MOST PCI Tool Kit

Experience the Versatile MOST PC Interfaces

Overview

The MOST® PCI Tool Kit (TK) is a combination of new MOST PC Interfaces accompanied by a software bundle offering a variety of multimedia applications including playing video data or networking and control over MOST, among others.

The MOST PCI Tool Kit provides a solution for any implementation, whether INIC (Intelligent Network Interface Controller) or NIC (Network Interface Controller)-based.

The advantage of MOST PCI Tool Kit lies within its architecture. Regardless of the PC Interface used, a seamless exchange of uncoupled hardware and software components is possible. Hardware modifications are detected automatically at PC start-up by the MOST Driver Stack asking for the appropriate driver. All functional layers above the MOST Driver Stack, starting with the MOST Tool Foundation, remain untouched.

The MOST Tool Foundation provides an interface to plug-ins such as MOST Radar and MOST Rapid Control. MOST Radar is used for analyzing MOST networks and MOST Rapid Control is a rapid prototyping tool offering Human Machine Interface (HMI) development, supporting automatic test scenarios based upon scripts. MOST NetServices examples, which are used to perform basic tasks in a MOST system, access the MOST Driver Stack. Utilization of plug-ins and MOST NetServices examples is mutually exclusive; only the plug-ins or the MOST NetServices examples can be accessed at the same time.

Ordering Information

The MOST PCI Tool Kit includes:
- MOST PC Interface
- CD with MOST PCI Tool Kit Software containing:
  - MOST Driver Stack
  - MOST Tool Foundation
  - Transceiver
  - User manuals
- Cables

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Applications

Multiple “Sound Cards-In-One” for Playing and Recording Audio Data

From an operating system perspective, the MOST PC Interfaces behave like a standard sound card. Therefore, standard applications like WinAmp can be used to play music over a MOST network. Since MOST has the capacity to transport multiple full stereo audio signals, MOST PC Interfaces can support this as well. To enable this MOST feature, each quadlet (group of four byte-wide channels that is capable of transporting a full stereo audio signal) is presented to the operating system (and tools) as an individual sound card.

An example of this capability is playing MP3 files over a MOST network. If desired, several players can enable audio to the MOST network at the same time. In doing so, it is not relevant whether the MP3 data comes from a local file on hard disk or the Internet.

For recording applications, a similar approach is possible. Gathering audio data from the MOST network and storing it on a hard disk can be done at the same time while playing audio data on the MOST network. The network can handle several audio recorders as well.

Playing Video Data

Similar to audio data, MOST PC Interfaces are integrated into the operating system for video applications as well. The DirectShow® driver allows for MPEG2, MPEG1 or VideoCD_2.0 encoded data from the MOST network to be displayed or processed using standard software tools. If required, the data streams from the MOST network can be stored on a hard disk and processed offline.

Linking PCs via MOST

Strong planning is the key to a successful hardware and software integration. With regard to PC-networking-related features, MOST PC Interfaces accept all NDIS-based protocols. MOST150 allows for MEP and MDP (MAMAC) and all other MOST PC Interfaces use MAMAC. Therefore, a MOST PC Interface works like a standard network card. It can be used to link PCs including file and printer sharing capabilities supporting network-based gaming.

Sharing an Internet Connection through MOST

When building a PC network, a link to the Internet is a must. One approach uses a single PC to handle Internet access. This PC is equipped to establish a connection to the preferred Internet service provider. Other PCs in the network have access to the Internet by sharing a connection via a specially equipped PC. Using techniques such as NAT (Network Address Translation) or proxy servers is also possible, enabling a more secure Internet access.

The system shown below has Internet access through a cellular phone and a proxy. Data is transported by means of TCP/IP to a web browser.

Audio Analysis and Signal Generation

There are a variety of analysis tools on the market which use sound cards as input, providing a simple FFT analysis of an audio data stream on the MOST bus.

If an audio output device needs to be tested by applying a defined audio signal, signal generators are available to provide this function through the PC Interfaces.
Concept Simulation and Testing for MOST Devices

Do you need to test system or concept feasibility, but don’t have the hardware? MOST PC Interfaces can help. A simple application can be written that easily interfaces with the MOST NetServices DLL. It is now possible to test your application in a wide variety of ways.

Since applications can be tested under conditions similar to "real world", development time may be shortened. As the firmware can be developed in tandem with the hardware, it is at a more mature development state when the hardware is available. Transferring the application from the simulation environment to the hardware is then just a simple step.

MOST Networking and Control

On the highest abstraction layer, ActiveX® (OptoLyzer® Components) allows for easy access of control messaging and data transfer services through PC Interfaces.

If direct access to all features is required, MOST NetServices DLL will support this as well.

Tool Collection and Supported Operating Systems

Incorporating a new technology to your application is not difficult if you have the right tools and support available. Therefore, SMSC provides several application examples that address a variety of MOST related areas. MOST PC Interfaces can be used for Windows® 2000/XP environments. Additional support for systems such as VxWorks®, Linux® and QNX®, is available by third party suppliers.

NIC-Based Application Examples (MOST NetServices)

All examples offered are Windows-based applications built with the Borland C++ Builder 6. They can be downloaded at: http://www.smsc-ais.com

Layer I Example
The Layer I Example demonstrates the use of MOST NetServices Basic Layer API. It can be used to perform basic communication tasks in a MOST system. A MOST NetServices license is not needed.

Layer II Example (BCClient2)
The BCClient2 example demonstrates the critical parts of the MOST NetServices API, including the Basic Layer and the Application Socket Layer. A MOST NetServices license is not needed to simply use the application, however to explore or modify the sample application, a Layer II license is necessary.

MOST High Protocol Example
The MOST High Protocol Example sample code demonstrates file transfer and handling of multiple simultaneous connections. A MOST NetServices license is not required to simply use the application, however to explore or modify the sample application, a High Protocol grade license is necessary.

Application Examples (Stream Data)

All examples offered are Windows-based applications built with the Borland C++ Builder 6. They can be downloaded from the Internet: http://www.smsc-ais.com

WinPlayer
WinPlayer is an application example which builds a MOST device based on MOST NetServices Layer I. It simulates a MOST CD Player and connects a signal source to the MOST network via a MOST PC Interface. Instead of playing CDs, the player provides sound files (*.wav and *.mp3) directly from a drive. The chosen directory corresponds to the CD while the files represent the tracks on the CD. WinPlayer is controlled via the MOST network.

MOST Video Viewer
MOST Video Viewer is a video player which allows the playback of MPEG1 files from Video CD or CDI directly through the MOST PC Interfaces, and then displays them on a MOST Video module.
MOST PCI Interface 25o, MOST PCI Interface 50e and MOST PCI Interface 150o

Features

PC Multimedia Network Solution
- INIC-based MOST network interface
- Access to real-time streaming transfer, packet data transport and control message service for MOST networks
- Concurrent multimedia sourcing and sinking
- Video support for MPEG2 program stream

Software
- Drivers available for Windows 2000/XP
- Drivers for standard Windows multimedia software to stream data onto a MOST network
- Ethernet-style networking via packet data channel of MOST (MAMAC)
- MOST NetServices LLD DLL
- MOST Tool Foundation (MOST Interface Control, Transceiver)
- Diagnosis and configuration tools

Hardware
- High-speed PCI real-time interface
- PCI 2.1 compliant 32-bit, 33 MHz PCI interface to PCI system bus
- PCI plug and play compliant
- PCI master/slave bus arbiter functions

MOST Interface
- Optical/electrical MOST network interface with optical fiber/twisted pair connector
- Selectable 3-dB attenuation of optical power (MOST PCI Interface 25o and MOST PCI Interface 150o)
- Support for both 44.1 and 48 kHz system frame rates
- Data recovery in 'All Bypass Mode'
- Power and lock status LED
- Control and packet data via I²C and MediaLB®
- INIC configuration:
  - Control port configured in parallel mode
  - Source port configured in parallel combined mode

Description

All INIC-based MOST PC Interfaces (MOST PCI Interface 25o, MOST PCI Interface 50e and MOST PCI Interface 150o) provide a high-speed connection between a PC and MOST network. They allow access to packet data and control messages.

The chip set used for these MOST PC Interfaces consists of the OS81050/OS81082/OS81110 Intelligent Network Interface Controller and a PC interface chip. Whereas the INIC is used as interface to the MOST network, the PC interface chip implements the connection to the PCI bus. This chip set, together with the corresponding device drivers, builds a complete interface solution for transferring packet data and control messages. Both 44.1 and 48 kHz system frame rates are selectable in timing master mode.

These MOST PC Interfaces operate in bus master mode for the highest possible data transfer at minimized system overhead for the main CPU.
MOST Device Development

MOST PCI Interfaces 25o, 50e and 150o enable software simulation for MOST devices without the need for any additional hardware. Network devices in the development phase may be controlled with the MOST NetServices V2 or V3 (separate license required) with these MOST PC Interfaces. All of them can also be used as a “sparring partner” for Devices Under Test (DUT).

These INIC-based MOST PC Interfaces permit access to the MOST Control Message Service by providing all software necessary to develop a MOST NetServices client directly on the board. They also provide the ability to send and receive packet data using:

- MOST NetServices Layer I,
- MOST NetServices Layer I and Layer II, or
- MOST NetServices Layer I and Layer II, plus the MOST High application which enables development of a PC-based MOST device simulation.

Additional Tools

The following tools (license required) can be used to supplement the MOST PCI Interface 25o, MOST PCI Interface 50e and MOST PCI Interface 150o:

- OptoLyzer Components
- MOST Radar
- MOST Rapid Control
- MOST System Management Module (MSMM) Win32® Executable

Overview of MOST Data Transport Layers

The graphic below illustrates the function blocks of a PC-based MOST device and the functions provided by the MOST PCI Interfaces 25o, 50e and 150o.
MOST PCI Tool Kit

MOST PCI Interface 25o NIC

Features

Multimedia Network PC Solution
- NIC-based MOST network interface
- Access to real-time streaming transfer, packet data transport and control message service of MOST networks
- Concurrent multimedia sourcing and sinking
- Video support for MPEG2 program stream

Software
- Drivers available for Windows 2000/XP
- Drivers for standard Windows multimedia software to stream data onto the MOST network
- Ethernet-style networking via packet data channel of MOST (MAMAC)
- MOST NetServices DLL with examples
- MOST Interface Control
- Supported by OptoLyzer Professional Software in node mode
- Diagnosis and configuration tools

Hardware
- High-speed PCI real-time interface
- PCI 2.1 compliant 32-bit, 33 MHz PCI interface to PCI system bus
- PCI plug and play compliant
- PCI master/slave bus arbiter functions

MOST Interface
- Optical MOST network interface with Yazaki 2+0 connector
- Selectable 3-dB attenuation of optical power
- Support for both 44.1 and 48 kHz system frame rates
- Data recovery in 'All Bypass Mode'
- Power and lock status LED
- NIC configuration:
  - Control port configured in parallel mode
  - Source port configured in parallel combined mode

Description

MOST PCI Interface 25o NIC provides a high-speed connection between a PC or laptop and a MOST network. It allows access to all network data. A programmable number of streaming source data channels can be transferred to and from the MOST network.

The chip set used for MOST PCI Interface 25o NIC consists of the OS8104 MOST Network Interface Controller and a PC interface chip. Whereas the OS8104 is used as an interface to the MOST network, the PC interface chip implements the connection to the PCI bus. This chip set, together with the corresponding device drivers, forms a complete multimedia interface solution for streaming audio and video as well as transferring packet data and control messages. Both 44.1 and 48 kHz system frame rates are selectable in timing master mode.

The interfaces operate in bus master mode for the highest possible data transfer with minimized system overhead on the main CPU.
MOST PCI Interface 25o NIC enables software simulation for future MOST devices without the need for hardware. Network devices in the development phase may be controlled with this PC Interface, and may also be used as a “sparring partner” for the simulation being tested.

NIC-based MOST PC Interfaces permit access to the MOST Control Message Service by providing all necessary software to develop a MOST NetServices client directly on the PC Interface. The API is similar to the embedded version of MOST NetServices Layer I, with additional functions needed to activate the PC Interface. The control drivers support the stand-alone MOST NetServices DLL, which is included.

MOST PCI Interface 25o NIC provides the ability to stream real-time (synchronous) data to and from a MOST network. It also enables the sending and receiving of packet data. The NDIS driver supports standard TCP/IP-based networking via a PC Interface. Using MOST High Protocol Service enables development of a PC-based MOST device or device simulation. The ability to do this is provided by the MOST Packet DLL.

**Additional Tools**

The following tools (license required) can be used to supplement the MOST PCI Interface 25o NIC:
- MOST NetServices Layer I ActiveX
- MOST High Protocol ActiveX
- MOST Radar
- MOST Rapid Control
- MSMM Win32Executable
Additional Products

**OptoLyzer Components**

OptoLyzer Components (successor to the well-known OptoLyzer ActiveX) helps you set-up a complete test environment for your final phase testing or to develop a sparring partner for your DUT. It provides full node control of the MOST PC Interface. A sample application provides basic information on programming options. The OptoLyzer Detector (part of OptoLyzer Components) can be used to locate all MOST network devices.

Utilization of OptoLyzer Components is targeted to INIC-based PC Interfaces used in combination with Windows applications.

**MOST NetServices Layer I ActiveX**

MOST NetServices Layer I ActiveX provides access to all transport mechanisms of the MOST network. The MOST Supervisor (included) handles the initialization of the MOST PC Interface, and ensures proper start-up and diagnostic behavior.

MOST NetServices Layer I ActiveX can only be used in combination with NIC-based PC Interfaces.

**MOST High Protocol ActiveX**

MOST High Protocol ActiveX provides a transmission path for packet data transfer, including an additional security layer. Large packets comprising up to 64 kBytes can be sent and received. An acknowledgement mechanism also provides a security layer to ensure data integrity.

MOST High Protocol ActiveX can only be used in combination with a NIC-based PC Interface.

**MOST Radar**

MOST Radar is a tool enabling analysis of the MOST network. A graphical interface displays all devices in the network, and then helps to interpret the function blocks and their real locations. Some of the many tasks that MOST Radar can perform include checking network configuration, verifying node properties and inspecting allocation status.

MOST Radar is able to support mixed MOST networks with devices based on NIC as well as INIC.

**MOST Rapid Control**

MOST RapidControl is a rapid prototyping tool used to develop Human Machine Interfaces. Message handling and interpretation is integrated. Bi-directional communication consists of controlling devices and receiving status information. Tests, supported by scripts, can be run automatically.

**MSMM Win32 Executable**

MOST System Management Module (MSMM) handles network and system-related tasks and can be considered as the middleware of a MOST system. It harmonizes the dynamic behavior of a MOST network, as well as the overall system management. It also helps to speed up the integration of MOST devices into a system platform. MSMM is implemented according to the MOST Specification and the MOST Dynamic Specification.

MSMM is independent of chip generation, therefore it can be used for both NIC and INIC-based PC Interfaces.

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**Acronyms**

- MOST: Multimedia open System Transport
- NIC: Network Interface Card
- INIC: In-Car Network Interface Card
- MSMM: MOST System Management Module
- WEEE: Waste Electrical and Electronic Equipment