



User's Manual

DASnet

DASNET-RACK99-230-ETH



Antes de utilizar el equipo, lea la sección "Precauciones de seguridad" de este manual. Conserve este manual para futuras consultas.

Before operating the device, please read the "Safety precautions" section of this manual. Retain this manual for future reference.

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Caja de distribución para DASnet / DASnet Splitter

El signo de exclamación dentro de un triángulo indica la existencia de importantes instrucciones de operación y mantenimiento en la documentación que acompaña al producto. Conserve y lea todas estas instrucciones. Siga las advertencias. **ATENCIÓN:** Es un producto clase A, por lo que en entornos domésticos puede causar radio-interferencias, en cuyo caso el usuario tendrá que tomar las medidas oportunas. De acuerdo con EN55103-2, usar el equipo sólo en entornos E1, E2, E3 ó E4.



The exclamation point inside an equilateral triangle is intended to alert the users to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product. Heed all warnings. Follow all instructions. Keep these instructions.

WARNING: This is a class A product. In a domestic environment this product may cause radio interferences in which case the user may be required to take adequate measures.

Use this product only in E1, E2, E3 or E4 environments according to EN55103-2.

Do not remove mains connector ground, it is dangerous and illegal. Class I device. The product must be connected to a mains socket outlet with protective earth connection. Only use this equipment with an appropriate mains cord for your country.

No desconecte la tierra en el conector de alimentación pues es peligroso e ilegal. Equipo de Clase I. El producto debe ser conectado a un enchufe con toma de tierra. Sólo use este equipo con el cable de red de alimentación adecuado para su país.

El signo del rayo con la punta de flecha, alerta contra la presencia de voltajes peligrosos no aislados. Para reducir el riesgo de choque eléctrico, no retire la cubierta.



The lightning and arrowhead symbol warns about the presence of uninsulated dangerous voltage. To reduce the risk of electric shock, do not remove the cover.

No instale el aparato cerca de ninguna fuente de calor como radiadores, estufas u otros aparatos que produzcan calor. Debe instalarse siempre sin bloquear la libre circulación de aire por las aletas del radiador.

Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus that produce heat. The circulation of air through the heatsink must not be blocked.

No exponga este equipo a la lluvia o humedad sin el protector de lluvia recomendado. No exponga el equipo a salpicaduras sin el protector de lluvia recomendado, ni coloque sobre él objetos que contengan líquidos, tales como vasos y botellas.

Do not expose this device to rain or moisture without the rain protector supplied. Do not place any objects containing liquids, such as bottles or glasses, on the top of the unit. Do not splash liquids on the unit without the rain protector supplied.

Este símbolo indica que el presente producto no puede ser tratado como residuo doméstico normal, sino que debe entregarse en el correspondiente punto de recogida de equipos eléctricos y electrónicos.



This symbol on the product indicates that this product should not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment.

Equipo diseñado para funcionar entre 15°C y 45°C con una humedad relativa máxima del 95%, con un rango de $\pm 10\%$ de la tensión nominal de alimentación indicada en la etiqueta.

Working temperature ranges from 15°C to 45°C with a relative humidity of 95%, with $\pm 10\%$ of the rated main voltage value indicated on the label.

El cableado exterior conectado al equipo requiere de su instalación por una persona instruida o el uso de cables flexibles ya preparados.

The outer wiring connected to the device requires installation by an instructed person or the use of a flexible cable already prepared.

Si el aparato es conectado permanentemente, la instalación eléctrica del edificio debe incorporar un interruptor multipolar con separación de contacto de al menos 3mm en cada polo.

If the apparatus is connected permanently, the electrical system of the building must incorporate a multipolar switch with a separation of contact of at least 3mm in each pole.

Para desconectar el dispositivo debe usar el enchufe. Desconecte este aparato durante tormentas eléctricas, terremotos o cuando no se vaya a emplear durante largos periodos.

To disconnect the device, you should use the mains plug. Unplug this apparatus during lightning storms, earthquakes or when unused for long periods of time.

No existen partes ajustables por el usuario en el interior de este equipo. Cualquier operación de mantenimiento o reparación debe ser realizada por personal cualificado. Es necesario el servicio técnico cuando el equipo se haya dañado de alguna forma, como que haya caído líquido o algún objeto en el interior del aparato, haya sido expuesto a lluvia o humedad, no funcione correctamente, haya recibido un golpe o su cable de red esté dañado.

No user serviceable parts inside. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.

Limpie con un paño seco. No use limpiadores con disolventes.

Clean only with a dry cloth. Do not use any solvent based cleaners.

GARANTÍA

Todos nuestros productos están garantizados por un periodo de 24 meses desde la fecha de compra.

Las garantías sólo serán válidas si son por un defecto de fabricación y en ningún caso por un uso incorrecto del producto.

Las reparaciones en garantía pueden ser realizadas, exclusivamente, por el fabricante o el servicio de asistencia técnica autorizado.

Otros cargos como portes y seguros, son a cargo del comprador en todos los casos.

Para solicitar reparación en garantía es imprescindible que el producto no haya sido previamente manipulado e incluir una fotocopia de la factura de compra.

WARRANTY

All our products are warrantied against any manufacturing defect for a period of 2 years from date of purchase.

The warranty excludes damage from incorrect use of the product.

All warranty repairs must be exclusively undertaken by the factory or any of its authorised service centers.

To claim a warranty repair, do not open or intend to repair the product.

Return the damaged unit, at shippers risk and freight prepaid, to the nearest service center with a copy of the purchase invoice.



DECLARACIÓN DE CONFORMIDAD DECLARATION OF CONFORMITY

DAS Audio Group, S.L.

C/ Islas Baleares, 24 - 46988 - Pol. Fuente del Jarro - Valencia. España (Spain).

Declara que *DASNET-RACK99-230-ETH*:

Declares that *DASNET-RACK99-230-ETH*:

Cumple con los objetivos esenciales de las Directivas:

Abide by essential objectives relating Directives:

- de Baja Tensión (Low Voltage Directive) 2014/35/UE
- de Compatibilidad Electromagnética (EMC) 2014/30/UE
- RoHS 2011/65/UE
- RAEE (WEEE) 2012/19/UE

Y es conforme a las siguientes Normas Armonizadas Europeas:

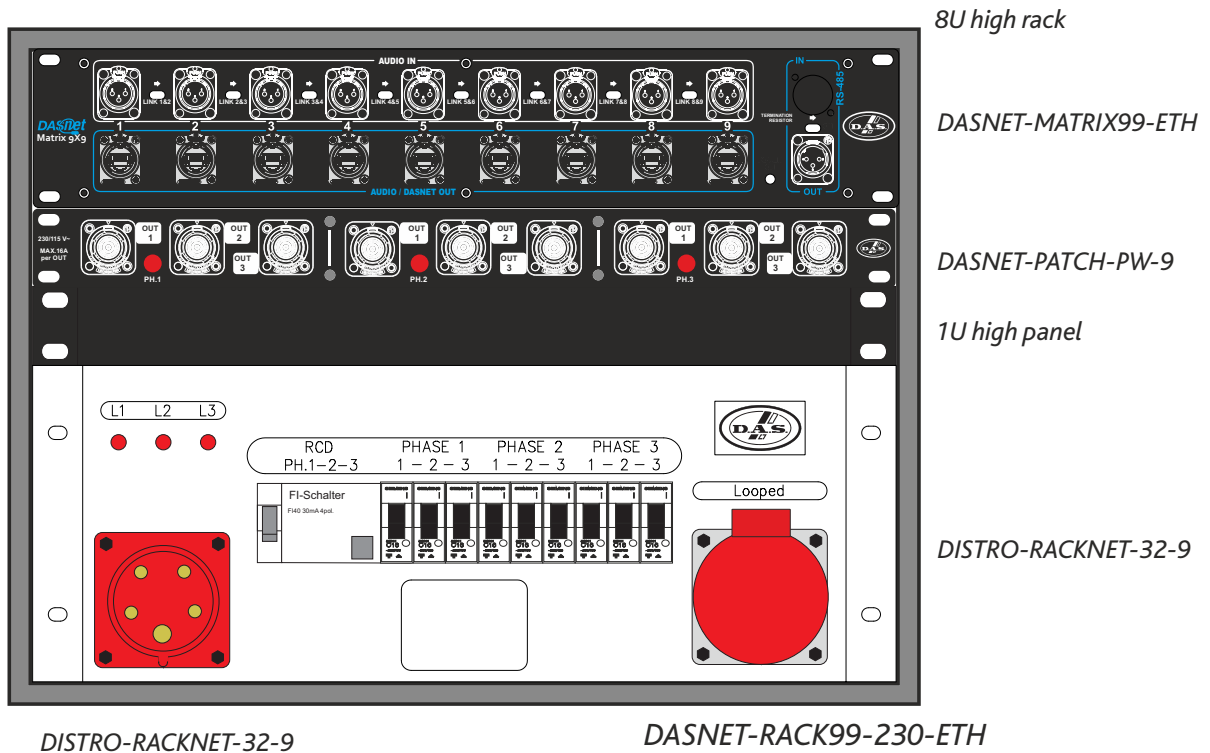
In accordance with Harmonized European Norms:

- EN 60065:2014.- Audio, video and similar electronic apparatus. Safety requirements.
- EN 55032:2012.- Electromagnetic compatibility of multimedia equipment. Emission requirements.
- EN 55103-2:2009.- Electromagnetic compatibility. Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2:Immunity.
- EN 50581:2012.- Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

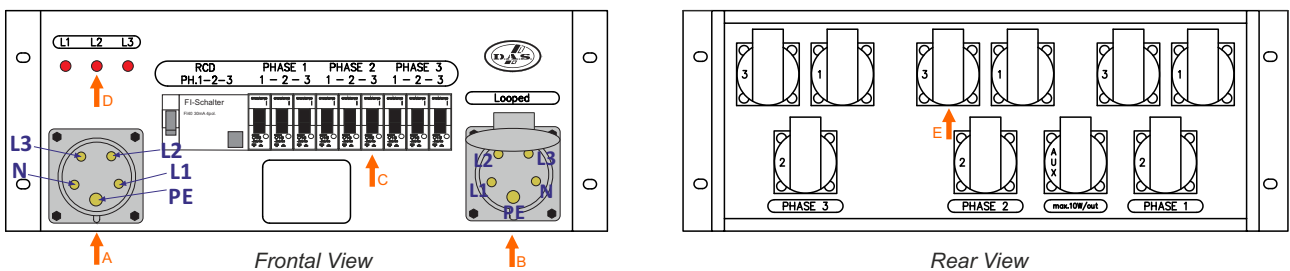
INTRODUCTION

The *DASNET-RACK99-230-ETH*, assembled in a 19", 8U high rack, is composed of three elements: 1x *DASNET-MATRIX99-ETH*, 1x *DASNET-PATCH-PW-9* and 1x *DISTRO-RACKNET-32-9* (all described in the following sections of this manual). Therefore it is a product derived from the *DASNET-RACK99-230*, but with a different matrix. Knowing the needs required by the system in terms of distribution of power, currents and supply voltages and electrical safety guidelines, will be essential for a safe use of this rack.

Caution: Before connecting to the mains make sure that all electrical safety specifications and guidelines are met, and that all the safety warnings have been given due attention.



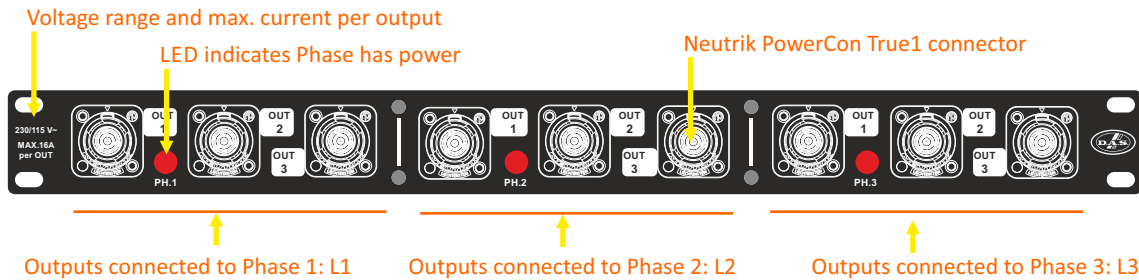
The *DISTRO-RACKNET-32-9* allows the distribution of power between the different equipment that form the system in a simple and safe way, and consists of:



- A.-** Three phase connector type IEC60309 or cetac, 32A / 400V for the input.
- B.-** Three phase connector type IEC60309 or cetac, 32A / 400V for the output (looped with the input).
- C.-** Phase 1, Phase 2 , Phase 3 breakers (one per ouput; total 9 units). The breakers are 16A nominal current (**In**), type C (max Peak current > 5**In**).
- D.-** Phase LEDs. Indicate power per phase.
- E.-** Schuko outputs. There are 3 outputs per phase. There is one Auxiliary output connected in parallel to the output 1 of phase 1 (max. 10W).

DASNET-PATCH-PW-9

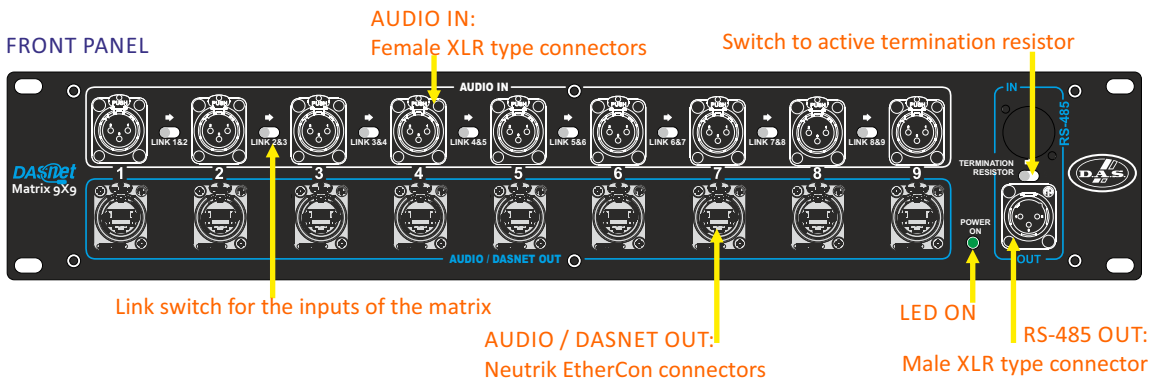
The *DASNET-PATCH-PW-9* provides AC power up to 9 connected devices, in a simple and safe manner, using Neutrik connectors type PowerCon True1. The information on the AC voltage range of the power supply and the maximum current available for each output is shown on the silkscreen.



On the rear of *DASNET-PATCH-PW-9*, a total of 9 cables with schuko are located. Each one of the cables with its corresponding schuko must be connected to each output of the *DISTRO-RACKNET-32-9*. On the other hand, the Schuko Auxiliary output of this will serve to power the *DASNET-MATRIX99-ETH*.

DASNET-MATRIX99-ETH

The *DASNET-MATRIX99-ETH* distribution module routes 9 balanced audio channels and *DASnet* monitoring data up to 9 “zones” or clusters with self-powered *DAS* Audio systems.

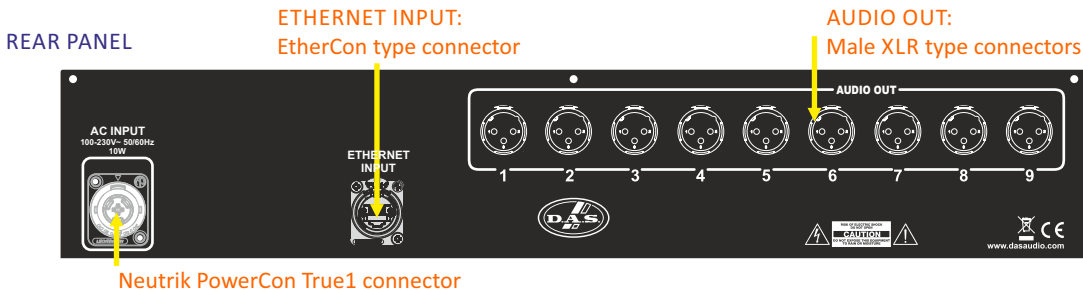


On the front panel of *DASNET-MATRIX99-ETH* we can view three connector types:

The first, AUDIO IN, female XLR type for 9 balanced audio inputs. The panel includes 8 link switches for routing audio from inputs to outputs. By the use of the switches one unique audio signal can be routed to all ethercon outputs (per example).

The second, AUDIO / DASNET OUT, Neutrik etherCon type to distribute audio and monitoring data to the different groups of self powered cabinets, 9 *DASnet* output connectors.

Finally we have the output RS-485 connector, which allows us to join several matrix to form a network with RS-485 protocol. Between the connectors the end-of-line switch is observed.



On the rear panel, using a power cable, the *DASNET-MATRIX99-ETH* will be connected to the Schuko Auxiliary output of the *DISTRO-RACKNET-32-9*. This cable has a Neutrik connector type PowerCon True1 at one end and an F type (CEE 7/7) plug at the other. In addition, we have 9 balanced audio outputs that are in parallel with the inputs.

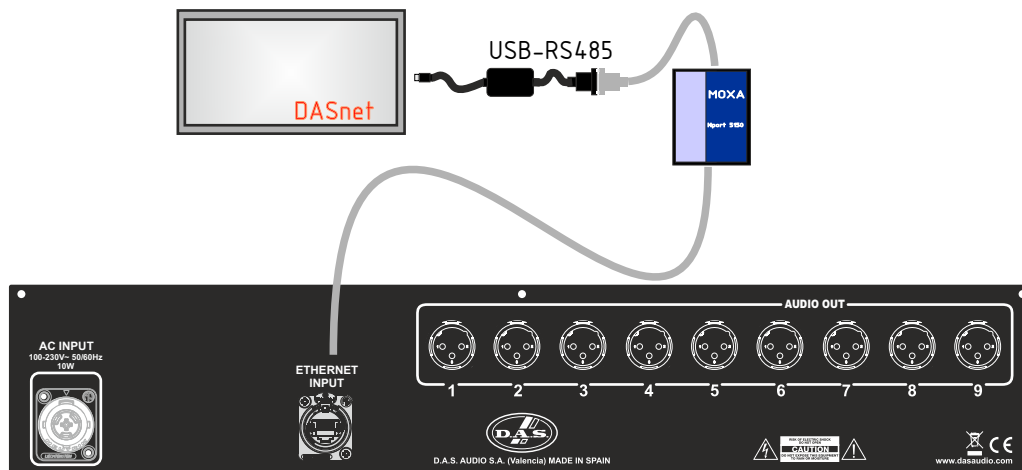
Internally, each *DASNET-MATRIX99-ETH* has an RS-485 repeater that is directly connected after the RS-485 input. The repeater allows having larger distances of cabling in the network and a much higher number of devices without losing capabilities.

The *DASNET-MATRIX99-ETH* is an ideal solution for audio and monitoring data distribution in self powered cabinets that include *DASnet: AERO-20A, AERO-40A, UX-221A, UX-30A, UX-218A, UX-218A-R, LX-218CA-NET, ROAD-12A-NET, ROAD-15A-NET*, etc.

There is a termination resistor which can be activated with a switch. It is recommendable to engage it in the first and last matrix of the network to increase network stability.

With this system, ideal solution for touring, we can link a maximum number of 288 devices, with a length of the DASnet data cable should higher than 1000 meters (counting both XLR data cables and ecp_xx), through multiple *DASNET-MATRIX99-ETH* units and converting the data transmission from ethernet to fiber optic. Note: always CAT5 cables for ethernet as a minimum.

DASNET-MATRIX99-ETH needs a USB to RS-485 converter and a MOXA Nport 5150 converter, to convert data from RS-485 to ethernet. These converters can be provided by DAS Audio. The converters have to be connected to the *DASNET-MATRIX99-ETH* using the ETHERNET INPUT connector, on the rear panel.

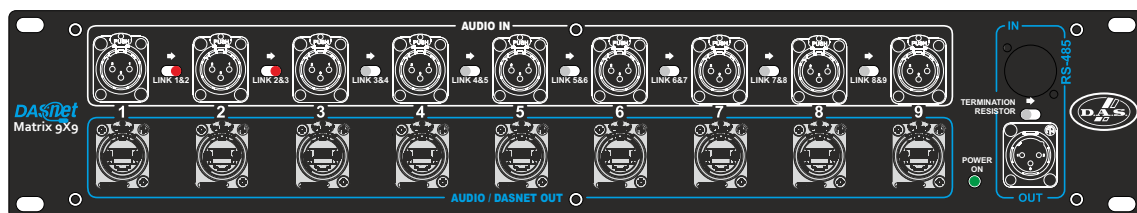


Basic connection of DASNET-MATRIX99-ETH

On the front panel, the *DASNET-MATRIX99-ETH* offers flexible routing with switches that allow you to mount an audio input to several outputs. The nine audio inputs can be linked directly to their corresponding ethercon outputs. In addition, a single audio input can be linked to all ethercon outputs by using the switches.

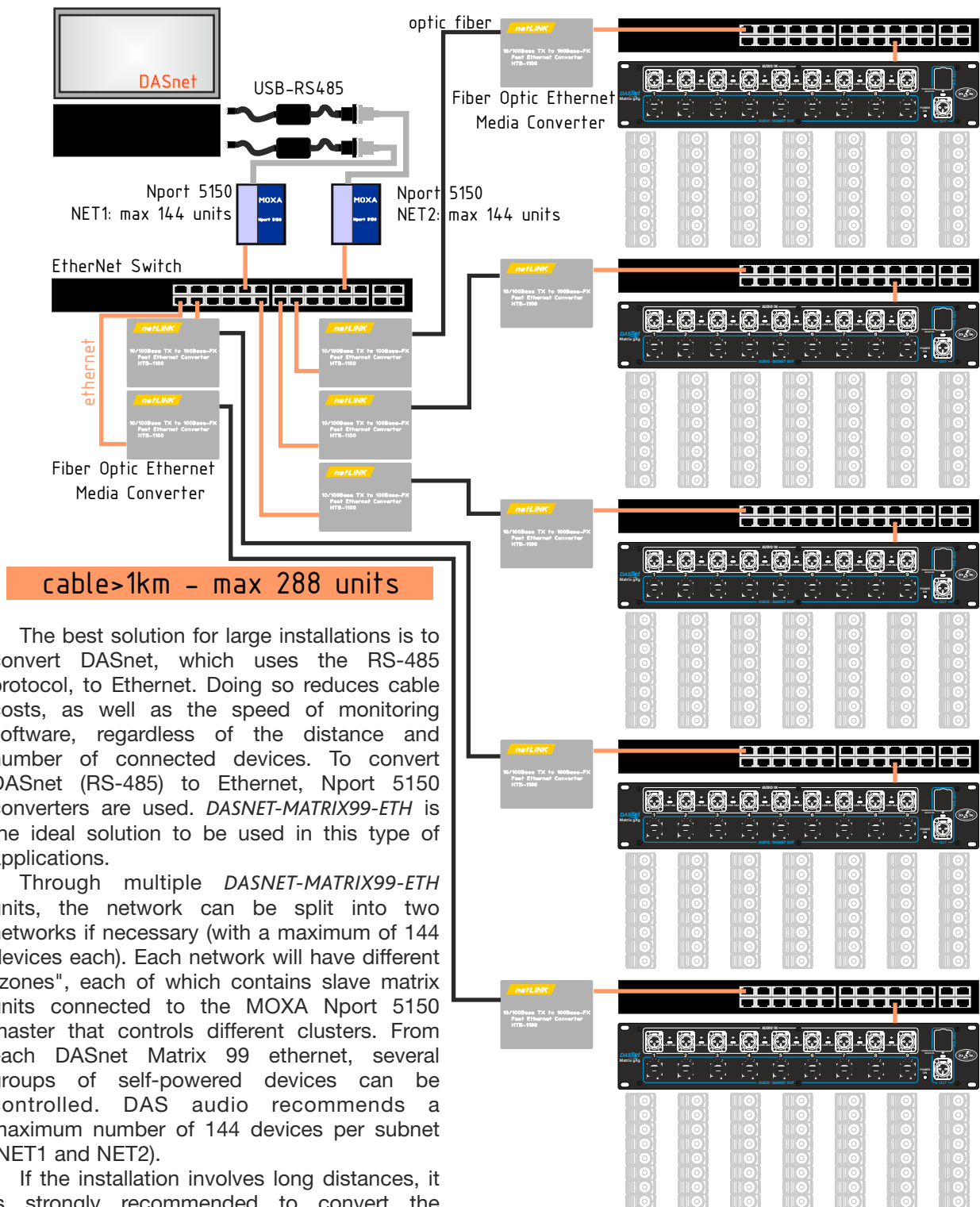
That is, if you look at the figure below, we have linked the inputs 1 with 2 on one side and 2 with 3 on the other. With this, it is enough to enter audio through connector 1 to output that signal through all the connected output connectors: 1, 2 and 3, both ethercon on the front, and XLR on the rear.

With this system, we can send a signal to all the equipment (linking all the outputs with the input 1) or create several zones with different signal sends.



Example of input links

CONFIGURATIONS



The best solution for large installations is to convert DASnet, which uses the RS-485 protocol, to Ethernet. Doing so reduces cable costs, as well as the speed of monitoring software, regardless of the distance and number of connected devices. To convert DASnet (RS-485) to Ethernet, Nport 5150 converters are used. *DASNET-MATRIX99-ETH* is the ideal solution to be used in this type of applications.

Through multiple *DASNET-MATRIX99-ETH* units, the network can be split into two networks if necessary (with a maximum of 144 devices each). Each network will have different "zones", each of which contains slave matrix units connected to the MOXA Nport 5150 master that controls different clusters. From each DASnet Matrix 99 ethernet, several groups of self-powered devices can be controlled. DAS audio recommends a maximum number of 144 devices per subnet (NET1 and NET2).

If the installation involves long distances, it is strongly recommended to convert the DASnet data from the Ethernet protocol to optical fiber as shown (image opposite side).

As we have indicated the *DASNET-RACK99-230-ETH* allows a power distribution of up to 32Amp per phase (three-phase). Every 3 outputs of the *DISTRO-RACKNET-32-9* of power are connected to a single phase. This means that of each group of 3 PowerCon True 1 connectors, the maximum available current is 32A.

The user must always consider the power consumption of the equipment (specified at 1/3 of the nominal power with pink noise) connected to each output and DO NOT exceed the limit of 32A for each group of 3 PowerCon outputs.

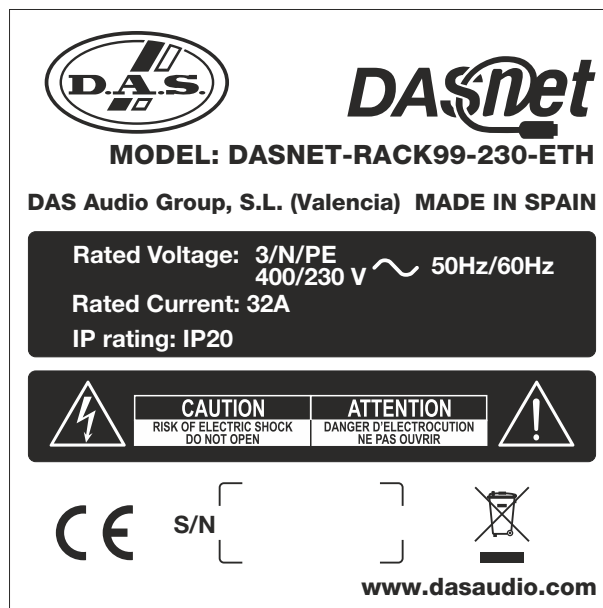
With the system configurations, DAS Audio recommends the maximum number of cabinets that can be connected depending on the model, the power consumption and the total equipment used (see table below).

Consumption per unit	Mains	
	230V	115V
AERO-20A	1,8A	3,6A
AERO-40A	3A	6A
UX-218A	4,5A	9A
UX-221A	9A	18A
UX-30A	6,7A	13,4A
LX-118A	3A	6A
LX-218CA-NET	3,1A	6,2A
ROAD-12A-NET ⁽¹⁾	1,7A	3,4A
ROAD-15A-NET ⁽²⁾	1,7A	3,4A

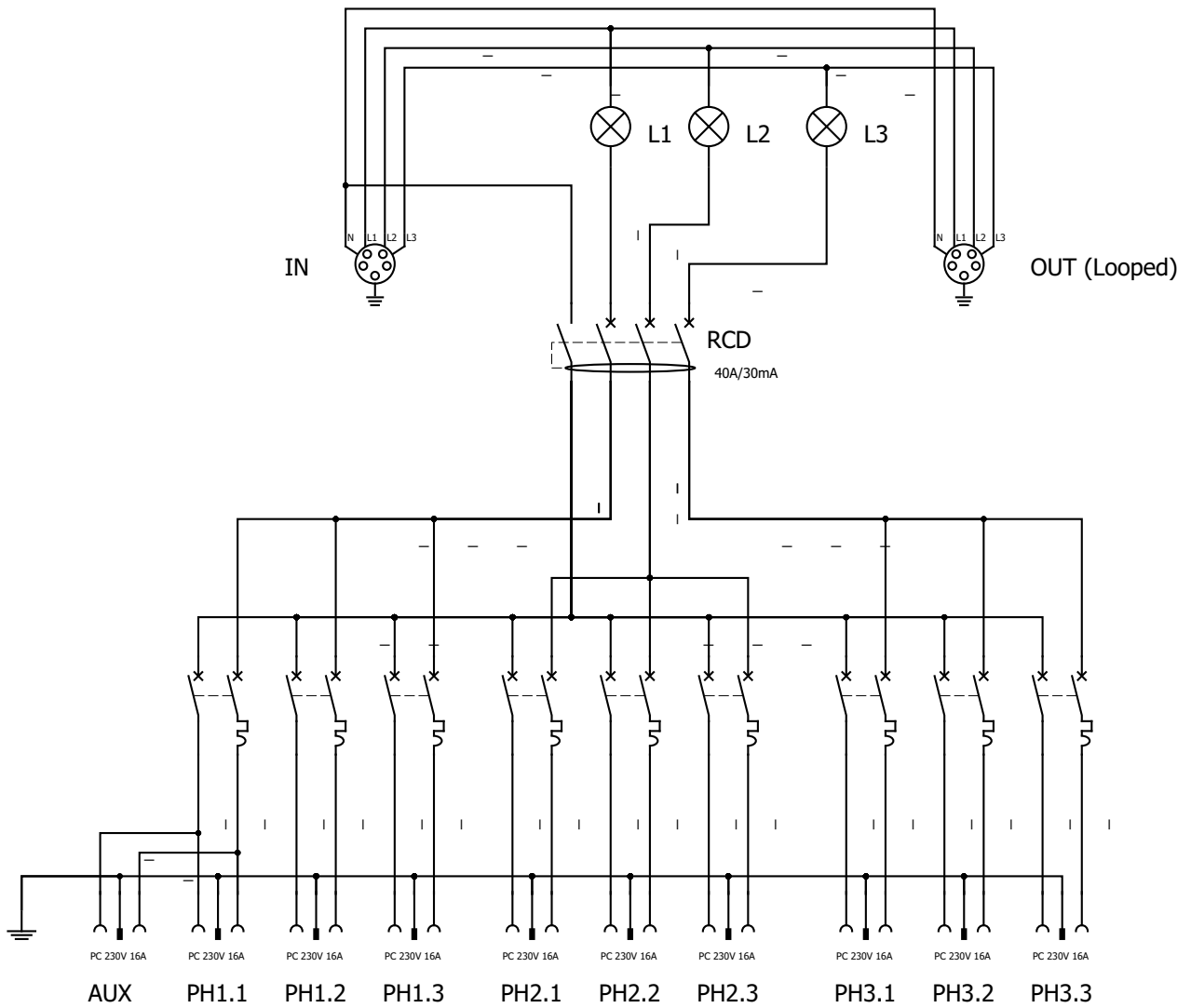
Note: Consumption measured at 1/3 of nominal power with pink noise.

(1) Models: ROAD-12ART-NET230, ROAD-12ALT-NET230, ROAD-12ART-NET115, ROAD-12ALT-NET115

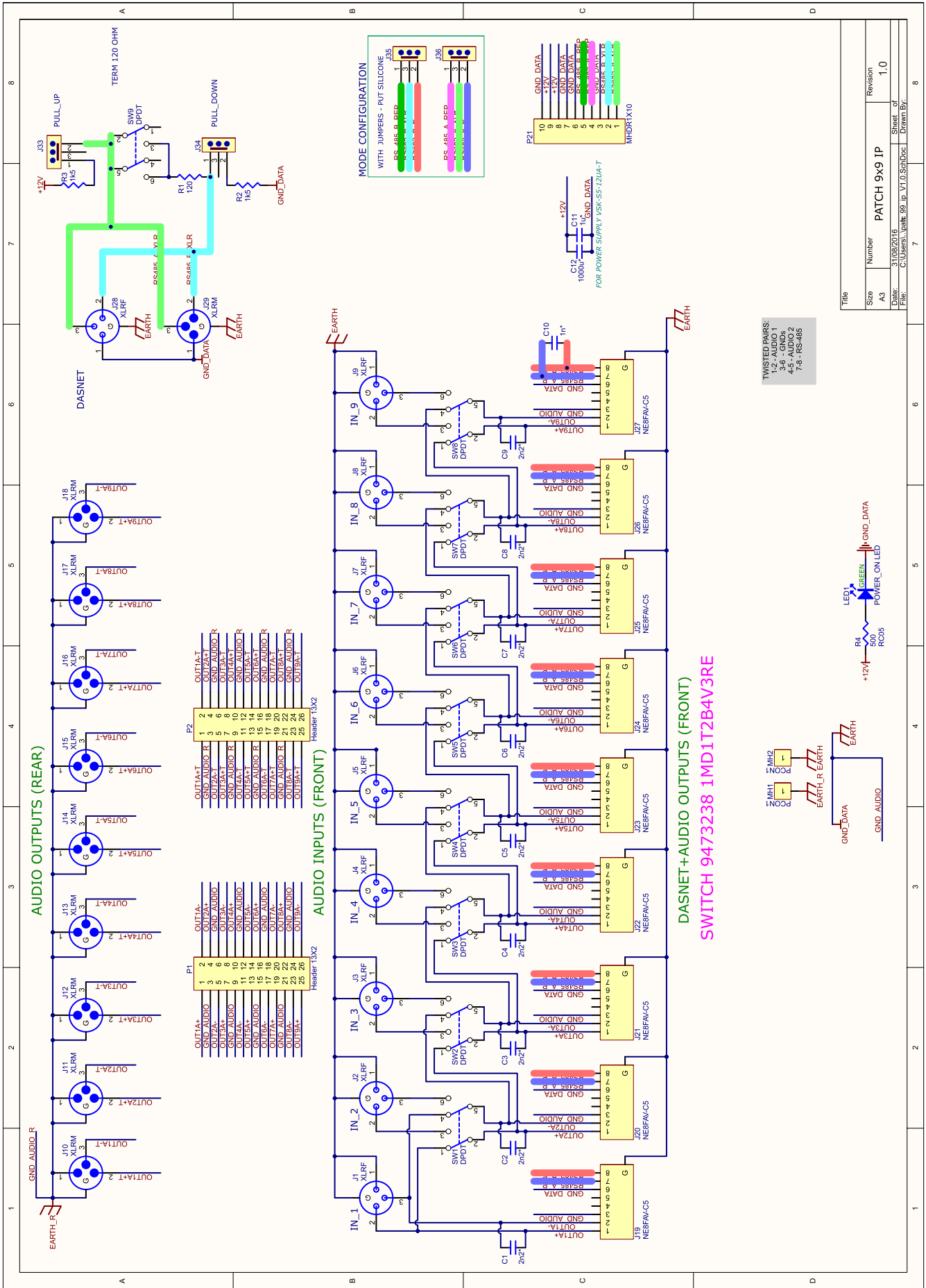
(2) Models: ROAD-15ART-NET230, ROAD-15ALT-NET230, ROAD-15ART-NET115, ROAD-15ALT-NET115



Label of DASNET-RACK99-230-ETH

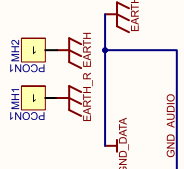


DISTRO-RACKNET-32-9



Title	Revision
Size	Number
A3	PATCH 9x9 IP
Date:	3/08/2016
File:	C:\Users\pate_99_ip\1.0_SchDoc
Drawn By:	Sheet of
	7
	8

TWISTED PAIRS:
 1-2 - AUDIO 1
 3-4 - AUDIO 2
 5-6 - AUDIO 2
 7-8 - RS-485



ANNEX II : DASnet cables

It is very important to use the system with the intended cables to prevent electromagnetic interferences between the analog audio signal, the DASnet data and the power. Be sure to check the specifications provided by the cable manufacturer. It is also especially important when installing connectors yourself, to note that when termination is not accurate, a cable will be unable to achieve its maximum performance and could have interferences.

There are 4 different types of cables.

- The main feeds which include power and a STP, CAT7 cable. These cables are named **eCP_xx** (xx refers to cable length).



- The links between cabinets (aero40A/Convert15A/LX-218CANet), which are STP CAT7 cables. Cable code **eC_09**



- Power Links between cabinets. Cable code **Plink1_09**



- Links for RoadNet series. Power+STP CAT7. eCPk_1/eCPk_5

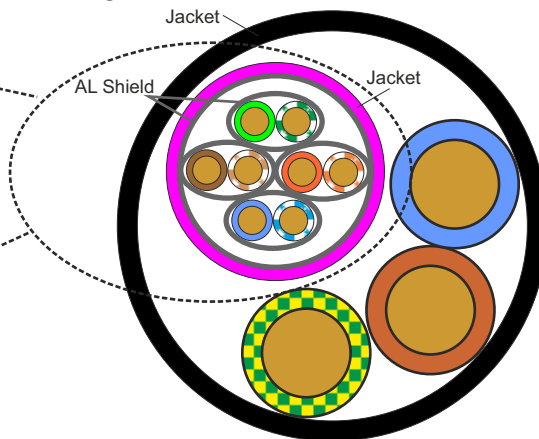


Important

The main feed cable eCP_xx has the following structure:

STP CAT 7 cable with Aluminium Shield for each individual pair and a main aluminium Shield. The main Shield has to be soldered to the etherCon housing.

The eC_09 cable is a CAT5e cable with global Aluminium Shield.



ecP_xx: Power cable $3 \times 2.5 \text{mm}^2 + \text{CAT7 } 4 \times (2 \times 0.14 \text{mm}^2)$

The pin out of the EtherCon to XLR is the following on the eCP cables:

	etherCon	XLR
1	Orange-White	Audio+ 2
2	Orange	Audio- 3
3	Green-White	Audio Earth 1
4	Blue	
5	Blue-White	
6	Green	Data Earth 1
7	Brown-White	Data- (A) 3
8	Brown	Data+ (B) 2



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