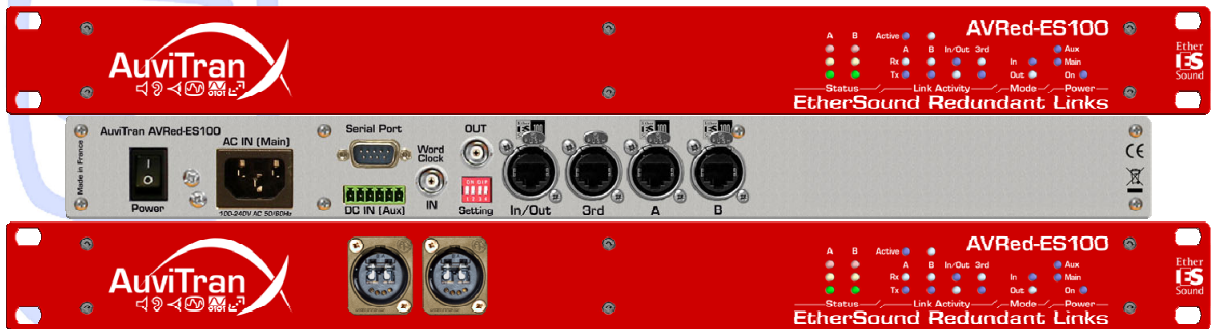




AVRed-ES100 USER'S MANUAL



Version 1.0 July 2008

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1- WELCOME!

Thank you for purchasing AuviTran's AVRed-ES100. We hope you will enjoy using it. This product will help you building secure redundant EtherSound networks. AVRed-ES100 guarantees that your digital EtherSound connection is secured by a second path. In case of cable failure or even only data errors, the AVRed-ES100 boxes will automatically switch on the best cable.

AVRed-ES100 is currently the fastest ever built redundancy system that will switch on the best cable in less than 100µs and 3.2µs pass-thru latency.

The AVRed-ES100 boxes offer full network and/or local control of all parameters as well as constant network status monitoring, making it ideal for live professional audio applications. Build-in serial port allows you to build serial tunneling communications thanks to native ES100 kernel. Also, word clock input and output are available for external audio synchronization over the network. Auxiliary power supply connector ensures extra redundancy of your system.

You will find herewith the necessary instructions to use your product. Please read them carefully as misuse of this device might cause serious damage to you and your environment.

2- ELECTRICAL AND ELECTRONIC INTERFERENCES RISKS

This Product uses high frequency digital circuits that might interfere with electrical or electronic devices placed in your working environment. Please make sure this kind of device (television, radio device, cell phones) is removed in order to ensure a proper functioning of each device.



Always use shielded cables and connectors (serial port, word clock and EtherSound ports). In the other case, AuviTran will not guarantee the proper behavior of the product.



Serial port cable must be length < 1m to ensure proper EMC and interferences behavior.



Word clock cable must be length < 1m to ensure proper EMC and interferences behavior.

3- LIMITATION OF LIABILITY

In no case and in no way, the provider of this Product (AuviTran, the distributor or reseller, or any other party acting as provider) shall be liable and sued to court for damage, either direct or indirect, caused by and to the user of the board and which would result from an improper installation or misuse of the Product. "Misuse" and "improper installation" mean installation and use not corresponding to the instructions of this manual.

Please note that graphics given in this manual (drawings and schemes) are only examples and shall not be taken for a real vision of your own equipment configuration.

AuviTran is constantly working on the improvement of the products. For that purpose, the products functionalities are bound to change and be upgraded without notice. Please read carefully the User's manual as the new functionalities will be described therein.

4- FCC

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received including interference that may cause undesired operation.

FCC INFORMATION (U.S.A.)

1. IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!

This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.

2. IMPORTANT: When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product **MUST** be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.

3. NOTE: This product has been tested and found to comply with the limits for a Class B Digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other radio communications. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problems by using one of the following measures:

Relocate either this product or the device that is being affected by the interference.

Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter(s).

In the case of radio or TV interference, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to co-axial type cable.

If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you cannot locate the appropriate retailer, please contact Yamaha Commercial Audio Systems, Inc., Electronic Service Division, 6600 Orangethorpe Ave, Buena Park, CA90620.

The above statements apply **ONLY** to those products distributed by Yamaha Commercial Audio Systems, Inc. or its subsidiaries.

COMPLIANCE INFORMATION STATEMENT (DECLARATION OF CONFORMITY PROCEDURE)

Responsible Party : Yamaha Commercial Audio Systems, Inc.
Address : 6600 Orangethorpe Ave.,
Buena Park, Calif. 90620
Telephone : 714-522-9011
Type of Equipment : EtherSound Redundant links
Model Name : AVRed-ES100

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following conditions:

- 1) This device may not cause harmful interference, and
- 2) This device must accept any interference received including interference that may cause undesired operation.

See user manual instructions if interference to radio reception is suspected.

5- TRADEMARKS

All trademarks listed in this manual are the exclusive property of their respective owners. They are respected "as is" by AuviTran. Any use of these trademarks must receive prior approval of their respective owners. For any question, please contact the trademark's owner directly.

6- COPYRIGHT

The information in this manual is protected by copyright. Therefore, reproduction, distribution of whole or part of this manual is strictly forbidden without the prior written agreement of AuviTran.

7- AUVITRAN WEBSITE / MORE INFORMATION

Please visit our website for any question of further inquiry concerning our product range. Updates will also be posted when available.

<http://www.auvitran.com>

8- PACKAGE CONTAINS

- 1 AVRed-ES100

① Cord-set with proper plug configuration must be used, depending on country in which the product is used

9- PRECAUTIONS



Do not modify, open or disassemble the Product. The guarantee shall be null and void in that case.



Do not apply excessive pressure on connectors or any other part of the board. Do not touch the metallic sharp parts (pins) of the product.



This product is designed to be rack-mounted. Be sure to observe following installation rules of this kind of equipment:

- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).



This product is electrostatic sensitive; make sure you check this before touching or using it.



The disconnect devices of the unit are the appliance inlet of the auxiliary power supply and the appliance inlet on the rear side of the unit. These must be easily reachable.



Conformity of this product is subject to proper electrical wiring, regarding CEI364 (NFC15-100). Installation must be equipped with differential protection.



To prevent electric shock, do not remove the cover. No user-serviceable parts inside. This unit contains hazardous voltages and should only be opened by a trained and qualified technician. Both power supply sources must be disconnected before servicing.



Each connection must be Safety Extra Low Voltage kind (SELV), and must stay inside buildings.



FI: "Laitte on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan"



NO: "Apparatet må tilkoples jordet stikkontakt"

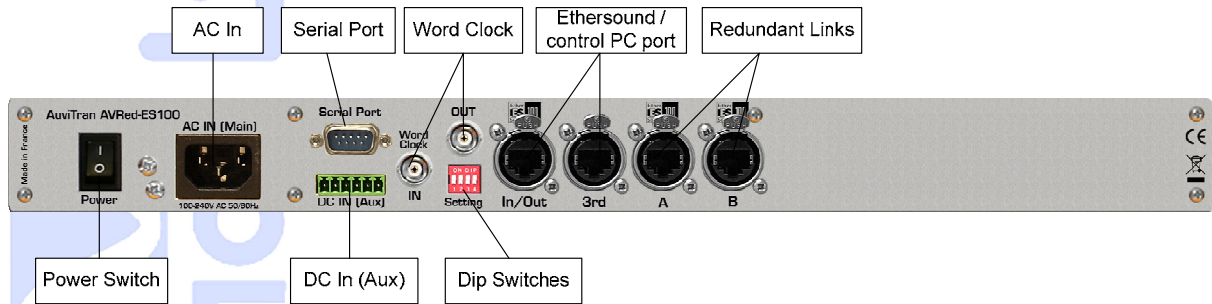


SE: "Apparaten skall anslutas till jordat uttag"

10- TECHNICAL SPECIFICATIONS

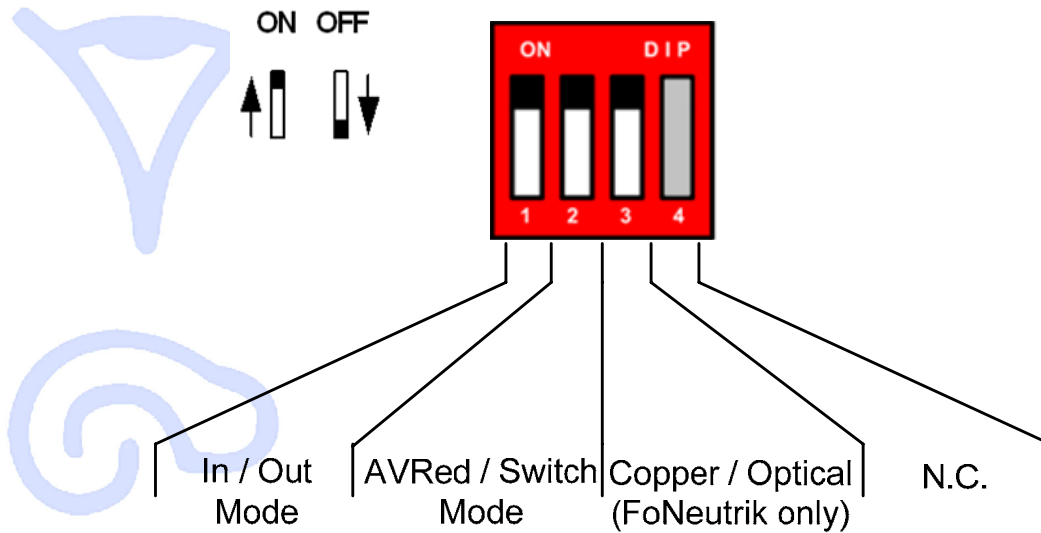
General	
Size	483 x 253 x 44mm (19' rack / 1U Height)
Power Consumption	<50 Watts
Main Power Supply	100-240VAC 50/60Hz 1.5A Max
DC supply (Auxiliary)	5Vdc 5A max – 12Vdc 2A max
Auxiliary Power Supply	100-240V~ 47-63Hz 1.35A / +5Vdc 5A ; +12Vdc 2A
Storage: Temp/Humidity	- 5°C to 70°C / Max 95% (non-condensing)
Operating: Temp/Humidity	5°C to 40°C / 5% to 90% (non-condensing)
Front Panel	Network and links Rx and Tx Activities; Active link running ; Quality Status of both Links A and B ; In or Out Mode selected for device ; Power Main, Aux and On Display; 2 Neutrik OpticalCon™ for /FoNeutrik version
Rear Panel	1 IEC Power inlet; 4 Neutrik EtherCon RJ45; 1x6 poles Euroblock Connector for Aux power supply; 2 BNC for word clock synch in and out; 1 DB9 connector for Serial Port; 4 Dip Switches for hardware configuration
Optical Fiber	62.5/125 Multimode fiber used with LC connectors or Neutrik Opticalcon™
AVRed-ES100 Features	
3 Operating modes set by external dip switch	<ul style="list-style-type: none"> Mode IN: EtherSound Input to 2 resilient links Mode OUT on AVRed-ES: 2 resilient links coming from an AVRed-ES module to one EtherSound Output Port Mode OUT on Switch: 2 resilient links coming from an Ethernet Switch to one EtherSound Output Port
EtherSound I/O	IN or OUT port depending of operating mode selected; 3 rd port for PC remote control
Resilient Link	A and B with automatic selection of best link
Pass-through Latency	2.8µs in AVRed-ES100 – AVRed-ES100 Mode Approx 22µs in Switch – AVRed-ES100 Mode
Link Switching latency	4 samples (83µs at 48 kHz)
Other I/O	RS232 serial port
Clock	<ul style="list-style-type: none"> 48 kHz local clock (when Primary Master) or EtherSound Network (When not PM) Word clock In used for synchronization
Temp / Fan monitoring	
Temp Monitoring	Network Monitoring of Temperature inside the Box
PSU Monitoring	Network Monitoring of PSU Failure for Main and Aux power supply
2 Fan Control modes	Automatically Controlled by internal Temperature Off
Development and Integration Environment	
OS Supported	Windows XP
ES-Monitor	ES-Monitor enables to remotely set, control and monitor an EtherSound network and provides enhanced property pages to manage the AVRed-ES100 specific parameters.
Remote Network Management	Links status, Power supply status (Main, Aux), Temperature monitoring , Fan remote control and PSU Aux/Main remote control

11- Rear Panel Description

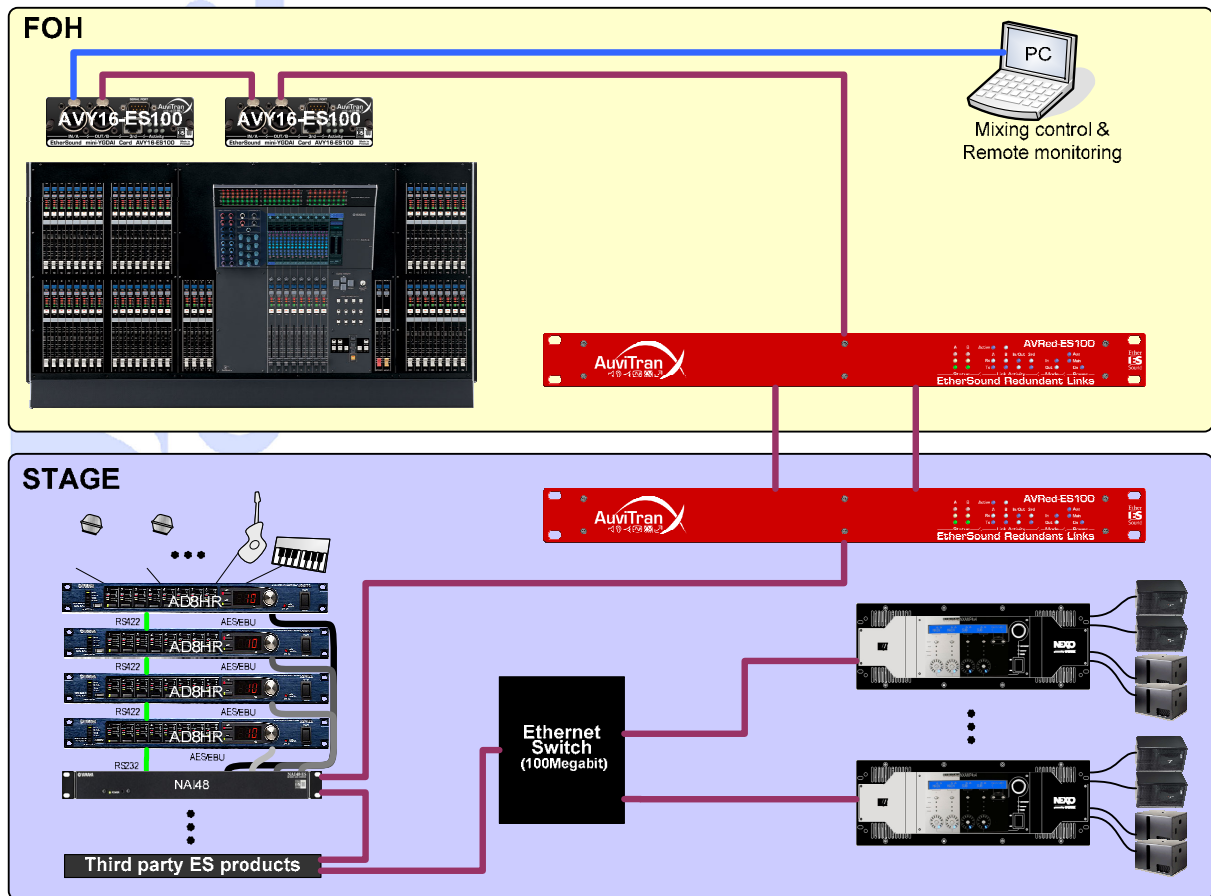


- 1- Power switch : switch on or off the main power supply
- 2- AC IN : main power supply. Refer to tech specs for AC range
- 3- DC IN : auxiliary power supply for redundancy purpose
- 4- Dip switches : setup the device
- 5- Serial Port : standard RS232 for custom application
- 6- Word Clock : Input and Output for external synchronization
- 7- EtherSound Ports : link to EtherSound network (or control PC)
- 8- Redundant Links : double Cat.5 redundant links

Here is the detailed description of the dip switches. Every setup will be explained below.



12- Architecture using AVRed-ES100










A pair of AVRed-ES100 boxes will build a redundant link composed of 2 Cat.5 cables (or fibres for AVRed-ES100/FoNeutrik). If one link breaks down, AVRed-ES100 will quickly switch on the second one. Status of both links is displayed on ESMonitor software and on front panel.



13- AVRed-ES100 Modes

AVRed-ES100 is able to work in 3 different modes that are set up with dip switches on the rear panel of the box.

13-1 Dip switches Mode setting

Dip Switches Position	AVRed-ES100 Mode	ESMonitor
	Mode Out Switch / AVRed	
	Mode Out AVRed / AVRed	
	Mode In AVRed / AVRed	
		

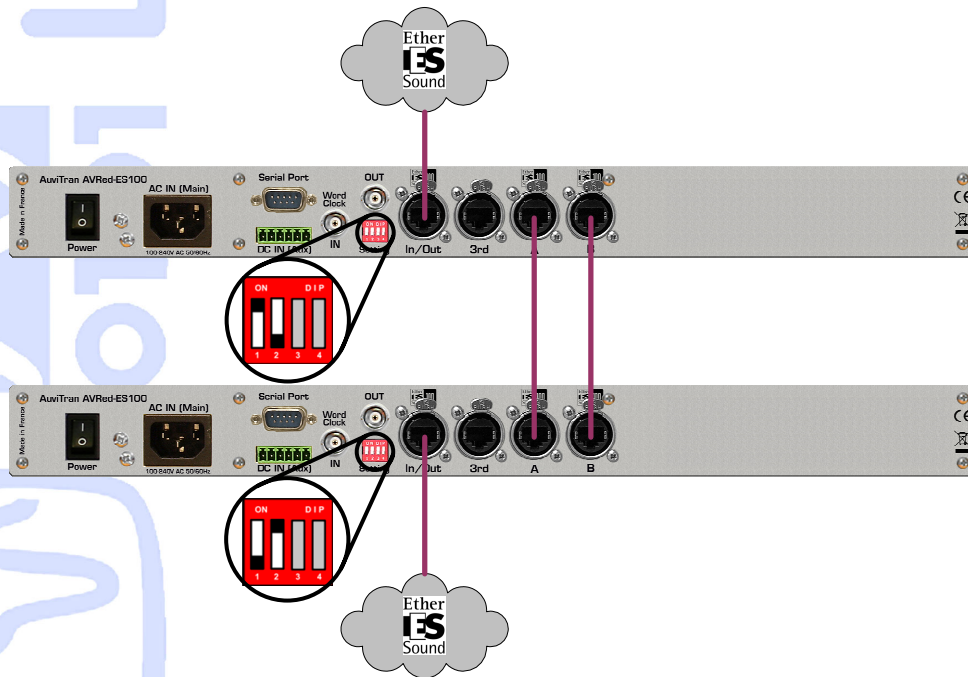
13-2 Copper / Optical setting

Dip Switches Position	AVRed-ES100/FoNeutrik Mode	ESMonitor
	Optical Fiber Mode (front panel OpticalCon)	Mode <input type="radio"/> EtherCon <input checked="" type="radio"/> OpticalCon
	Copper Mode (back panel RJ45)	Mode <input checked="" type="radio"/> EtherCon <input type="radio"/> OpticalCon

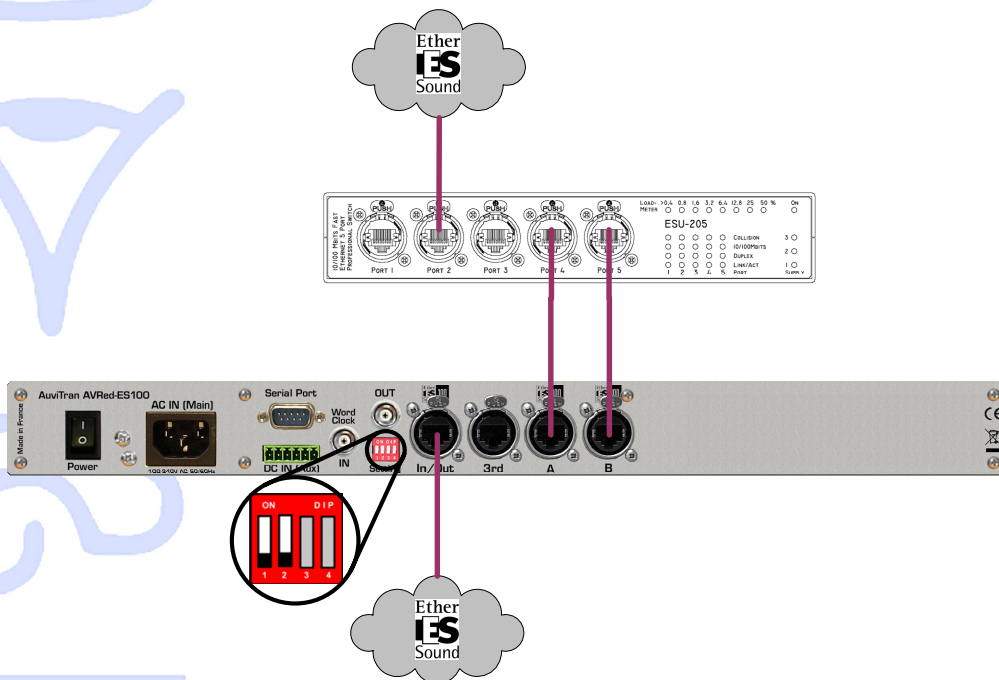
If you own an AVRed-ES100/FoNeutrik, you can choose if you want to use optical fiber connectors, or switch back to regular copper RJ45 connectors. This setting is useless if you own a standard AVRed-ES100.

13-3 Connection schematics

13-3-1 AVRed / AVRed mode



13-3-2 Switch / AVRed mode



13-4 Why using AVRed-ES100 in Pair instead of with a switch

When using a combo of 2 AVRed-ES100 Boxes instead of switch + AVRed-ES100, computation of link status is more precise and allows more accurate switch between links. The Switch / AVRed-ES100 Mode combo will only detect cable disconnection, while AVRed-ES100 / AVRed-ES100 Mode will detect cable failure including quality status.

The AVRed-ES100 / AVRed-ES100 mode allows system to precisely analyse status of each pair of cables. Therefore, system can choose the best pair for both upstream and downstream signals. Consequently, if errors occur on both links, the system is able to use one cable for upstream and the other for downstream provided this gives better results. This feature is not available on Switch / AVRed-ES100 Mode.

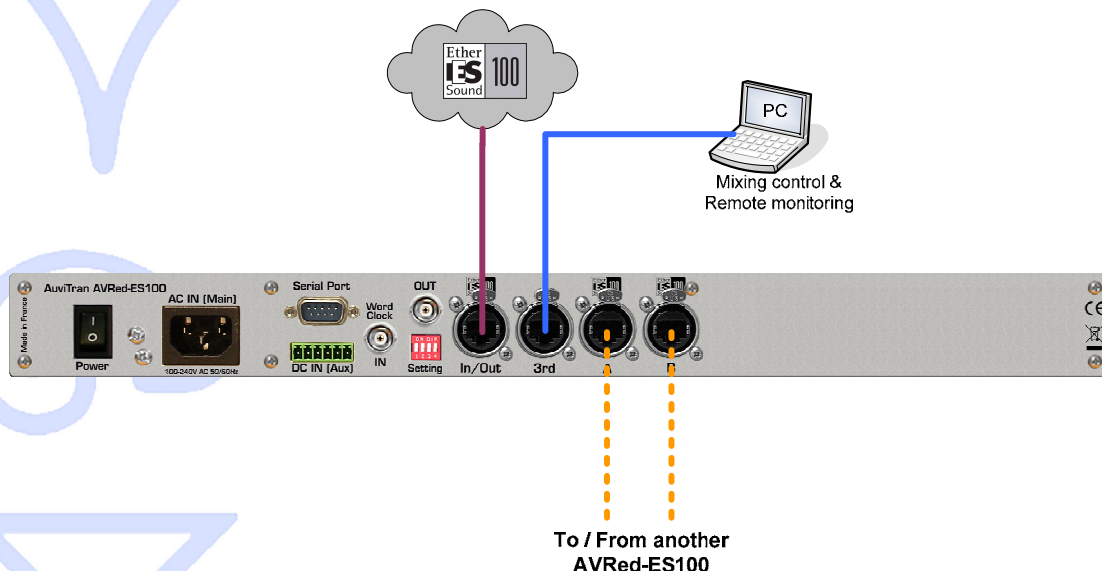
Last but not the least, the AVRed-ES100 / AVRed-ES100 Mode proves better results (by ten times superior) in terms of latency for the redundant link than the Switch / AVRed-ES100 Mode.

14- Third Port and Remote Control

AVRed-ES100 was built with the latest EtherSound ES100 technology, and includes a 3rd port for remote control and monitoring. With previous version of EtherSound, the control PC should always be connected to the "IN port" of the first EtherSound device in the network, i.e. the primary master.

Now, thanks to EtherSound ES100, and native AVRed-ES100 3rd port, you can plug your control PC directly to your device, even if it is not primary master.

14-1 Example of architecture using 3rd port



14-2 Limitations of architectures



Remote control via 3rd port of your ES100 device is subject to few limitations when in heterogeneous EtherSound network (i.e. ES100 and non-ES100 devices). Please read carefully following points:

- The primary master of the network should always be an ES100 EtherSound device.
- If a non-ES100 device is within the daisy-chain, 3rd port enables remote PC control of the local device only (if not primary master).



15- AVRed-ES100 IN ESMONITOR SOFTWARE

15-1 Software Installation

Please visit our website to download the latest version of our EtherSound Monitor Software called ESMonitor (http://www.auvitran.com/view.php?products_AVS-ESMonitor.php) and save the file on your hard disk. ESMonitor requires Windows XP to function.

You are now ready for installation. Refer to the ESMonitor documentation for installation.

When ESMonitor is installed on your PC, you can run ESMonitor and manage any AVMRed-ES100 devices connected to an EtherSound network. Refer to ESMonitor documentation for generic EtherSound device management such as Enumeration of EtherSound devices.

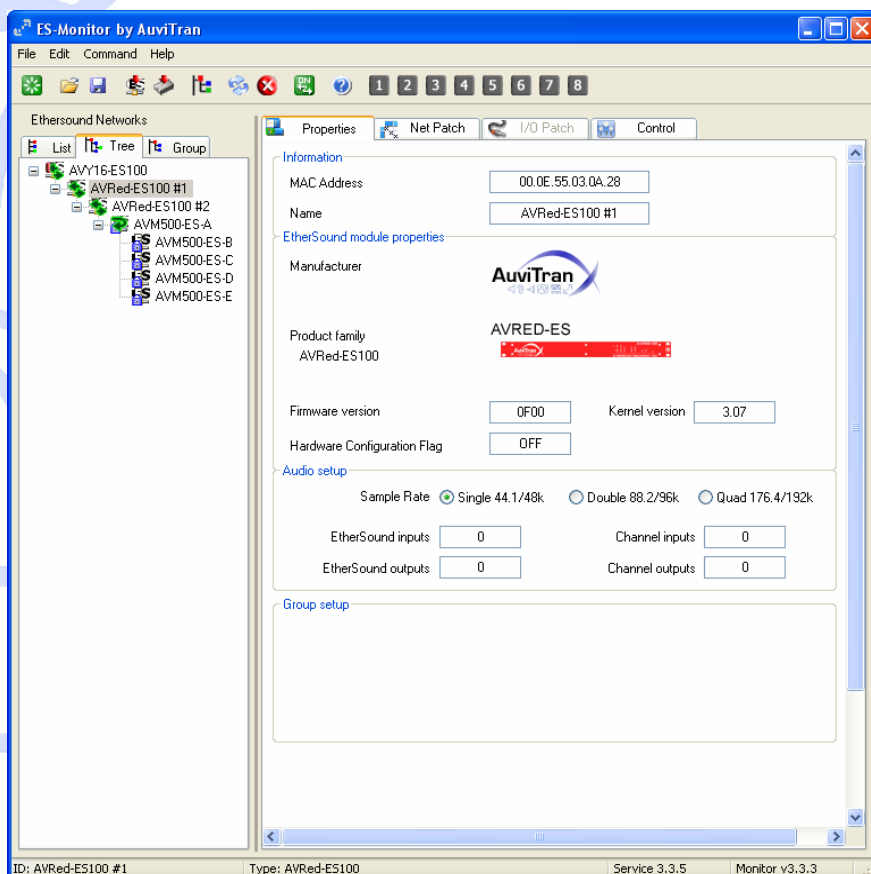
15-2 Getting Started with AVRed-ES100 and ESMonitor Software

The computer on which the EtherSound Monitor is installed should now be connected to the primary master of the EtherSound network. The primary master must be the first EtherSound-based device of the network.

After running the ESMonitor, Select an AVRed-ES100 device on the device list or tree list.

15-3 AVRed-ES100 Properties Page in ESMonitor

When selecting the properties page, ESMonitor will display the following information:



15-4 AVRed-ES100 Control Page in ESMonitor

If the Control page is selected, ESMonitor will display following information:

AVRed-ES100

EtherSound Redundant Links

Link Status

Remember to activate priority link mangement on linked AVRed

Bi-Directional Status

Bi-Directional mode ON Loopback

Status

Temp : 39.5 °C Fan Speed : 0/4 Stop Fan Brightness . . . +

Mode

EtherCon OpticalCon

Clock Setting

W. Clock EtherSound

Serial Communication Mode

Unicast Slave

Serial Port Configuration

Baud Rate 38400 Parity Disable

Bits per Char 8 Bits Parity Even

Stop Bits 1 Stop Bit Handshake Off

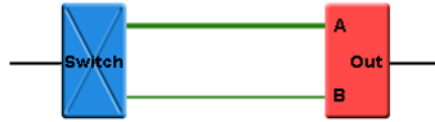
All standard parameters of the AVRed-ES100 can be seen or changed in this control page.

You can now start the configuration of your network and enjoy the functionalities of Auvitrans AVRed-ES100.

15-4-1 AVRed-ES100 Mode

The scheme below shows the current mode of your the AVRed-ES100:

1- Mode Output from Switch:



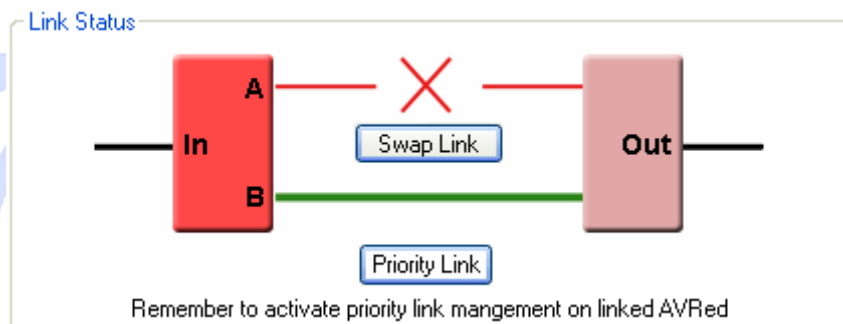
2- Mode Output from AVRed-ES100:



3- Mode Input:



15-4-2 Links Status box



The link status is shown with colours:

Green for a good link.



Orange for a link with errors.



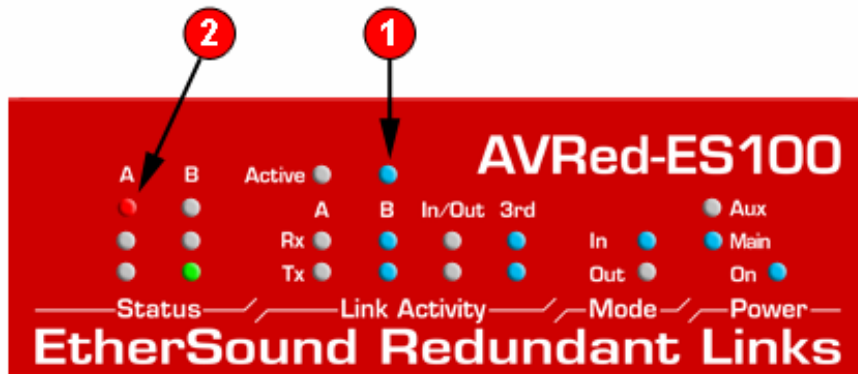
Red for a broken link.





The active link is in Bold.

The front panel (on box and in ESMonitor) shows the active link (1) and the error memory (2). As errors are sometimes too fast to be seen on Leds or because you were away when the error occurred, Error memory is blinking during 20s.



15-4-3 Links Options

Swap Link

Swap link button allows user to swap active link if possible.

Priority Link

When available on device, priority link management allows device to automatically select first link. To activate priority link management, button must be selected.

Note: Option must be set on both side of redundant link (i.e. selected on both AVRed-ES100 control page).

15-4-4 Status box

The Status box shows temperature in the box, fan speed and its turn-off switch, and the front panel brightness setting.



Fan speed is automatic, depending on box temperature. Thresholds were optimized regarding fan noise and maximum working temperature. For noise-critical environment, fan can be turn-off.

ⓘ Please note that if internal temperature becomes too high, AVRed-ES100 will override the "Stop Fan" command to ensure proper cooling of the box.

15-4-5 Bi-directional Status box



If AVRed-ES100 is inside a bi-directional ES network, this box will display the “Bi-Directional mode ON” message. You can also force the device to be end of bi-directional loop, thanks to “Loopback” checkbox.

15-4-6 Mode box

If you own an AVRed-ES100/FoNeutrIk, this box shows you if redundant links are routed on the back panel EtherCon® RJ45 connectors or on the front panel OpticalCon® optical connectors. It is a read-only display, as you must use back panel Dip Switches to change mode.



15-4-7 Clock Setting box

This control box enables you to choose the clock source of your network, in case your AVRed-ES100 is the Primary Master.



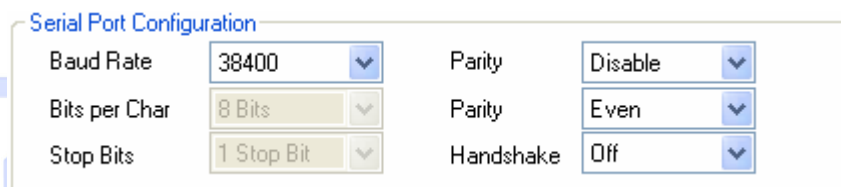
15-4-8 Serial Communication Mode box

This box helps you to create a Unicast serial tunneling between AVRed-ES100 serial port, and a remote device. All you have to do is to check the “Unicast” button and choose the destination device of the communication to create the tunnel.



If you leave the “Slave” button checked, that means that AVRed-ES100 is able to communicate with a remote device that was configured to communicate with.

15-4-9 Serial Port Configuration box



This box will helps you to configure properly the physical serial port parameters, as baud rate, parity, etc.

16- Auxiliary power supply

AVRed-ES100 provides another source of power supply, to improve the reliability of the system. It allows you to have two distinct power supply sources, for redundancy solutions. When both power supply units (PSU) are plugged, AVRed-ES100 monitors them, and always chooses best. In case of failure of one PSU (or associated electrical network), AVRed-ES100 will so continue to work.

Auxiliary PSU (ref. AVPSAUX-E45/EB) is validated and provided by Auvitrans only. Please contact us if you want to integrate the redundant PSU in your system.

<http://www.auvitran.com>

