

## Introduction

This application note provides guidelines for when Pharos controllers need to be part of a local network. These guidelines include specific information as well as reassurances regarding Pharos hardware behaviour on a network. Network setup may require the advice, assistance or cooperation of IT professionals and network administrators. Please feel free to pass on these guidelines.

## Terms

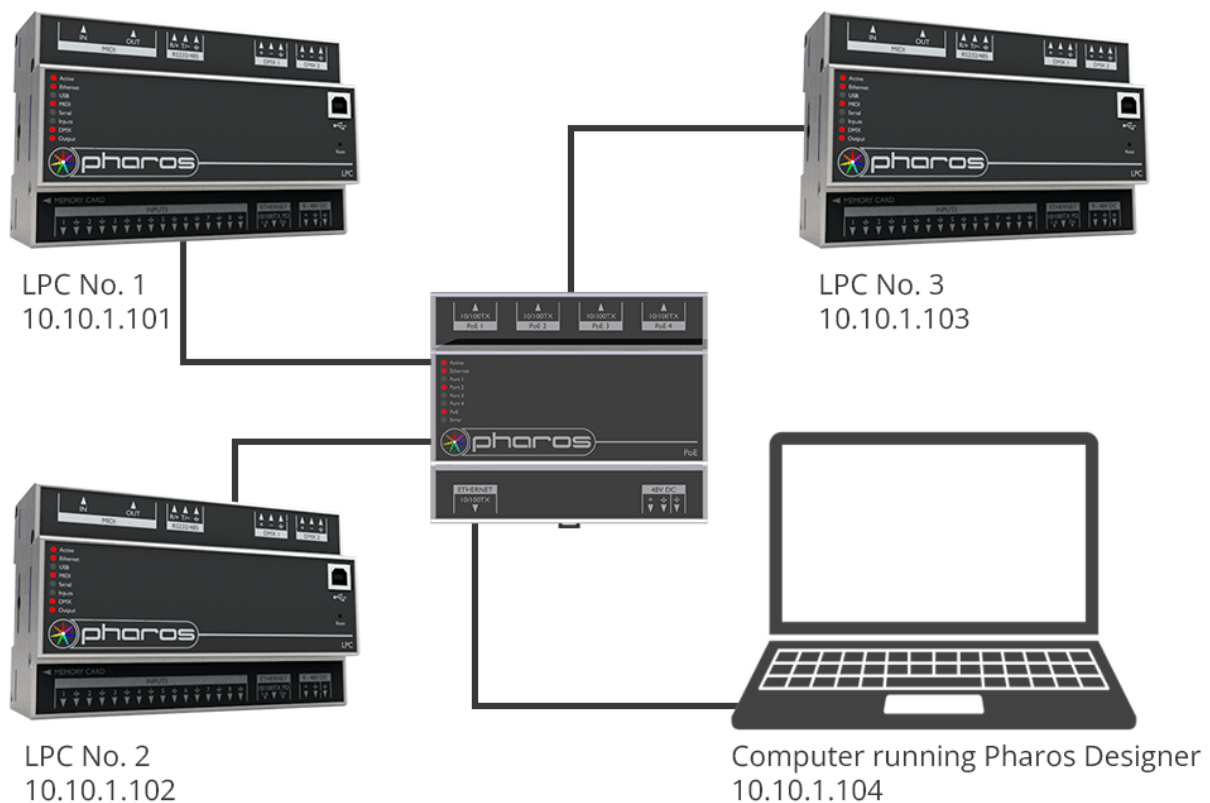
**Pharos Designer:** Commissioning software used for programming an installation as well as uploading programming to the Pharos devices connected to a network.

**Local Area Network (LAN):** The Ethernet network that connects all of the Pharos hardware, computers, and lighting fixtures. It does not connect directly to the Internet or another network.

**IP Address:** The numerical address that a computer uses to communicate on a Network.

## Pharos Lighting System Example

Here is an example of a Pharos system comprised of three LPCs, a computer and a Power over Ethernet (PoE) switch to connect them together as a local network.



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## Pharos on a Managed Network

- LPC 1/2/4s, TPCs (+EXTs), and the Management port of the LPC X, VLC, and VLC+ are designed for connection to a facilities network for internal and remote access. They can be set to DHCP or assigned a static IP address within any network.
- The LPC X, VLC, and VLC+ data ports output only lighting data, which can be connected to:
  - A different IP network on the same physical network
  - A different physical network
  - The same IP network as the management port (not recommended – see below)
- The available IP settings for the data port may be restricted by the lighting fixtures' requirements.
- The LPC 1/2/4 and TPC (+EXT) can also output lighting data on their Ethernet port. In this case, IP restrictions may apply as per the LPC X, VLC, and VLC+ data port.
- Controllers can be connected to a facilities network, and if required, they can be isolated via a managed switch. This allows them to be accessed by, but not communicate with, other network devices.
- For multicast access, the following addresses need to be routed on managed switches:
  - 239.192.38.7 – Discovery
  - 239.192.38.8 – Controller to Designer communication
- For access to a controller's web interface, port 80 is required.
- Navigating to the controller's IP address in a web browser will present pages showing the status of the controller including timeline, scene and input status, output values, etc. This is information only - nothing can be changed, edited, or entered in these pages. The Control and Configuration pages, which allow you to trigger events, change settings and upload new shows, can be password protected.
- Controller web interfaces require web sockets (RFC 6455) between the Controller and the client device. If web sockets are blocked on the network (or proxy server), the web interface will not populate with data.

## Multiple Controller Ports on One Network

When using the multiple ports of LPC X, VLC, or VLC+ there may be scenarios where you wish to have all ports on the same physical and IP network.

Although this can work in some limited circumstances, we do not recommend it, for the following reasons:

- Both ports will respond to ARP requests for either IP address.
- Multicast subscriptions/joins may be sourced from the wrong port

## Typical Network Troubleshooting

- Multicast data can be blocked by certain 'managed switches'. The following multicast addresses need to be routed for controllers to be able to discover and communicate with each other and with Designer:
  - 239.192.38.7
  - 239.192.38.8
- We recommend simple, unmanaged switches where possible.
- Firewalls can cause issues with multicast. Bear in mind antivirus and other security software may apply firewall settings. If you disable these settings, remember to turn them back on if the PC is then restored to its usual network.

## Further Information

Information on Remote Access – that is, the ability to access your programming or controllers remotely via the Internet - can be found in the application note: Remote Access Guidelines.

If you need further help, please email [support@pharoscontrols.com](mailto:support@pharoscontrols.com)