



**Pioneering Light**  
a Coemar Company

**DRIVE** Hub

# **GDS Lamp**

COMMISSIONING MANUAL

Processor Card Firmware: v2.6.0

Drive Card Firmware: v2.3.1

UI Firmware: v3.7.0

## Electro-static discharge (ESD) precautions

While the Drive Hub system is designed and manufactured to be resilient and reliable, certain items of circuitry are susceptible to damage by electrostatic discharge if handled incorrectly. Drive cards are particularly at risk if incorrectly treated while being inserted or removed from the Mini Pack chassis.



To reduce the chance of damage being caused, please follow these guidelines:

- Keep drive cards within their anti-static protective bags until the last moment before installation, particularly when moving around.
- Ensure that you are properly grounded before opening anti-static protective bags and handling drive cards. For best practice, wear an ESD wrist band connected by a grounding wire to a nearby earth contact or the bare chassis of the Mini Pack.
- Always hold cards by their edges and never touch the contacts or the card components.

## Technical support

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# Contents

<b>Introduction.....</b>	<b>2</b>
GDS Lamp Summary	2
Drive Hub Summary	2
IPM Summary	2
<b>Connection.....</b>	<b>3</b>
<b>Getting Started.....</b>	<b>4</b>
Home Page	4
Status Page	4
<b>Settings.....</b>	<b>5</b>
General Settings	5
Dimmer Settings	7
Advanced Settings	8
Group Assignment	10
Advanced Dimmer Config	11
Patch	12
<b>Contact.....</b>	<b>13</b>

# Introduction

## GDS Lamp summary

Thank you for choosing the GDS Lamp, an IPM-powered LED luminaire designed for integration with Drive Hub, providing a high-quality, multi-channel controllable replacement for existing lamps. Available in a range of configurations, it installs seamlessly into both new and existing applications while leveraging the flexibility and performance of the Drive Hub and IPM system.

## Drive Hub Summary

Drive Hub is a high-capacity, centralised LED driver system designed to power and control widely distributed LED fixtures from a single location. Built with flexibility and reliability in mind, the platform is fully modular and expandable end-to-end. The central driver is available in three form factors - Card Frame (with Power Frame), Mini Pack, and Micro Pack - and supports IPM Drive Cards alongside a wide range of other drive card options, enabling control of large quantities of IPM luminaires, including the GDS Lamp.

## IPM Summary

IPM is a revolutionary driver technology for the GDS Drive Hub system, developed to overcome the challenges of multiple constant-current LED light fittings on one cable, allowing perfectly synchronised control.

The IPM Drive Card can provide power (up to 10A @ 40-56V DC) and data to multiple LED fixtures using 2-core legacy mains cabling, operating with up to 6 control channels and 7 configurable personalities. A perfect replacement for tungsten dimmers & lamps.

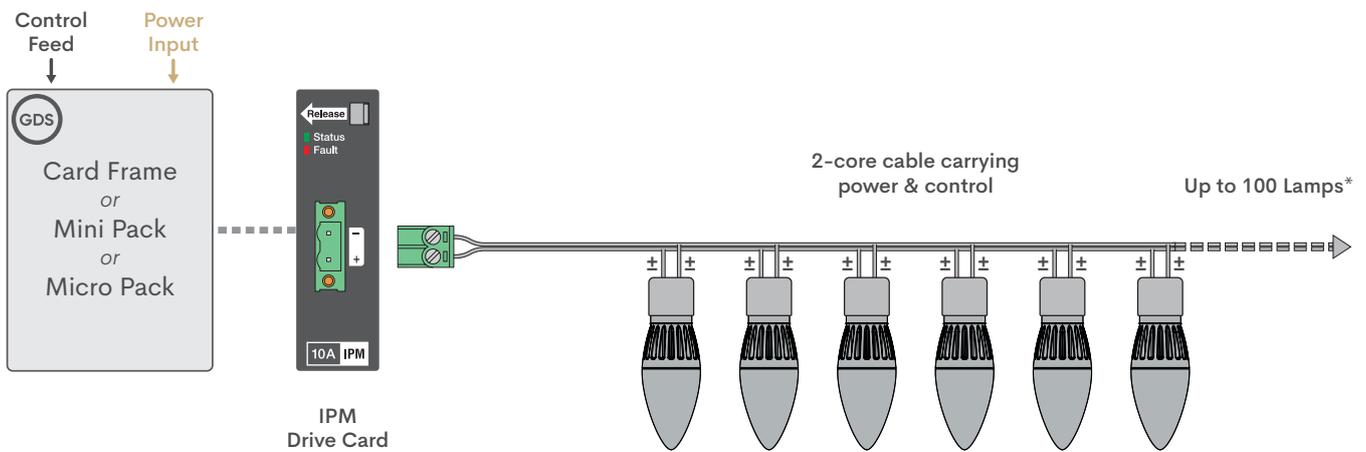


# Connection

Available in various base configurations (E14, E27, B15d, B22), the GDS Lamp is designed to fit seamlessly into any new or existing installations. No consideration needs to be made for the polarity of the lamp, as an internal full bridge rectifier means that it can be connected in either polarity.

There are, however, some important safety considerations when connecting and powering up the system. Any existing wiring (mains power or otherwise) should be completely isolated prior to the installation of the GDS Lamp, only connecting to the GDS Drive Hub system at the final stage of commissioning.

The GDS Lamp should only be connected to the DriveHub Card Frame, Mini Pack or Micro Pack system, via IPM Drive Cards. Under no circumstances should they be connected to an ordinary mains voltage system. These are low-voltage devices and connection to mains voltage will result in irreversible damage to the fixtures. The GDS IPM circuit should be connected as follows:



*\*subject to installation-dependent limitations*

The GDS Lamp uses IPM as its source of both power and data. This system enables DC power and control data to be distributed over a two-core cable to multiple lamps on a single circuit, as shown in the connection diagram above. Each circuit supports a theoretical maximum load of up to 500 W; actual limits will vary depending on factors such as cable length, cable type, and installation conditions.

The system provides six independent control channels (groups), defined by the IPM drive card, allowing fixtures to be addressed and controlled in groups, via the Drive Hub interface.

**Important note:** *When assigning control groups for IPM Lamps, each group must be physically installed separately. Due to the unidirectional nature of IPM, this is the only method to ensure that lamps are correctly associated with their intended control group. This process is described in more detail on page 10.*



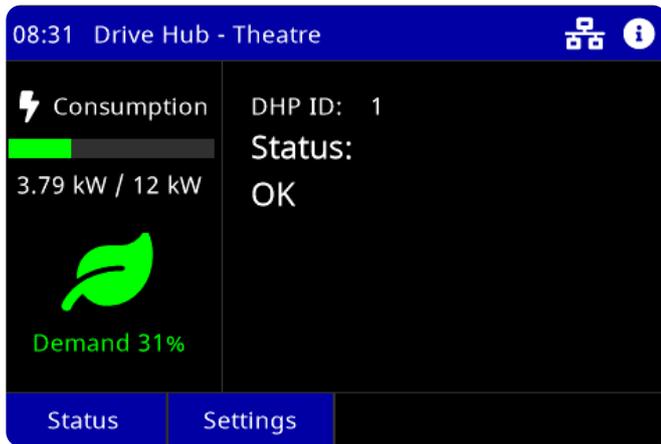
**CAUTION: THIS IS A  
LOW VOLTAGE DEVICE!  
CONNECTION TO MAINS WILL  
RESULT IN IRREVERSIBLE DAMAGE  
TO THE LAMPS!**

# Getting Started

## Home

All available settings for the GDS Lamp can be configured via the integrated touchscreen user interface on the Card Frame and Micro Pack. As the Mini Pack does not include a touchscreen interface, its commissioning process differs and is not covered in this manual.

Upon powering the unit, the user is presented with the Home page. From here, the user may select either the *Status* menu or the *Settings* menu. Access to the *Settings* menu requires entry of the PIN code on the Unlock page. Please contact GDS if you do not know your PIN:



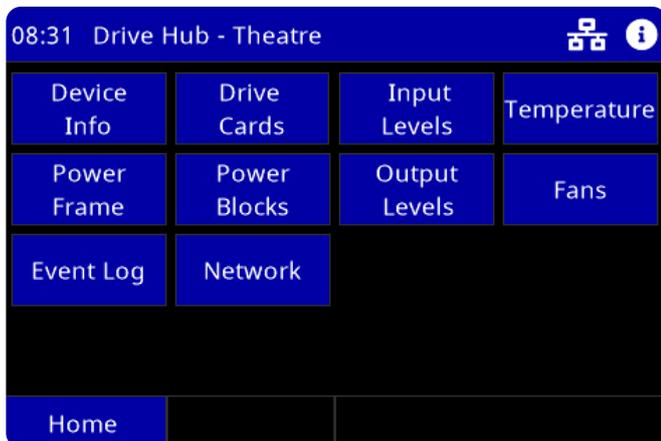
Home Page



Unlock

## Status

This page allows the user to view, but not modify, information related to the current system configuration. Selecting *Device Info* provides access to core device information:



Status



Device Info

# Settings

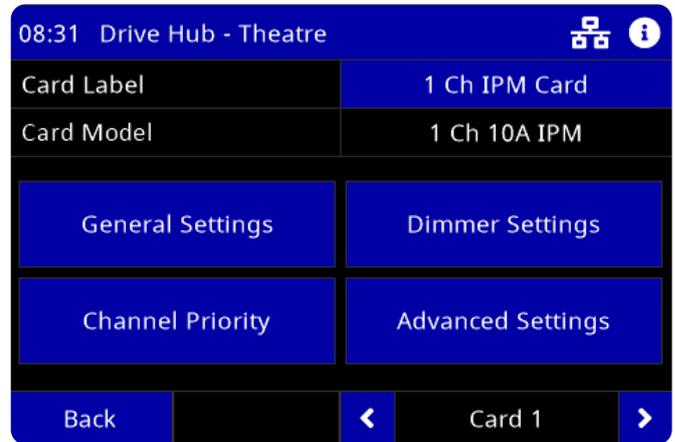
The *Settings* page allows the user to view and configure the Drive Hub and its associated system components. For the purposes of this manual, only the *Patch* and *Drive Cards* sections are covered, as all GDS Lamp and IPM configuration parameters are accessed here.

Drive Cards are navigated using the controls at the bottom of the page. Depending on the system configuration, this may present up to 12 pages on a fully populated Card Frame or up to 2 pages on a Micro Pack. Only options relevant to the specific Drive Card installed will be displayed.

For clarity and consistency, this manual focuses exclusively on IPM Drive Cards.



Settings



Drive Cards (IPM)

## General Settings

The *General Settings* page shows the options related to the entire Drive Card. Anything changed here will affect the operation of the card itself and everything connected to it:



General Settings

**IPM Eco Mode** - When Eco Mode is enabled, the Drive Card will shut off power to the connected lamps if the DMX dimming value remains at 0% for more than *10 seconds*, helping reduce standby power consumption. Once the dimming level rises above 0%, the Drive Card automatically restores power and the fixtures turn back on.

*Note: When exiting Eco Mode, there is a brief delay of approximately ~50mS before the lamp responds. Eco Mode can be disabled when faster reaction speeds are required.*

**IPM Encoding Speed** - This setting allows the user to select between three speed options (Slow, Fast and Max). By default, this option is set to "Max" and should not need to be changed unless support of legacy IPM receivers is necessary.

**IPM Protocol Revision** - This setting defines the number of IPM control channels transmitted by the system.

**Default:** IPM - 1CH

**Available options:**

- Legacy
- IPM - 1CH
- IPM - 2CH
- IPM - 3CH
- IPM - 4CH
- IPM - 5CH
- IPM - 6CH

**Legacy Mode**

Transmits data using the original IPM protocol. Select this option only when supporting legacy IPM fixtures that require the earlier protocol format.

**IPM - CH Modes (1-6CH)**

Transmits data using the latest IPM protocol with the specified number of control channels. Select the number of channels required for the installation.

***Performance Consideration:** Increasing the number of transmitted control channels reduces the dimming data update rate. For applications requiring very fast response times, configure the system with the minimum number of distinct control channels necessary.*

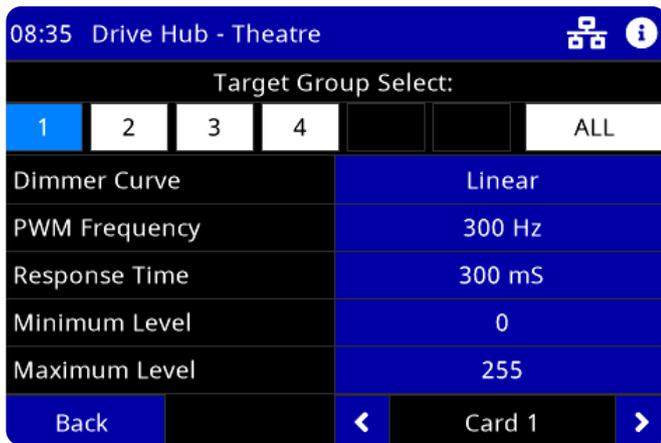


The above bar is displayed on many IPM settings pages when any protocol other than Legacy is selected. The number of selectable groups depends on the number of control channels configured in the active IPM protocol revision. The currently active Target group is highlighted in blue. Groups may be addressed individually or via a global broadcast. When the All button is selected, any configuration changes are applied to all connected devices, irrespective of their assigned group; in this mode, all visible groups are highlighted in blue

**IPM Emergency Polling** - This setting enables transmission of a short IPM status message once per second to all IPM receivers. This message confirms that no emergency condition is present. It functions as an "emergency hold-off" signal, preventing fixtures from entering emergency state. When this message stops being received by a lamp or other IPM receiver while still receiving power, emergency state is activated locally by the fixture. See page 9 for more details.

## Dimmer Settings

The *Dimmer Settings* page provides configuration of the dimming parameters for connected IPM fixtures:



Dimmer Settings

**Dimmer Curve:** *Incandescent, Linear, Square Law, Custom.*

This setting defines the intensity response of the fixture relative to the transmitted DMX level. For example, the *Linear* curve increases perceived intensity more rapidly than the *Incandescent* curve, which more closely replicates the thermal response characteristics of a traditional tungsten source.

Selecting *Custom* enables user-defined curve shaping via the *PWM Bezier Parameter* page.

**PWM Frequency:** *255Hz, 300Hz, 510Hz, 600Hz, 1020Hz, 1200Hz, 2040Hz, 4080Hz, 19200Hz*

Adjusting this setting changes the modulation frequency of the pulse-width modulation (PWM) control scheme used to regulate fixture intensity.

Lower PWM frequencies can achieve a higher contrast ratio, typically resulting in improved perceived dimming performance. Conversely, higher PWM frequencies reduce the achievable contrast ratio but may help to minimise visible flicker. This can be beneficial in applications where certain individuals are sensitive to flicker or where lighting is captured by video equipment.

**Response Time:** *0mS, 50mS, 100mS, 200mS, 250mS, 300mS, 400mS, 500mS, 600mS, 700mS, 800mS, 900mS, 1000mS*

Adjusting this setting determines the degree of smoothing (interpolation) applied to changes in output intensity in response to DMX level adjustments.

Higher values distribute intensity changes over a greater number of smaller incremental steps, resulting in smoother transitions over a longer period. Lower values apply changes over fewer, larger steps, producing a faster and more responsive output.

Higher settings are preferable where smooth dimming performance is the priority, whereas lower settings are suited to applications requiring more immediate lighting response. For most installations, a value between 200–500 ms provides a practical balance.

For example, with a setting of 500 ms, a single transition from DMX 0 to DMX 255 would be applied progressively over a 500 ms period.

**Minimum/Maximum Level:** 0-255

This setting allows a fixed minimum and/or maximum DMX level to be defined for the selected channel. Any incoming DMX values outside the configured limits will be overridden, and the output will be constrained to the specified range.

**Note:** These settings can be applied either to all connected IPM receivers or each group separately using the target group selection

## Advanced Settings

The IPM Advanced Settings page provides configuration options for connected IPM fixtures that extend beyond the core requirements of a standard IPM installation. These advanced settings encompass parameters intended for specialised applications or installations requiring enhanced control and customisation.



**Advanced Dimmer Config:** This page provides additional parameters relating to the dimming behaviour of connected IPM receivers. These settings are described in full on page 11.

**Select Personality:** IPM personalities are supported by the GDS Lamp:

**FTW1**

1-channel Fade-to-Warm (1800–3000K), calibrated to Puppis 1K FTW 3000K @ 600 Hz reference.

**FTW2**

1-channel Fade-to-Warm (1800–2700K), calibrated to Puppis 1K FTW 2700K @ 600 Hz reference.

**FTW Custom**

1-channel Fade-to-Warm with user-defined CCT curve via the CCT *Bezier Parameter* page.

**Fixed CCT**

1-channel fixed colour temperature. CCT is configured within *Advanced Dimmer Config*.

**Tuneable (2CH)**

Provides independent control of:

- Channel 1: Intensity
- Channel 2 (next sequential group): CCT

Dimmer curve and response settings remain active on each channel.

### Candle 1CH

Single-channel flicker personality:

- DMX controls maximum intensity
- Flicker volatility configured via *Flicker Settings* within *Advanced Dimmer Config*
- CCT behaviour derived from *FTW Custom*

Influenced by dimmer curve and response time

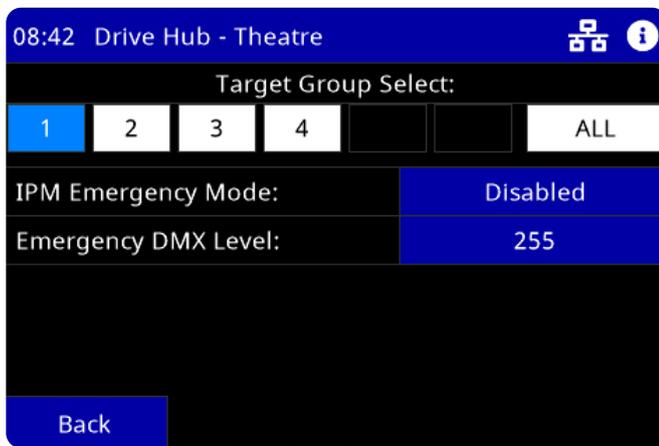
### Candle 2CH

Two-channel flicker personality:

- Channel 1: **Maximum intensity**
- Channel 2 (next sequential group): **Flicker volatility**

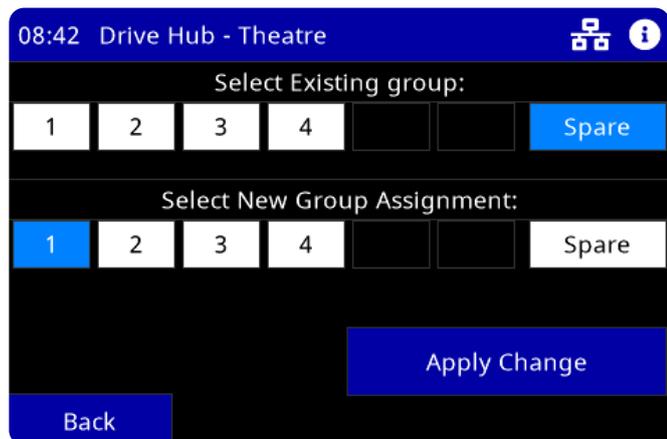
Allows real-time flicker control.

**Emergency Settings:** This page allows emergency mode to be enabled for a selected group of IPM fixtures or lamps. When Emergency mode is enabled and the fixtures are powered but not receiving valid data (for example during change over to a direct DC connection to an Emergency Power Source), they will operate at their configured Emergency DMX Level (0-255):



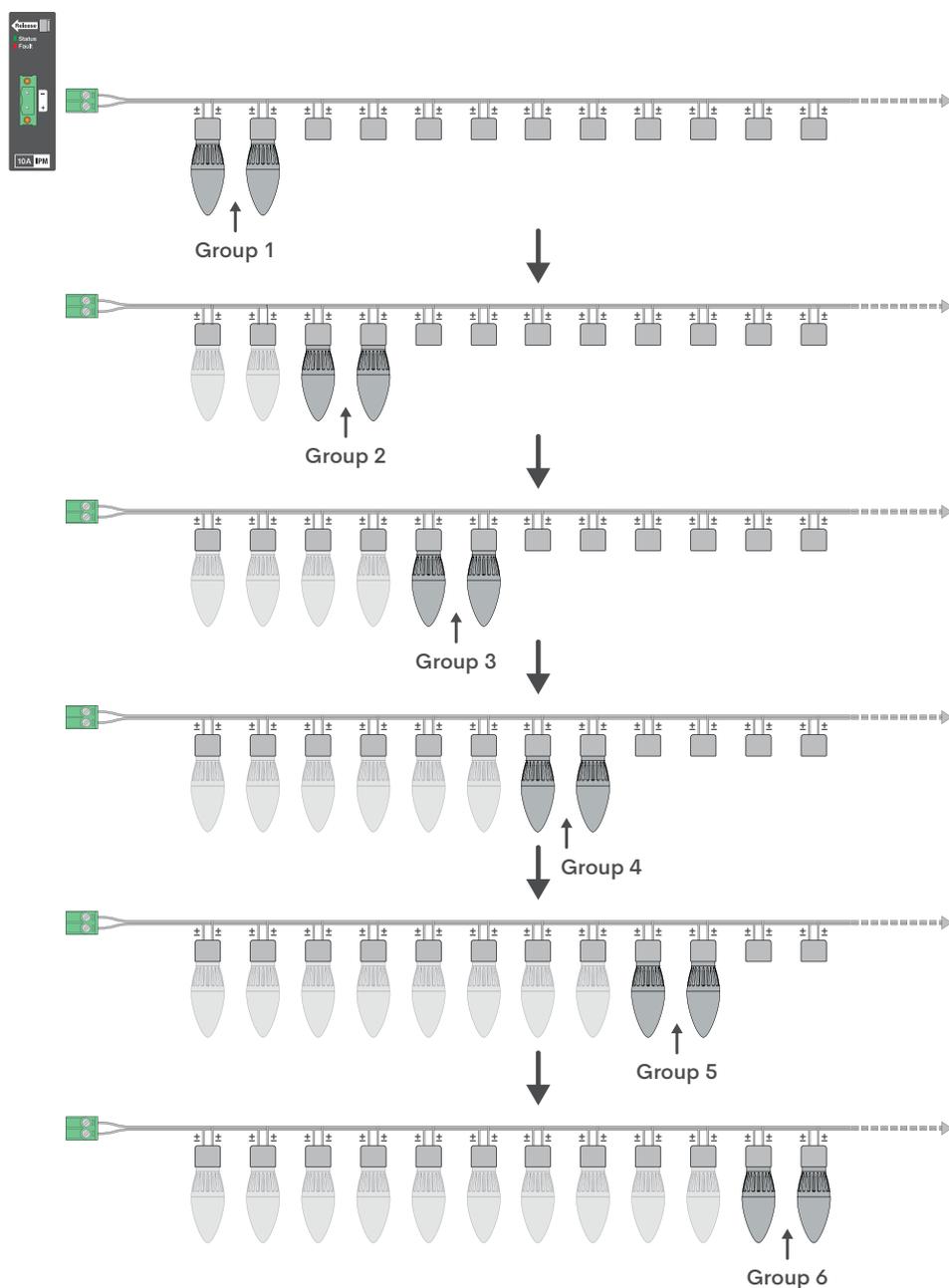
Emergency Settings

**Group Assignment:** This page allows IPM fixtures to be configured or moved between IPM groups. By default, all receivers are assigned to the *Spare* group from the factory. Fixtures in the *Spare* group will respond to dimming data when the *IPM – 1CH* protocol is selected. However, if a multi-channel protocol is applied, fixtures must be explicitly assigned to a group to receive control:



**Important note:** When assigning control groups for IPM Lamps, each group must be physically installed and assigned before proceeding to the next group. This ensures correct initial group assignment. Once all lamps have been assigned, they can be reassigned to different groups directly from this menu without needing to move the fixtures physically.

Group Assignment

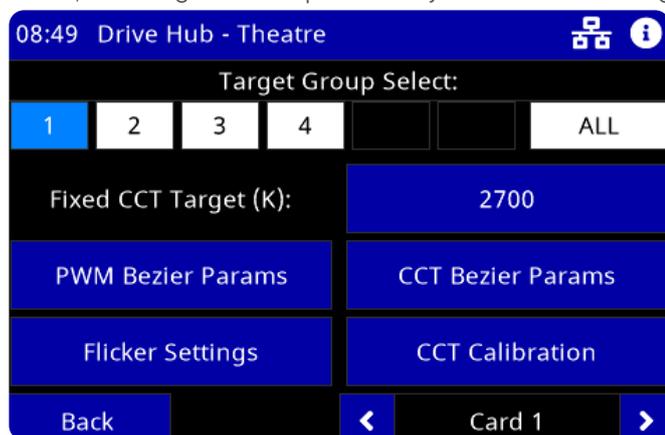


**Output Current:** This option is disabled for GDS Lamps, as their maximum current is fixed by the hardware and cannot be adjusted.

**Factory Reset:** Pressing this button will restore the selected group to its factory default configuration. This action will undo any group assignments and custom dimming settings.

## Advanced Dimmer Config

These settings provide additional control over the parameters of specific functions within the Advanced Settings menu, allowing for more precise adjustment of dimming behaviour on supported IPM fixtures:



Advanced Dimmer Config

**Fixed CCT Target:** Specifies the fixed colour temperature that IPM Lamps will use when configured with the *Fixed CCT* personality.

**PWM Bezier Params:** This page allows adjustment of the Bezier control points that define the shape of the *Custom Dimming Curve*. Modifying these values effectively requires an understanding of cubic Bezier curves and should only be attempted by advanced users. For clarification, please contact GDS.

**CCT Bezier Params:** This page allows adjustment of the Bezier control points that define the Custom FTW personality, determining the correlated colour temperature (CCT) at any given intensity. Modifying these values requires an understanding of cubic Bezier curves and should only be attempted by advanced users. For clarification, please contact GDS.

**Flicker Settings:** This page allows adjustment of the *1CH Candle Volatility* setting (0-255), which controls the behaviour of the flicker effect when the *1CH Candle* personality is applied. Volatility increases as the value increases.

**CCT Calibration:** This page is intended for internal use and should not require access by end-users. It provides adjustment of the calibration coefficients used to calculate colour temperature ratios within the *Custom FTW* and *Fixed CCT* personalities.

## Patch

Accessible from the main *Settings* page, the Patch page allows users to configure the DMX patch for each IPM Drive Card channel. For IPM Drive Cards using multi-group IPM protocol versions, group addresses can be assigned individually from this page:



Patch

## Contact

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