OptoLyzer OL3150o

User's Manual

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Mar. 2010

MOST®

Media **O**riented **S**ystems **T**ransport

Multimedia and Control Networking Technology

Legend

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OptoLyzer
OL3150o
SMSC
SUCCESS BY DESIGN
Power
R
M
L
Extension
MOST150 oPHY
Line
IN
OUT
Headphone
44 kHz
48 kHz
SPDIF

User's Manual Versions

Doc. Number	Date	Description
UM_OptoLyzer_OL3150o_V01_00_XX-4	Mar. 10	Section 2: Description improved.
		Section 2.1: Feature list adapted (44.1 kHz removed).
		Section 2.2.3: New chip order added for OptoLyzer OL3150o based on FM V1.4.0.
		Section 4.1: Description of first step improved: Disconnection from MOST network added.
		Section 5.1.2: Description improved in paragraph "Protection against Over Temperature". Ambient operation temperature reduced from 50°C to 40°C.
		Section 5.2.4: Frequency range corrected.
		Section 6.1: Figure improved (number 4 added).
		Section 6.2: Description of first paragraph improved.
UM_OptoLyzer_OL3150o_V01_00_XX-3	Nov. 09	All: SPDIF replaced by S/PDIF.
		Section 1.2: Accessories: Examples added.
		Section 2.1: Features revised.
		Section 2.2: Figure improved, OptoLyzer Trigger Box added.
		Section 2.2.1: Description improved.
		Section 3.1.1: Description of the extension interface improved. Table 3-2: Frequency deviation adapted.
		Section 3.1.2: S/PDIF: Crossreference added to Section 5.2.5.
		Section 4.1: Hint added that mentions the UpdateStickGenerator.exe
		Section 4.4: Updating of the tools license revised. Now the OptoLyzer Suite is used.
		Section 5.1.2: Description improved.
		Section 5.2.4: New section about S/PDIF formats added.
		Section 6: New chapter, describing the optional OptoLyzer Trigger Box.
UM_OptoLyzer_OL3150o_V1_00_XX-2	Jan. 09	First release User's Manual

TABLE OF CONTENTS

1 Preface

1.1 Intended Use

This SMSC product is intended to be used for developing, testing, or analyzing MOST® based multimedia products and systems by persons with experience in developing multimedia devices.

1.2 Scope of Delivery

The delivery covers the following:

- OptoLyzer OL3150o
- User Manual (printed version)
- Power-supply
- Cables
- Accessories (e.g., USB stick)

Check your shipment for completeness. If you have any complaints direct them to sales-ais-europe@smsc.com (Europe and Asia) or to sales-ais-usa@smsc.com (America). Providing the delivery note number eases the handling.

1.2.1 Software on the CompactFlash

The CompactFlash™ comes with:

- Microsoft® Windows® CE 5.0 as operating system
- Microsoft® Windows® CE loader
- Extended software with spy functionality, MOST drivers and specific services

1.2.2 Software on the USB Stick

The USB stick comes with a complete backup of the CompactFlash. In addition, maintenance utilities (DOS Tools) are offered on the USB stick (described in Section 4.3 on page 20).

1.3 Definition of Terms

For better understanding of the following chapters, this section provides explanation to special terms, used in the description of the OptoLyzer OL3150o.

Term	Definition
BFB	Boot Fallback Button
Controlling Software	A software that is running on a PC connected to the OptoLyzer OL3150o. It manages the communication with the OptoLyzer OL3150o. The controlling software comprises both the handling of spied data and performing control tasks.
Event	The OptoLyzer Suite is working with a common data format, called 'Event'. The incoming data is formatted in a specific way. The format is described in the *Socket Protocol User Manual*.
INIC	Intelligent Network Interface Controller
LED	Light-Emitting Diode
MBI	Message Based Interface
MDP	MOST Data Packet
MEP	MOST Ethernet Packet
MOST	Media Oriented Systems Transport
oPHY	Optical Physical Layer
OptoLyzer G2 3150o	This product comprises OptoLyzer Suite and OptoLyzer OL3150o.
OptoLyzer OL3150o	Hardware of the OptoLyzer G2 3150o.
OptoLyzer Suite	This is the software of the OptoLyzer G2 3150o dedicated for analyzing and debugging the MOST network. In addition, the software is a base for multiple plug-ins.
OptoLyzer Trigger Box	Optional device box allowing to use the trigger of the OptoLyzer OL3150o. The OptoLyzer Trigger Box has to be connected to the OptoLyzer OL3150o by using a specific cable delivered together with the OptoLyzer Trigger Box.
POF	Plastic Optical Fiber
S/PDIF	Sony/Philips Digital Interconnect Format
USB	Universal Serial Bus

Table 1-1: Definition of Terms

2 Introduction

The OptoLyzer OL3150o is a versatile hardware for analyzing and monitoring Control, MOST Data Packet (MDP), MOST Ethernet Packet (MEP) data, and network status information in an optical MOST150 network. In node mode it is able to perform control tasks. The OptoLyzer OL3150o provides connection to the optical MOST150 network via a MOST oPHY connector that is based on the Optical Physical Layer. When used in combination with the OptoLyzer Suite or other third party software all data is transferred via an Ethernet connection to a PC running the installed OptoLyzer Suite. The device is prepared to work in laboratory (stationary) environments (voltage range of 100 - 240 V DC transformed to 12 V). The OptoLyzer OL3150o is able to run in different timing master modes, slave mode, and invisible slave mode (bypass).

2.1 Features in Use with OptoLyzer OL3150o

Depending on the currently loaded firmware the OptoLyzer OL3150o features the following:

- Versatile MOST network analysis tool for Control, MDP, MEP data and network status information
- Optical interface for MOST150 network
- SpyNIC for MOST150 running in retimed bypass mode designated for analyzing data on the MOST network
- StressNIC for MOST150 usable for testing scenarios in the MOST network
- INIC running either in retimed bypass mode (default), in master or slave mode. The INIC allows sending and receiving of MOST Control and Packet (MDP and MEP) data.
- Remote connection via Ethernet interface
- Routing of 4 MOST synchronous channels; respectively one to Line OUT, to Line IN, to S/PDIF OUT and to S/PDIF IN
- Extension connector for connecting an OptoLyzer Trigger Box
- LEDs indicating different states of device and network
- Support for 48 kHz system sample rates
- Time stamp resolution: ~1 µs; accuracy: 1 frame
- USB connectors for firmware updates and service purposes via a bootable USB stick
- Headphone interface
- Boot Fallback (BFB) functionality
- OptoLyzer Trigger Box (optional)

2.2 Possible Scenario

A MOST network might consist of various MOST devices. State-of-the-art multimedia systems need powerful tools for both finding of irregularities and controlling of the MOST network's interfaces. The OptoLyzer OL3150o is able to perform these tasks.

A possible scenario is depicted in Figure 2-1. The OptoLyzer OL3150o is part of the MOST network and spies its data. The data is transmitted to a connected PC via an Ethernet connection. A controlling software (e.g., OptoLyzer Suite) handles the spied data. Triggering in both directions is possible. Additionally, control tasks can be performed via a controlling software.

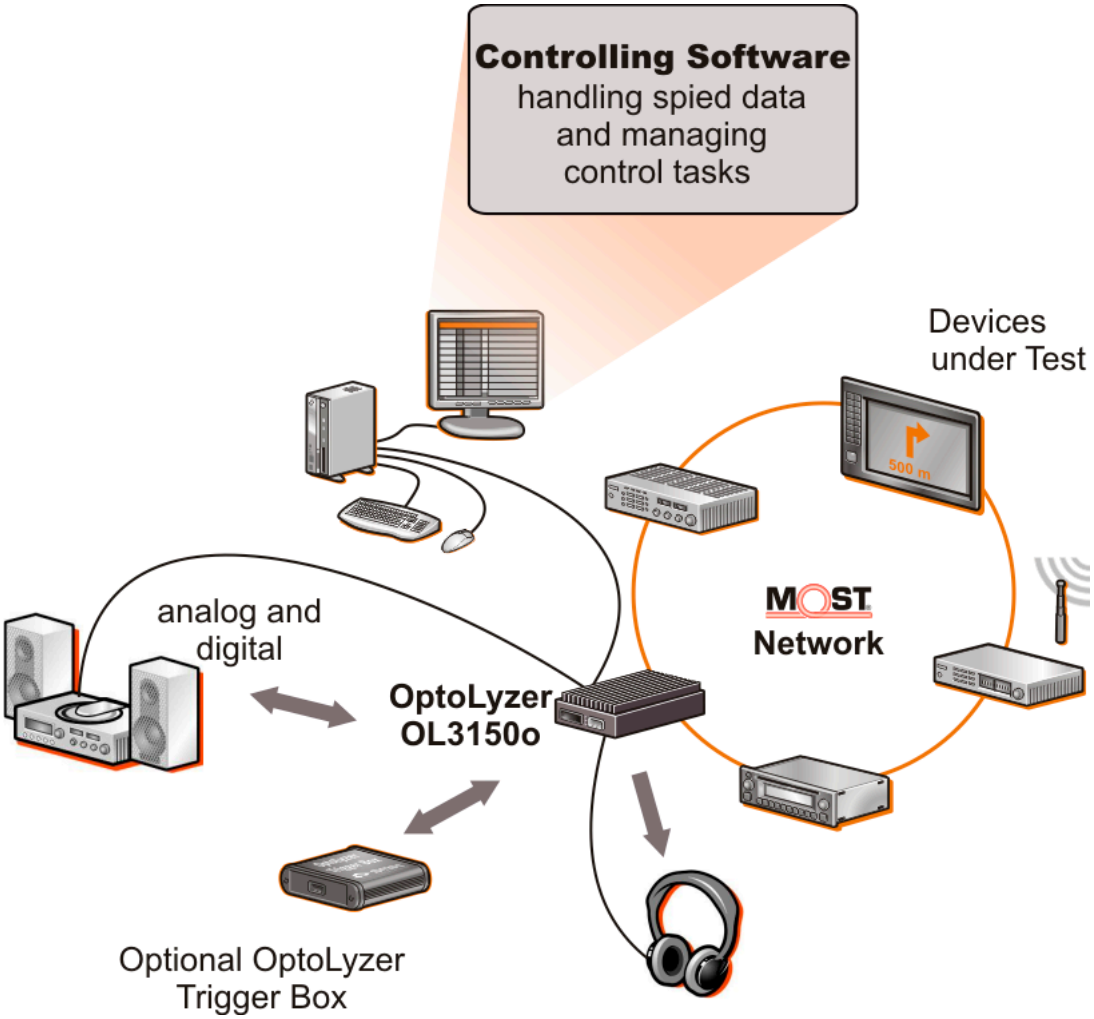


Figure 2-1: Possible Scenario of an OptoLyzer OL3150o

The following sections describe the concepts for both:

- Analyzing the MOST network as spy

And

- Performing control tasks (via e.g., OptoLyzer Suite)

2.2.1 Analyzing the MOST Network as Spy

The OptoLyzer OL3150o provides full spy functionality. Since the OptoLyzer OL3150o is always configured as spy it has simply to be connected in a MOST network to use this feature. The OptoLyzer OL3150o spies the traffic - even bursts - on the Control data channel and the Packet (MDP and MEP) data channel of a MOST network. It is also able to inform about network states or to route audio data. The OptoLyzer OL3150o is delivered with applications that are ready for use. They manage e.g., the incoming data (i.e., take the incoming data and convert it into a common format named 'Events') or provide socket connections for further processing.

The spied data can be analyzed online if the OptoLyzer OL3150o is used in combination with a controlling software. After recording the data it is also possible to analyze the data offline.

The OptoLyzer Trigger Box allows injecting hardware trigger events. It is also possible to trigger external hardware depending on internal events.

2.2.2 Performing Control Tasks

The OptoLyzer OL3150o can also operate as timing master (different modes as e.g., static master, S/PDIF master or normal timing master) or slave. In these modes it is possible to perform control tasks via a controlling software installed on a connected PC. For example the addresses of the OptoLyzer OL3150o can be changed. Messages can be sent and viewed for e.g., test or simulation on the MOST network. In addition, the OptoLyzer OL3150o is able to route streaming data.

2.2.3 Order of Chips

When analyzing data e.g., when interpreting an acknowledge code it is important to know how the chips (INIC, SpyNIC for MOST150, StressNIC for MOST150) are arranged inside the OptoLyzer OL3150o.

The chip order inside an OptoLyzer OL3150o having a **serial number "3150o22000" and higher** is the following: SpyNIC for MOST150, INIC, StressNIC for MOST150.

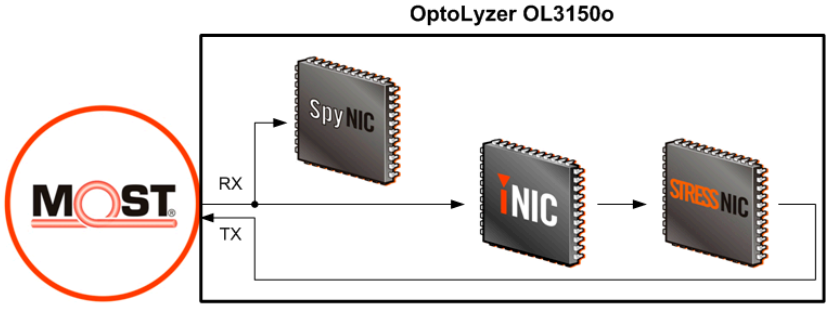


Figure 2-2: Order of Chips inside the OptoLyzer OL3150o - New Design

The chip order inside an OptoLyzer OL3150o having a **serial number below "3150o22000"** is the following: StressNIC for MOST150, INIC, SpyNIC for MOST150.

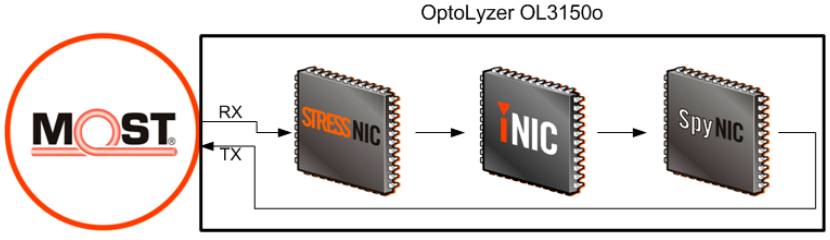


Figure 2-3: Order of Chips inside the OptoLyzer OL3150o - Old Design

3 Installation

This chapter describes the elements and connectors of the OptoLyzer OL3150o. In addition, a connectivity diagram shows how to connect the OptoLyzer OL3150o and the PC in a typical MOST environment. The 100Base-TX Ethernet connection to the laptop/PC running controlling software and the power supply are mandatory for booting the OptoLyzer OL3150o. The MOST150 oPHY interface is mandatory for analysis purposes. Furthermore some connections are mentioned that can be used for optional functionality like monitor, mouse, keyboard, and analog audio devices. Service aspects as e.g., an update procedure are handled in Chapter 4 on page 18.

3.1 OptoLyzer OL3150o System Description

The OptoLyzer OL3150o comes with all components configured and prepared for default operation. The OptoLyzer OL3150o needs to be connected to the PC the OptoLyzer Suite is running in case both are used together. The following sections describe the different views of the OptoLyzer OL3150o.

3.1.1 Connectivity Diagram of the Front View

The front view of the OptoLyzer OL3150o provides access to external interfaces and elements for controlling and information.

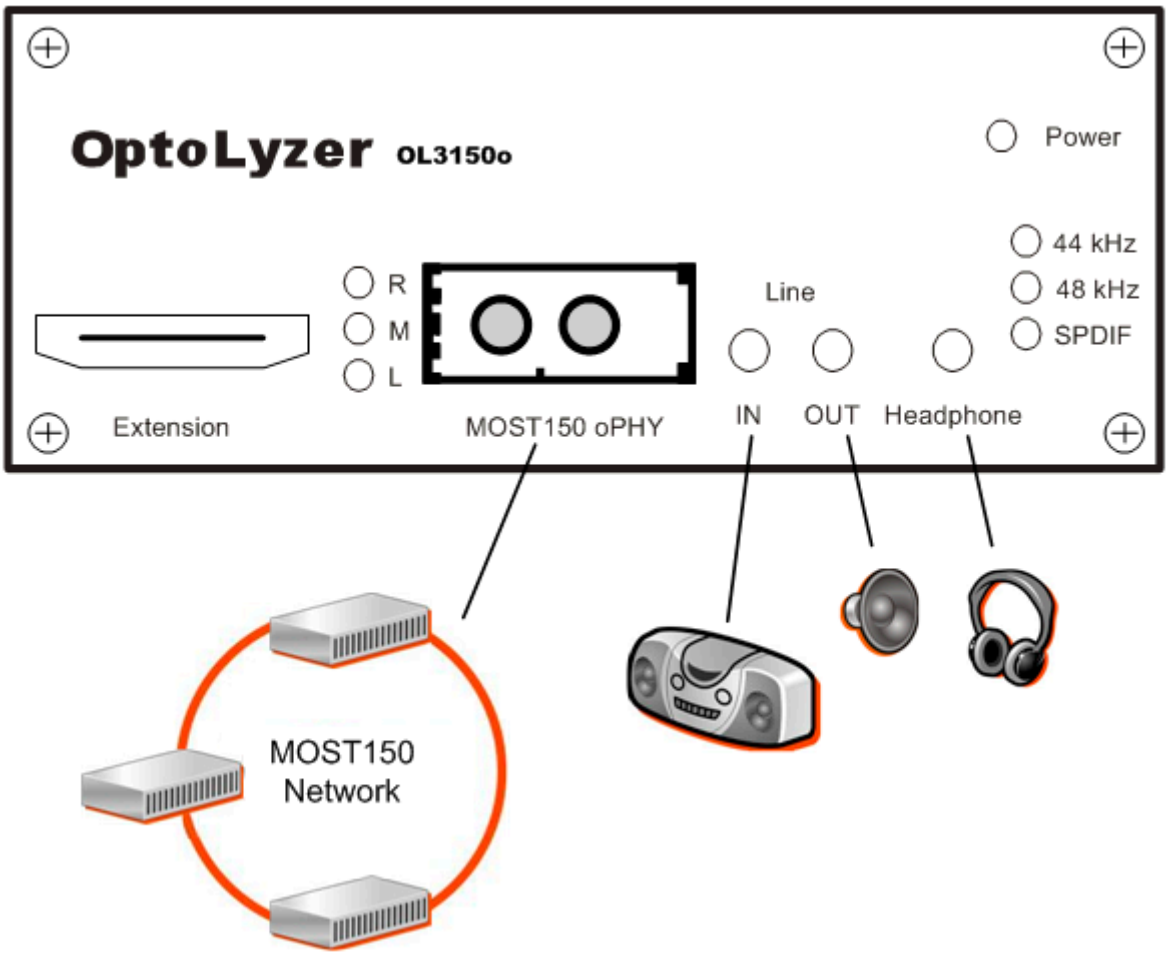


Figure 3-1: Connectivity Diagram—Front Panel

The components are described from left to right:

Extension:

The extension connector allows connecting an OptoLyzer Trigger Box. For details please refer to Chapter 6.

LEDs:

Three LEDs are placed to the right of the extension connector. Each of these supports different functionalities depending on the operating mode. Normal operation means the OptoLyzer OL3150o is ready i.e., the OptoLyzer OL3150o's applications are running and an IP address is available. The booting procedure describes the time interval from switching on the power of the OptoLyzer OL3150o until the device is ready for operation. For more details on the booting process refer to Section 3.2 on page 17. In an updating procedure either the CompactFlash or the ICs of the OptoLyzer OL3150o are updated or the license is updated. For more details on the updating process refer to Chapter 4 on page 18.

LED label	Color	State	Despription
R (Ready)	Red	On	1. Normal operation: The OptoLyzer OL3150o is ready. 2. Booting operation: Booting is completed. The OptoLyzer OL3150o is ready. 3. Updating operation i.e., ICs are in flashing mode if: • Red and yellow LED are on simultaneously or • Red, yellow and green LED are on simultaneously. Although this can take a few minutes **do not switch off** the OptoLyzer OL3150o **in this state**.
		Off	1. Normal operation: The OptoLyzer OL3150o is not ready. Services does not work properly or there is no valid IP address present on the device. 2. Booting operation: The OptoLyzer OL3150o is waiting for a valid IP address. 3. Updating operation: Update is finished when red, yellow and green LED are off simultaneously. Switch off, remove USB stick and switch on.
		Blinking slowly	1. Normal operation: No function 2. Booting operation: The OptoLyzer OL3150o gets initialized. 3. Updating operation: No function
		Blinking fast	1. Normal operation: A twinkle command is sent from an application. 2. Booting operation: The operating system is loaded.
M (Message)	Yellow	On	1. Normal operation: A message is received by the INIC. 2. Booting operation: No function 3. Updating operation: a. CompactFlash is updated. • Only yellow LED is on. b. Chips are in flashing mode if: • Yellow and red LED are on simultaneously or • Yellow, red and green LED are on simultaneously. Although this can take a few minutes **do not switch off** the OptoLyzer OL3150o **in this state**.
		Off	1. Normal operation: No function 2. Booting operation: No function 3. Updating operation: Update is finished when red, yellow and green LED are off simultaneously. Switch off, remove USB stick and switch on.
L (Lock)	Green	On	1. Normal operation: The MOST network is locked. 2. Booting operation: The MOST network is locked. 3. Updating operation: If green, yellow and red LED are on simultaneously: Chips are in flashing mode. Although this can take a few minutes **do not switch off** the OptoLyzer OL3150o **in this state**. The green LED is only on if the INIC is updated. If the FPGA, the SpyNIC for MOST150 or the StressNIC for MOST150 of the MOST PC Interface is flashed the red and the yellow LED are on.
		Off	1. Normal operation: The MOST network is not locked. 2. Booting operation: The MOST network is not locked. 3. Updating operation: Update is finished when red, yellow and green LED are off simultaneously. Switch off, remove USB stick and switch on.

Table 3-1: Function of the Status LEDs

MOST Interface

The OptoLyzer OL3150o can be connected to the MOST network via a 2+0 optical header.

- Tx: Optical output for MOST network
- Rx: Optical input for MOST network

Audio Line IN and OUT:

The OptoLyzer OL3150o provides one audio line input and one audio line output connector to the right of the MOST interface on its front panel. Each of them has a 3.5 mm plug. For technical details refer to Section 5.2 on page 22.

Audio Headphone OUT:

The OptoLyzer OL3150o provides one audio headphone connector (3.5 mm plug) to the right of its front panel. For technical details refer to Section 5.2 on page 22.

LED Power:

A green colored LED top right on the front panel indicates power is switched on.

Frequency LEDs:

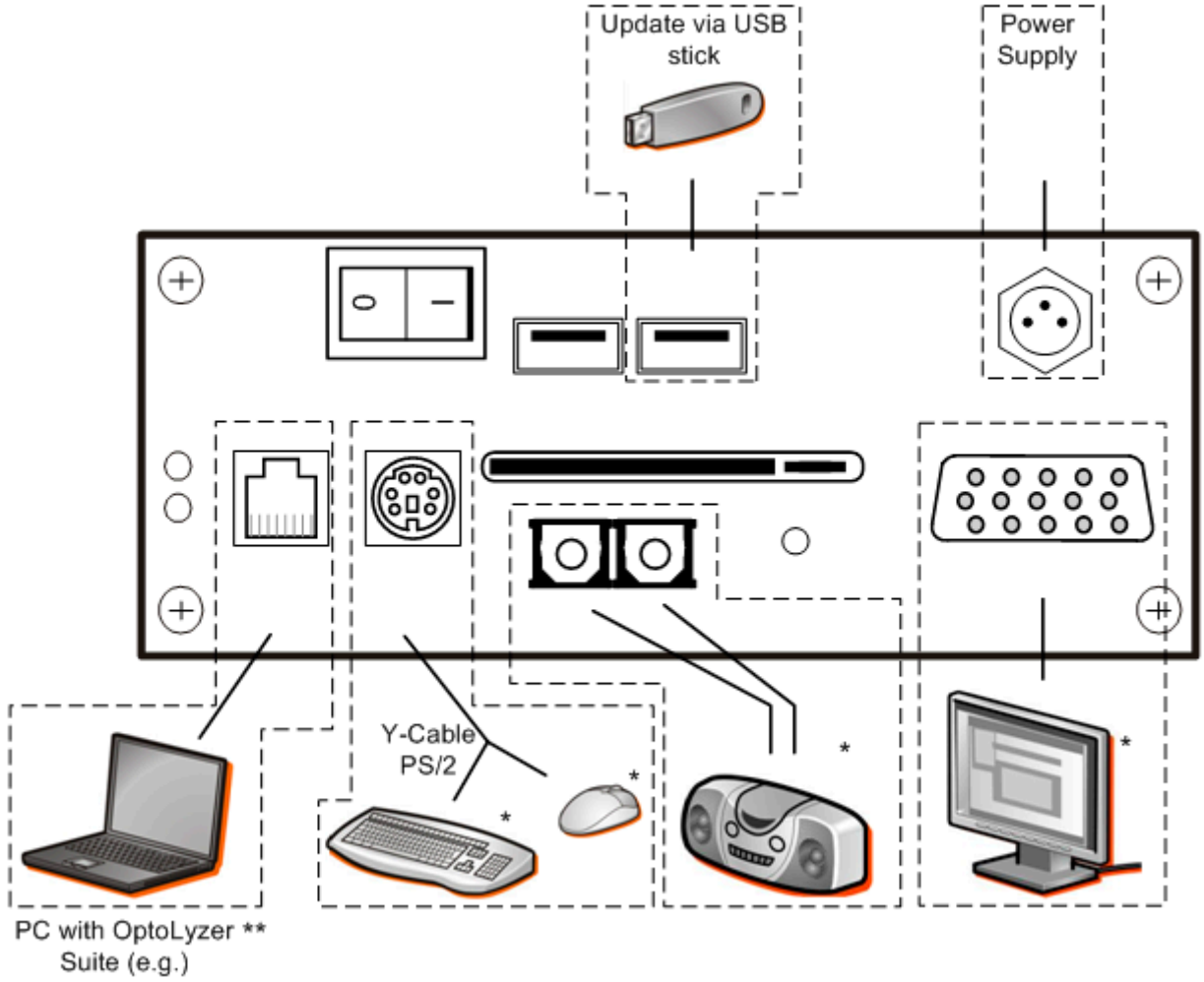
The LEDs located on the right side indicate the frequency of the MOST network in all modes: timing master, slave, bypass and S/PDIF master. S/PDIF master means the OptoLyzer OL3150o is running in timing master mode and it generates the frames for the entire MOST network synchronized to the incoming S/PDIF source data stream. An external S/PDIF signal may have a tolerance of ± 8.8 Hz for 44.1 kHz or of 9.6 Hz for 48 kHz.

LED	State	Description
44 kHz	On	The frequency of the MOST network is 44.1 kHz tolerating a deviation of ± 8.8 Hz.
	Off	The frequency of the MOST network is not 44.1 kHz.
48 kHz	On	The frequency of the MOST network is 48 kHz tolerating ± 9.6 Hz.
	Off	The frequency of the MOST network is not 48 kHz.
S/PDIF	On	1. **Only S/PDIF:** The incoming S/PDIF source data stream has a frequency that is not equal to 44.1 kHz or 48 kHz. 2. **S/PDIF together with 44 kHz LED:** The incoming S/PDIF source data stream has a frequency of 44.1 kHz tolerating a deviation of ± 8.8 Hz. 3. **S/PDIF together with 48 kHz LED:** The incoming S/PDIF source data stream has a frequency of 48 kHz tolerating a deviation of ± 9.6 Hz.
	Blinking fast	S/PDIF master is set but the signal is not a valid S/PDIF signal.
	Blinking slowly	1. S/PDIF master is not set: A S/PDIF signal is routed but it is not a valid S/PDIF signal. 2. S/PDIF master is set but the S/PDIF signal differs more than 8.8 Hz from 44.1 kHz or more than 9.6 Hz from 48 kHz. This means if the S/PDIF signal is • < 44.0912 kHz or • > 44.1088 kHz and < 47.9904 kHz or • > 48.0096 kHz.
	Off	If the device is not in S/PDIF master mode.

Table 3-2: Frequency LEDs

3.1.2 Connectivity Diagram of the Rear Panel

The rear panel of the OptoLyzer OL3150o provides access to power jack, power switch, CompactFlash slot, USB interfaces, a BFB button, and interfaces to a remote PC.



* Optional

** There are several connection concepts how to connect a PC with the OptoLyzer. For details refer to the *OptoLyzer Suite Start-up Guide [2]*.

Figure 3-2: Connectivity Diagram—Rear Panel

All components of the rear panel are described from left to right and top down:

Power on/off Switch:

The power on/off switch is located left most. In position 'I' the OptoLyzer OL3150o is on, in position '0' the power is switched off.

USB Interfaces (2x):

Designated only for connecting SMSC products as e.g., an USB stick for updating purposes or a WLAN USB adapter.

Power Jack (mains):

The OptoLyzer OL3150o comes with an AC power supply unit (voltage range from 100 V to 240 V) that has to be connected to this plug. For technical details refer to Section 5.2 on page 22.

Ethernet Interface:

This interface is the standard communication port that connects the OptoLyzer OL3150o to a PC via a 100Base-TX Ethernet connection. If the OptoLyzer Suite is running on this PC it is able to control the OptoLyzer OL3150o and to receive its data. The connector is a standard RJ45. On the left side two LEDs give information on connection (Link LED: yellow) and traffic (Activity LED: green).

PS2 Interface (keyboard, mouse):

External interfaces are not needed neither for operating the OptoLyzer OL3150o nor for performing all standard use cases. Nevertheless there is a PS2 interface for mouse and keyboard. It can be useful to connect a mouse and a keyboard for special use cases. The mouse and the keyboard are not part of the shipping.

CompactFlash Slot:

A CompactFlash slot is placed in the center of the rear panel. The delivered CompactFlash provides the operating system Microsoft® Windows® CE 5.0 and all other software that is necessary for analyzing and controlling purposes. To the right of the slot there is a small button to eject the CompactFlash.

S/PDIF OUT/IN

The OptoLyzer OL3150o provides respectively an optical S/PDIF output and input.

Connector types:

- S/PDIF OUT: TOTX173 (Toshiba)
- S/PDIF IN: TORX173 (Toshiba)

For more details on S/PDIF formats refer to Section 5.2.4 on page 23.

BFB Button:

This button provides a fallback solution if the update of an FPGA is interrupted (e.g., loss of power). Switch off the OptoLyzer OL3150o. Then hold the Boot Fallback button (BFB) pressed for about 1 second while you switch on the OptoLyzer OL3150o simultaneously.

VGA Interface:

The hardware of the OptoLyzer OL3150o supports a VGA interface for connecting a VGA monitor. The display will be recognized automatically.

3.2 Booting the OptoLyzer OL3150o

The OptoLyzer OL3150o can be switched on after connecting to the power supply and after connecting it according to the selected connection concept via the Ethernet interface (for details refer to the *OptoLyzer Suite Start-up Guide [2]*). The red LED (R) to the left of the MOST Interface indicates the progress while booting. The single steps are described in the sequence as they occur.

1. The red LED blinks slowly: The OptoLyzer OL3150o starts initializing.
2. The red LED blinks fast: This indicates the operating system is loaded.
3. The red LED switches off: The operating system has been loaded and the OptoLyzer OL3150o is waiting for a valid IP address.
4. The red LED is on: All services are running and a valid IP address is available. The OptoLyzer OL3150o is ready to run.

4 Maintenance

The OptoLyzer OL3150o is shipped with a bootable USB stick. This chapter describes an automatically performed update of both CompactFlash and MOST PC Interface (recommended case). In addition it is possible to separately update the CompactFlash (Section 4.2) or the MOST PC Interface (Section 4.3).

4.1 Update All (Recommended Case)

The USB stick offers the possibility to automatically update the CompactFlash and the MOST PC Interface (FPGA firmware, SpyNIC for MOST150, StressNIC for MOST150 and INIC) in one step. This option is the recommended use case and is preset as default in the boot menu of the USB stick, i.e. this update procedure will be performed if not another option will be selected within five seconds. Neither a keyboard nor a monitor need to be connected in the default case. Only those ICs are updated for which newer versions are available.

SMSC provides a utility called 'UpdateStickGenerator.exe' that features the following:
- Search for the recent firmware.
- Download and storage of the recent firmware on a removable storage device.

The utility can be downloaded from SMSC's Web site. On the Web site search for 'UpdateStickGenerator'.

The update procedure is described below:

1. Switch off the OptoLyzer OL3150o and disconnect it from the MOST network. Otherwise the green LED can light if a static master is in the MOST network.
2. Plug in the USB stick with the latest OptoLyzer OL3150o firmware that can be downloaded from SMSC AIS's web site.
3. Switch on the OptoLyzer OL3150o.

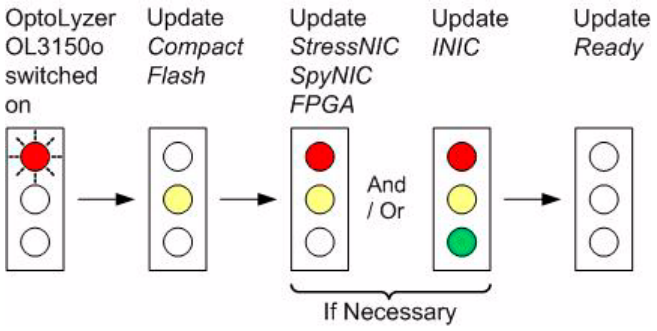


Figure 4-1: Automatical Update Procedure

The red LED (Ready) blinks slowly. After some seconds the red LED (R) stops blinking and the yellow LED (M) turns on indicating the CompactFlash is updated. After some time the red LED (R) and maybe the green LED (L) turn(s) on additionally. In this state the ICs are checked and updated if necessary. **The flashing procedure can take a few minutes depending on the number of ICs to be updated.**

Note: Do not switch off the OptoLyzer OL3150o during flashing the ICs, i.e., while the red, yellow and green LEDs are on.

After finishing the ICs update, the LEDs turn off and finally the OptoLyzer OL3150o beeps once.

4. Power down the OptoLyzer OL3150o and remove the USB stick.
5. Switch on the OptoLyzer OL3150o. Because of the initialization caused by the update of the CompactFlash the OptoLyzer OL3150o will boot twice. The red LED (R) indicates the progress:
   1. Blinking slowly
   2. Blinking fast
   3. Blinking slowly
   4. Blinking fast
   5. Off
   6. On

4.2 Update CompactFlash

The delivered USB stick contains a complete backup of the original CompactFlash data (factory default). The CompactFlash can be recovered using the backup of the USB stick. The procedure how to recover the CompactFlash is described below.

To recover or update the OptoLyzer OL3150o follow these steps:

1. Connect a keyboard, a monitor (not part of the shipment) and a mouse (optional) according Figure 3-2.
2. Plug in the delivered bootable USB stick into a USB slot.
3. Restart the OptoLyzer OL3150o.
   The OptoLyzer OL3150o displays a boot menu.

> Note: If no item is selected for five seconds the CompactFlash and the PCI Board are updated automatically (described in Section 4.1 on page 18).

4. Enter '1' for 'Update CompactFlash'.
5. Follow the instructions. The CompactFlash memory will be overwritten.
6. After finishing the recovery procedure switch off the OptoLyzer OL3150o.
7. Remove the USB stick.
8. Start the OptoLyzer OL3150o again by switching on the power. The OptoLyzer OL3150o will boot twice as described in Section 4.1 step 5.

4.3 Update MOST PC Interface Manually (DOS Tools)

The USB stick allows to update the firmware of the chips manually. The procedure to achieve this with the DOS tools is described below:

1. Connect a keyboard and a monitor (not part of the shipment).
2. Plug in the delivered bootable USB stick into a USB slot.
3. Restart the OptoLyzer OL3150o.
   The OptoLyzer OL3150o displays a boot menu.

> Note: If no item is selected for five seconds the CompactFlash and the MOST PC Interface are updated automatically (described in Section 4.1 on page 18).

4. Enter '2' for 'Update MOST PC104+ Interface (DOS Tools)'.
5. Select the MOST PC Interface. Afterwards the following options are provided
   - Check or Write License Keys
   - Automatic update (easy mode)
   - Manual update (advanced mode)
6. Select ’Manual update (advanced mode)’ and follow the instructions.
7. After finishing the update procedure switch off the OptoLyzer OL3150o.
8. Remove the USB stick.
9. Start the OptoLyzer OL3150o again by switching on the power.

For details on how to use the DOS tools options please refer to the additional user manual DOS Tools MOST PC Interfaces that can be found on the CD.

4.4 Update a License

If e.g., the customer purchased a new plugin for the OptoLyzer Suite it could be useful to update a license (in this case the tool license). The tools license can be comfortably updated using the OptoLyzer G2 Admin Web Interface implemented in the OptoLyzer Suite.

The procedure is described below:

1. Start the OptoLyzer Suite.
2. Right click in the main window and select ’Search’.
3. Select the OptoLyzer OL3150o (use the twinkle functionality to find the correct device) and confirm.
   Afterwards the device will be shown in the main window.
4. Select the device in the main window.
5. Right click and select ’Configure’.
6. In the main menu select ’Tools License’. The current license is shown above an input field.
7. Enter the new license in the input field. You can find it on the application’s license card.
8. Click ’Set’.

The new license is written onto the OptoLyzer OL3150o V2. Now your new application can be started.

> Note: The tools license can also be updated via the WIBU-Key Writer implemented in the OptoLyzer Suite, via an MBI command that is described in the *OptoLyzer Socket Protocol [1]* or via the DOS Tools available on the delivered USB stick.

For details how to use the DOS tools options please refer to the additional user manual *DOS Tools MOST PC Interfaces* that can be found on the CD.

5 Technical Specification

5.1 Mechanical and Environmental Characteristics

5.1.1 Mechanical Dimensions

Mechanical dimensions of the OptoLyzer OL3150o in millimeters, without screws, plugs and switches:

Height	Width	Depth
50	134	175

Table 5-1: Mechanical Dimensions of the OptoLyzer OL3150o

5.1.2 Environmental Specification

Protection against Over Temperature

The OptoLyzer OL3150o integrates temperature sensitive components. Therefore do not cover the device with paper, textiles or other objects. Covering disables the passive cooling (cooling rips). Make sure to allow enough airflow to the OptoLyzer OL3150o, when the device is assembled. Do never place the running OptoLyzer OL3150o in a closed case or box. Clean the surface of the computer system from dust, oil and other isolating materials, to prevent a reduction of the cooling efficiency. Do not stack any OptoLyzer OL3XXX.

Operating Mode

Parameter	Values
Ambient temperature	0° to 40° C
Relative humidity (non-condensing)	80%

Table 5-2: Operating Mode

Non-Operating Mode (Storage)

Parameter	Values
Ambient temperature	-40° to 85° C
Relative humidity (non-condensing)	95%

Table 5-3: Non—Operating Mode

5.2 Electrical Characteristics

5.2.1 Power Supply

Operating Voltage: 8 V - 30 V (DC)

Power Consumption: Operation (typical): 14 W

Current Drain (max): 3 A

Power Input / Main Supply Connector

Pin	Description
1	Power
2	-
3	GND

Table 5-4: Power Supply Connector

5.2.2 Audio Line IN/OUT

The electrical properties are described in Table 5-5.

Name	Description
Line IN	Audio stereo signal input: R_{in} = 12 kΩ
Line OUT	Audio stereo signal output: RL_{min} = 3 kΩ

Table 5-5: Line IN/OUT

5.2.3 Headphone OUT

The electrical properties are described in Table 5-6.

Name	Description
OUT	Output power: P_o = 35 mW (R = 160 Ω)

Table 5-6: Headphone OUT

5.2.4 S/PDIF IN/OUT

The following tables describe which SPDIF formats are supported by the OptoLyzer OL3150o.

5.2.4.1 S/PDIF (IN) to MOST

SPDIF data from an external SPDIF source routed to the MOST network.

IN	MOST	Supported Framerates
16, 20, 24 bit (stereo) / channel	16 bit / channel	30 - 96 kHz (if not being S/PDIF master)

Table 5-7: Direction S/PDIF (IN) to MOST

5.2.4.2 MOST to S/PDIF (OUT)

SPDIF data from MOST network routed to an external SPDIF sink.

OUT	MOST	Supported Framerates
16 bit (stereo) / channel	16 bit / channel	30 - 96 kHz (if not being S/PDIF master)

Table 5-8: Direction MOST to S/PDIF (OUT)

6 OptoLyzer Trigger Box

SMSC optionally offers an OptoLyzer Trigger Box that can be connected to the Extension port of the OptoLyzer OL3150o. A specific cable is part of the shipment designated to connect the OptoLyzer OL3150o and the OptoLyzer Trigger Box. For ordering information refer to our Web site.

6.1 Connection Diagram

Figure 6-1 depicts how to connect the OptoLyzer OL3150o to the OptoLyzer Trigger Box.

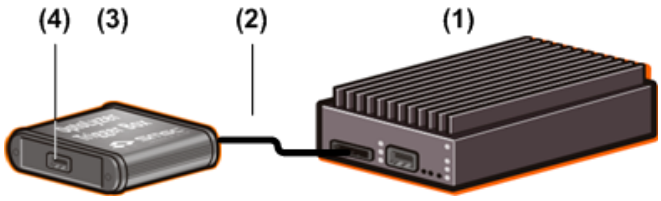


Figure 6-1: Connection of the OptoLyzer Trigger Box

Proceed as follows:

1. Plug the cable **(2)** delivered with the OptoLyzer Trigger Box in the Extension port **(1)**.
2. Plug the other end of the cable **(2)** in the Extension port of the OptoLyzer Trigger Box **(3)**.

6.2 Trigger Interface

Trigger Interface Front View of the OptoLyzer Trigger Box

Figure 6-2 depicts the pins of the Trigger interface (see number **(4)** in Figure 6-1) of the OptoLyzer Trigger Box.

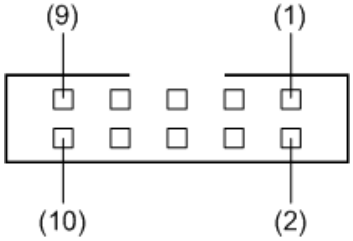


Figure 6-2: Trigger Interface Front View

Technical Data of the Trigger Interface

Table 6-1 describes the pin connection of the hardware trigger interface.

Hardware Trigger	0		1		2		3			
Pin	1	2	3	4	5	6	7	8	9	10
Signal	GND	Input/ Output	GND	Input/ Output	GND	Input/ Output	GND	Input/ Output	GND	Do not connect.

Table 6-1: Connector Pin List of the Hardware Trigger Interface

By default the hardware triggers are specified as input triggers. Refer to the user manual Socket Protocol V1.3 for more details about how to switch from an input to an output trigger.

- **As Input:**

  Switching threshold = 2.2 V

  $U_{i\ max}$ = 16 V

- **As Output:**

  Open collector with internal pull up (47 k) to 5 V

  Current limiting:

  If $U_{a\ external}$ on high and U_a set to low: I_{amax} = 15 mA

Note: For more technical details on the circuit diagram referring to the trigger interface contact the technical support available at: http://www.smsc-ais.com/contact.

Appendix A: References

1. Socket Protocol User Manual, SMSC. Contact: support-ais-de@smsc.com
2. OptoLyzer Suite Start-up Guide, SMSC. Contact: support-ais-de@smsc.com

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Further Information

For more information on SMSC's automotive products, including integrated circuits, software, and MOST development tools and modules, visit our web site: http://www.smsc-ais.com. Direct contact information is available at: http://www.smsc-ais.com/offices.

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