

Examensarbete
LiTH-ITN-KTS-EX--02/21--SE

Audio over Bluetooth and MOST

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2002-03-07

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**Examensarbete utfört i kommunikationssystem
vid Linköpings Tekniska Högskola, Campus Norrköping**

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Norrköping den 2002-03-07



Avdelning, Institution
Division, Department

Institutionen för teknik och naturvetenskap
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Datum
Date

2002-03-20

Språk
Language

- Svenska/Swedish
 Engelska/English

Rapporttyp
Report category

- Licentiatavhandling
 Examensarbete
 C-uppsats
 D-uppsats
 Övrig rapport

ISBN

ISRN LiTH-ITN-KTS-EX--02/21--SE

Serietitel och serienummer
Title of series, numbering

ISSN

URL för elektronisk version

Titel Ljud över Bluetooth och MOST

Title Audio over Bluetooth and MOST

Författare

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Sammanfattning

I detta examensarbete studeras möjligheten att ansluta standardprodukter trådlöst till MOST, ett multimedienätverk för fordon. Den trådlösa tekniken som analyseras är Bluetooth. Rapporten beskriver teoretiskt hur MOST ska integreras med Bluetooth via en gateway och tar även upp olika framtida scenarier som möjliggörs med hjälp av denna gateway. Lösningen beskriver hur en förbindelse kan upprättas och ljuddata överförs från en ljudkälla till MOST-nätet med hjälp av Bluetooth-teknik.

Abstract

In this Master Thesis the possibility of connecting standard products wirelessly to MOST, a multimedia network for vehicles, is investigated. The wireless technique analysed is Bluetooth. The report theoretically describes how MOST could be integrated with Bluetooth via a gateway. Future scenarios that are made possible by this gateway are also described. The solution describes how a connection could be established and how the synchronous audio is transferred from a Bluetooth sound source to the MOST network.

Nyckelord

Trådlös, Bluetooth, MOST, samplingsfrekvenskonvertering, interpolation

Keywords

Wireless, Bluetooth, MOST, sample rate conversion, interpolation

Abstract

In this Master Thesis the possibility of connecting standard products wirelessly to MOST, a multimedia network for vehicles, are investigated. The wireless technique analysed is Bluetooth. The report theoretically describes how Bluetooth could be integrated with MOST via a gateway. Future scenarios that are made possible by this gateway are also described. The solution presents how a connection could be established and how the synchronous audio is transferred from a Bluetooth sound source to the MOST network.

As a sound source equipment supporting the Bluetooth Headset Profile is used. It communicates with the MOST network via a gateway. As the recipient of the system, a speaker module connected to MOST is used.

The gateway task when transmitting audio, using synchronous data, is to convert the sample rate of the audio stream from 8 kHz used in the Bluetooth system to 48 kHz used in MOST. This is done by interpolation and filtering. Several different methods for this are described and compared.

The key issue in this report is the sample rate conversion between the two systems sample frequencies.

Sammanfattning

I detta examensarbete studeras möjligheten att ansluta standardprodukter trådlöst till MOST, ett multimedienätverk för fordon. Den trådlösa tekniken som analyseras är Bluetooth. Rapporten beskriver teoretiskt hur Bluetooth ska integreras med MOST via en gateway och tar även upp olika framtida scenarier som möjliggörs med hjälp av denna gateway. Lösningen beskriver hur en förbindelse kan upprättas och ljuddata överförs från en ljudkälla till MOST-nätet med hjälp av Bluetooth-teknik.

Som ljudkälla används utrustning som stöder 'Bluetooth Headset Profile'. Den kommunicerar via en gateway med MOST-nätet. Som mottagare i systemet finns en högtalarmodul ansluten till MOST.

Vid överföring av ljud, i form av synkron data, är gatewayens uppgift att samplingskonvertera ljudströmmen från 8 kHz som används i Bluetooth-delen till 48 kHz som används på MOST. Detta sker med interpolation och filtrering. Flera olika metoder för detta redovisas och jämförs.

Huvuduppgiften i rapporten är samplingskonverteringen mellan de olika systemens samplingsfrekvenser.

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