eDIDIO® S10

ethernet DALI/DMX & Infrared options; Digital Inputs/Outputs

Ethernet-enabled modular DIN-mount Lighting Controller for DALI/DMX$_{512\text{-}A}$

User Manual



Creative Lighting can be contacted through your local distributor.

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Description

Congratulations on your purchase of an eDIDIO S10, the modular DALI and $DMX_{512\text{-}A}$ intelligent lighting controller that suits standard DIN mounting. The controller allows for 2 lines of control, via either DALI, $DMX_{512\text{-}A}$, or a combination of both.

The controller has the following features;

- **Modular Control**
  - Modular hardware allows for any combination of up to two (total) DALI and or $DMX_{512\text{-}A}$ outputs while still maintaining proper $DMX_{512\text{-}A}$ signal conditioning and DALI separation.
- **Open Protocol**
  - Creative Lighting embraces open protocols and allows any TCP-IP capable system to interact with the eDIDIO. Our 'Protocol Buffers'-based API enables systems written in most languages to integrate with the eDIDIO quickly and easily.
- **Easy Installation**
  - DIN Mounted with 'plug and play' connectors: a black 2-way for DC in, a 12-way for I/Os, 2 x 3 ways for Data Lines, and a 4 way for Logic Ground and IR. Conveniently, if the controller is moved / removed, the connectors can remain behind, leaving the existing wiring connected to the connectors.
- **Multi-Line Control**
  - Any interface or trigger in the system can call a command over multiple connected lines.
- **Easy to use configuration**
  - An easy-to-use interface provides quick configuration access/changes; uniquely, each section is treated individually so for example, inputs can be programmed without erasing schedules.
- **Spektra**
  - Control Freak Spektra has been baked into the eDS10 allowing for sophisticated colour control of any type of coloured light using DALI or $DMX_{512\text{-}A}$.
    User-selectable light types of up to 6 colours per light – from white to R/G/B/A/WW/CW - for up to 128 DALI devices, or 1024 $DMX_{512\text{-}A}$ channels.

*API, Windows-compatible GUI, and Android apps available. IR and RS232 Serial optional

Requirements

The eDIDIO must be powered with a 24vdc (>100mA) source, recommended as a HDR15-24 (minimum) or HDR60-24. This supply is connected to the eDIDIO supply input screw down terminals marked DC IN + & -. Ensure the cable from the DC power supply to the eDIDIO is less than 30 meters.

For DALI to work, an external DALI PSU must be present on each line, recommended as a Control Freak UBi Power.

Configuration software available for free at http://www.ctrlfreak.com.au/products/configurator

Safety

- This product is NOT for household use and must only be used by a professional qualified person.
- This product is designed to be powered by a suitable DC supply 24V
- Turning connected lights off by DALI or DMX commands does not disconnect the power to the fixtures.

Installation

This section of the manual describes the process of connecting a DC supply, DALI and DMX_{512-A} lead to the eDIDIO. The example is diagrammatic only as it depends on the configuration of the DALI and DMX_{512-A} lines.

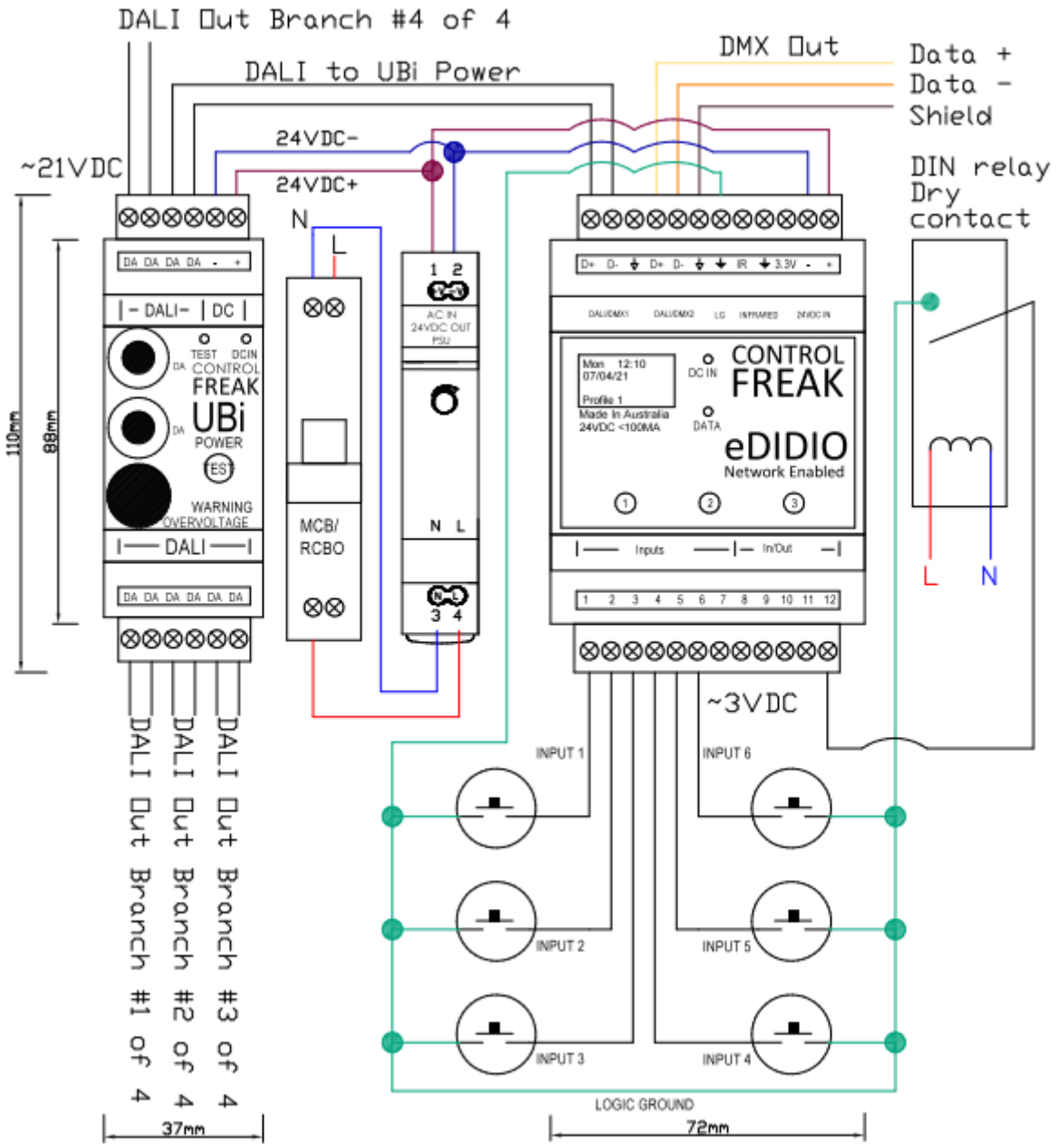

Figure 1. Example Wiring diagram showing DMX_{512-A} and DALI. Also depicts examples of connecting I/Os for switches, relays et cetera

DALI Line connection

The DALI line wires are connected in the screw terminals at the top of the enclosure as shown above: you must not have two DALI line power supplies on the same DALI line. DALI Standard mandates no more than 2Vdc voltage drop.

DMX_{512-A} Line Connection

The DMX_{512-A} line wires are connected in the screw terminals at the top of the enclosure as shown above. Do not confuse the DALI and DMX_{512-A} lines: as connecting a DALI bus PSU to a DMX_{512-A} line will cause irreversible damage.

Inputs

The inputs of the eDIDIO allow for short, long, and latching presses by connecting the input pin source to a ground pin source. This means that any potential-free contact, such as a switch mech or relay device, that can connect two wires together will be able to be used as an input device for the eDIDIO.

The inputs 1-8 will show ~3VDC (In reference to the GND pin) when floating, allowing for easy testing via multimeter. I/Os 9 to 12 will initially show a higher VDC and decay down to 3VDC over time. A display option is also available using the keypad/menu to show the state of each input.

Menu and Display

The eDIDIO has a 128 x 96-pixel display that can show the time, status, and other useful information.

Home Screen

The home screen displays the time and date, as well as battery, temperature, and connection status icons. The battery icon will show when the PCB battery is below its recommended voltage, the temperature icon will display in over 50-degree situations, and the connection status icon will display when a valid Ethernet connection is accepted.



An information line is available at the bottom of the display which will provide status updates on either; Schedules, Burn-in, or current profile. The default is schedule status and is settable using the keypad menu.

Pressing any button will open the menu, and there is a 10 second timeout during menu screens (if idle for 10 seconds due to no user-interaction, the display will return automatically to the home screen).

Figure 2. Status Icons

Main Menu

The main menu shows options for Installation, Testing, and Settings. Button 1 moves the cursor up, button 3 moves the cursor down, and button 2 confirms selection.



Installation

The installation allows for Random Addressing of DALI fittings



Testing

The testing screen allows for DALI and $DMX_{512\text{-}A}$ Min/Max commands, displaying of inputs, and counting devices



Settings

The settings screen lets you choose between various options, such as status information display and muting/unmuting sensors.



Ethernet Connectivity

The controller has a 10/100 Base T Ethernet port, DHCP capabilities, and multiple open TCP sockets. UDP is used for broadcast discovery.

Connecting the eDIDIO via Ethernet cable to a network will allow for easy configuration and advanced control tools.

Controller Functionality

The controller has a wide range of capabilities that can be utilised using the Configurator V2 application.

Actions

The controller can perform actions called triggers. These triggers can be called from Inputs, Lists, and schedules. The following table shows the available triggers. If a controller is connected to the Configurator V2, the program will read the line properties and allow for check box selections depending on the installed protocol.

DALI Actions	$DMX_{512\text{-}A}$ Actions	Other Actions
Arc Level	Arc Level	On/Off (Arc Level) Toggle
Min, Max, Off		Min/Max Toggle
Fade Up, Fade Down, Step Up/Down		Store, Recall, Reset User Level
Recall Scene		Change Profile
		Enable/Disable Input/Sensor
		Run Preset Code
		Start/Stop List
		Enable/Disable burn-in
		Spektra Control (Start/Stop/next)
		Output Control

Input/Output Functions

There are 12 inputs available on the eDIDIO, of which 4 can be selected as optically isolated outputs. Each input has an associated action for short and long press, or low and high press if latching. Short press is > 50ms and < 400ms. Long press is > 400ms, with a repeat of 200ms if continually held down.

The input can be associated to an action above, or if multiple actions are required, call an associated list of actions.

Lists

Lists allow for multiple actions to occur at the same time or delayed if necessary. The list actions can call commands over multiple DALI and $DMX_{512\text{-}A}$ Lines, for example;

Step 1 – LINE 1 DALI Group 0 to MAX, Step 2 – LINE 2 $DMX_{512\text{-}A}$ Arc Level 50%

There are 32 lists available with 256 steps in each, for a total of 8196 steps. A delay is available from 0s, up to 960 minutes. Any actions that occur with 0 second delays will be sent as soon as possible, but keep in mind real world restrictions. I.e DALI requires ~20ms to send a message.

Schedules

There are 10 schedules available allowing for interrupt driven alarms to be set. Schedules can call any action, such as *All DALI Line 1 Group 0 0% at 6pm Every weekday*. Schedules can be configured to repeat every day, or on specific days.

Burn-Ins

Two burn-in timers are available, allowing for individual burn-in control for different groups or lines. Burn-in prevents the DALI commands for sending any level which will cause a fade. Any level of 1 or over will cause the light fitting to go to MAXIMUM, while counting down until the number of hours is reached and normal operation can resume.

Sensors
Up to 10 motion and light sensors can be used per DALI line.

Sensors options include; daylight harvesting, motion only, setpoint/level, warning level, warning timeout, grouping, and disable timeout.

Disable allows for the user to exit the room using an action which causes the associated sensor group to turn off. If a schedule/list or input is triggered for this group, the sensor will be put into 'user override mode' and maintain the user adjusted level until the lights have been turned off, or occupancy is no longer detected.

Translators
The eDIDIO features a $DMX_{512\text{-}A}$ to DALI translator for up to 16 channels. Offsets for both $DMX_{512\text{-}A}$ and DALI can be set, as well as input disable flags if $DMX_{512\text{-}A}$ is detected. Three translation objects can be setup, allowing for multi-line DMX to DALI translation

Options
- Time can be updated from the Device->Target Device Settings Page
- Developer Options can be unlocked if password is requested

Firmware Upgrade
The eDIDIO allows for over-the-air updates using the Configurator V2 application. If a new firmware file is available, connect to the eDIDIO, enable developer tools mode, and upload firmware via the prompts. The upgrade takes around 2 minutes to complete.

WARNING – Upgrading the firmware may erase the stored configuration and is only recommended if additional functionality or bug fixes are necessary.

3rd Party Connectivity
The eDIDIO will accept connections from third party TCP sockets. A Google Buffer API is available at request allowing for commands to be sent easily from any third-party system.

Spektra
Spektra is a full in-built colour control application (additional charges apply, time of order only). It is configured by the Control Freak Android tablet application Spektra X. Please see the Spektra User manual for full details on the colour control capabilities.

Troubleshooting
- Device not found in by discovery -> Check connections, make sure network symbol is present on controller OLED
    - Using the keypad menu, check in settings->device status to see if an IP has been set. If it is 0.0.0.0, check network settings for the router to make sure it supports DHCP.
- Device fails to select appropriate version -> Reset power to controller, make sure network is not affected by other devices.
- Start-up System Check – On start-up various systems are checked, they will display on a screen for 5 seconds after the standard boot sequence. Consult Creative Lighting if this screen appears and what it shows.

Notes
- Device must be connected through a router with DHCP capabilities to work normally. For direct connection, your PC adaptor settings must be manually changed, and the cable be cross-over type.

Physical	
Size (d) x (w) x (h) mm – excluding terminals – including terminals	60x72x88 60x72x108
Weight (grams, approximate)	170
Materials - case	ABS BLUE Anti-flammability to UL94V0
Power	
Input – range (>100mA recommended)	24VDC
Battery backup for real time clock	3VDC CR2032
Protection	
Polarity reversal on DC input	Immune
Over-current protection	Yes
Transient protection	Yes
Keypad	
Indicating status LED	DC In, Data, & Data (Ethernet)
Keypad – 3 key membrane type	Momentary
Special	
Clock	Internal RTC with battery back-up
OLED screen	128*64 Organic LED
Networking	MAC address & TCP/IP
Compliance	
Designed to meet or exceed relevant standards Safety EMC	AS/NZS 61347.2.1; EN 55015 + A1; EN61547+A1. CE and C Tick, IEC/AU CISPR15

Ordering

For assistance with projects or ordering products, please consult the QLD or SA offices (Details on first page)

Configuration Options

Version

- 4 Pole (2 Line Version)
- 9 Pole (4 Line Version)

$DMX_{512\text{-}A}$ or DALI

- DALI or DMX (DALI/DALI/DALI/DMX etc)

Additional Functionality

The control has additional functionality available on request for bespoke applications.

DALI to DMX

DALI emulation of up to 32 devices is possible through the eDIDIO. A separate manual is provided on this method but allows a single 4 pole DIN mounted device to control 32 DMX channels using 32 emulated DALI channels. DALI V2, no device type specified.

Modbus to DALI

Modbus RTU through RS485 to control the other 3 DALI lines. A separate manual is provided on this method.

DALI Repeater

Isolated DALI Repeater with 1 in and up to 3 out. From a central location a 9 pole eDIDIO could provide up to 900m of additional DALI cable length, while maintaining central control. Automatic lock out is also available, disabling the repeaters actions if the head end is transmitting.

BACnet Implementation

The eDIDIO S10 has an optional BACNET implementation that can be provided at time of order.

- Description - Lighting Controller
- Vendor Name - Ctrl Freak
- Vendor ID - 812
- Model - edidio-s10

The device implements a BACNET lighting object and simplifies the DALI/BACNET relationship by offering various commands.

Lighting Objects - There are 32 instances available, broken down into DALI Groups 0-15 on DALI Line 1 and DALI Groups 0-15 on DALI Line 2.

Default properties use 2.8s Fade time, with a step increment of 44/256.

- BACNET_LIGHTS_FADE
    - Optional use fade time
- BACNET_LIGHTS_STEP_UP
    - Uses DALI Step Up Function
- BACNET_LIGHTS_STEP_DOWN
    - Uses DALI Step Down Function
- BACNET_LIGHTS_STEP_ON
    - 100% Level using inbuilt fade time
- BACNET_LIGHTS_STEP_OFF
    - 0% Level using inbuilt fade time

To reduce DALI traffic, RAMP is not suggested and is not active by default. Light commands are recommended to be sent as BACNET_LIGHTS_FADE with use_fade_time TRUE for optimal results. Present Value is tracked and can be read from system

Binary Value Objects

Binary Value objects allow for quick and easy commands to be sent to the controller. The polling command allows polling to begin, which will check on the status of all devices at a 1 second interval (64 seconds per line). The General Fault values will show a 1 if any of the devices on that line recorded with a DALI ‘Status’ or ‘Lamp’ failure. Once the failure is rectified, either allow ~2 minutes for the fault to clear or write the value as 0.

Instance	Property	Read/Write	Present Value = 0	Present Value = 1
0	FMS Override	R/W	FMS Override OFF	FMS Override ON
1	DALI Line 1 Master On/Off	R/W	DALI Line 1 0%	DALI Line 1 100%
2	DALI Line 2 Master On/Off	R/W	DALI Line 1 0%	DALI Line 2 100%
3	DALI Line 3 Master On/Off	R/W	DALI Line 1 0%	DALI Line 3 100%
4	DALI Line 4 Master On/Off	R/W	DALI Line 1 0%	DALI Line 4 100%
5	General Fault Line 1	R/W	No Fault Line 1	Fault Detected Line 1
6	General Fault Line 2	R/W	No Fault Line 2	Fault Detected Line 2
7	General Fault Line 3	R/W	No Fault Line 3	Fault Detected Line 3
8	General Fault Line 4	R/W	No Fault Line 4	Fault Detected Line 4
9	DALI Polling	R/W	Poll Off	Poll On

Binary Input Objects

The 8 inputs on the eDIDIO can be read. The value is read only and will return the instantaneous reading.

Instance	Property	Read/Write	Present Value = 0	Present Value = 1
0	Input 1 Status (Default high)	R	Input Low	Input High
1	Input 2 Status (Default high)	R	Input Low	Input High
2	Input 3 Status (Default high)	R	Input Low	Input High
3	Input 4 Status (Default high)	R	Input Low	Input High
4	Input 5 Status (Default high)	R	Input Low	Input High
5	Input 6 Status (Default high)	R	Input Low	Input High
6	Input 7 Status (Default high)	R	Input Low	Input High

Binary Output Objects

The 4 eDS10 outputs can be set if they are configured as outputs from the configuration utility.

Instance	Property	Read/Write	Present Value = 0	Present Value = 1
0	Input 8/Output 1	R/W	Output Low	Output High
1	Input 9/Output 2	R/W	Output Low	Output High
2	Input 10/Output 3	R/W	Output Low	Output High
3	Input 11/Output 4	R/W	Output Low	Output High

Schedule Object

An interface between BACNET and the internal eDIDIO schedules is available. To get the most out of the eDIDIO schedules they will need to be initially configured using the configuration software. This allows for the additional

functionality (Day/Month Mask, Astronomical Time, Large Command List) to be used with times and enable/disable status set by BACNET.

5 schedule objects are available, mirroring the first 5 of the eDIDIO configuration schedules.

- Sending Present Value will allow for enable/disable schedule.
- Sending 'Weekday Schedules' with at least 2 times (Start and Stop) will update the start and end times of the schedule.

Control Freak eDIDIO Warranty

Refer to the Creative Lighting Warranty Statement

Other products

Creative Lighting also make SLAMMO led dimmers for DALI $DMX_{512\text{-}A}$ DSI and RDM, DIDIO DALI serial Communication Interfaces, eDIDIO DALI line power supplies, eDIDIO Scene Controllers, eDIDIO RGB and Sequence Controllers, eDIDIO DMX-DALI interfaces, LIDA DALI AC controllers for Contactors/relays, Fans and HID loads, ADDICT tools for DALI, $DMX_{512\text{-}A}$ and RDM