

Support Handbook

Network architecture for connecting multiservice networks NEO systems



NEO

Reference: **Network**

1 INTRODUCTION

This document describes the specification of network for interconnecting systems NEO distributed indifferent groups call islands. The network architecture will therefore depend on the number of master devices NEO-8060 containing a system. When there are more than two units, we call these multi-site or multi-island systems.

2 SYSTEM DEVICES. ETX-1 MODULE

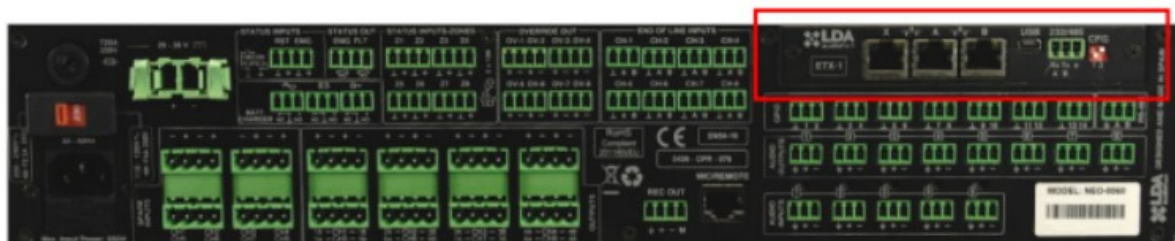
NEO systems and ZES-22 matrices equipment use a communication module called ETX-1. It is a switch capable of managing two internal network cards, one for data and one for control audio data:

This module is configured as a single unit at level 3, but as two network cards level 2. Therefore, each NEO series unit in the system should be considered as a unit with two MAC addresses (one per network card) but a unique IP address.

The module allows multiple connection modes, depending on the network topology used. Typically integration the marked 'X' port in Flexnet mode is used. This mode allows the audio data communication and control through the same port as encapsulated VLANs (802,1q).

Computers are configured with VLAN ID 1 for control and VLAN 2 for audio by default.

For more information, seen matrix user manual ([LDA ZES22 – user's manual](#)) and NEO Systems ([LDA NEO8060 – user's manual](#)).



The module consists of three ports (X, A and B) that can be configured for control data and / or audio data. This will depend on the DIP switch CFG according to the following table:

Marca	Descripción	Activación
CFG	Puerto A Datos de control Puerto B Datos de audio Puerto X Flexnet**	Posición 00 
CFG	Puerto A Flexnet** Puerto B* Flexnet** Puerto X Datos de control	Posición 01 
CFG	Puerto A Flexnet** Puerto B* Flexnet** Puerto X Datos de audio	Posición 10 
CFG	Puerto A Flexnet** Puerto B* Flexnet** Puerto X Flexnet**	Posición 11 

* In the case of NEO-8060, the port B is usually in standby modes 01, 10 and 11 to prevent storm in Flexnet loop. This decision will only be open when a problem appears with other devices on the network.

** *FlexNet mode*: VLAN ID 1 for control data + VLAN ID 2 for audio data: FlexNet mode. The ID number for the VLAN will be 1 and 2 by default, but it will be possible to configure the software.

Therefore, the ports of this switch can be configured in:

- Trunk mode for visibility to both control data and audio data.
- Untagged mode, to have visibilidad to a single VLAN on each port

3 VLANs ESPEFCIFICATIONS AND PROOCOLS

The necessary network configuration for evacuation system consists of two extended VLANs by the system to all teams that comprise LDA.

These networks should be **transparent**, allowing **Broadcast and multicast ethernet communication** between its ends.

For this purpose systems MPLS routing type or similar may be used, depending on the multiservice network topology used .

VLAN control data operates at level 3 unicast and broadcast and does not require activation of any especific protocol:

- "Spanning Tree Protocol" (STP) is not required to be activated, the ports of the NEO units are managed to prevent the loop existence.
- "Internet Group Management Protocol" (IGMP): This multicast stream protocol must not be activated.

3.1 VLAN AUDIO

The CobraNet protocol operates on the data link layer, also known as 2º level OSI layer or link layer. It uses four types of packages.

All CobraNet packets are differentiated by a unique identifier Ethernet (0x8819) protocol assigned to Cirrus Logic. As CobraNet technology is a local area network (LAN) technology rather wide area network (WAN), do not use the Internet Protocol (IP) to transport audio.

Packets are multicast with MAC destination 01: 60: 2b .. and must reach all computers on the network, it is necessary to have enabled this kind of traffic.

3.2 VLAN CONTROL

Control data traffic mainly use UDP protocol. Depending on the type of communications unicast or broadcast addressing is used, so it should be left enabled this type of traffic within the virtual local network.

3.3 BANDWIDTH

- VLAN audio: Maximum usable bandwidth 100Mbit / s
- VLAN control. Maximum bandwidth 10 Mbit / s.

3.4 PACKET SIZE. MTU

The maximum size that can contain the data packet (MTU) will always be below 1,500 bytes.

3.5 QOS

Quality of service requirements for proper audio transmission:

- <250 us. Maximum delay synchronization packet variation. MAC address: 01: 60: 2b: ff: ff 01
- <500us-1ms. Maximum end to end latency.

In systems where these specifications can not be met, should consider using other topologies where ensure these parameters.

4 NETWORK TOPOLOGY

4.1 "FLEXNET" SYSTEM

The configuration that requires fewer ethernet multiservice network ports host is described.

In the typical configuration each NEO system uses a local ring for connection between computers NEO and NEO Extension Master. This loop allows you to always have a redundant link facin a possible link failure.

For the connection of these systems within a larger system the ethernet 'X' port is used as described in the next chapter. Summarizing:

- Each NEO an ethernet system (1) port is required.
- For each team ZES an ethernet port (1) is required.

4.2 *SETTING UP ACCESS*

The computers could connect to Ethernet ports that belong to an independent LAN or a VLAN configuration is performed only in the multiservice network.

This system has the disadvantage of requiring two (2) connection ports for each NEO system and 2 connection ports for each ZES installed equipment.

In this case two independent local area networks or two extended VLANs with the same requirements described above need to be configured. For this, it is modified by the DIP switch CFG located in the communications module ETX-1 (see previous paragraphs).

Mode access (two separate networks), it is recommended that you connect the audio network in the master NEO-8060 computer, and network connection control data in one of the free ports from NEO extensions amplifiers.

In certain multi-site systems, it may be necessary to establish the private mode in the communications module to prevent traffic from all subsystems (sites) reaches all network points. In this case, the audio packets (do not affect control) sent via the CobraNet network each subsystem, only reach the FlexNet ports connected to the master computer equipment, and not the rest.

Similarly, it may be necessary to establish a prioirty to the master conductor (priority driver) to indicate that traffic should be managed by a specific equipments. The highest priority (lower number) must be set on the central master controller. If all equipment have the same priority, restarting the network ports could set the driver on another computer (not controlled).

5 SETTING NETWORK PORTS

As discussed in previous sections, the ports of the computers can manage different VLANs. They can establish the management of each as follows (default VLAN 1 corresponds to control data and VLAN 2 is used for data digital) audio:

- **Control Ports:** must be untagged access mode (untagged) link to VLAN 1, and not be a member of VLAN 2.
- **Digital audio port:** must be untagged access mode (untagged) link to VLAN 2, and not be a member of VLAN 1.
- **Puerto FlexNet:** They are labeled in trunked (trunk) to VLAN1 and 2. Both VLANs must be tagged mode.

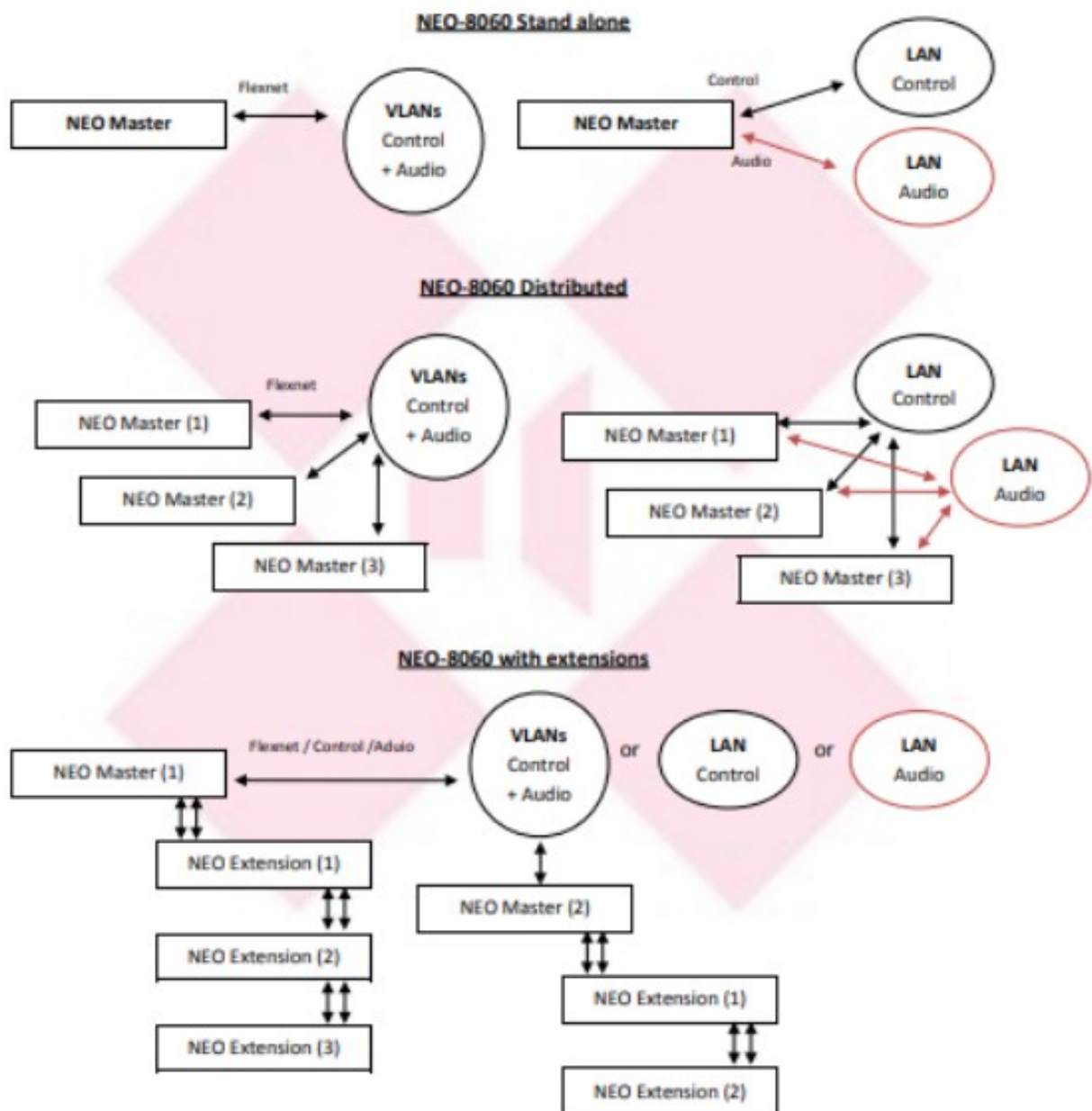
Example:

In a PA / VA system with a ZES-22 matrix, a server and two extensions NEO amplifiers ports must be connected:

- Connects the "A" port of ZES-22 matrix in a Flexnet switch port ([see LDA ZES22 - user manual](#)). Set the correct position of the DIP switch CFG, it should be DATA + AUDIO (down-up position) mode.
- Connect the "Ethernet" port on the server on port control switch.
- Extensions connect NEO and equipment including using the "A" ports and "B" ([see LDA NEO8060 - user's manual](#) Y [Link & unlink NEO with Extensions](#)).
- Connect the "X" port NEO in the FlexNet port switch ([see LDA NEO8060 - user's manual](#)). It is necessary to set the DIP switch CFG in the correct position, that must be in FLEXNET mode (up-up position).

6 CONNECTION DIAGRAM

See attached the block diagram of typical network connections between NEO Series equipments for "FLEXNET" access mode and flat access mode:



For more information, please, contact with our Support Department at:

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