Connected Services Product Development

SYNC® TDK Quick Reference and Architecture Guide

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Revision History

Date	Version	Created/Modified By	Notes
8/16/12	0.1	EW	Initial version
8/16/12	0.2	EW	Incorporated the architecture guide
10/10/12	1.0	EW	Updated formatting

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1 Introduction

1.1 Disclaimer, Copyrights, and Trademarks Notice

SYNC® and AppLink™ are trademarks of Ford Motor Company. All other trademarks are the property of their respective owners.

1.2 Purpose

The purpose of this document is to give a quick setup and operation of the SYNC® TDK, or Technology Development Kit as well as detailing the architecture of the various head units.

1.3 Nomenclature

This section contains the common terms and their descriptions that you may come across while reading this document.

Term	Description
US	United States
HMI	Human Machine Interface
TTS	Text To Speech
FMC	Ford Motor Company
TDK	Technology Development Kit
AHU	Audio Head Unit
GPSM	Global Positioning System Module
MS_CAN	Medium Speed Controller Area Network
HS_CAN	High Speed Controller Area Network
IGN	Ignition
PTT	Push To Talk
QA	Quality Assurance
UI	User Interface
UX	User Experience

1.4 References

This section contains any references made to other available documents.

Reference Title

2 Quick Reference Guide

2.1 First Time Setup for the TDK

Setting up the TDK correctly will help QA testing and validations go smoothly.

2.1.1 Unpacking

The TDK will need to be removed from the shipping box and foam. Keep both the foam and the box someplace safe, as you may have to return the TDK to FMC if there are any issues with the unit.

The unit should consist of the following items:

- AHU – Audio Head Unit
- Control Box
- Power cable
- GPSM (if needed)
- GPSM cable (if needed)

2.1.2 Setting Up the Unit

To correctly set up the unit, please perform the following steps:

1. Place the Control Box on a solid surface
2. Place the AHU on top of the Control Box
3. Carefully extend the harness from the back of the AHU
4. Connect this harness to the back of the Control Box
   - The slot you are looking for is located directly in the middle of the back plate
   - There are notches to help you line up the connector to the slot
   - Once lined up, simply twist the connector and it will pull itself into the slot
5. (If needed) Connect the GPSM cable to the back of the Control Box
   - The slot you are looking for is labeled 'MS_CAN' and is located on the left side of the back plate
6. Plug in the power cord
   - The slot you are looking for is located on the right side of the black plate

2.1.3 Configuring the Unit

To ensure proper operation, please confirm the following switches are set:

- First Row of Switches
  - MS_CAN is set to ON
  - DOOR CLOSED / OPEN is set to CLOSED
  - RUN / KEY OFF set to RUN
  - FORWARD / REVERSE is set to FORWARD
  - 10 KM/H / 0 KM/H is set to 0 KM/H
  - Not Used
- Second Row of Switches
  - HS_CAN is set to ON
  - 911 ASSIST (NORMAL / NOT SUPPORTED) is set to NORMAL
  - ACTIVE / ACTIVE is used to simulate the 911 Assist call
  - Not Used
  - Not Used
  - Not Used

2.1.4 Powering the Unit

To send power to the unit, simply toggle the POWER switch to **ON**.

To remove power to the unit, toggle the POWER switch to **OFF**. This switch simulates a vehicle battery disconnection, and will reset SYNC to its original settings.

2.2 Audio

The TDK does not come with speakers. In order to hear SYNC® TTS and any audio, you must plug in some speakers/headphones to the 3.5mm jack on the back of the control box. The **FRONT** audio jack is the label for the connection.

Note: If the speakers/headphones are connected to the **REAR** audio jack the TTS will not me heard.

2.3 Voice Commands

To issue voice commands, simply toggle the VOICE switch **UP** or **DOWN**.

2.4 Pairing a Device (Bluetooth)

To pair a device, please follow these steps on the TDK:

1. Press the "Phone" switch on the front of the Control Box or the Phone icon on the AHU
2. Select **Add Bluetooth Device** with the "Tune" knob
3. Press **OK** button
4. Sync will display "Find SYNC" and inform you to press the "OK" button again, press **OK** button
5. Sync will display "SYNC" and inform you to search nearby devices. SYNC will then show a PIN.

SYNC is now in a discoverable state, and follow normal pairing procedures for you device. You must use the PIN on screen to establish a connection.

Once paired, SYNC will typically ask you the following questions:
- Set as Primary Phone?
  - You select **YES** or **NO** by pressing the "OK" button and twisting the "Tune" knob.
  - We typically select **YES** which ensures your device will be first in the list of paired devices.
- Download Phonebook?
  - You select **YES** or **NO** by pressing the "OK" button and twisting the "Tune" knob.
  - We typically select **YES** which ensures easier contact calling and phone call testing.
- Set 911 Assist to ON?
  - You select **YES** or **NO** by pressing the "OK" button and twisting the "Tune" knob.
  - We typically select **YES** which ensures the question won't be asked again.

3 Head Unit Architecture

As different vehicle lines have different needs, there have been a few different head units created for SYNC®. This document will detail those various screens, as well as providing the available features for UI/UX considerations.

3.1 Center Information Display (CID)

Figure 1: CID head unit for a Technology Development Kit (TDK)

CID head units are one of the most popular displays on the road. The above image is a CID head unit provided within the Technology Development Kit (TDK). The button controls are specifically taken from Ford Escape, and will vary from vehicle line to vehicle line. However, all the below features will be available on any CID system.

3.1.1 Major Features

3.1.1.1 Screen
- Two lines of text - "MainText1" & "MainText2"
- Limited by 20 characters on screen.
- Media clock – "9:15"

3.1.1.2 Buttons - Center Stack
- 10 preset buttons
- 4-way controller
- Up = Tune Up
- Down = Tune Down

- Left = Seek Backward
- Right = Seek Forward
- Tune Up/Down dial
- Clockwise = Tune Down
- Counter-Clockwise = Tune Up
- OK (Play/Pause)

3.1.1.3 Buttons – Steering Wheel

- Seek Forward/Backward
- OK (Play/Pause)
- Push-To-Talk (PTT)

3.2 Next Generation Navigation (NGN)

Figure 2: NGN head unit for a Technology Development Kit (TDK)

NGN head units are the only touch-enabled screens for the first generation of head units for SYNC®. The above image is a NGN head unit that can connect to a TDK. The button controls are specifically taken from Ford Mustang, and like the CID, will vary from vehicle line to vehicle line. All the below features will be available on any NGN system.

3.2.1 Major Features

3.2.1.1 Screen

- Two lines of text - "MainText1" & "MainText2"
- Media clock – "9:15"
- Media Track – "SYNC Tour"
- Soft Buttons – First 4 AddCommands will be displayed as soft buttons

3.2.1.2 Buttons - Center Stack

- 6 preset buttons
- Seek Backward
- Seek Forward
- Tune Up/Down dial

- Clockwise = Tune Up
- Counter-Clockwise = Tune Down
- OK (Play/Pause)

3.2.1.3 Buttons – Steering Wheel

- Seek Forward/Backward
- OK (Play/Pause)
- Push-To-Talk (PTT)

3.2.1.4 Additional Information

If an application is considered a "Non-media" application, the default SYNC® AppLink™ screen will only have one line of text and a list of all registered commands.

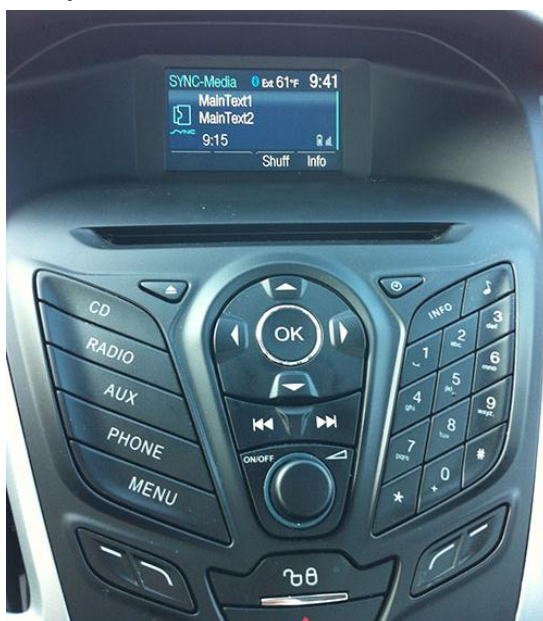## 3.3 Multi-Function Display (MFD)

Figure 3: MFD 4 head unit in a 2012 Ford Focus

MFD head units will be the replacement for CID screens and come in three different sizes (3", 4", and 5"). They will function just like the CID screens, but with a few additional Soft Buttons as you can see to the right and left of the Door Unlock button.

Note: MFD 5 units are not yet available with SYNC® AppLink™.

3.3.1 Major Features

3.3.1.1 Screen

- Two lines of text - "MainText1" & "MainText2"
- Limited dynamically by the physical size of the characters
- Media clock – "9:15"

3.3.1.2 Buttons - Center Stack

- 10 preset buttons
- 4-way controller
- Up = Tune Up
- Down = Tune Down
- Left = Seek Backward
- Right = Seek Forward

- Seek Backward
- Seek Forward
- OK (Play/Pause)

3.3.1.3   Buttons – Steering Wheel
- Seek Forward/Backward
- OK (Play/Pause)
- Push-To-Talk (PTT)

3.4   SYNC® with MyFordTouch (MFT)/MyLincolnTouch (MLT) – 8 inch

Figure 4: MFT in a 2013 Ford Edge

SYNC® with MyFordTouch/MyLincolnTouch will be the replacement for NGN screens.

Note: These units are not yet available with SYNC® AppLink™, and Major Features are still being defined.

4   Testing

4.1   IGN Cycles

To simulate turning off the vehicle and exiting, simply toggle the following switches in the first row:
- DOOR CLOSED / OPEN is set to **OPEN**
- RUN / KEY OFF is set to **KEY OFF**

To simulate turning on the vehicle and closing the doors, simply toggle the following switches in the first row:
- DOOR CLOSED / OPEN is set to **CLOSED**
- RUN / KEY OFF is set to **RUN**

4.2   Driver Distraction

To simulate driving the vehicle, simply toggle switch E in the first row (10 KM/H / 0 KM/H) to **10 KM/H**.

To simulate a vehicle coming to stop / parked, simply toggle switch E in the first row (10 KM/H / 0 KM/H) to **0 KM/H**.

A connected application will receive a notification through the proxy that indicates Driver Distraction is on or off if the version of SYNC is 4.1.1 or greater.

5   Troubleshooting and FAQ

5.1   Module will not power up

Be sure that the power cord is connected, the Power switch is in the ON position, that the Key switch is in the RUN position, and that MS_CAN switch is in the ON position.

5.2 Sound from headphones/speakers too loud/quiet

First try adjusting the volume on the ACM. If that does not help the situation, be sure the ACM Mode switch is set to "Normal" setting. If audio through speakers/headphones is too low, then switch to "Boost". Recommendation: Leave the ACM at the default volume while adjusting the headphones or speakers.

5.3 Phone won't pair

Please make sure that the speed switch is set to "0 km/h". Phones cannot be paired while vehicle velocity more than 10 km/h, so the signal must be sent that the "vehicle" is not moving.

5.4 Volume +/-, Seek +/- changes media sources

The ACM is not configured correctly. Contact support team for assistance.

5.5 SYNC® is not responding to "Voice" switch

Reset SYNC®. Wait 10-15 seconds for SYNC® to reboot.