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Source: [Myunghee Son, Tae-Gyu Kang] Company [ETRI]
Address [138 Gajeongno, Yuseong-gu, Daejeon, 305-700, Korea]
Voice:[+82-42-860-6473], FAX: [+82-42-860-1085], E-Mail:[mhson@etri.re.kr]
Re: [vlc_sg]

Abstract: [This document presents Idle Stop technologies using the VLC for high gas mileage]

Purpose: []

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Idle Stop Technologies using the VLC for High Gas Mileage

Myunghee Son
mhson@etri.re.kr
ETRI
Introduction

• According to the Kyoto Protocol, the environment related automotive regulations have strengthened.

• The portion of renewable energy among total energy will be 1% (currently, about 0.4%) on 2020 year.

• The necessity of energy-saving technology is growing stronger before developing alternative energy.

• Several leading auto-makers have studied idle-stop control device which stops engine while idling in traffic.
**What is an Idle Stop Vehicle?**

- To prevent unnecessary fuel consumption and exhaust emissions, the Idle Stop vehicle’s engine is turned off when there is no need for propulsion or air conditioning.

- **Conditions for Engine Stop**
  - Vehicle speed is less than 4km/h & the brake pedal is pressed
  - Engine speed is less than 1000 rpm

- **Conditions for Engine Restart**
  - A gear is selected with the clutch disengaged
  - The brake pedal is release or the accelerator pedal is depressed with the transmission neural position
Proactive Idle Stop Test Car

RF Transmitter

ICT converged Idle stop car
Why do we need VLC for the Idle Stop?

• To prove the effectiveness in drive, VLC is required.
  – More than 5% gas mileage and CO$_2$ reduction
  – Release the driver’s load to fix his/her eyes on the traffic light

• For greater economy between the light and vehicles
  – To send the red light interval to vehicles stopped for the light
  – Can avoid additional traffic installation
**Service Scenario**

- While a driver is waiting at the red light, the VIS system gets the red interval from the Traffic Light in order to decide the engine stop.

* VIS : VLC Idle Stop
VIS Architecture

VIS platform

VLC Idle Stop: Engine OFF/ON Decision

Red light interval for the individual car

Engine OFF/ON

Idle status

IVS2

Red Light Interval Driving direction

Car Data

IVS1

Driving direction

VIS application

MAP & Application

Broadcasting Communication

LED TX

LC

USB

CAN, Serial

VIH Hub

Engine OFF/ON

Car Data

ECU

USB

MCU/LLI

Engine OFF/ON

Car Data

Myunghee Son, ETRI
What is the strengths of the VIS?

- Can predict the Idling interval with accuracy
  - To solve the unnecessary engine stop and start
- Need not additional equipments
Traffic Light

Local Controller
Anything else?

- Audi Puts More 'Go' Into Stop-and-Go

Source: *Audi Travolution Project*
Conclusion
Next Step

- Business Requirements for VIS
- System Requirements for VIS
- Considerations of Green and Yellow lights