Ghost1, Ghost2, Ghostπ & GHostX User's manual

Ghost Firmware version 1.6.0
Ghost Manager Software version 1.0.5.1

AGORA

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IMPORTANT SAFETY INSTRUCTIONS

⚡ This symbol significates the presence of uninsulated dangerous voltage within the product's enclosure that may be sufficient to constitute a risk of electric shock for persons.

⚠ **This symbol is intended to alert the user to the presence of important operating and maintenance instructions in the literature joined to this product, particularly in this document.**

1 Read these instructions

2 Take in consideration

3 Follow all instructions

5 Don't use this device near water

6 Clean only with a dry cloth

7 Don't close up any ventilation or air cooling reserved space

8 Install in accordance with the manufacturer's instructions

9 Don't install near any heat source as radiators, or other devices that produce heat

10 Don't remove the grounding electrical connection. This device must be powered with a 3 ways IEC 13 shucko (L/N/G).

11 Only use fixations and accessories specified by the manufacturer

12 Unplug this device during maintenance service and when one of its hoods is removed.

13 Unplug this device when unused for long periods.

14 Use one or two twice power cords to disconnect the device from the mains. The device is not equipped of main power switch

15 To reduce the risk of electric shock or fire, do not expose this device to rain, water, or any liquids and ensure that no objects which contains liquids are placed on the equipment.

CE

EC-Declaration of Conformity

The undersigned, representing the following manufacturer :

Agora SAS
16, rue Alfred Nobel
Pôle de la République 3
86000 POITIERS – FRANCE

Declares that the following products :

Product type	Description	Nominal Voltages	Current	Freq.
GHOST1	Network switch	100/127 VAC	0.3A	50/60Hz
		200/240 VAC	0.2A	
GHOST2	Network switch	100/127 VAC	0.6A	50/60Hz
		200/240 VAC	0.37A	
GHOSTπ	PoE+ Netwok swich	100/127 VAC	3.2A	50/60Hz
		200/240 VAC	1.6A	

Are in conformity with the regulations of the following EC directives and in accordance with CE mark following directives

Standard reference number	Title
2004/108/EC	EMC Directive (EMC)
2006/95/EC	Low voltage directive (LVD)

The conformity of the product with EC directives for use in environments E1, E2, E3 and E4 is provided by the compliance with the following standards:

Reference number	title

Date and place: 2016 February, Poitiers FRANCE   David ROCHER, CTO and R&D director

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CONTENTS

CHAPTER 1: Getting Started

Before installing, setting up or operating this equipment, make sure you have read and fully understand all of the "IMPORTANT SAFETY INSTRUCTIONS" at the front of this document.

Important: You must set up the IP address and netmask of your computer (PC Windows XP to 10 32/64 bits) before using it for the first time.

Unpacking

Carefully unpack your GHOST equipment package. Then, inspect the device for any signs of damage that may have occurred during transit and notify the courier immediately if you discover any. Please retain the original packing in case you should need to return the equipment to the manufacturer or supplier, or transport or ship the unit later.

Installation

When installing the unit, take the following into consideration.
• Do not install the equipment in places of poor ventilation.
• Do not install this equipment in a location subjected to excessive heat, dust or mechanical vibration. Allow for adequate ventilation around the equipment, making sure that its vents are not obstructed. To prevent excessive heating of the equipment, avoid mounting it directly above power amplifiers or other devices that radiate significant amounts of heat, such as radiators and heaters. Keep the equipment out of direct sunlight.
• This unit is designed for mounting in any 19" EIA standard rack. Four rack-mount holes in the front panel are provided for rack mounting and are designed to fully support the weight of the unit in the rack. **Avoid over-tightening the rackmount screws, as this could damage the front panel.**

Handling the Equipment

Completely isolate the equipment electrically and disconnect all cables from the equipment before moving it.
When lifting or moving the equipment, always take its size and weight into consideration.

EMC Regulatory Statements

Europe CE (EN55022)
Warning
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

U.S.A.FCC Class A
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area may cause interference in which case the user will be required to correct the interference at his own expense.

Canada
This product complies with Class A Canadian EMC requirements. CAN ICES-3 (A) / NMB-3 (A)
Changes or modifications not expressly approved by Agora could void the user's authority to operate the equipment.

Australia/New Zealand

This product complies with Australia/New Zealand EMC Class A requirements.

Electric fields

Caution: In accordance with Part 15 of the FCC Rules & Regulations, "… changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment."

These are safety class I products and have protective earth terminals. There must be an uninterruptible safety earth ground from the main power source to the product's input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, disconnect the power cord until the ground has been restored.

For LAN cable grounding:

■ If your LAN covers an area served by more than one power distribution system, be sure their safety grounds are securely interconnected.

■ LAN cables may occasionally be subject to hazardous transient voltages (such as lightning or disturbances in the electrical utilities power grid). Handle exposed metal components of the network with caution

In accordance with EN 60950-1 the base of power socket must be installed near the equipment and must be free of access for the disconnection of the power supply in case of danger.

Connecting Ghost devices

Making sure that all equipment is switched off, connect the GHOST to the rest of your Network equipment, as shown in the following diagrams.
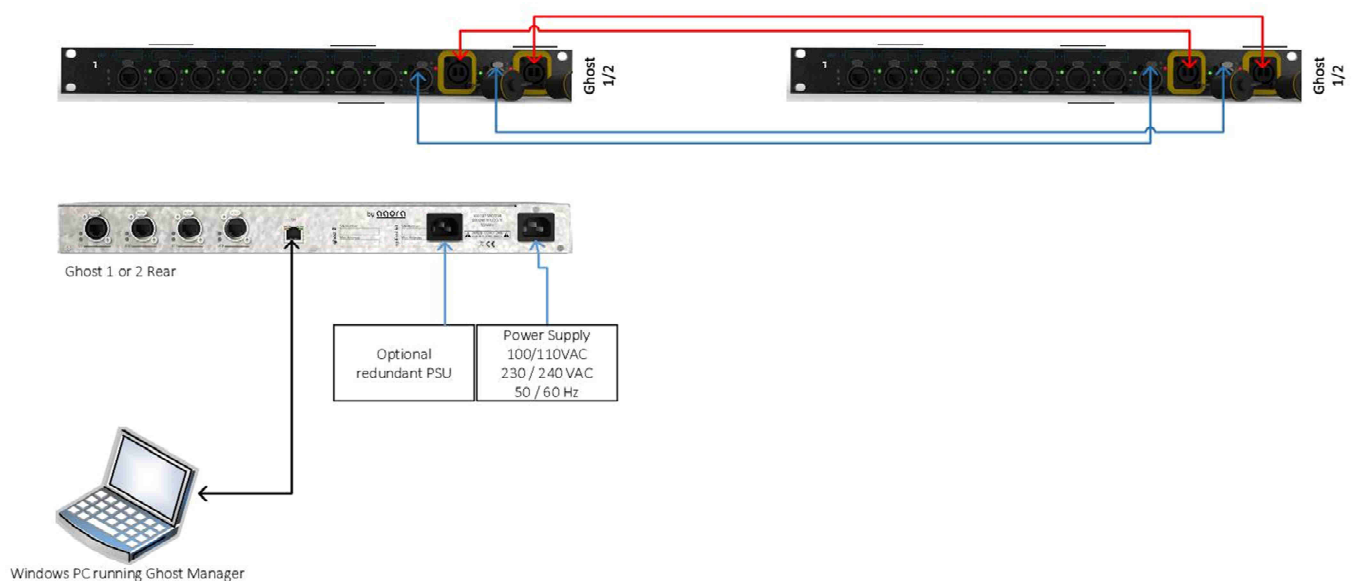
Key points note:

• To control the Ghost network, your PC must be connected exclusively to the control port and a static IP address in the same network with the same subnet mask must be defined on the network adapter by the Windows control panel (read the chapter 4 bellow)
• The Factory delivered Ghost IP address is 192.168.1.201 255.255.255.0. In a first time you must connect your PC running Ghost manager on each engine to give his new IP Address.
• To reconfigure factory IP Address press hold 3 times successively the function button on the front panel
• The Ghost units must be connected by transmit ports to work correctly and be recognized by Ghost Manager Software.
• One link between Ghost units is sufficient to connect them to the Software and transmit data's flows between Units. The 4 supported Transmit ports are dedicated to make Different topologies and redundant links (read Chapter 4 and Appendix C to obtain more information).
• Optical fiber ports must be connected in Single mode OR Multimode. UNDER NO CIRCUMSTANCES A MULTIMODE PORT CAN BE CONNECTED TO A SINGLE MOIDE;

Configure Ghost for the first time.

All the Ghost units' parameters must be defined through the Ghost Manager Software. Please connect your PC to the Ghost system as explained previously to the chapter 1 and produce you to the chapter 5.

Chapter 2: General Information

Thank you for purchasing an Agora GHOS1 / GHOST2 Convergent Network System. The GHOST System is a user-friendly, high-performance, network switch especially designed to meet the requirements of AV IT professional's applications.

Both the GHOST1 GHOST2 units complement each other. The two devices can coexist in the same network topology Your GHOST System was developed by Agora to offer AV professionals high-performance network equipment, designed to provide no-compromise network builder and an easy to use interface to build the most complex networked system in a minimum of time. It represents the most advanced French design and engineering combined with contemporary methods, and will give you many years of reliable service.

All this is backed up, of course, by five years warranty for all materials and accessories.

Please take the time to complete and return the registration card or fill in the Warranty Registration Form online by visiting our website at www.agora-audio.com and, to obtain the best results with a minimum of effort, also read this operator manual.

Finally, enjoy your Agora GHOST Convergent Network System!

About

The Ghost System comprise 3 kinds of units, GHOST1, GHOST2 and GHOSTπ. Each engine provides 12 User ports (8 on the front panel and 4 on the rear panel) fully manageable with the Ghost Manager software. Units can be inter-connected by means of transmit ports available on the Front panel. A RJ45 port on the rear panel is dedicated to the control and monitoring of Ghost System. Each unit supports 2 Gigabit Ethercon™ ports and 2 Gigabit 1000Base LX OpticalCon™ ports in Single mode or Multimode. The units can be equipped in option by a redundant power supply unit.

A Status LED and one Traffic LED is appointed on each port. The eight front panel User ports are appointed of an LCD screen and an ID LED fully manageable in the Ghost Manager Software. The only one differences between GHOST1 and GHOST2 is the speed of User ports and the CPU capacity. Ghost 1 User ports are speeded at a maximum of 100Mbps, GHOST2 User ports can be speeded up at 1000Mbps and GHOSTπ provides Poe+ (IEEE 802.3at) on the twelve User ports. All the Ghost Units can coexist on the same network topology.

Ghost Convergent Network System is dedicated to build and manage easily a multi-protocols secured network for AV IT applications, without specific skills in IT management.

In this Version the tested and approved protocols are:

- Audinate Dante
- Digigram Ethersound 100
- ArtNet
- TCP/IP standard commands for remote and control works

For each Group mode, Vlans and Qos are prepared on each User port according to the recommendation of each manufacturer and/or protocol implementer and tested in a real world experience. Other Protocols are being implemented and will be released in Software updates in a close future.

Key Features

The GHOST has the following key features (for more technical information please refer to the Appendix A and/or to the Datasheets.

- 1U high, 19" rack mount unit.

- Able to manage a convergent network of the most well-known protocols in the AV IT market.

- Ethernet port for remote computer connection (unit configuration and software updating).

- Dedicated software running on Windows OS computers (XP to 10 32/64 bits) with a telnet connection – no driver

- Push "function" button dedicated to the LCD screens management and Unit rapid access.

- 100V-240V universal power supply, 50Hz to 60Hz.

- Firmware and Software Upgrades managed on the same Software.

Ghost firmware and software revisions

This manual is for GHOST1, GHOST2 and GHOSTπ units running host software version 1.0.3.6 and later. An Ethernet Control port is provided on the rear panel to facilitate software updates. To check new software revisions, please visit our website www.agora-audio.com

About this manual

This is the operator manual for the GHOST1, GHOST2 and GHOSTπ Network units and the Ghost Manager software. It is intended to help get your units installed and in operation as quickly as possible by giving you unpacking, installation, connection, configuration and setting up instructions. To help familiarize you with the units, there is a description of the front and rear panels, along with easy-to-follow user instructions. When referring to both GHOST1 and GHOST2 type units you will see "GHOST" Any information applying only to one type of unit will include the name of the unit.

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Ethersound™ is a registered mark of Digigram Company in France and other countries.

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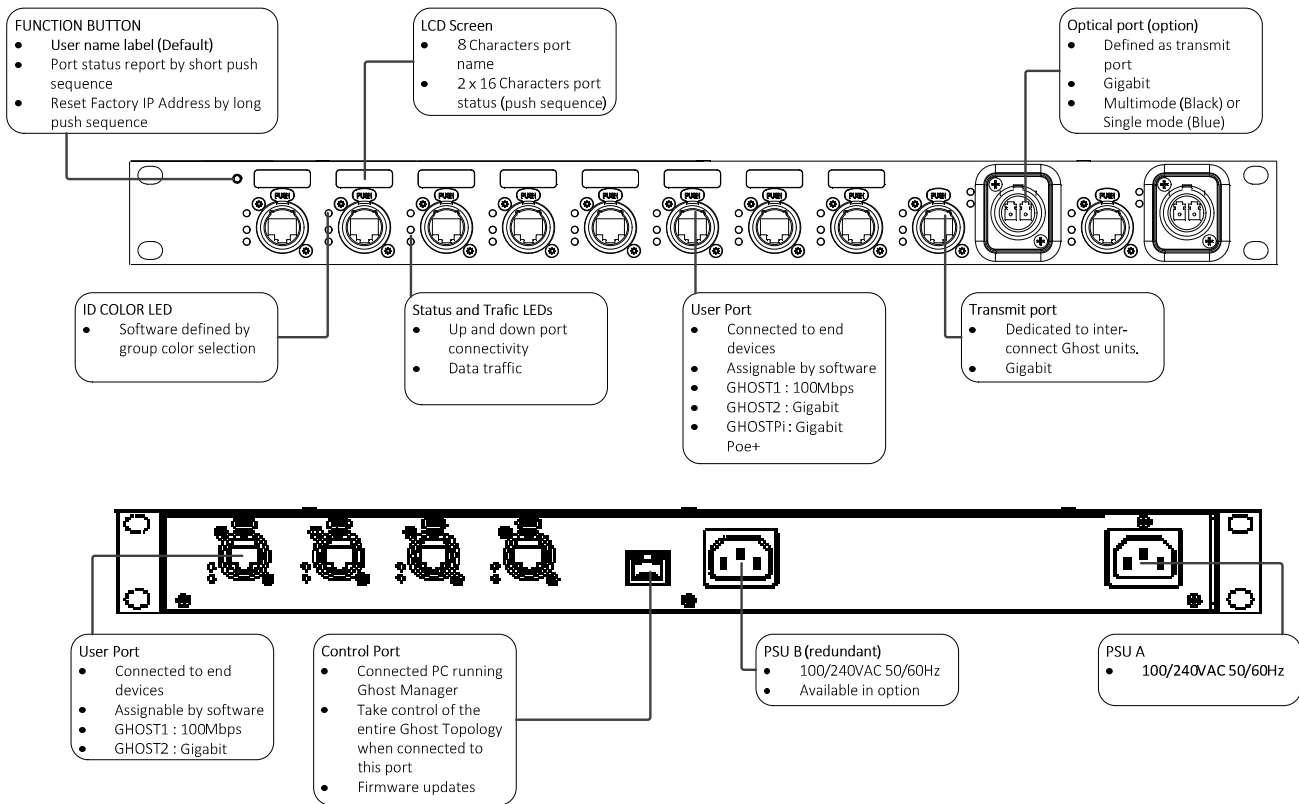
Chapter 3: Front and rear panels

FUNCTION BUTTON
- User name label (Default)
- Port status report by short push sequence
- Reset Factory IP Address by long push sequence

LCD Screen
- 8 Characters port name
- 2 x 16 Characters port status (push sequence)

Optical port (option)
- Defined as transmit port
- Gigabit
- Multimode (Black) or Single mode (Blue)

ID COLOR LED
- Software defined by group color selection

Status and Trafic LEDs
- Up and down port connectivity
- Data traffic

User Port
- Connected to end devices
- Assignable by software
- GHOST1 : 100Mbps
- GHOST2 : Gigabit
- GHOSTPi : Gigabit Poe+

Transmit port
- Dedicated to inter-connect Ghost units.
- Gigabit

User Port
- Connected to end devices
- Assignable by software
- GHOST1 : 100Mbps
- GHOST2 : Gigabit

Control Port
- Connected PC running Ghost Manager
- Take control of the entire Ghost Topology when connected to this port
- Firmware updates

PSU B (redundant)
- 100/240VAC 50/60Hz
- Available in option

PSU A
- 100/240VAC 50/60Hz

Figure 1 : Ghost Front and rear panels

Chapter 4: Configure Ghost with Ghost Manager

This chapter shows you how to configure the GHOST units with the Ghost Manager Software version 1.0.2.1. The revisions and coming features implemented in the next versions will be notified in a release note included in the software compressed folder.

About GHOST Configuration:

The communication between Ghost units and Ghost Manager Software is based on a telnet service. Ghost Manager is the only one software that can be used to configure Ghost. The company disclaims all liability in case of connection of other Telnet sessions on the Ghost Engines and warms the user of the end of warranty support.
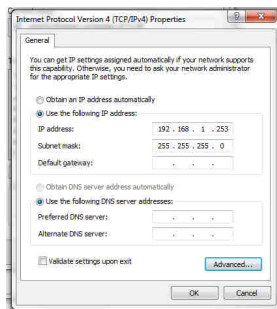
Configure IP address

Ghost control protocol needs to use static IP addresses. The factory IP address of Ghost units has been fixed to 192.168.1.201 255.255.255.0. You'll must define new IP to control multiple units.

1: Set a Static IP Address on your network card

Control Panel / Network / Select the network card connected to the Ghost control port
Right click / properties / TCP/IPv4 / Properties
Define a static IP in the network domain 192.168.1.xxx and a subnet mask as 255.255.255.0

Note you can add a second IP Address to match with the second IP scanning range defined in the Network Address window. To do this click on Advanced button in the previous window
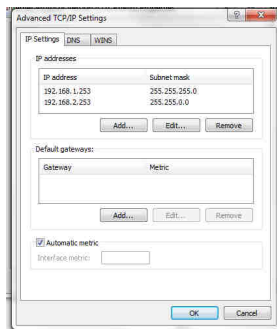
2: Configure the Ghost IP Address by click on the IP of concerned Unit. Change and confirm with Enter. The procedure can be approximatively five seconds. When the procedure finish, the new Address will be displayed on the device screens and the unit will be Re synchronized in the Framework

Note: The Manager IP address must be different as factory IP address

Installing Ghost Manager

Ghost Manager is a executable software (.exe) developed for Windows OS. He's well supported and tested on XP, 7, 8, 8.1, 10 version in 32 and 64 bits. He doesn't need Windows installation

1: Unzip The Ghost Manager Folder on the local disk of computer which run Ghost Manager

2: Open the Software Folder

3: Double click on the installer Setup icon. If an older version is already installed, the Setup program will remove it in a first time. In this case, please redo the installation process a second time to make the new version available

Note: When start Ghost manager application, the firewall window can appear. You must authorize Telnet service in your firewall on the Windows control panel and verify than telnet service is well installed on your computer.

Framework

Framework is the idle screen of Ghost Manager. He resumes all the connected units and builded groups in the design. Some rapid access of units and the Group Adding, deleting and assignment. Group editing is coming soon in the next release.
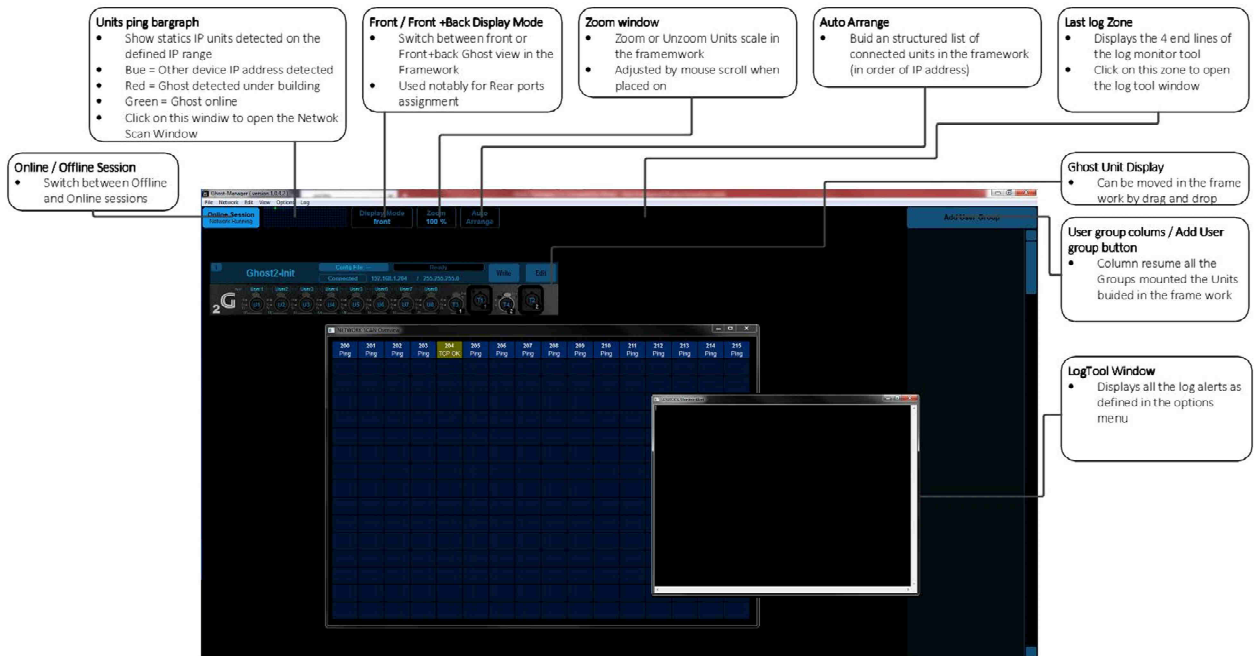
Units ping bargraph
- Show statics IP units detected on the defined IP range
- Bue = Other device IP address detected
- Red = Ghost detected under building
- Green = Ghost online
- Click on this windiw to open the Netwok Scan Window

Online / Offline Session
- Switch between Offline and Online sessions

Front / Front +Back Display Mode
- Switch between front or Front+back Ghost view in the Framework
- Used notably for Rear ports assignment

Zoom window
- Zoom or Unzoom Units scale in the framemwork
- Adjusted by mouse scroll when placed on

Auto Arrange
- Buid an structured list of connected units in the framework (in order of IP address)

Last log Zone
- Displays the 4 end lines of the log monitor tool
- Click on this zone to open the log tool window

Ghost Unit Display
- Can be moved in the frame work by drag and drop

User group colums / Add User group button
- Column resume all the Groups mounted the Units buided in the frame work

LogTool Window
- Displays all the log alerts as defined in the options menu

Figure 2: Ghost Manager Framework

Interface Window

Interface window is the user interface for advanced parameters on the concerned unit opened by clicking on Edit button in the Framework.
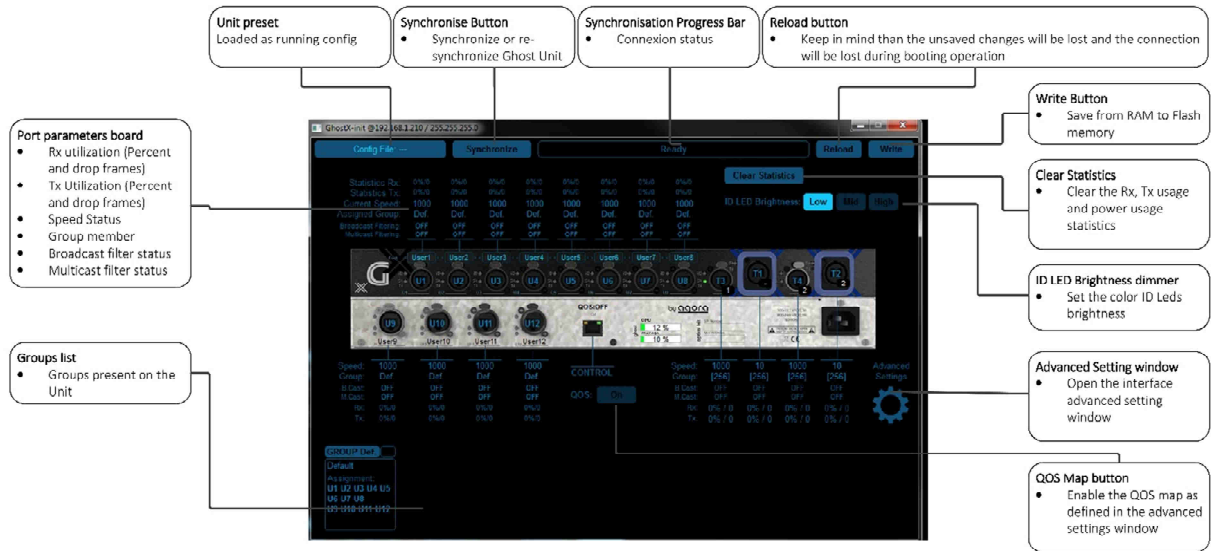

Figure 3: Ghost 2 and GhostPi Interface Windows

Advanced settings window

The advanced settings window gives access to fine service and maintenance parameters. In this version the QOS management is implemented.

Ghost1 / Ghost2 / GhostPi / Ghost X Ethernet gigabit host
User's Manual
Rev 1.7 – 2018 July

Key points note:

- **To be efficient the QOS Map must be turned on**
- **Policy Level assign the packets to a Priority Queue**
- **Queue 4 has the highest level of priority, Queue 1 the lowest**
- **Per Group Mode, the QOS Map helps you to choose the rules of treatment**
- **To be applied to QOS the Group QOS button must be turned On**

Options Menu

The Options menu helps you to configure your session. The options parameters are stored in the session.
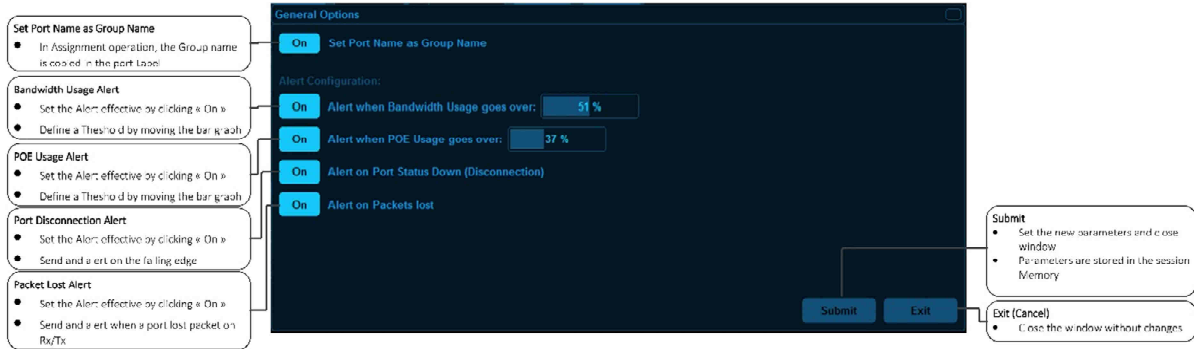
List of Options:

- Set Port Name as Group Name: In Assignment operation, the Group name is copied in the port Label
- Alert bandwidth usage: Set the Bandwidth trigger threshold for an alert in the log file
- Alert POE usage: Set the POE usage trigger threshold for an alert in the log file
- Packets lost Alert: send an alert when a port lost packets on Rx and/or Tx counters
- Disconnection Alert: Send an alert on the Port status falling edge

Group Create and management

Groups are defined as simple Vlans. By Groups we understand, Vlan's, Qos settings according to chosen mode, Identification colors if necessary, Speed and Filtering settings, for all the User ports assigned in the group. Group is the main tool which helps the user to prepare a Protocol based way in the Ghost topology.

Create New Group:

Figure 4:Group Procedure

Groups Inconsistency flags:

Inconsistency alerts have been developed to warm the user of incoherency between unmatched Groups which have identic ID's located on different Units

- M flag points a Group mode inconsistency
- C flag points a Group color inconsistency

Figure 5: Group inconsistency

Key points note:

- To be Managed a group must be created with the Add
- To be shared between several Ghost units, a group must include Transmit ports
- User ports can be only members of a single Group
- Transmit ports can be member of several Groups
- An Inconsistency flagged Group must be deleted and rebuilt or edited and forced

Port Edit Window

The port edit window gives to user an access to User and Transmit Ports advanced parameters. This window pops up by a single click on the port icon in the Unit Interface window. According to the Mode Group defined, modification of some parameters may be access denied.

Figure 6: Port Edit window

Set up a Ghost Manager Session:

To be connected and dialog the Ghost Units with the Ghost Manager Software the Ghost Units must be configured with a static IP Address as the PC running Ghost Manager to. Firstly, define a static IP address for the network adapter connected on Ghost Network through the control port (rear panel). The IP address must be defined in 192.168.1.xxx 255.255.255.0 and the Ghost Units must have different IP address in the same range with the same subnet Mask.

The Ghost Units are delivered with a factory IP Address **192.168.1.201 255.255.255.0. You will must change them device per device before connect your Ghost units.**

To improve the software commands refresh, define a scan range as narrow as possible. Please note however that the change of Ghost IP address is only authorized in this range except if "Allow Out-of-range IP" box is checked.

Define a network scan range:

Go to the menu Network / Network Address to open the Network scan start and stop point's window

- Define the first and the last Address and a second IP range if necessary
- Don't forget to check the Second range box to activate the second scanning range
- Note than the cumulated IP Addresses number in the two ranges can't never be superior to 256.
- Confirm by OK

By clicking on the scan zone open the Network Scan Overview window to get advanced information about you IP plan and the free Address available on the network
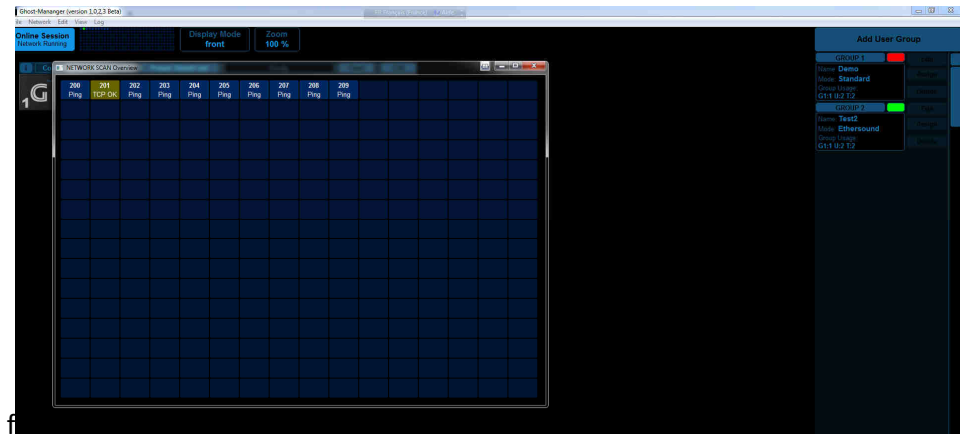
Figure 7: Network Scan Window

On the Rescan Network you'll erase and rebuild Ghost connected Units in the Framework and reset the network scan memory.

Offline sessions

By clicking on the Online / Offline button the Ghost Manager switches to offline mode to create and/or manage different Ghost sessions.

Please see below the principal features of Offline / Online management modes and information's transfer.

Edit/
- Add Ghostxx: Add a Blank Ghost unit in the framework
- Create New Group : equal to Add User group button
- Copy Online Session in Offline session

Matching gauge
- Set the Matching percentage between offline and online units which have the same IP address
- All the parameters which differs between offline and online units ar bolded in orange)

Upload
- Upload offline unit settings in the IP matched online unit

File/
- New session: Create a new session
- Load Session from PC storage
- Save Session to PC storage
- Quit Ghost Manager
- About : Popup splash screen

Key points note:

- **The Units match between Offline and Online is defined by IP Addresses**
- **The unmatched parameters are bolded in orange in the offline mode**
- **The Units and the groups are parts of a session**
- **An offline session must be Uploaded in physical units by matching of Ip addresses and clicking on the Upload button unit per unit**

Chapter 5: Service and maintenance information

Restoring the Factory IP Address

By pressing hold 3 times on the Function button the Ghost unit IP address will be reset to factory 192.168.1.201 255.255.255.0

- First push: display the Unit IP Address
- Second push: invite to reset
- Third push: Confirm

Note that after a manual reset, a new device will be reconstructed in the Ghost Manager Framework. The old address will be available again after a Rescan Network

Routine Maintenance

To help keep your GHOST unit in good working order and to make sure it gives you optimum performance, we recommend that you carry out the following at monthly intervals:

• Clean the unit (see "Cleaning" below).

• Check the controls for freedom of operation.

• Check the functionality of all controls, that is, control knobs, pushbuttons and LEDs.

You can carry out a visual check of all illuminated items (LEDs etc.) by switching the unit off and then on again, as they should all illuminate during power up.

• Check the functionality of the equipment.

Cleaning

Switch off the unit and electrically isolate it from the mains *before* cleaning. Clean the GHOST device using a dry, lint-free cloth. Do not use harsh abrasives or solvents. When cleaning the unit, take great care not to damage control knobs, pushbuttons etc.

To clean the LCD screen, wipe it carefully with a soft, lint-free cloth using ethanoic liquid, such as a screen cleaner for LCDs, or by using a screen wipe specially designed for the purpose. When cleaning the LCD screen, please take the following precautions:

• Don't use harsh abrasives, such as paper towels.

• Don't apply liquids directly to the screen.

• Don't use ammonia-based cleaners and solvents, such as acetone.

Appendix A: Technical Specifications

DATASHEET_EN

GHOST — Convergent Network System

GHOST Gigabit ethernet host — **G¹**

OVERVIEW

Ghost is a gigabit platform mounted in a 19'' 1U rack box dedicated to the multiplexing, transport and monitoring of true Ethernet broadcast signals. Ghost integrates a layer 2 programmable switch motherboard, an interface and control front panel board and an extended 120/230 VAC 50/60Hz power supply. Ghost offers a multi services platform to create and manage easily the most complex networks without specific skills in IT technologies. Ghost manager is the dedicated software specially developed for touring and live application. Ghost Manager can manage instantly up to 200 devices connected to the network from a Windows xp to 10 OS PC connected on one device. Ghost networks are fully independents of any protocol and perfectly versatile for each drive data. Ghost systems can be defined like a broadcast medias highway where every kind of vehicle can run freely and firstly on his dedicated part without global traffic jams.

PRINCIPAL FEATURES

- 12 Ethercon® 10/100 Mbps ports fully independents and assignable.
- 99 Groups can be managed at once.
- 2 Ethercon® 1000 Mbps ports for Ghost linking or User port.
- 2 Opticalcon® Duo 1000 Mbps for Ghost linking.
- Available in single-mode and multi-mode versions.
- 1 x 8 characters LCD screen on each front assignable port.
- Status and traffic LEDS for remote of each ports.
- ID Led on each user port.
- 1 RJ45 plug on the back panel for monitoring and control.
- Bus, ring, star and hybrid topologies available.
- Ghost Manager software included in the package on an USB stick.
- Redundant power supply is available in option.

COMPATIBLE PROTOCOLS

The list below states at present tested and certified protocols. It can change in the future without hardware modifications. Firmware updates will be released from our web site.

- Ethersound™
- Dante
- Cobranet®
- Artnet
- TCP/IP remote netwoks

CobraNet · **Ether ES Sound 100** · **ARTNET ETHERNET** · **Dante™**

APPLICATIONS

Live and touring:
- Live events and concerts
- Live broadcast
- Public address
- TV and Radio itinerant projects

Fixed installations:
- Stadiums and sport venues
- Museums, theme parks and entertainment venues
- Theatres
- Music and shows venues
- Corporate boardrooms and buildings.

Broadcast and studios:
- Radio and TV Studios
- OB Vans
- Data centers

Others:
- Multi medias broadcasting

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Ghost1 / Ghost2 / GhostPi / Ghost X Ethernet gigabit host
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Rev 1.7 – 2018 July

TECHNICAL SPECIFICATIONS

GENERAL

Size W x D x H (mm)	442 x 300 x 44.5
Weight	3 Kg
Power Consumption	120-127 VAC/0,3 A 200-240 VAC/0,2 A
Power Supply	120 / 230 VAC 50/60Hz
Storage temp. / Humidity	-40° - 70° / 15-90% without condensation
Operating temp. / Humidity	0° - 45° / 15-95% without condensation

CONNECTIVITY AND INTERFACE

Front Panel	12 x 10Base-T/100Base-TX Ethercon ports 2 x 10Base-T/100Base-TX/1000Base-T Ethercon® ports 2 x 10Base-T/100Base-TX/1000Base-T OpticalCon® Duo ports 8 x 8 caracters LCD sceens 3 Leds (Status, traffic, ID) on each Ethercon® port 2 Leds (Tx Rx) on each OpticalCon® port 1 x Configuration function switch
Rear Panel	4 x 10Base-T/100Base-TX 1 x Remote and control RJ45 1 x Power Cord
Software	Telnet protocols for up to 100 devices connected Offline editor mode Service and maintenance window

PROCESSING

Motherboard	1 x ARM9E : 800 MHz 256 Mo – DDR3 SDRAM 128 Mo Flash Memory Data flow : 9.5 Mbps
Network	99 x Groups available 16000 MAC Address capacity. Power Over Ethernet IEEE802.3at IEEE 802.1p traffic priority

PACKAGE AND WARRANTY

Package includes	1 x Ghost1 engine 1 x Power cord IEC13 Lock 1 x Start configuration guide 1 x USB key with Software, firmware and owner's documents 1 x Warranty card
Warranty	5 years parts and service

Pictures and features are not contractual. Product specifications can be modified without prior notification.

GHOST
Convergent Network System

GHOST
Gigabit ethernet host

G²

OVERVIEW

Ghost is a gigabit platform mounted in a 19" 1U rack box dedicated to the multiplexing, transport and monitoring of true Ethernet broadcast signals. Ghost integrates a layer 2 programmable switch motherboard, an interface and control front panel board and an extended 120/230 VAC 50/60Hz power supply. Ghost offers a multi services platform to create and manage easily the most complex networks without specific skills in IT technologies. Ghost manager is the dedicated software specially developed for touring and live application. Ghost Manager can manage instantly up to 200 devices connected to the network from a Windows xp to 10 OS PC connected on one device. Ghost networks are fully independents of any protocol and perfectly versatile for each drive data. Ghost systems can be defined like a broadcast medias highway where every kind of vehicle can run freely and firstly on his dedicated part without global traffic jams.

PRINCIPAL FEATURES

- 12 Ethercon® 10/100/1000 Mbps ports fully independents and assignable.
- 99 Groups can be managed at once.
- 2 Ethercon® 1000 Mbps ports for Ghost linking.
- 2 Opticalcon® Duo 1000 Mbps for Ghost linking.
- Available in single-mode and multi-mode versions.
- 1 x 8 characters LCD screen on each front assignable port.
- Status and traffic LEDS for remote of each ports.
- ID Led on each user port.
- 1 RJ45 plug on the back panel for monitoring and control.
- Bus, ring, star and hybrid topologies available.
- Ghost Manager software included in the package on an USB stick.
- Redundant power supply is available in option.

COMPATIBLE PROTOCOLS

The list below states at present tested and certified protocols. It can change in the future without hardware modifications. Firmware updates will be released from our web site.

- Ethersound™
- Dante
- Cobranet®
- Artnet
- TCP/IP remote netwoks
- HDBaseT

CobraNet | **EtherES Sound 100** | **ART NET ETHERNET** | **◢Dante™**

APPLICATIONS

Live and touring:
- Live events and concerts
- Live broadcast
- Public address
- TV and Radio itinerant projects

Fixed installations:
- Stadiums and sport venues
- Museums, theme parks and entertainment venues
- Theatres
- Music and shows venues
- Corporate boardrooms and buildings.

Broadcast and studios:
- Radio and TV Studios
- OB Vans
- Data centers

Others:
- Multi medias broadcasting

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Rev 1.7 – 2018 July

TECHNICAL SPECIFICATIONS

G²

GENERAL

Size W x D x H (mm)	442 x 300 x 44.5
Weight	3 Kg
Power Consumption	120-127 VAC/0,6 A 200-240 VAC/0,37 A
Power Supply	120 / 230 VAC 50/60Hz
Storage temp. / Humidity	-40° - 70° / 15-90% without condensation
Operating temp. / Humidity	0° - 45° / 15-95% without condensation

CONNECTIVITY AND INTERFACE

Front Panel	12 x 10Base-T/100Base-TX/1000Base-T Ethercon ports 2 x 10Base-T/100Base-TX/1000Base-T Ethercon® ports 2 x 10Base-T/100Base-TX/1000Base-T OpticalCon® Duo ports 8 x 8 caracters LCD sceens 3 Leds (Status, traffic, ID) on each Ethercon® port 2 Leds (Tx Rx) on each OpticalCon® port 1 x Configuration function switch
Rear Panel	4 x 10Base-T/100Base-TX /1000Base-T ports Ethercon 1 x remote and control RJ45 1 x Power Cord
Software	Telnet protocols for up to 100 devices connected Offline editor mode Service and maintenance window

PROCESSING

Motherboard	1 x ARM9E : 800 MHz 256 Mo – DDR3 SDRAM 128 Mo Flash Memory Data flow : 41.6 Mbps
Network	99 x Groups available 16000 MAC Address capacity. Power Over Ethernet IEEE802.3at IEEE 802.1p traffic priority

PACKAGE AND WARRANTY

Package includes	1 x Ghost2 engine 1 x Power cord IEC13 Lock 1 x Start configuration guide 1 x USB key with Software, firmware and owner's documents 1 x Warranty card
Warranty	5 years parts and service

Pictures and features are not contractual. Product specifications can be modified without prior notification.

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GHOST
Gigabit ethernet host

GHOST
Convergent Network System

G π

OVERVIEW

Ghost is a gigabit platform mounted in a 19" 1U rack box dedicated to the multiplexing, transport and monitoring of true Ethernet broadcast signals. Ghost integrates a layer 2 programmable switch motherboard, an interface and control front panel board and an extended 120/230 VAC 50/60Hz power supply. Ghost offers a multi services platform to create and manage easily the most complex networks without specific skills in IT technologies. Ghost manager is the dedicated software specially developed for touring and live application. Ghost Manager can manage instantly up to 200 devices connected to the network from a Windows xp to 10 OS PC connected on one device. Ghost networks are fully independents of any protocol and perfectly versatile for each drive data. Ghost systems can be defined like a broadcast medias highway where every kind of vehicle can run freely and firstly on his dedicated part without global traffic jams.

PRINCIPAL FEATURES

- 12 PoE+ powered Ethercon® 10/100/1000 Mbps ports fully independents and assignable.
- 99 Groups can be managed at once.
- 2 Ethercon® 1000 Mbps ports for Ghost linking or User port.
- 2 Opticalcon® Duo 1000 Mbps for Ghost linking (OPTION).
- Available in single-mode and multi-mode versions.
- 1 x 8 characters LCD screen on each front assignable port.
- Status and traffic LEDS for remote of each ports.
- ID Led on each user port.
- 1 RJ45 plug on the back panel for monitoring and control.
- Bus, ring, star and hybrid topologies available.
- Ghost Manager software included in the package on an USB stick.
- Redundant PoE+ 195 W power supply is available in option.

COMPATIBLE PROTOCOLS

The list below states at present tested and certified protocols. It can change in the future without hardware modifications. Firmware updates will be released from our web site.

- Ethersound™
- Dante
- Cobranet®
- Artnet
- TCP/IP remote networks

CobraNet   EtherES Sound 100   ART NET ETHERNET   Dante™   PoE+ Power Over Ethernet

APPLICATIONS

Live and touring:
- Live events and concerts
- Live broadcast
- Public address
- TV and Radio itinerant projects

Fixed installations:
- Stadiums and sport venues
- Museums, theme parks and entertainment venues
- Theatres
- Music and shows venues
- Corporate boardrooms and buildings.

Broadcast and studios:
- Radio and TV Studios
- OB Vans
- Data centers

Others:
- Multi medias broadcasting

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Rev 1.7 – 2018 July

SPÉCIFICATIONS TECHNIQUES G π

GÉNÉRAL

Size W x D x H (mm)	442 x 481 x 44.5
Weight (without options)	4.05 kg
Power Consumption	100-127 VAC / 3.2 A 200-240 VAC / 1.6 A
Power Supply	120/230 VAC 50/60 Hz
Idle power*	25.2 W
PoE power available**	195 W
Allocated power (per port)**	1-33 W
Maximum power rating***	247 W
Storage temperature / Humidity	-40° to - 70° / 15 to 90% with condensation
Operating temperature / Humidity	0° to 45° / 15 to 95% with condensation
Altitude	Up to 10000 ft (3 km)
Acoustic	43.9 dB

* Idle power is the actual power consumption of the device with no ports connected.
** PoE power is the total power budget available to all PoE ports.
*** Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated.

CONNECTIVITY AND INTERFACE

Front Panel	8 x 10 Base-T / 100 Base-TX / 1000 Base-T Ethercon PoE+ ports 2 x 10 Base-T / 100 Base-TX / 1000 Base-T Ethercon® ports 2 x 10 Base-T / 100 Base-TX / 1000 Base-T OpticalCon® Duo ports 8 x 8 caracters LCD sceens 3 leds (Status, traffic, ID) on each Ethercon® port 2 leds (Tx Rx) on each OpticalCon® port 1 x configuration and navigation function switch
Rear Panel	4 x 10 Base-T / 100 Base-TX / 1000 Base-T Ethercon PoE+ ports 1 x remote and control RJ45 port 1 x Power Cord
Software	Telnet protocols for up to 100 devices connected Offline editor mode Service and maintenance window

TRAITEMENT ET CALCUL

Motherboard	1 x ARM9E: 800 MHz 256 Mo - DDR3 SDRAM 128 Mo Flash Memory Data flow: up to 41.6 Mpps Switching capacity: 56 Gb/s Memory Flash: 128 Mo
Network	99 x Groups available 16000 MAC Address capacity Power Over Ethernet IEEE802.3at IEEE 802.1p traffic priority

PACKAGE AND WARRANTY

Package includes	1 x Ghost π engine 1 x Power cord IEC13 Lock 1 x Start configuration guide 1 x USB key with Software, firmware and owner's documents
Warranty	5 years parts and service

Pictures and features are not contractual. Product specifications can be modified without prior notification.

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GHOST
Gigabit ethernet host G^X

Convergent Network System

OVERVIEW

Ghost is a gigabit platform mounted in a 19" 1U rack box dedicated to the multiplexing, transport and monitoring of true Ethernet broadcast signals. Ghost integrate a layer 2 programmable switch motherboard, an interface and control front panel board and an extended 120/230 VAC 50/60Hz power supply. Ghost offers a multi services platform to create and manage easily the most complex networks without specific skills in IT technologies. Ghost manager is the dedicated software specially developed for touring and live application. Ghost Manager can manage instantly up to 200 devices connected to the network from a Windows xp to 10 OS PC connected on one device. Ghost networks are fully independents of any protocol and perfectly versatile for each drive data. Ghost systems can be defined like a broadcast medias highway where every kind of vehicle can run freely and firstly on his dedicated part without global traffic jams.

PRINCIPAL FEATURES

- 12 powered Ethercon® 10/100 /1000Mbps ports fully independents and assignable.
- 99 Groups can be managed at once.
- 2 Ethercon® 1000 Mbps ports for Ghost linking.
- 2 Opticalcon® Duo 1000 / 10 000 Mbps for Ghost linking.
- Available in single-mode and multi-mode versions.
- 1 x 8 characters LCD screen on each front assignable port.
- Status and traffic LEDS for remote of each ports.
- ID Led on each user port.
- 1 RJ45 plug on the back panel for monitoring and control.
- Bus, ring, star and hybrid topologies available.
- Ghost Manager software included in the package on an USB stick.
- Redundant Power Supply Unit.

COMPATIBLE PROTOCOLS

The list below states at present tested and certified protocols. She can change in the future without hardware modifications. Firmware updates will be released from our web site.

- Ethersound™
- Dante
- AES 67
- Cobranet®
- Artnet
- TCP/IP remote netwoks

CobraNet Ether ES Sound 100 ART NET ETHERNET Dante™ AUDIO AES AES67

APPLICATIONS

Live and touring:
- Live events and concerts
- Live broadcast
- Public address
- TV and Radio itinerant projects

Fixed installations:
- Stadiums and sport venues
- Museums, theme parks and entertainment venues
- Theatres
- Music and shows venues
- Corporate boardrooms and buildings

Broadcast and studios:
- Radio and TV Studios
- OB Vans
- Data centers

Others:
- Multi medias broadcasting

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User's Manual
Rev 1.7 – 2018 July

TECHNICAL SPECIFICATIONS

GENERAL

Size W x D x H (mm)	442 x 300 x 44.5
Weight	3.5 Kg
Power Consumption	100-127 VAC/0.7 A 200-240 VAC/0.5 A
Power Supply	120/230 VAC 50/60 Hz
Idle Power*	20.5 W
Maximum Power rating**	31 W
Storage temp. / Humidity	-40 -70°C / 15-90% without condensation
Operating temp. / Humidity	0-45°C / 15-95% without condensation
Altitude	Up to 10000ft (3 km)
Acoustic	22.3 dB

CONNECTIVITY AND INTERFACE

Front Panel	8 x 10 Base-T/100Base-TX /1000 Base-T Ethercon PoE+ ports 2 x 10 Base-T/100 Base-TX/1000 Base-T Ethercon® ports 2 x 10 Base-T/100 Base-TX/1000 Base-T / 10 000 Base-T OpticalCon® Duo ports 8 x 8 caracters LCD sceens 3 leds (Status, traffic, ID) on each Ethercon® port 2 leds (Tx Rx) on each OpticalCon® port 1 x configuration and navigation function switch
Rear Panel	4 x 10 Base-T/100 Base-TX /1000 Base-T Ethercon PoE+ ports 1 x remote and control RJ45 port 1 x Power Cord
Software	Telnet protocols for up to 100 devices connected Offline editor mode Service and maintenance window

PROCESSING

Motherboard	1 x ARM9E: 800 MHz 256 Mo – DDR3 SDRAM Memory Flash: 128 Mo Data flow: up to 65.4 Mpps Switching capacity: 88 Gb/s
Network	99 x Groups available 16000 MAC Address capacity. IEEE 802.1p traffic priority Power Over Ethernet IEEE802.3at

PACKAGE AND WARRANTY

Package includes	1 x Ghost X engine 1 x Power cord IEC13 Lock 1 x Start configuration guide 1 x USB key with Software, firmware and owner's documents 1 x Warranty card
Warranty	5 years parts and service

* Idle power is the actual power consumption of the device with no ports connected.
** Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. PoE power is the total power budget available to all PoE ports.
Pictures and features are not contractual. Product specifications can be modified without prior notification.

Appendix A (b): Ghost Options technical specifications

OPTK-MM

The Multi-mode Optical Kit optionally installed in GHOST series is a class 1 laser certified for 1000Mbps over 550m.

The Multi-mode Optical kit includes:

- 2 SFP-SX-MM-H 1.25G 850nm transceivers
- 2 OM3 duplex patch cords
- 2 Neutrik OpticalCon™ duo sockets

OPTK-SM

The Single Mode Optical Kit optionally installed in GHOST Series is a class 1 laser certified to 1000Mbps over 10Kms.

The Single Mode Optical kit includes:

- 2 SFP-LX-SM-H 1.25G 1310nm transceivers
- 2 Single mode 9/125 duplex patch cords
- **2 Neutrik OpticalCon™ duo sockets**

OPTK-MMX

The Multi-mode Optical kit installed in Ghost X Series is a class 1 laser SFP+ transceiver certified for 10 000 Mbps over 300 meters

OPTK-SMX

The Single-mode Optical kit installed in Ghost X Series is a class 1 laser SFP+ transceiver certified for 10 000 Mbps over 10 Kms

RPSKT (G1,G2) / RPOEKT (Gπ) / RPSKTX (GX)

The redundant power supply delivers a highly secured power saving strategy.

The Redundant Power Supply Kit includes:

- 1 power supply identic
- 1 redundant Diod card to host the two power supplies and delivers a secured output regulated power
- 1 IEC13 sockets
- 1 cable kit

All the options are mounted in factory on order. Any option ordered individually will require the return of materials for mounting operations.

WARRANTY CARD

Send this copy to: AGORA SAS – 16, rue Alfred Nobel – 86000 POITIERS FRANCE

Product Model Number:………………………………………………………………………………………………

Date of Purchase:…………………………………………………………………………………………………..

Supplier:……

Print Name:……..

Address:………...

E-mail:………

My signature below acknowledges that I have read, fully understand, and accept this limited warranty agreement.

Signature:…………………………………………………………………………………………. Date:…………………

Must return within days of purchase with copy of dated register receipt.

Please make a copy for yourself, and mail to: support@agora-audio.com