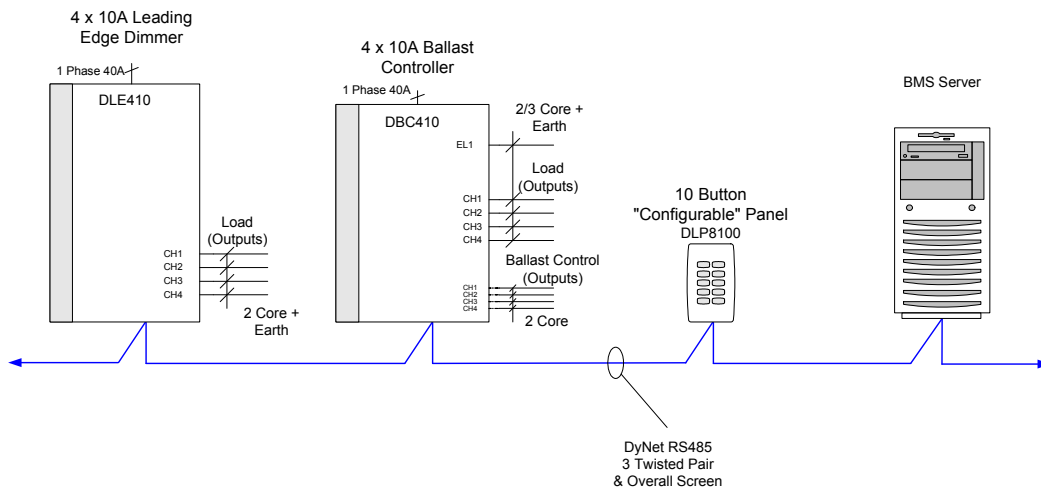


overview

Dynalite provide several different methods for interfacing with other services, such as building management systems (BMS), projector controllers and audio-visual controllers and components. This guide outlines the differing techniques.

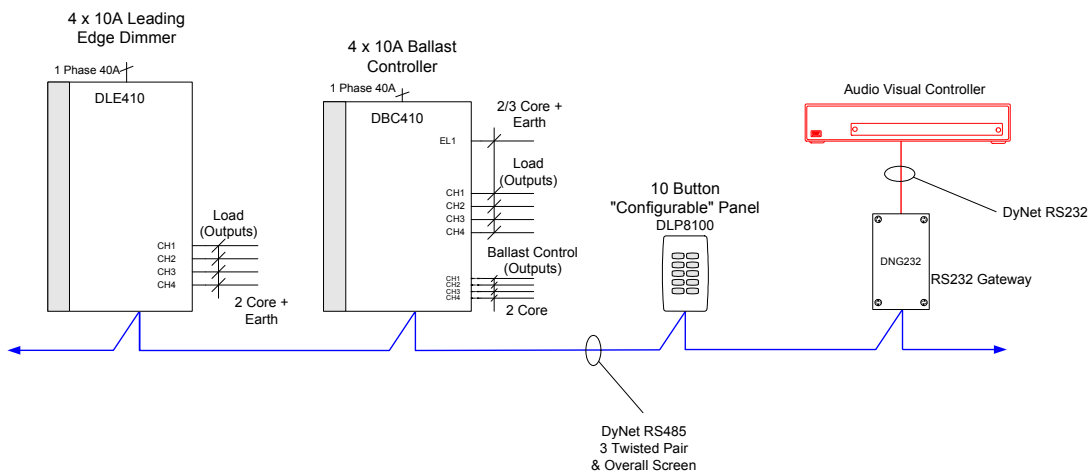
DyNet over RS485

All Dynalite products communicate using the DyNet protocol. A subset of commands is made available to anyone wishing to directly communicate on the DyNet bus. Many AV controller, alarm system and BMS vendors also make available drivers that can communicate using DyNet. The drawing below illustrates connection of a BMS directly onto the DyNet bus. To assist in the development of communications drivers for DyNet, we have developed an "Integrator's Handbook", a copy of which is available on request.



DyNet over RS232

The same DyNet message packets that are delivered directly on to the network via RS485 can be issued via an RS232 port. The Dynalite DNG232 is an RS485 to RS232 converter, or network gateway, which allows direct connection to the DyNet network. Common devices that require this type of connection include audio-visual controllers and peripherals that comprise an RS232 port.



text over RS232

The Dynalite DNG232 has several modes of operation. In the previous example, it routed DyNet packets, but it can also be configured to operate as a text interpreter, which will allow control of a Dynalite system via plain English text strings. These strings are sent from a terminal program, such as HyperTerminal®, or any controller with ASCII ability.

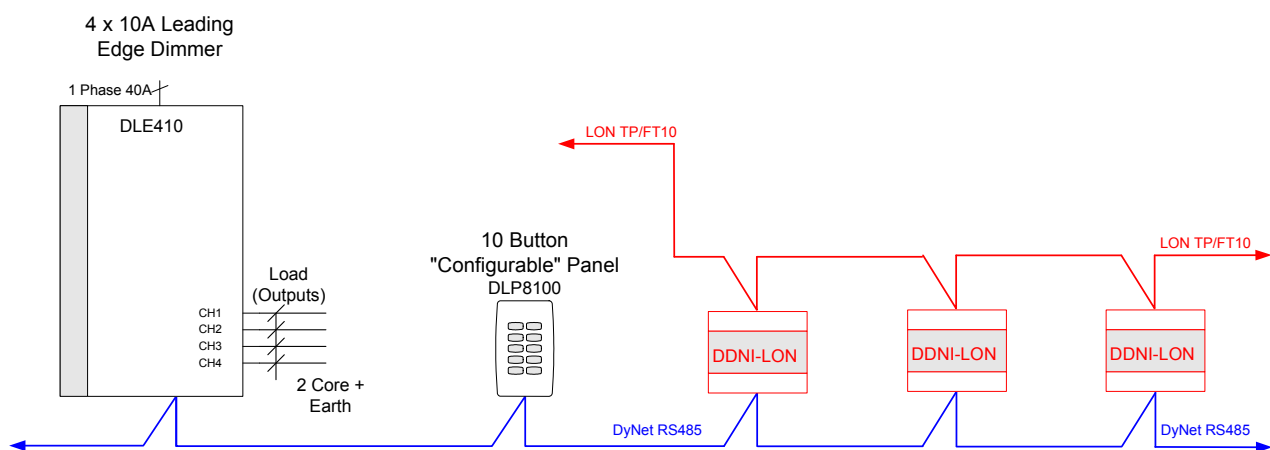
Examples of plain English commands when using a terminal program are outlined below. (Note: [enter] means the Enter key on the computer's keyboard):

Desired Action	Type this string	Device will reply with this string
Select Preset 8 in Area 1 with a fade of 3 seconds	Preset 8 Area 1 Fade 3 [enter]	Preset 8 Area 1 Fade 3
Request the Current Preset for Area 1	RequestCurrentPreset Area 1 [enter]	Reply with Current Preset x Area 1 Join fhex
Fade Channel 4 in Area 1 to a level of 70%	Channel 4 Area 1 Level 70 Fade 3 [enter]	Channel 4 Area 1 Level 70 Fade 3
Request the current level for Channel 1 Area 1	RequestChannelLevel 1 Area 1 [enter]	Channel 1 Area 1 Level 70
Request a full list of commands available	help [enter]	

An extensive embedded Help system, accessible through any terminal program, details full and abbreviated versions of each available command.

LonWorks®

The Dynalite DDNI-LON provides a LON® interface to the DyNet network, via a TP/FT10 LonWorks port. Lighting SNVTs (standard network variable type) are supported, as well as user-defined types. The device can typically translate up to 100 presets in 30 areas.



The diagram above illustrates the cascading of multiple DDNI-LON devices to accommodate a DyNet network with more than 30 areas.

TCP/IP Internet-Ethernet

ethernet connectivity

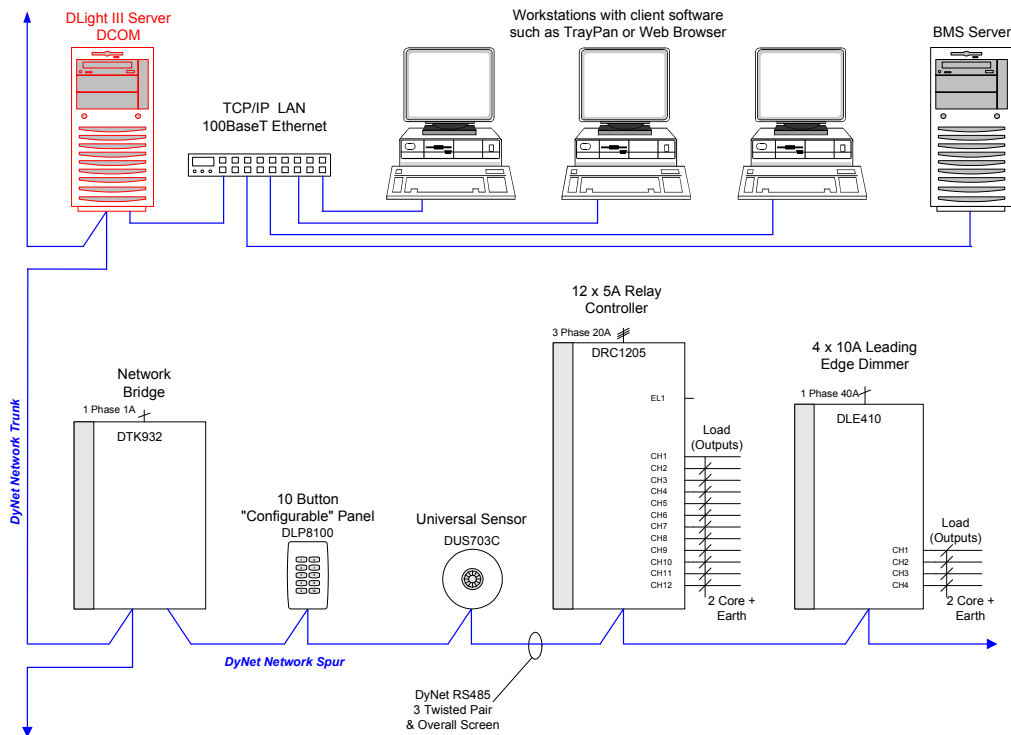
There are many reasons for integrating a Dynalite control system with Ethernet. Common situations include:

- Providing a backbone that links several Dynalite DyNet RS485 networks together. A typical application is a high-rise office building, where the field wiring of each floor is RS485 and the backbone that links the floors together is 100BASE-T Ethernet. In applications where the distance between the Dynalite RS485 networks is substantial, such as interconnecting separate buildings or linking control centres in a tunnel, it is common practice to provide a 100BASE-T Ethernet gateway at each Dynalite RS485 network that connects to a fiber optic cable that spans the distance between the sub-networks.
- Providing a gateway into the Dynalite control system for the purpose of interfacing to another control system. A typical application would be in a commercial site where a BMS connects to the Dynalite system via Ethernet.
- Providing remote control of a residential site via a web browser interface or Dynalite DLight III software. This remote control functionality can be made available from external locations by making the gateway visible on the Internet, as well as providing remote control within the dwelling via hand held computing devices such as Palm Pilots® and web tablets, via connection to a Wi-Fi® hub.

ethernet connectivity products

Connection of Dynalite RS485 to the Ethernet is achieved using the DNG100BT Network Gateway. It is normally configured to use the TCP/IP protocol and has an inbuilt web server that can be configured to serve up pages allowing control of a site via a web browser. It can also be configured to operate in a “bridge” mode, providing an Ethernet backbone for multiple RS485 sub-networks.

DLight III Server software is designed to provide high-level integration and control options to a DyNet network via Ethernet. The DyNet network is connected to a server PC’s COM or USB port and information can then be exchanged via client software running on the server PC or clients connecting remotely over the Ethernet network using TCP/IP.



Integration to other services is made simple by the use of a set of calls for an industry standard DCOM interface. DLight III Server is an inexpensive solution for providing occupants of open plan office space with control over their local environment. TrayPan client software is provided with DLight III Server and resides in the tool tray of desktop PC's. It uses the existing LAN to communicate with DLight III Server, providing a cost benefit over the provision of local control panels that would otherwise be required. A web page with an ActiveX® control is another inexpensive option of client control. The optional DLight III Toolbox Software Development Kit provides a rapid integration environment for connection to BMS. A set of system calls and example clients, including source code, are provided to assist with development of integration solutions and custom clients. As well as control and status reflection of the lighting system, alarm events such circuit breaker trips and lamp failures can be automatically forwarded to the BMS. Diagnostic and maintenance data such as lamp burn time is also readily available.

infrared

infrared reception

Dynalite DUS703 sensors are multi-function devices; incorporating motion detection, light level measurement and infrared reception. Infrared signals from hand held remote controls are received by the DUS703 and are translated into DyNet messages, which are then passed onto the network and used to trigger one-shot or macro functions in other devices. These messages can also be translated into other formats via network gateways, such as into ASCII text strings via the DNG232 Network Gateway, or back into infrared via the DIRTX8 Infrared Transmitter. Dynalite offers a range of hand held remote controls for use with the DUS703. The codes from these remote controls can be used to program most models of unified programmable or 'leaner' remote controls.

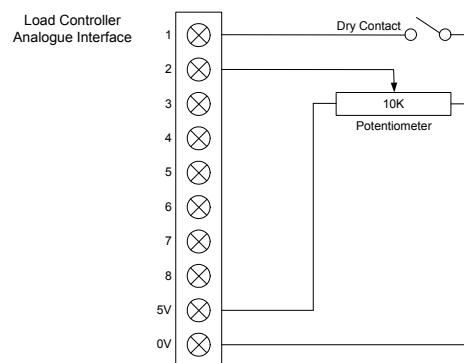
infrared transmission

The DIRTX8 Infrared Transmitter is an 8-channel device, commonly used to integrate equipment with an IR port, such as AV controllers and air conditioners, onto the DyNet network. A typical situation is where small IR emitters are fixed to the IR window of Hi-Fi equipment. The IR emitter includes a one-metre lead terminated with a 2.5mm plug, which is plugged into the DIRTX8. Multiple channels allow the DIRTX8 to transmit individual codes out on each channel, which eliminates problems where different Hi-Fi components share the same code. The DIRTX8 can record and store macros that are executed in response to DyNet messages on the RS485 network.

analogue and dry contact inputs

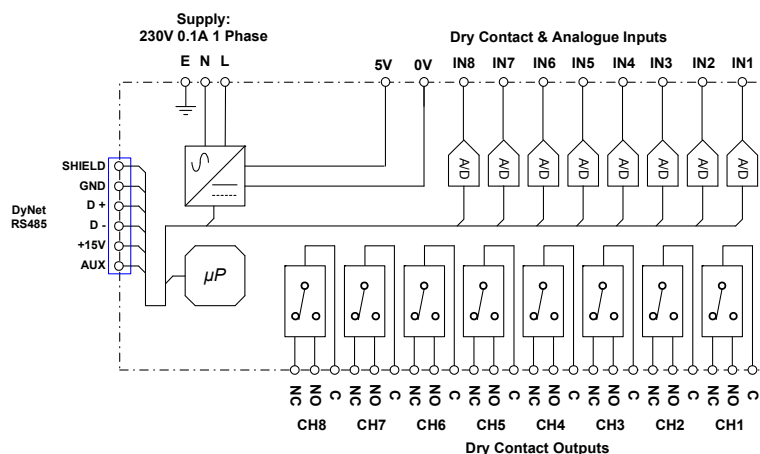
Most Dynalite load controllers are supplied with an analogue interface. This interface has up to 12 SELV (Safety Extra Low Voltage) inputs, depending on the model. Each input is individually configurable to operate in dry contact or analogue mode. When in analogue mode, the input range is configurable to be 0-5V or 0-10V. A buffered 5V terminal is provided for ease of connection to passive faders. 0-10V mode is useful for connection to other vendor's control equipment.

These inputs are fed into a programmable logic controller, which has access to the DyNet network and can control other devices in the system, as well as the device on which the port physically resides.



dry contact outputs

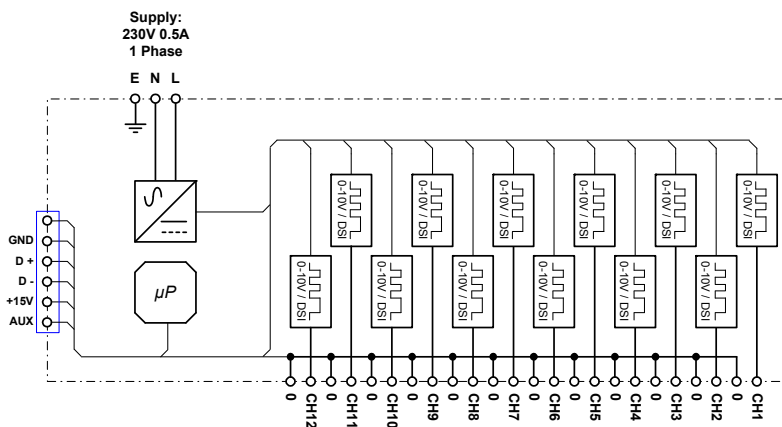
Dynalite offers several dry contact units that can be used for interfaces, as well as load control. Two of the more common models comprise eight sets of changeover contacts for added flexibility; the DDRC810DT (DIN rail mount) and the DRC810DT (wall mount). These outputs are suitable for connection to SELV circuits.



The electrical drawing above is of the DRC810DT. Note that in addition to the dry contact outputs, this device also has the eight programmable dry contact/analogue inputs described earlier.

analogue outputs

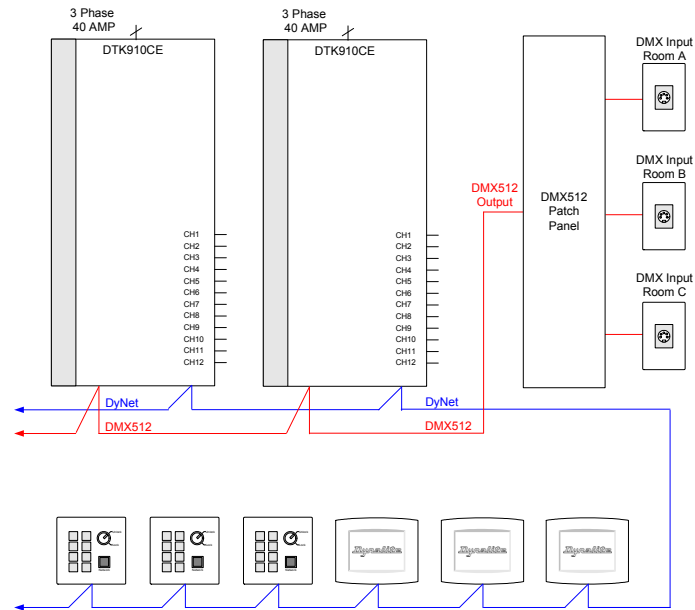
Dynalite ballast controllers can be configured for 0-10V output, providing a ready means of communicating a control variable to another system. The DDBC1200 illustrated below should be used where connection to SELV circuits is required.



dmx512

dual port load controllers

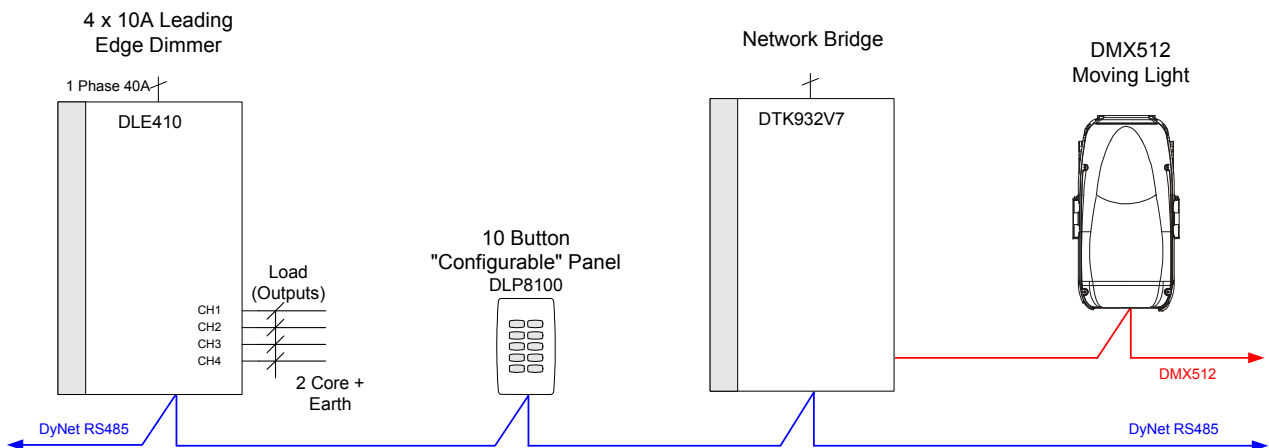
Many Dynalite load controllers are available with dual ports, which allows a separate control network for DMX512 signals, while still allowing the use of the main control system. The DyNet network can be used to control the behaviour of the system in response to DMX signals, such as the selection of the circuits for which DMX512 control is allowed. It is also possible to only allow partial control of a circuit via DMX512, in the form of setting a “low limit”, which is useful for allowing partial control of critical circuits such as egress lighting, but never allowing these circuits to be switched off or dimmed to an unacceptably low level.



The diagram above illustrates the use of dual port load controllers.

converting dynet to dmx512

A common requirement for buildings such as hotels, museums and other sites with a lighting control system is to connect outdoor architectural lighting to the control network. Often this style of fixture operates on DMX512. The Dynalite DTK932 Network Bridge converts DyNet into DMX512 signals.



converting dmx512 to dynet

DMX512 can also be converted into DyNet. This would be typically be achieved by connecting a theatrical lighting desk onto a DyNet network, removing the need for the lighting control network to have provision for DMX512, apart from a single interface.

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