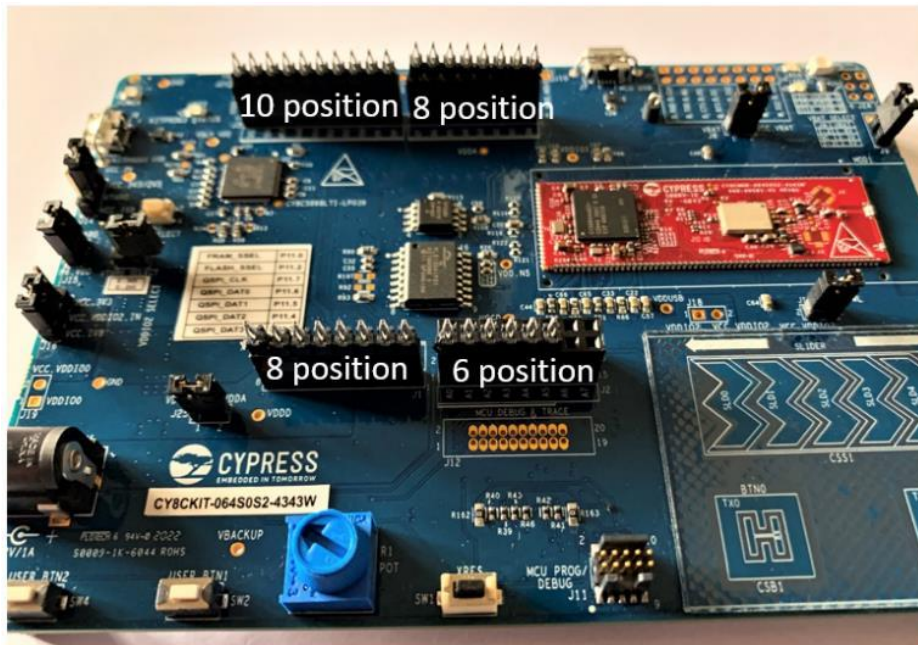
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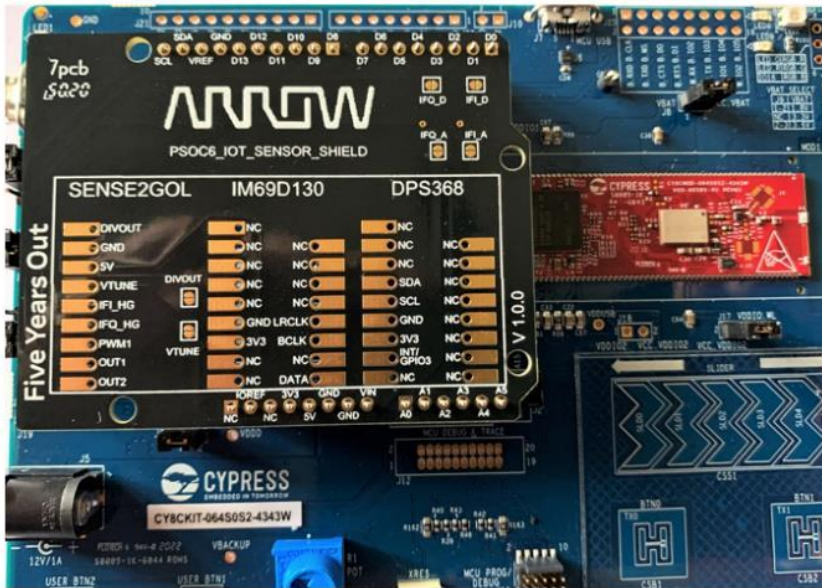
1. One 10 position, two 8 position and one 6 position press fit pins are needed. Leave 1 of the 10 position press fits intact. Break off 2 of the pins of 2 of the other 10 pin press fit connectors. Break off 4 pins on the last 10 pin press fit connector. See below



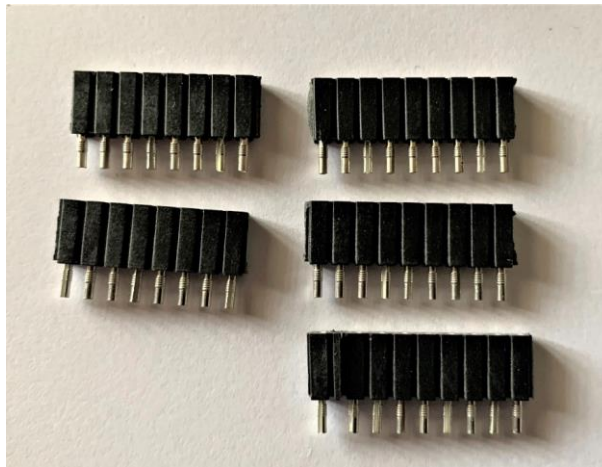
2. Put the press fit pins on the Pioneer Kit



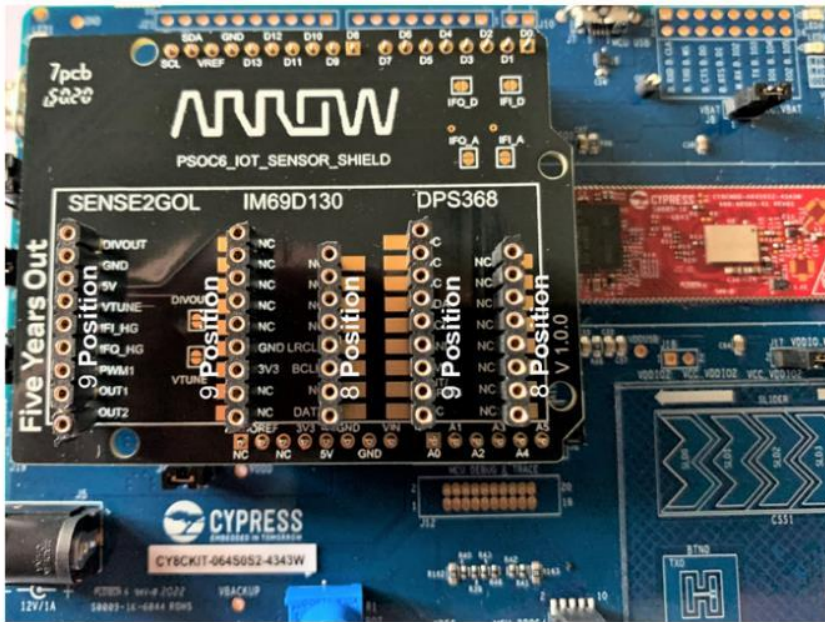
3. Mount the Arrow PSoC6 IoT Sensor Shield and press it down on the press fit pins



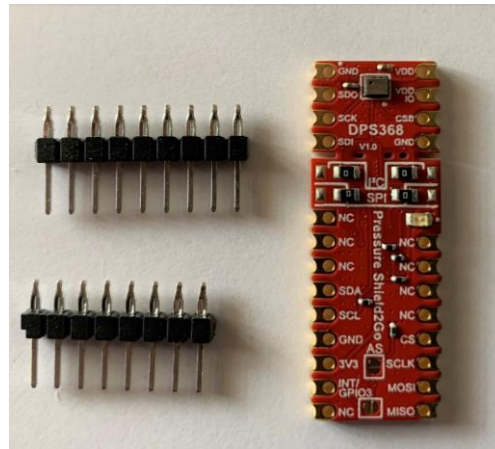
4. Break the press fit socket strip into three 9 position strips and two 8 position strips.



5. Place sockets on the Arrow PSoC6 IoT Sensor Shield



6. Break the press fit pins for the DPS368 Shield2Go Kit into one 8 position row and one 9 position row

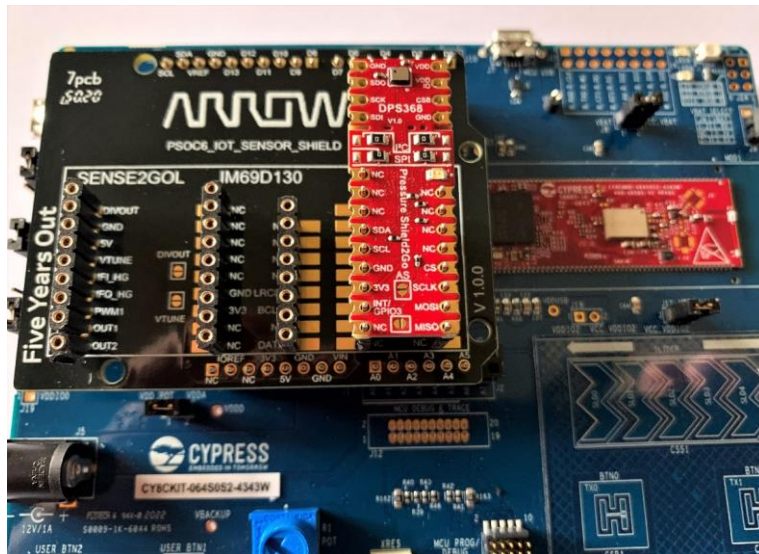




7. Place the pin press fit up in the DPS368 socket on the Arrow PSoC6 IoT Sensor Shield



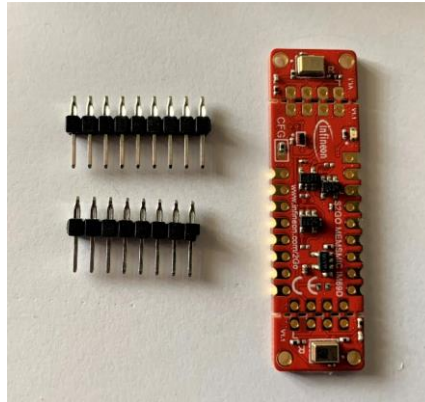
8. Place the DPS368 Shield2Go on the press fit pins components side up.



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9. Break the press fit pins for the IM69D130 Shield2Go Kit into one 8 position row and one 9 position row



10. Place the pin press fit up in the IM69D130 socket on the Arrow PSoC6 IoT Sensor Shield



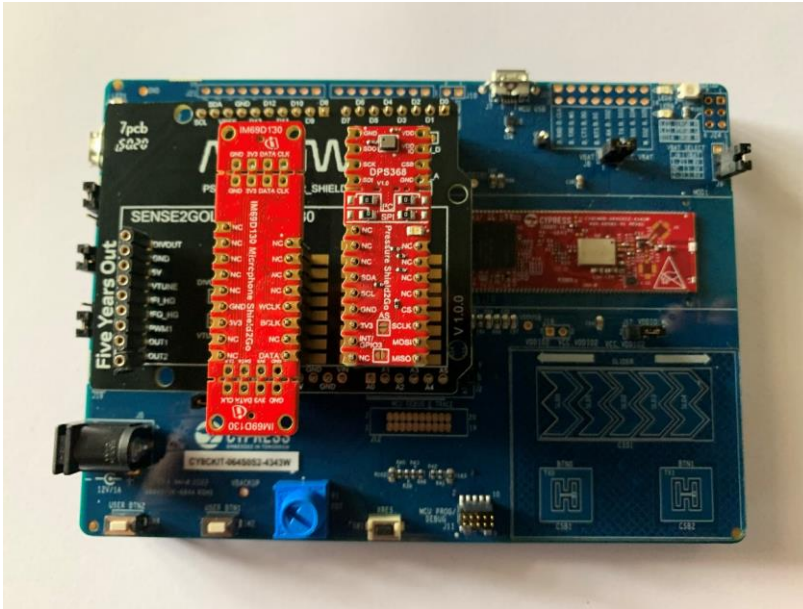
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11. Place the IM69D130 Shield2Go board (component side down) on the press fit pins



12. This is the finished assembly.



#### TIPS & TRICKS

Modus Shell useful commands and knowledge.

Note: If using a Linux Operating System, use Terminal instead of Modus Shell.

Note: Modus Shell accepts Linux type commands. For comparison to Windows Command Prompt, use the "whereis" command in front of a couple commands to see how environmental paths may be set to point at different installations of similar tools. Start with "whereis python"

- *where <command>* → show where the program to run a <command> is located. If multiple programs are listed, they will be attempted in order.
- *whereis <command>* → Show where the program and related .dll files to run a <command> are located. If multiple programs are listed, they will be attempted in order.
- *pwd* → To know what directory you're in within Modus Shell
- *cd..* → To move up a directory,
- *pip list* → Useful to see all the tools installed with python along with their versions

Note: The top level C:/ directory will appear as /cygdrive/c/

Note: When navigating directories within Modus Shell, the Forward Slash (/) must be used

## SOFTWARE SETUP

## 13. REVISION HISTORY

Revision #	Date	Editor	Note
1.0	10/7/2021	G Carson & R Smith	First full released version
1.7	10/8/2021	R Smith	File labeled internally in header as "Version 1.7". File name appended with 1.01 – No changes tracked or All changes accepted.
1.8	10/8/2021	G.Carson	Comments on how to create a new project folder and link MTB to the new project.