

# Introducing Wi-Fi and Bluetooth Application in AGL Charming Chinook

2<sup>nd</sup> June 2017

SRI MALDIA HARI ASTI

Perfecting the Art of Electronics

**ALPS**<sup>®</sup>

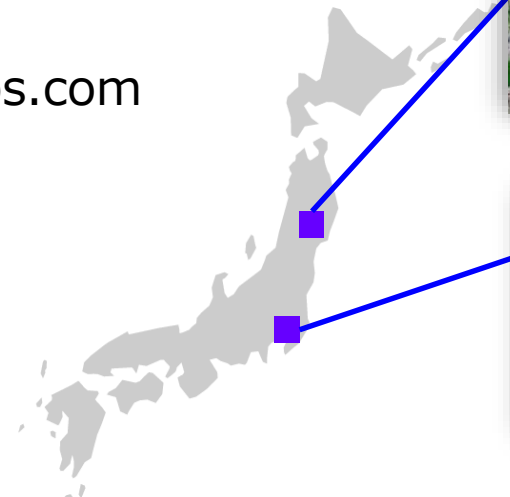
- SRI MALDIA HARI ASTI (ALPS Electric Japan)
- Location : Furukawa – Osaki City – Miyagi Prefecture – Japan
- Wi-Fi Software Engineer for Automotive (2013 ~ Present)
- Email : hariasti.srimaldia-1@jp.alps.com



Furukawa Plant



Tokyo Headquarter



ALPS Electric has become a member since 2015 and decided to directly contribute into connectivity field of AGL. We have been developing application for Wi-Fi and Bluetooth for AGL, including middle layer(API) and UI, which works on AGL application framework. Our applications have been merged to Charming Chinook distribution, however not yet been presented in public. [This talk will introduce about Wi-Fi and Bluetooth application in AGL Charming Chinook and listed APIs we have inside, as guidance to any developers who would like to apply Wi-Fi and Bluetooth connection into their application into AGL.](#)

- ① Company Profile
- ② ALPS Activity in AGL
- ③ Bluetooth and Wi-Fi's APIs in CC (Charming Chinook)
- ④ Live Demo and Result
  - 4-1 AGL Reference Environment
  - 4-2 AGL ft. ALPS product
- ⑤ Latest version in Master Branch
- ⑥ Conclusion

## ① Company Profile

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## ⑥ Conclusion

## Mobile

- Mobile phones (incl. smartphones)
- Notebook PCs and tablets
- Wearable devices
- Portable music players
- Portable game consoles



## Home

- Hard disk/Blu-ray recorders and DVD players
- TVs
- Home game consoles
- Audio systems
- Major home appliances

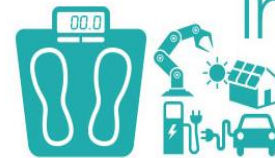


## Automotive

- In-vehicle interfaces
- Vehicle exterior interfaces
- Body control
- Powertrain

TouchSense™ Technology Licensed by Immersion Corporation

## Energy, Healthcare, Industrial, IoT



- IoT
- Power conditioners
- Hybrid/electric vehicles
- Healthcare equipment
- Robots



★ To provide best solution to the customers ★

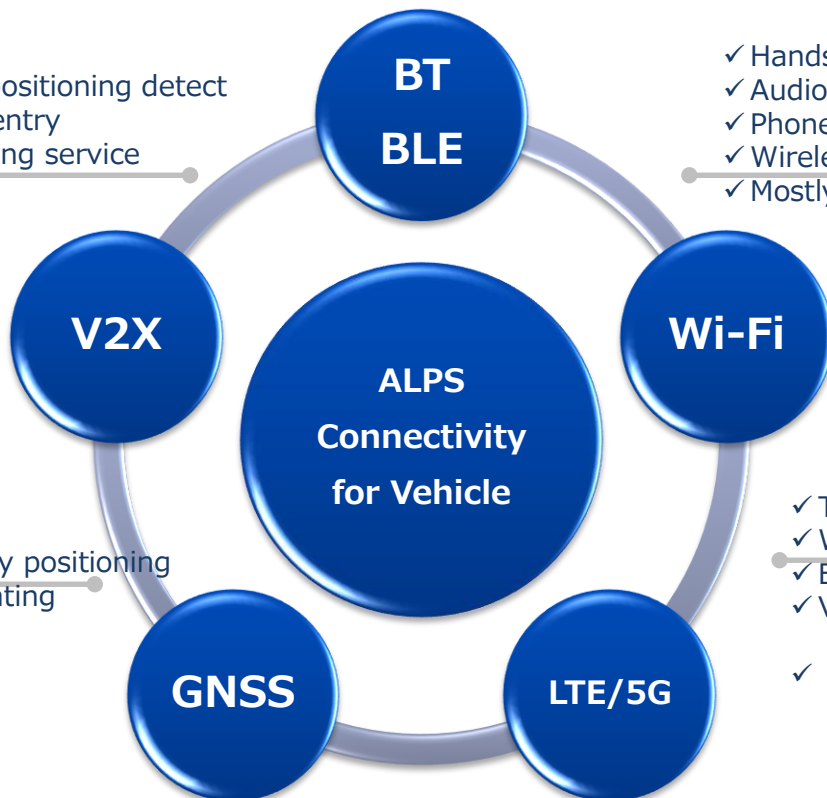
## Keyless Entry

- ✓ Vehicle positioning detect
- ✓ Keyless entry
- ✓ Car sharing service



## Autonomous Vehicle

- ✓ V2V / V2I
- ✓ High accuracy positioning
- ✓ 3D Map updating



## Infotainment

- ✓ Hands free
- ✓ Audio streaming
- ✓ Phone book download
- ✓ Wireless MirrorLink
- ✓ Mostly support Linux OS



## Network access

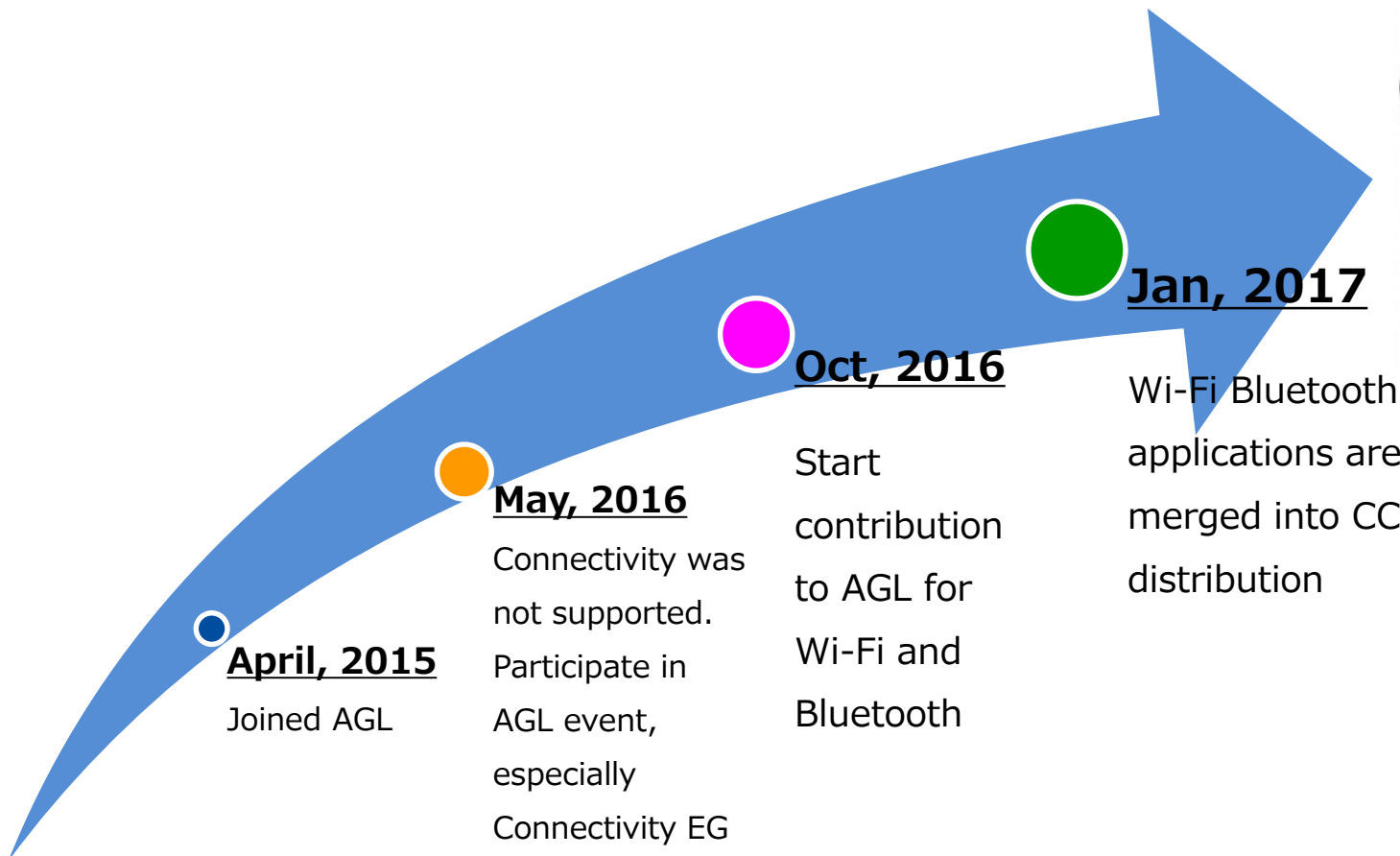
- ✓ Tethering
- ✓ Web browsing
- ✓ Emergency call
- ✓ Vehicle data for diagnostic
- ✓ Mostly support Linux OS



**ALPS eager to support all car connectivity platforms (Genivi, AGL, etc)**

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**Automotive  
Linux  
Summit  
June 2017**

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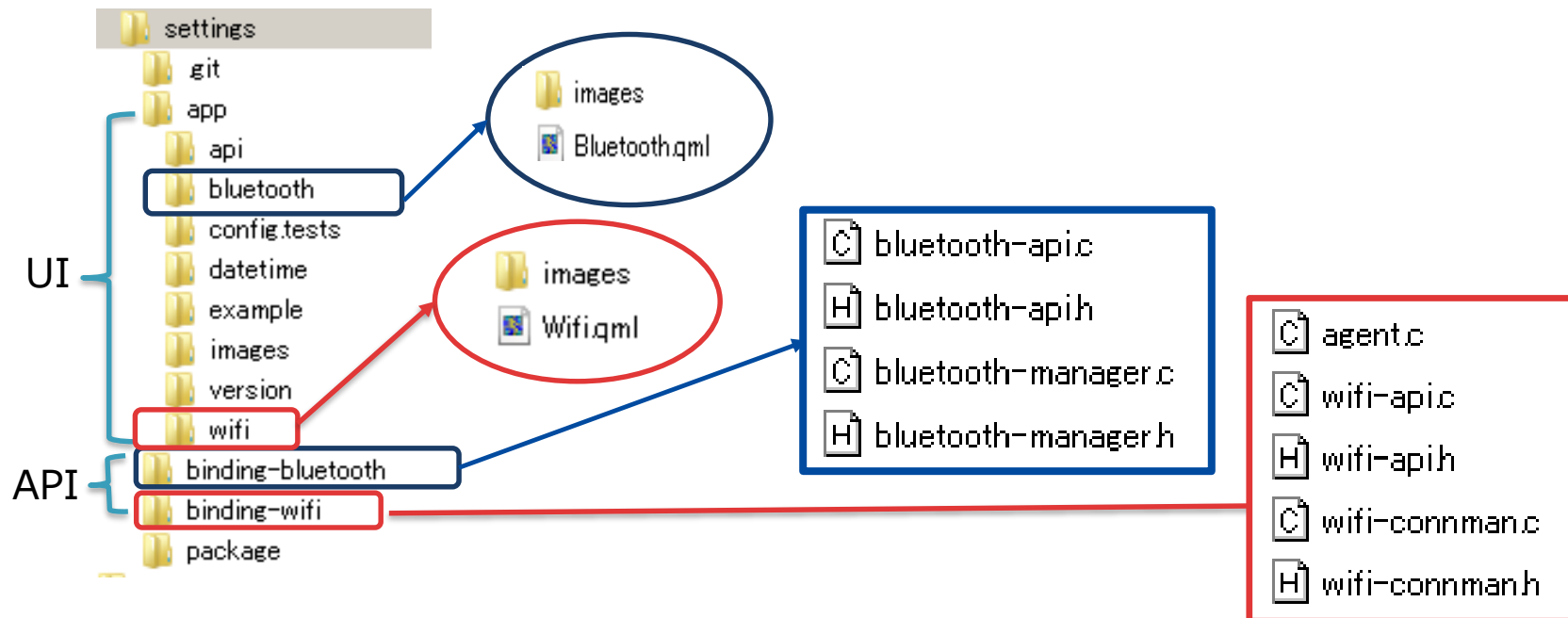
## ALPS source code has been merged!

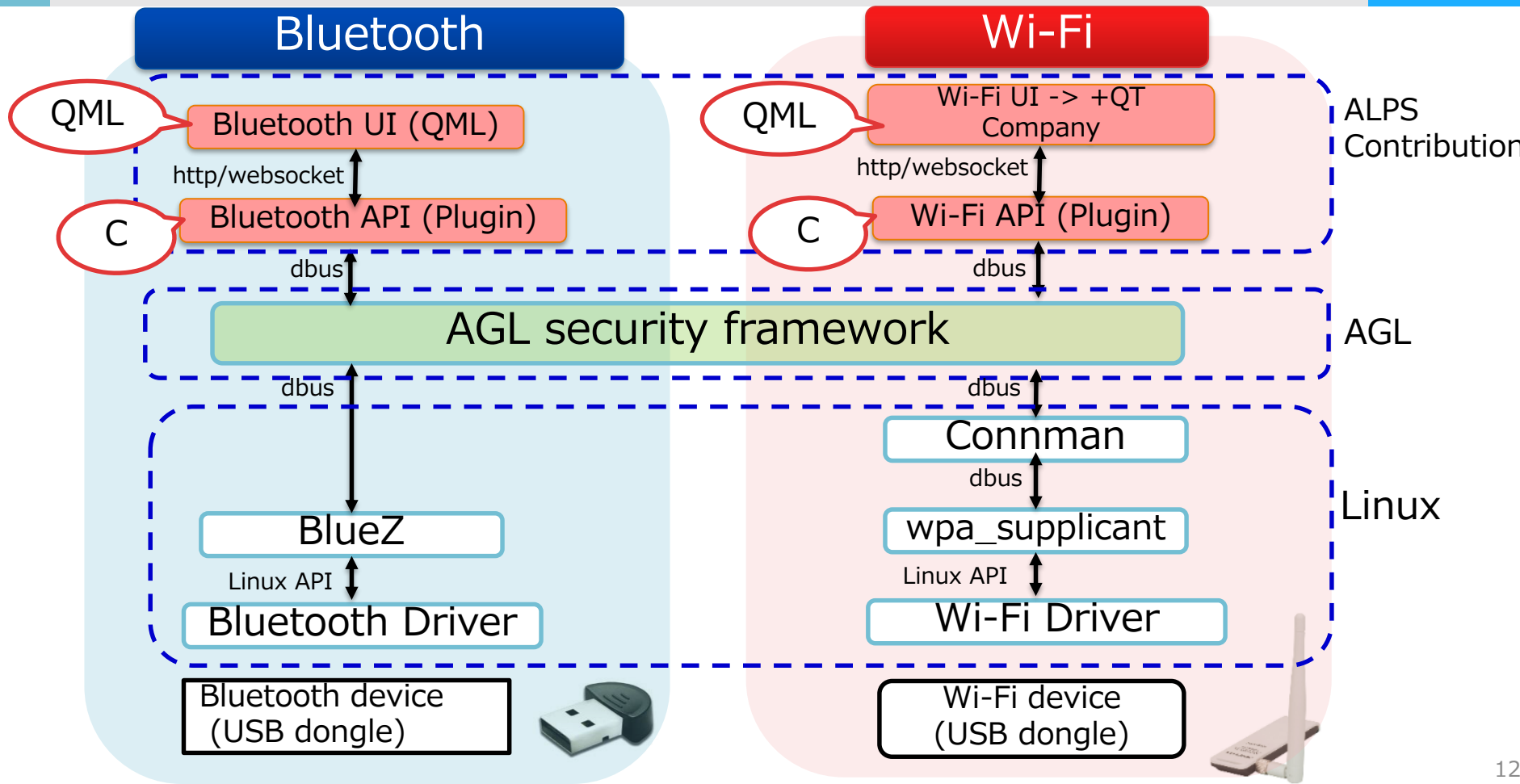
- ◆ Charming Chinook branch (support http protocol):

```
$ git clone https://gerrit.automotivelinux.org/gerrit/apps/settings -b chinook
```

- ◆ Master branch (support websocket)

```
$ git clone https://gerrit.automotivelinux.org/gerrit/apps/settings
```





Features	API (verb name)
<b>BLUETOOTH</b>	
Power ON/OFF	power
Start Scanning	start_discovery
Stop Scanning	stop_discovery
Display scan result	discovery_result
Pairing	pair
Remove pairing	remove_device
Cancel pairing	cancel_pair
Connection	connect
Disconnection	disconnect
Set device property	set_property

Features	API (verb name)
<b>Wi-Fi</b>	
Power ON	activate
Power OFF	deactivate
Start scanning	scan
Display scan result	scan
Connection	connect
Disconnection	disconnect
Check connection status	status
Input password	security

UI (User Interface) @ app/bluetooth/Bluetooth.qml

<http://localhost/<port>/Bluetooth-manager/power?value=1>

API @ binding-bluetooth/bluetooth-api.c

```
.type = AFB_BINDING_VERSION_1,↓  
.v1 = {↓  
  .info = "Application Framework Binder - Bluetooth Manager plugin",  
  .prefix = "Bluetooth-Manager",↓  
  .verbs = binding_verbs↓  
}↓
```

VERB'S NAME	FUNCTION TO CALL
.name = "power",	callback = bt_power,
.name = "start_discovery",	callback = bt_start_discovery,
.name = "stop_discovery",	callback = bt_stop_discovery,
.name = "discovery_result",	callback = bt_discovery_result,
.name = "remove_device",	callback = bt_remove_device,
.name = "pair",	callback = bt_pair,
.name = "cancel_pair",	callback = bt_cancel_pairing,
.name = "connect",	callback = bt_connect,
.name = "disconnect",	callback = bt_disconnect,
.name = "set_property",	.callback = bt_set_property,

```
/* "?value=" parameter is "1" or "true" */  
else if ( atoi(value) == 1 || !strcasecmp(value, "true") ) ↓  
{↓  
  if (adapter_set_powered (TRUE)) ↓  
  {↓  
    afb_req_fail (request, "failed", "no more radio devices available");  
    return;↓  
  }↓  
  json_object_object_add (jresp, "power", json_object_new_string ("on"));↓  
  setHMIStatus(ACTIVE);↓  
}↓  
/* "?value=" parameter is "0" or "false" */  
else if ( atoi(value) == 0 || !strcasecmp(value, "false") ) ↓  
{↓  
  if (adapter_set_powered (FALSE)) ↓  
  {↓  
    afb_req_fail (request, "failed", "Unable to release radio device");↓  
    return;↓  
  }↓  
  json_object_object_add (jresp, "power", json_object_new_string ("off"));↓  
  setHMIStatus(INACTIVE);↓  
}↓
```

# Wi-Fi Application Example in CC

UI (User Interface) @ app/wifi/Wifi.qml

http://localhost/<port>/wifi-manager/activate

API @ binding-wifi/wifi-api.c

```
static const struct atb_binding binding
/* description conforms to VERSION 1 */
.type = AFB_BINDING_VERSION_1, .v1 = {
.prefix = "wifi-manager", /* the API na
.info = "wifi API", /* short descriptio
.verbs = binding_verbs /* the array des
```

```
/* VERB'S NAME >>> FUNCTION TO CALL >>>
.name = "activate", .callback = wifi_activate,
.name = "deactivate", .callback = wifi_deactivate,
.name = "scan", .callback = wifi_scan,
.name = "scan_result", .callback = wifi_scanResult,
.name = "connect", .callback = wifi_connect,
.name = "status", .callback = wifi_status,
.name = "disconnect", .callback = wifi_disconnect,
.name = "reconnect", .callback = wifi_reconnect,
.name = "security", .callback = wifi_insertpasskey,
```

```
static void wifi_activate(struct atb_req request) /*AFB_SESSION_CHECK*/
{
  json_object *jresp;
  GError *error = NULL;

  if (ptr_my_callback == NULL) {
    printf("Registering callback\n");
    ptr_my_callback = ask_for_passkey;
    register_callback(ptr_my_callback);
  }

  jresp = json_object_new_object();
  json_object_object_add(jresp, "activation", json_object_new_string("on"));
  error = do_wifiActivate();

  if (error == NULL) {
    atb_req_success(request, jresp, "Wi-Fi - Activated");
  } else {
    atb_req_fail(request, "failed", error->message);
  }
}
```

## Wi-Fi and Bluetooth Application in CC (Charming Chinook)



Support Wi-Fi and Bluetooth basic features and connection



Support AGL framework



Compatible with BlueZ and connman



Connect UI and API via http protocol



Not yet support receive event



Not yet support security on framework



No yet support websocket



Not yet support network management

Lot of things to do to make it better...

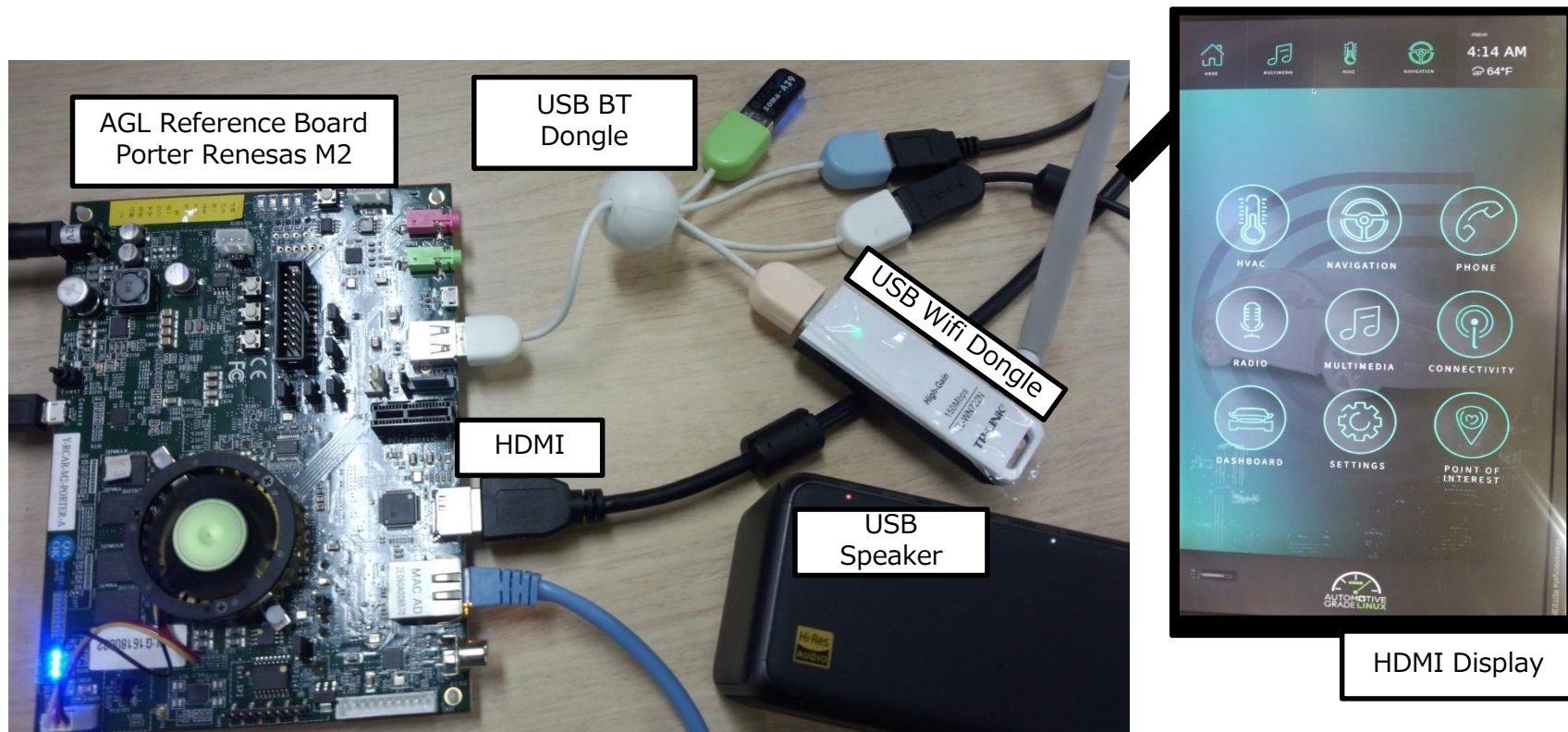


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# Demo 1.

## AGL Reference Environment

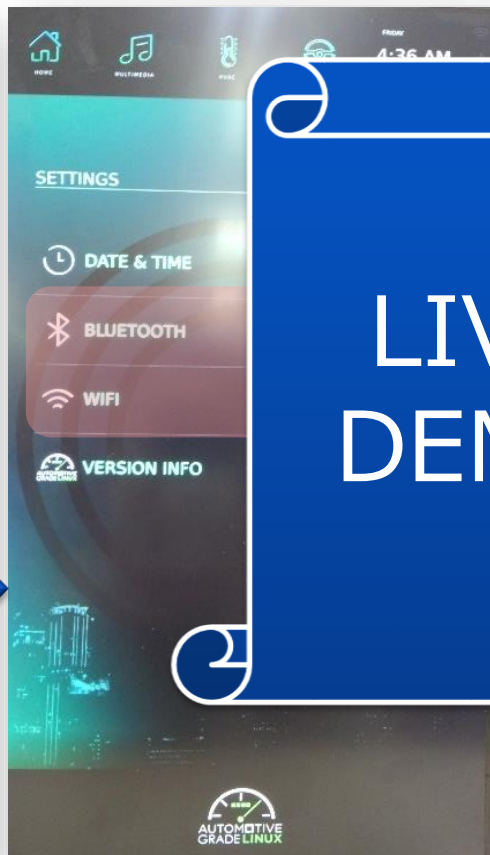
# Demo 1. AGL Reference Environment



Upload Demo video on youtube :

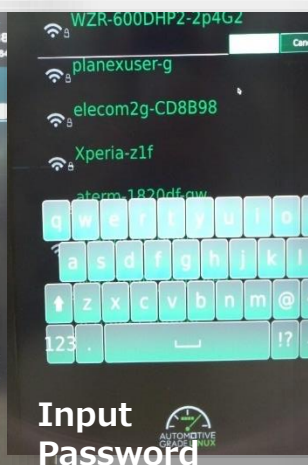
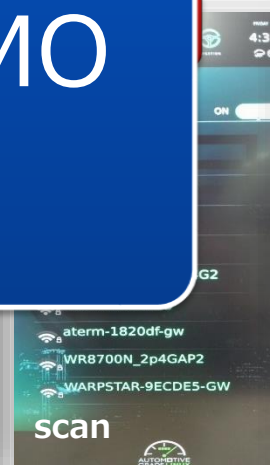
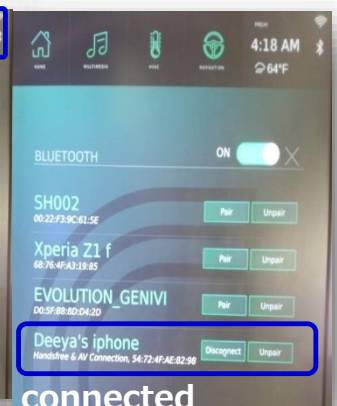
[https://www.youtube.com/watch?v=HLEcL7M\\_-eY&feature=youtu.be](https://www.youtube.com/watch?v=HLEcL7M_-eY&feature=youtu.be)

# Demo 1. AGL Reference Environment



LIVE DEMO

Bluetooth



# Demo 2.

## AGL ft. ALPS Product



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# List of APIs in CC

**UPDATED!**

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Power ON	activate
Power OFF	deactivate
Start scanning	scan
Display scan result	scan
Connection	connect
Disconnection	disconnect
Check connection status	status
Input password	security
Add events	eventadd
Subscribes event	evensub
Pushes event	eventpush
Unsubscribes event	eventunsub
Deletes event	eventdel



## Wi-Fi and Bluetooth Application in Master Branch

 Support Wi-Fi and Bluetooth basic features and connection

 Support AGL framework

 Compatible with BlueZ and connman

 Connect UI and API via http protocol

 Support receive event

 Support websocket

 Not yet support security on framework

 Not yet support network management

**We need help  
to make it  
better!**

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1. AGL finally supports Bluetooth and Wi-Fi connectivity pioneered by ALPS
2. ALPS Product (Hardware and Software) compatible with AGL platform
3. ALPS invites everybody to improve Bluetooth and Wi-Fi application as one of AGL OSS applications by submitting advice and/or patches into JIRA and Gerrit
4. Contact us for further ALPS hardware and software information

ALPS Electric Co.,Ltd

<http://www.alps.com/e/index.html>

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