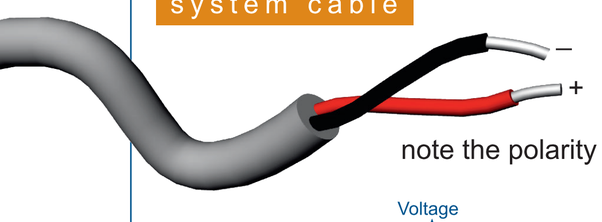
Lighting Controls

1-10v Standard

An Analogue control signal of the range of 1 Volt to 10 Volts (DC- Direct Current) is used to control the luminous output of the flourescent Lighting. By varying the voltage , it corresponds to almost a linear change in lamp brightness. A single control voltage is sufficient in controlling the dimming of multiple flourescent Ballast at the same time.

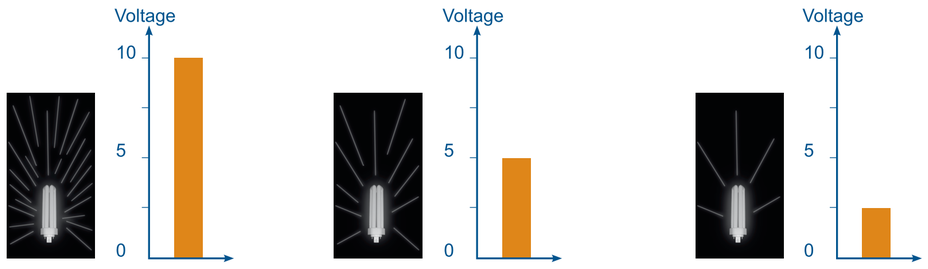
system cable



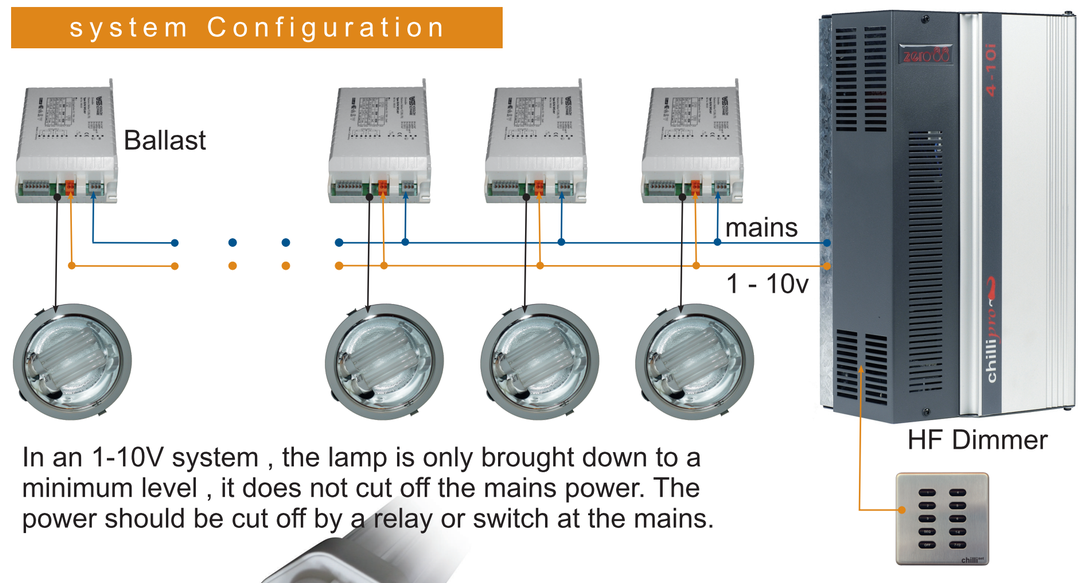
note the polarity

ballast

An electronic lamp ballast uses solid state electronic circuitry to provide the proper starting and operating electrical condition to power one or more fluorescent lamps.



system Configuration



In an 1-10V system , the lamp is only brought down to a minimum level , it does not cut off the mains power. The power should be cut off by a relay or switch at the mains.

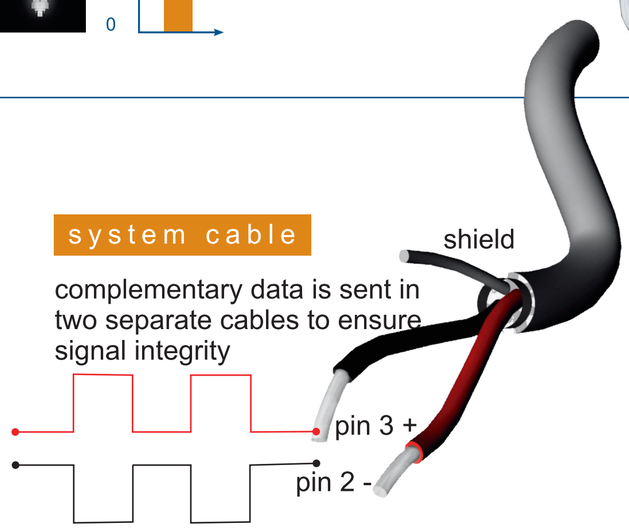
Note: A fluorescent 4 pin PLC lamp is used for dimming

DMX 512

system Configuration

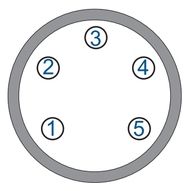
DMX simplex communication

system cable

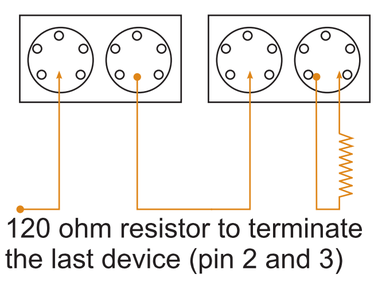


complementary data is sent in two separate cables to ensure signal integrity

pin configuration
pin 1 isolated ground
pin 2 signal -
pin 3 signal +
pin 4 not used
pin 5 not used



last device

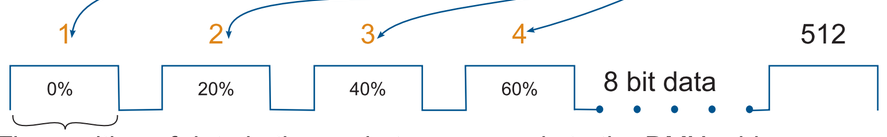


120 ohm resistor to terminate the last device (pin 2 and 3)

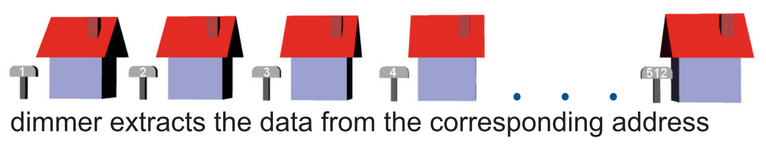
digital multiplex

Standard communications protocol for moving heads and dimmers. 512 channels of control are digitally multiplexed and sent down a cable to fixtures, which listen for their specific data, according to their start address.

1. One way communication - simplex
2. Maximum wired distance about 80m. A splitter is needed to cover greater distances.



The position of data in the packet corresponds to the DMX address, continuos stream of data packets being broadcast 44 times a second



dimmer extracts the data from the corresponding address

non terminated loop could result in a reflected signal

terminator prevents signal reflection

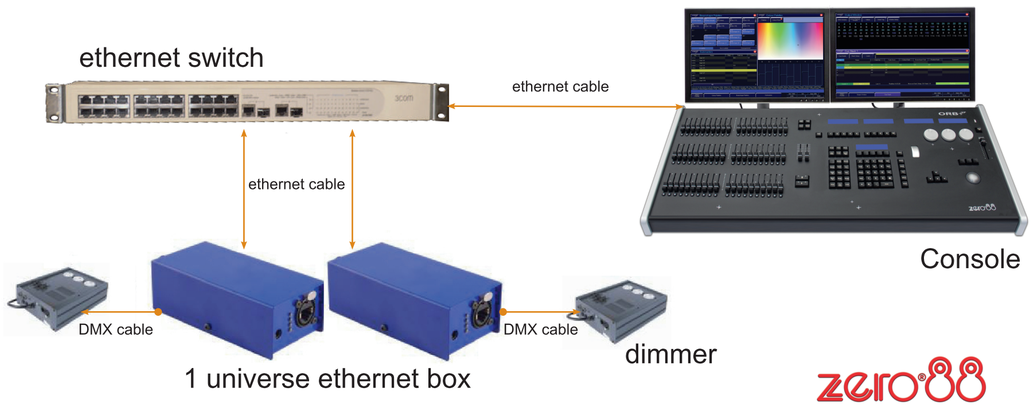
Art- Net

what is art-net

Art-Net is a lighting protocol which sends DMX data over Ethernet. The standard allows for multiple DMX universes to be sent over a single Ethernet cable. The ZerOS consoles can output upto 4 universes of DMX data via Art-Net.

Each Art-Net device needs an IP address starting with a 2.x.x.x or a 10.x.x.x, and this setting must match on the desk itself. Each DMX universe must then be allocated to a Port – Art-Net Ports numerate from 0-15, so it is generally accepted that desk universe 1 will become Art-Net universe 0, however this is user definable.

Art-Net enabled devices include Media Servers, Moving Lights and also dedicated DMX output boxes such as the “1 Universe Ethernet Box” by Cooper Controls. The system will look something like this:



subnet

A group of 16 consecutive DMX universes is referred to as a sub-net when speaking about an Art-Net system. Not to be confused with the subnet mask.

Ethernet

Many modern lighting consoles use Ethernet as a medium for transmitting DMX lighting control data using protocols such as Art-Net. This allows lighting data to be carried over existing wiring infrastructure.

RDM

what is RDM

DMX RDM half duplex communication

Remote Device Management, or RDM, is a new standard for allowing DMX enabled devices to communicate in both directions along existing DMX cabling. This allows the console (controller) to discover, patch and configure the fixtures (responders). RDM is intended to work seamlessly with existing DMX cabling and equipment - it uses the standard data pins (pins 2 & 3) to both send and receive data.

An RDM system is comprised of two basic types of devices – controllers and responders.

- A controller is a device such as a lighting desk.
- A responder is a device such as a dimmer or a moving light.

Controllers initiate all RDM conversations, the rule is that responders do not transmit messages until told to do so by the controller. You can think of it like a website – the information is out there, but you have to click the link to ask for it.

For some time now, the majority of new DMX products have claimed in some way to be ‘RDM ready’. Usually this means that the hardware is expected to be capable of supporting RDM, but that the software has not yet been implemented. Look for ‘RDM enabled’ equipment to be certain that it supports RDM functionality. It may be possible to upgrade the firmware in some older ‘RDM ready’ products, contact the manufacturer for further details.

Lighting Controls
"the future looks bright"

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Images courtesy of Phillips Selecon, Zero88