SYNC Gen II Theory of Operation

SYNC is a voice-activated hands-free, in-car communications and entertainment system that integrates user's mobile phone and digital media player into the vehicle cabin. Ford worked with Microsoft to design and engineer the Microsoft Auto software. Ford further developed and customized this technology to deliver in-car solutions that help drivers conveniently and reliably enjoy digital entertainment and communications while on the road.

Architecture

The CCPU is a System on Chip (SOC) containing the main microprocessor and integrated peripherals. The main operating system (WinCE 6.X based) runs on the CCPU. The CCPU is responsible for all infotainment related processing; i.e. audio, video, speech, etc. The CCPU interfaces to other infotainment components directly over analog and digital I/O. The CCPU interfaces to the VMCU via an Inter-processor Communication (IPC) strategy which allows the CCPU to communicate on the vehicles high and medium speed CAN buses.

The VMCU serves as a hardware firewall to the vehicle networks preventing any unapproved CAN traffic from going onto the high or medium speed vehicle CAN buses. The VMCU also has the ability to remove power and reset the CCPU if necessary. The VMCU also receives input from a resistive ladder for the vehicle's steering wheel control switch.

CAN Interfaces

The SYNC Hardware implements three CAN nodes each running FNOS (Ford Network Operating System).

The I-CAN interface is a high speed (500kbps) CAN node. The I-CAN network is a private network used only for infotainment components. The I-CAN interface shall be connected to the VMCU directly.

The HS-CAN interface is a high speed (500kbps) CAN node. The HS-CAN network is a public vehicle network. The HS-CAN interface shall be connected to the VMCU directly.

The MS-CAN interface is a medium speed (125kbps) CAN node. The MS-CAN network is a public vehicle network. The MS-CAN interface shall be connected to the VMCU directly.

Auxiliary Audio / Video input

The Media Connectivity Module provides the customer an analog stereo audio and video input. The input is passed through to the SYNC module via the vehicle connector.

Bluetooth/Wi-Fi

A Bluetooth/Wi-Fi module is connected to the CCPU via a high speed UART interface for the Host Controller Interface and via a PCM interface for the audio data. This module supports SCO, eSCO and A2DP, as well as other Bluetooth profiles.

The Wi-Fi function supports both Client and Access Point Wi-Fi profiles.