DyNet Integrator's Handbook for the DNG232 V2

Contents

Introduction

Before reading this handbook it is important to understand the operation and architecture of a Dynalite system. Please read ‘An introduction to the Dynalite system’ prior to commencing with any integration programming.

How to use this handbook

This handbook has been designed to assist companies who want to create or improve the integration of their systems to the Dynalite network. It contains detailed explanations of all the necessary network messages to control and monitor any Dynalite system from a small apartment to a commercial building.

For your assistance, details are given of the message structure for both current and superseded messages.

In this handbook all numbers are expressed in hexadecimal. Byte values shown in *italics* in the message structure are explained below the message in the Parameters section.. The Op code in the message structure section is always shown in **bold**.

if you require further information on Dynalite, its products or any of the messages provided within this document the relevant contact details can be found in the back of this handbook.

Disclaimer

Dynalite reserves the right to change any details listed in this document at any time without notification.

DyNet (Dynalite Network) Addressing System

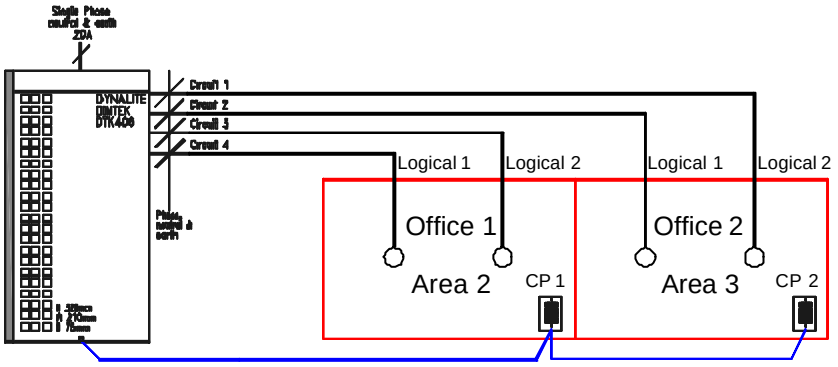
- ***Physical addressing*** is used primarily during the testing and commissioning stage to configure DyNet Devices. It is also used for physical, location specific parameters such as circuit breaker trip signalling. A Device Type, Box Number and Physical channel number are used to identify each lighting circuit.

- ***Logical addressing*** is used in day-to-day operation of the lighting system. Lighting circuits and control panels are configured to Areas; independent of the physical device they are connected to. An Area Number and Logical channel number are used to identify lighting points.

Areas and Channels

Areas are used to group related lighting points by the area/room they are in. Consider the example of a load controller that supplies lighting circuits to 2 rooms, with a control panel in each room. The controllers lighting circuits and the control panel in Room 1 could be configured as Area 2, and the controllers lighting circuits and the control panel in Room 2 could be configured as Area 3.

The end result would be that the control panel configured to Area 2 would only control circuits designated Area 2. The control panel configured to Area 3 would only control circuits designated Area 3. This allows the two rooms to operate independently of one another.



A single DyNet network will support 255 separate Areas. Each Area can contain up to 255 Logical Channels. It is also possible to link networks together removing any size limitations from the system.

Join

The Join feature is used by DyNet Engineers primarily to provide a room linking system. This feature is used in ballrooms, function rooms etc that contain partition walls, to provide full room control from a control panel in each area for whichever room configuration is being utilised.

The DyNet engineer programs the join levels for an area into the system when the Dynalite system is commissioned and will be able to provide a complementary system programmer with any area join level details if required.

Area linking is the preferred method of room linking for 3rd party integrators and is explained in its own section later in this handbook.

Note: If a third party system is controlling an area that is part of a Dynalite join system the DyNet engineer on the project should use an RMask message with the Join message when changing the join state. This allows third party devices to use native join preset messages to control more than one area.

Message filtering

In a standard message the Join byte should be set to 0xff. It is however possible to filter channels within an area using different values for the join byte.

Channels can be configured to only respond to messages if a specific bit is set in the join byte. This feature is very useful and a programmer should have the ability to change the join byte of a transmitted message.

The default Join level is 0xff. Using a join level of 0x00 will cause a message to have no effect on the state of the network.

LED Tracking

Wall Panel LED's are used to indicate the current preset scene that the area is in. When a preset message is transmitted on a the network, any button on any panel that also sends that area to that preset will illuminate and any button that sends that area to any other preset will turn off. In this way the panels will tell the end user the current state of an area.

Global Area Control

It is possible to send every area on a network to a single preset using area 0 as the target area. This is often a crude method as it can affect different 3rd party devices such as curtains etc. For this reason preset messages to specified areas are the preferred method of global control.

ASCII Control Messages using the DNG232 and DNG485

Physical Interface

Signalling Protocol Data Rate	DNG485 uses RS485 DNG232 uses RS232 9600 default (configurable)
Data Word Format	8 bit data, 1 start bit, 1 stop bit, no parity default (configurable)

ASCII Message Protocol

The Start Byte

All ASCII messages are prefixed with a *Start Byte*. This asterisk (*) byte is used as the start byte to mark the start of a message.

Commands

The command is the first character or keyword after the start byte asterisk. There are 2 command types, short and long for each command for example:

Short command: `*P 10,6,2000↵`

Long command: `*Preset 10,6,2000↵`

Commands are not case sensitive.

Delimiters

The delimiter is the value used between the arguments to the command and can be either a comma (0x2c) or a space (0x20). The delimiter between the command and the first argument must always be a space.

Defaults

If an argument is not specified in a command string the DNG will use the argument from the previous transmitted message.

Notation

[ ]	Delimits the field between the brackets. These brackets are not actually part of the message.
P	Character as a character
[0x20]	Single space character
[36]	Multiple ASCII string
¿	Carriage return.

1 Area Control

The Dynalite system uses preset levels in its load controllers to store lighting scenes that can then be recalled from anywhere on the network using a single DyNet message.

There are 170 presets available in most Dynalite load controllers.

1.1 Area Preset Messages

Structure:

```
*P [Preset]¿
```

or

```
*P [Preset],[Area],[Fade]¿
```

or

```
*Preset [Preset],[Area],[Fade]¿
```

Parameters:

Preset

A multiple ASCII string number representing the area preset level the controllers should go to.

Fade

The amount of time in thousandths of a second the system is to take to get to the new scene.

Settings:

Fade

Argument	Actual fade time
2000	2 Seconds
10500	10.5 seconds
120000	2 minutes

Example Message:

All lighting in Area 6 to go to Preset 10 over 2 seconds

```
*P 10 6 2000 ¿
```

or

```
*P 10,6,2000 ¿
```

or

```
*Preset 10,6,2000 ¿
```

1.2 Area Off

This message will send all channels in an area to 0%. It is not used often, as Preset 4 is ‘all levels at 0%’ by default and is more commonly used as

an ‘off’ command. Dynalite wall panel LED’s will still follow this command so any preset buttons for the area receiving the off command will turn off their LEDs.

Structure:

```
*O [Area]¿
```
or
```
*O [Area],[Fade]¿
```
or
```
*Off [Area],[Fade]¿
```

Fade

The amount of time in thousandths of a second the system is to take to get to the new scene.

Settings:

Fade

Argument	Actual fade time
2000	2 Seconds
10500	10.5 seconds
120000	2 minutes

Example Message:

Turn Area 3 Off

```
*O 3 ¿
```
or
```
*0 3 2000 ¿
```
or
```
*Off 3,2000 ¿
```

1.3 Program to Current Preset

This message makes it possible to save lighting level changes to an area and so reconfigure presets. The lighting levels will be saved over the current preset levels so it is important to select the preset to be changed before changing any channel levels and sending the program preset message.

Note: Once this message is sent, the target areas current preset is permanently overwritten.

Structure:

```
*PCP [Area] ¿
```

or

```
*ProgramCurrentPreset [Area] ¿
```

Example:

Save the current channel levels of area 4 to area 4's current preset

```
*ProgramCurrentPreset 4¿
```

1.4 Record and Restore Preset

Record Current Preset

The record current preset message causes all load controllers to record the current preset for all the channels in the area indicated by the area arguement. The preset can then be recalled at any time. Once the record current preset message is used the previously recorded preset number is overwritten in the controller. The recorded preset by default is preset 1.

Structure:

```
*SP [Area] ¿
```

or

```
*SavePreset [Area] ¿
```

Example Message:

Save Current Preset in Area 6

```
*SavePreset [6] ¿
```

Restore Preset

The restore preset message will cause all channels assigned to the area identified by the area to go to the recorded preset level. If a preset has not been recorded previously the area will go to preset 1.

Structure:

```
*RP [Area],[Fade]¿
```

or

```
*RecallPreset [Area],[Fade]¿
```

Parameters:

Fade

The amount of time in thousandths of a second the system is to take to get to the new scene.

Settings:

Fade

Argument	Actual fade time
2000	2 Seconds
10500	10.5 seconds
120000	2 minutes

Example Message:

Restore Saved Preset in Area 33 over 10 seconds

```
*RP 33,10000 ¿
```

1.5 Reset Preset

If any channel levels in an area are changed using a message other than a preset message the load controllers remember the last preset that area was in. It is then possible to return an area to its last preset state using the 'reset preset' message. This makes it possible for the end user to make mood changes to a lighting scene using channel level messages etc. but still be able to recall the last preset scene when required.

Structure:

```
*RsetP [Area],[Fade]¿
```

or

```
*ResetPreset [Area],[Fade]¿
```

Parameters:

Fade

The amount of time in thousandths of a second the system is to take to get to the new scene.

Settings:

Fade

Argument	Actual fade time
2000	2 Seconds
10500	10.5 seconds
120000	2 minutes

Example Message:

Reset preset in area 10 over 5 seconds

```
*RP 10,5000 ¿
```

1.6 Preset Offset

The preset offset message causes the load controllers to change their offset value. This is a value applied as an offset to any received preset message. The received preset and the offset value are added together and the load controller adjusts the appropriate channels to the resulting preset number. By default the preset offset is 0 and any received preset is a true preset.

This is used in areas that require different lighting levels at different times of the day and night. These messages are generally transmitted to the network automatically by a time controlled device.

Note: If preset offset is used on a project, documentation must state that it is being used and in what areas it is applied to. This is to assist in diagnosing suspected system faults at a later date.

Example: Area 4, Preset 1 is received at a load controller.

The load controller had previously received an area 4 preset offset of 3.

The load controller will send the channels it controls in area 4 to preset 4.

Structure:

```
*PO [offset],[Area] ¿
```

Parameters:

Offset

The number of presets the area is offset by.

Example Message:

Preset Offset of 15 in Area 44

```
*PO 15,44 ¿
```

1.7 Preset Status Request and Reply

It is possible to interrogate the DyNet network to find out the current state of an area or even a specific channel within an area. With these messages it is possible to have live feedback to a touch screen that allows a freshly opened page to display the current preset for an area or the current levels of any channel within an area.

If an area has received a preset offset message it will still display the current preset that area is in. I.e. if area 6 has is in an offset state of 3 and it is sent a preset 5 message, when a current preset request reply from area 6 will give a current preset of 8 (see Preset Offset).

Structure:

Current Preset Request

```
*RCP [Area] ¿
*RequestCurrentPreset [Area] ¿
```

Current Preset Reply (response to a current preset request)

Parameters:

Preset Number

Example Messages:

Request Current Preset of Area 4

```
*RequestCurrentPreset [4] ¿
```

Area 4 is currently in Preset 6

2 Channel Control

There are a number of different messages available to fade a single channel or all channels in an area to a defined percentage level. These messages allow for fade between 0.1 seconds and 22 minutes using a single data byte. It is also possible to stop the fade using a 'stop fade' message.

2.1 Linear Channel/Area Control

Structure:

```
*CL [Channel],[level],[Area],[Fade] ¿
*ChannelLevel [Channel],[level],[Area],[Fade] ¿
```

Parameters:

Channel number

The logical channel number that the message is to control.

Level

The percentage level the channel is to go to.

Fade

The amount of time in thousandths of a second the system is to take to get to the new scene.

Settings:

Level

0 – 100 as a percentage of maximum output.

Fade

Argument	Actual fade time
2000	2 Seconds
10500	10.5 seconds
120000	2 minutes

Example Messages:

Area 2 Channel 3 Fade to 50% over 5 seconds

```
*CL 3,50,2,5000 ¿
```

Area 2 Channel 3 Fade to 50% over 50 seconds

```
*CL 3 50 2 50000 ¿
```

Area 2 Channel 3 Fade to 50% over 15 minutes

```
*ChannelLevel 3 50 2 900000 ¿
```

2.2 Channel Level Request/Reply Messages

Structure:
Channel Level Request (to a specified channel in a specified Area)

Structure:

```
*RCL [channel],[Area] ¿
*RequestChannelLevel [channel],[Area] ¿
```

Channel Level Reply (response to a Channel Level Request)
Structure:

Parameters:

Channel number

The logical channel number that the message is to control.

Example Messages:

Request Level of Channel 5 in Area 16

```
*RCL 5,16 ¿
```

Channel 5 (Area 16) target level is 58% & current level is 58%

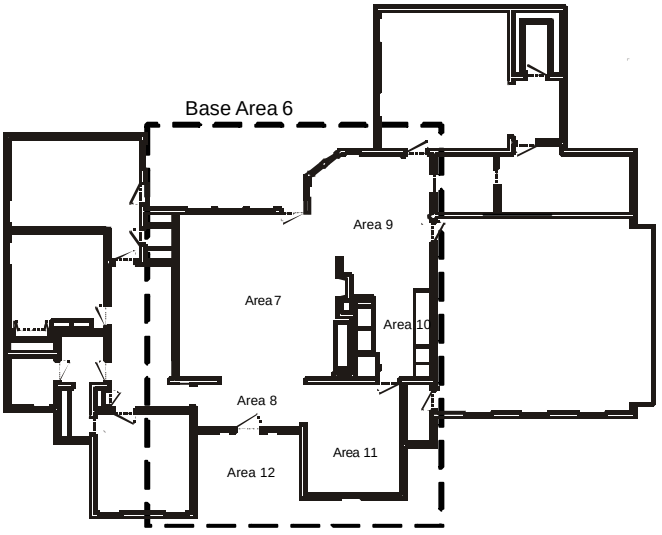
3 Area Linking

Area linking modifies the load controllers to temporarily assign channels to more than one area. With area linking it is possible to create temporary control links between up to 24 independent areas with unidirectional or bi-directional control for each area in the link. The obvious main difference between this method and Join is the ability of area link to combine a greater number of areas.

A dedicated Base Link Area can also be used to act as a global area for Channels assigned to that Base Link Area, and is useful as a global control for a block of Areas. The channels to be controlled are assigned by the DyNet engineer during commissioning and can be in of the 24 areas above the dedicated Base Link Area.

Area linking is uni-directional so if two areas 7 and 10 for example, are to work in tandem there must be two area link messages sent. One message to link area 7 to area 10 and one message to link area 10 to area 7.

In the example below areas 7-12 are all independent areas that can be controlled with standard preset messages etc. Assigning them to base link area 6 means that if and when required, any of the six areas shown can be linked to any of the other areas causing it to listen to another area's messages as well as its own. It could be possible; for example, if all areas indicated by base link area 6 were to be used together for a function, all the areas could be linked and controlled together with a single DyNet message.



Area linking also provides a global area other than area 0. It is possible to create a pathway of light through a number of different areas by sending a single control message to the base link area.

3.1 Link/Unlink Messages

Structure:
Set Area Links

```
*SLA [Area],[BLA],   ¿
*SetLinkAreas [Area] [BLA]    ¿
```

Clear Area Links

```
*CLA [Area],[BLA],   ¿
*ClearLinkAreas [Area] [BLA]   ¿
```

Parameters:

Data

Example Messages:

Link Area 4 to area 5 (The base link area must be area 2 or area 3)

Separate Area 4 from Area 3 (The base link area is area 2)

3.2 Area Link Status Request/Reply Messages

It is possible to find out the current area link status of a system from a DyNet message.

> **Important**: To interpret the response to the request area links message you must know the base link area of the area interrogated.
> **Note**: Area link status reporting is a new feature on the Dynalite network. It only works with certain load controllers.

Structure:
Area Link Status Request

```
*RLA [Area] ¿
*RequestLinkAreas [Area] ↵
```

Area Link Status Reply

Parameters:

Example Message:

Area 20 Area Link status request

Base Link Area is 10; Area 20 is linked to areas 12 and 31

4 Panic

Every area has a configurable Panic preset that can be called using the Panic message. When a control panel sees a panic message for an area that it controls it will lock the buttons for that area. This prevents anyone overriding the panic levels.
When an un-panic message is received the area will go back to its previous preset and the buttons on the control panels will be active again.
Note: The default level for Panic is 100%.

Structure:

Panic

```
*Panic [Area],[Fade] ¿
```

Un- Panic

```
*UnPanic [Area] [Fade] ¿
```

Parameters:

Fade

The amount of time in thousandths of a second the system is to take to get to the new scene.

Settings:

Fade

Argument	Actual fade time
2000	2 Seconds
10500	10.5 seconds
120000	2 minutes

Example:

Select Panic Mode in Area 2, fade lighting to Panic preset over 1 second

```
*Panic 2 1000 ¿
```

Restore normal operation in Area 2, fade lighting back to previous preset over 2 seconds

```
*UnPanic 2 2000 ¿
```

5 Panel Disable/Enable

The disable and enable messages allow any buttons configured to an area to be disabled and enabled from a single DyNet message. It is possible on some control panels to set buttons to ignore these messages.

Structure:

Disable Control Panels

```
*DP [Area] ¿
*DisablePanel [Area] ¿
```

Enable Control Panels

```
*EnablePanel [Area] ¿
```

Example:

Lock All Control Panels in Area 6

```
*DP 6 ¿
```

Unlock All Control Panels in Area 6

```
*EP 6 ¿
```

6 Remote Panel LED Control

In some circumstances it may be necessary to change the state of some or all the button LEDs on a remote panel. To do this a DyNet message is sent to the remote panel containing the new LED illumination configuration. It is possible to change the state of specified button LEDs while leaving others in their current state.

Structure:

To turn Leds on

```
*SetL [Device code],[box number],[led numbers] ¿
```

To turn Leds off

```
*ClrL [Device code],[box number],[led numbers] ¿
```

Parameters:

Device Codes

This indicates the device type of the panel the message was transmitted from.

Box Number

The unique address of the Target device.

Led numbers

Indicated the button leds the message is targeted at.

Settings:

Device Codes

8 Series Universal Panel	0xA7
5 Series Micro Panel	0xAB

Box Number

Each panel has a unique box number. This ID can be provided by the Dynalite programming engineer.

Led numbers

Each button location has a number on the panels PCB. On a 5 button LSP panel the buttons are numbered 1-5. On a 7 button LSP panel the buttons are numbered 1-5, 7 and 9 as buttons 6 and 7 are located over positions 7 and 9 on the panels PCB.

Example Message:

Turn Off Leds 1,3 and 4 and turn on Led 2 on UPAN Box 2

```
*ClrL 0xa7,2,1,3,4 ¿
*SetL 0xa7,2,2 ¿
```

Notes

Notes