4-Channel Ballast Controller (474)

Product Description

The Digidim 474 is a four-channel ballast controller fitted with high-inrush relays rated at 16 A per channel, which handle short, high-peak currents during switch-on of loads.

The outputs can be configured to match common ballast control loads including 1–10 V, DSI®, and DALI-broadcast.

The outputs can be configured independent of, or paired with, a relay channel.

The unit can operate with either a Helvar Digidim or Imagine lighting control system and is DIN-rail mounted for ease of installation.

It has an intuitive LED segment display and push buttons known as the 'Control Panel', for monitoring, manual configuration and control purposes.

The Control Panel comprises:
- A 3-digit, 7-segment LED display (normally showing device activity)
- Two buttons ('up' and 'down') to the right of the display, to view and configure parameters

Control Panel

*DSI® is a registered trademark of Tridonic GmbH.*

Installation

1
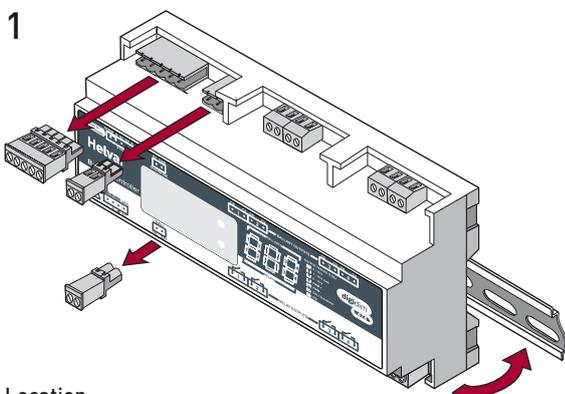
Location
- For installation in a restricted access location only.

Position & Ventilation
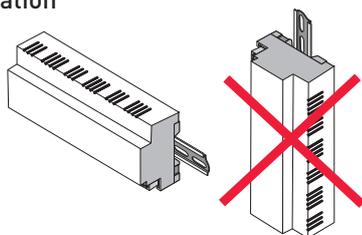
- Install the unit horizontally to allow for heat dissipation.
- Any enclosure must provide adequate cooling ventilation.

2

SDIM/DMX
Override
Ballast Outputs
1 2 3 4
'Status' Display
Mains Supply
DALI
1 2 3 4
Relay Terminals
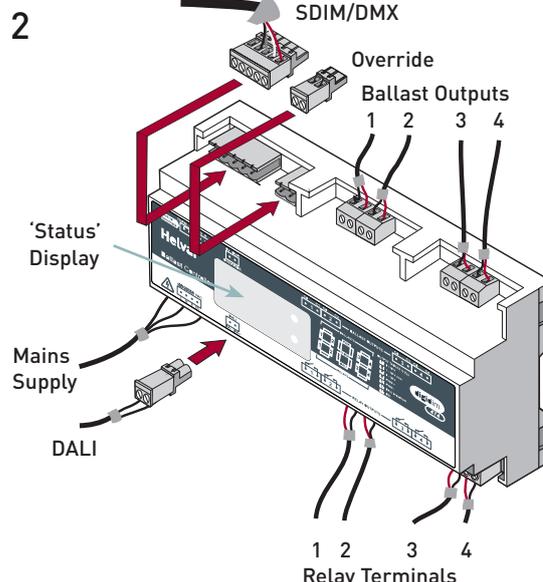
Electrical
- Do not connect DALI and SDIM/DMX at the same time.
- Isolate the mains supply before installation.
- The external supply must be protected: 6 A MCB max.
- All DALI and mains cabling must be 230 V mains rated.

| Cable	Cable Type
DALI	2-wire mains-rated, 0.5 mm² to 1.5 mm² Max. length 300 m (with 1.5 mm² cable). Example: Belden 8471.
Mains cable / Dimmed outputs	Max. 2.5 mm² stranded (4 mm² solid).
SDIM/DMX	Low-loss RS485 Type (multistranded, twisted and shielded). ***Note:*** *One twisted pair for A and B (85 Ω to 100 Ω impedance), one core or twisted pair for 0 V, and shield for screen.* Size: 0.22 mm² to 1.5 mm². Core: 3 or 4 + Screen. Max. length 1000 m (low-loss cable). Example: Belden 8102 or Alpha 6222C.
Override	2-wire, 0.5 mm² to 1.5 mm². Max. cable length 50 m.

Contents

Connections

Ballast Outputs

SDIM/DMX · OVERRIDE · 1 · 2 · 3 · 4
TERM B SC 0V A · 0V OVR · C0 C1 · C0 C2 · C0 C3 · C0 C4

L N ⏚ SC · DA- DA+ · 1 · 2 · 3 · 4
Mains Supply · DALI · **Relay Outputs**

Mains Supply & DALI

Mains Supply

L N ⏚ SC

DALI

DA– DA+

A

B

Screen (if required)

DALI Devices

Notes: Functional earth connection used for DALI/SDIM/DMX screens only.

Do NOT connect DALI and SDIM/DMX at the same time.

Override

$V_{in} < 1.5\ V$

$I_{short} = 1\ mA$

SW

Close switch to cause level override

OV OVR
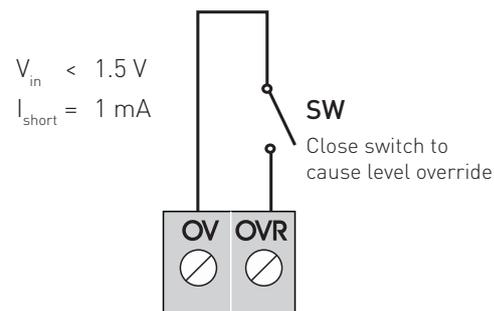
Input for override

Note: *Maximum cable length = 50 m.*

SDIM/DMX

ii

i

TERM B SC 0V A

SDIM or DMX

i

iii

TERM B SC 0V A
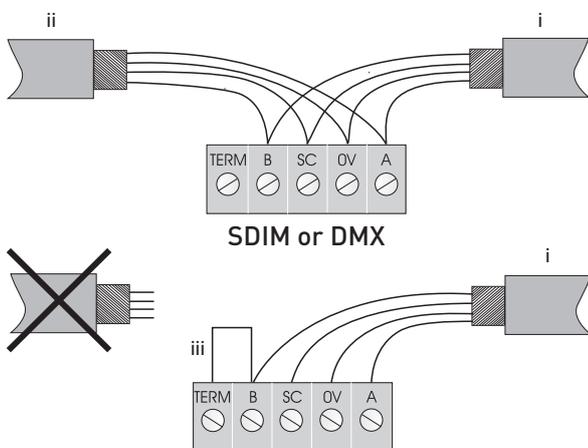
i = SDIM or DMX data cable (from previous device)
ii = SDIM or DMX data cable (to next device)
iii = Link for termination (if unit is at end of SDIM/DMX cable line)

Note: *Keep unscreened wire lengths to a minimum.*

Ballast Outputs

Helvar EL-sc ballast

Helvar iDim (DALI) ballast

C1 (+)
C0 (–)

1–10 V

DA (+)
DA (–)

DALI

C0 C1 C0 C2
(–) (+) (–) (+)

C0 C3 C0 C4
(–) (+) (–) (+)
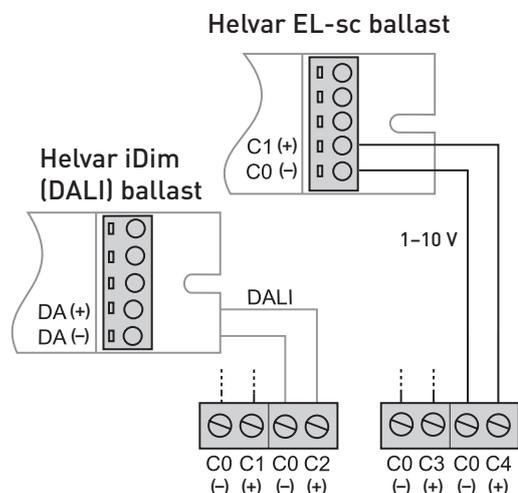
Power Up

During power up, the following sequence is displayed on the LED Control Panel.

Each display is held for one second. At the end of this sequence, the 'Status' display appears.

Start-Up Sequence:

| 1. All segments on	2. Product model	3. Software version	4. Normal operation ('Status' display)
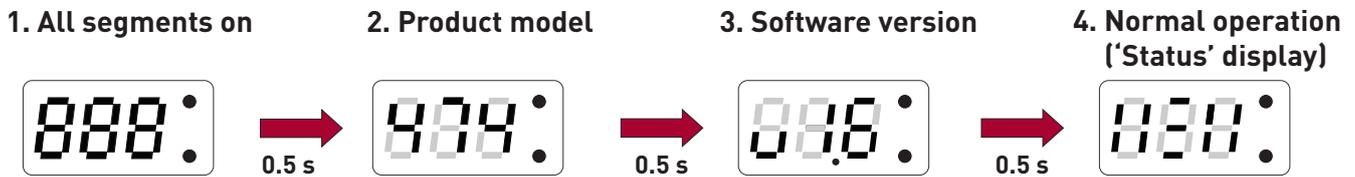
'Status' Display

The 'Status' display is the default view in operation. It is the starting point for navigating and configuring the 474.

'Power' indicator

SDIM/DMX activity indicator

'Up' button

'Down' button

Output mimics: 1, 2, 3 & 4

'Software Override' indicator

'DALI Power/ Activity' indicator

Hardware (wired) override indicator
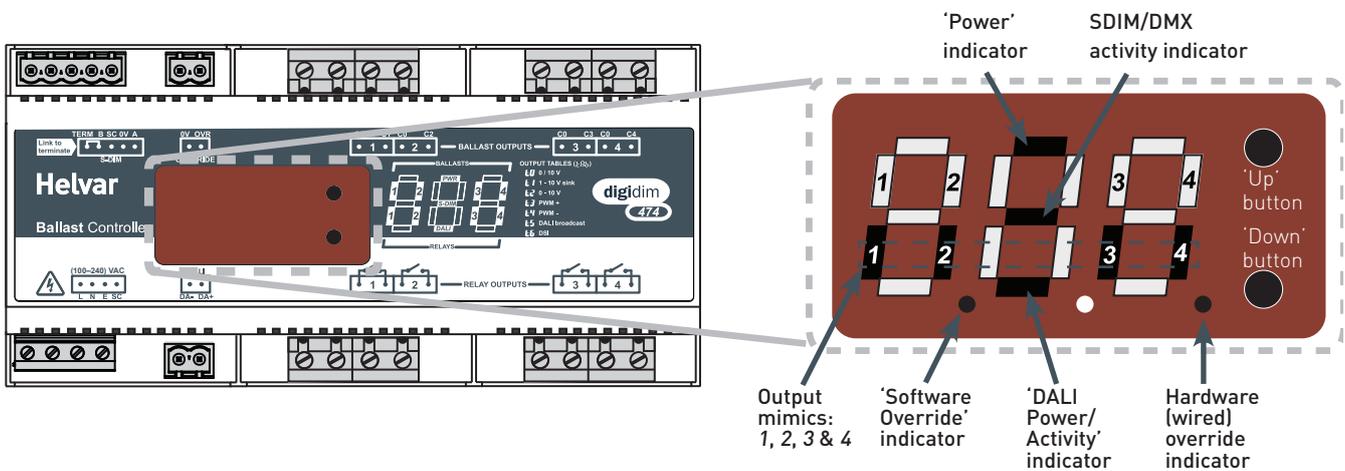
Key and LED Descriptions:

'Power' indicator

The 'Power' indicator (top segment of the middle digit) is always on when the 474 'Status' display is active.

'SDIM/DMX Activity' indicator

The 'SDIM/DMX Activity' indicator (centre segment of the middle digit) is normally off, and flashes on intermittently if any SDIM/DMX activity (communications) is directed to a channel within the ballast controller.

Output mimics

The output mimics (1, 2, 3 and 4) are illuminated when the relays/outputs are on, and not illuminated when the relays/outputs are off.

'Software Override' indicator

The decimal point on the left is illuminated to indicate software override from the 910 / 920 router. The middle segment of the display will also flash.

'DALI Power/Activity' indicator

The DALI indicator (bottom segment of the middle digit) is off if there is no DALI power, and on if DALI power is present. If any DALI activity is directed to a channel within the device, the indicator blinks off.

Hardware (wired) override indicator

The decimal point on the right is illuminated to indicate wired override. The middle segment of the display will also flash.

Navigating the Menu

The 'Status' display LEDs on the front of the unit are lit in the following way when power is on:

Navigate the 474 menu to configure the unit.

Navigate through the 474 menus using the up/down push buttons located on the front of the unit.

Cycle through the menu:

1. Press both buttons simultaneously to cycle through the menus.

Tip! *To cycle through the menus quickly, keep holding down both buttons.*
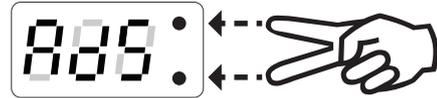
Select the desired channel to modify:

2. At your chosen function, quickly press up or down button to scroll through the channel destinations. These are the channels that will be affected by the following settings.

Note: Select 'ALL' to alter all channels simultaneously.
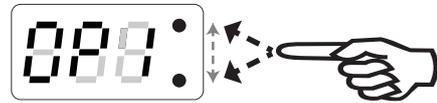
Modify function settings:

3. Hold up or down buttons to alter the levels, settings, fade times, output modes (dependent on function activated).

   For more details, see the 'Configuration' section on page 4.

Note: LEDs blink if the value has been changed and not yet stored.
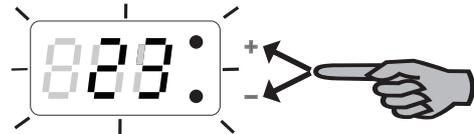
Save changes:

4. Hold both buttons together to save the change.

   The LEDs will show 888 for one second to confirm setting is stored.
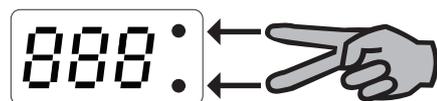
Back To Previous Menu

To go back to the previous menu, do not touch the buttons for five seconds.
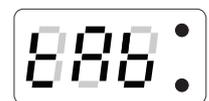
Back To 'Status' Display

Ten seconds of inactivity returns the 474 to the 'Status' display screen.
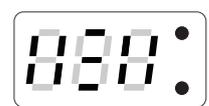
Tip! *You can also return to the 'Status' display by cycling through all the menus.*

Configuration

Various settings can be configured via the control panel.

'Status' Display / Set Channel Level

Set Channel Levels (0 % – 100 %) by using the push buttons in the 'Status' menu. Select the channel(s) to change, and then hold the up or down button to alter levels. For more information, see the 'Quick Start Guide' section on page 7.

Note: *You can access 'Status Display / Set Channel Level' mode while the device is in override mode, but it is not possible to change the channel levels.*

Set SDIM/DMX Address

Set the SDIM or DMX address for each channel.

Select bAS to set the SDIM or DMX base address.

SDIM: 252 addresses available.

DMX: 512 addresses available.

Note: *DMX updates are disabled while using manual control.*

Set DALI Address

Set the DALI address for each channel. Select bAS to set the DALI base address.

DALI: 64 addresses available.

Enable/Disable DMX

Enable or disable DMX from this menu.

When DMX is enabled ('On') it will use the SDIM address.

There is no channel select option; it is a global setting.

Note: *DMX is disabled by default.*

Output Table Selection

The outputs can be configured to match common ballast control loads via the 'Output Table Selection' (tAb) menu.

The following table gives a brief summary of output types.

Output	Output Type	Standard information
t 0	0 / 10 V	Switched. OFF = 0 V ; ON = 10 V
t 1	1–10 sink	EN 60929 Annex E, analogue control
t 2	0–10 V source	ANSI E1.3 analogue control
t 3	N/A	N/A
t 4	N/A	N/A
t 5	DALI broadcast	EN 62386
t 6	DSI®	Tridonic™ version 2
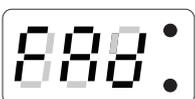
Minimum Fade Time

Set the minimum fade time for the channels.

Select the minimum fade time for each channel individually or ALL channels simultaneously.

Minimum fade time can be set to: 1.00 second, 0.50 seconds, 0.15 seconds and 0.02 seconds.

Channel Pairing

The output and relay channels are paired by default in a simple, one-to-one format.

Configure the pair, or separate ('SEP') the channels as required.

Note: Currently it is not possible to set channel pairing using Designer software. All channel pairing must be manually configured at the device.

Override Level

The override level can be configured for individual relay channels or ALL channels and ranges from 0 to 100. It can be manually tested via the override test function ('Ort')

Note 1: When SDIM/DMX is connected, the override settings in the router (configured using Helvar Designer software) will take precedence over the device's override settings unless you configure the software to use the device override settings.

Note 2: When the unit is running in override, the left decimal point is illuminated and the middle digit of the screen flashes in the 'Status' display.

Override Test

Test that the override level (set in the previous mode) functions as required, by choosing ON or OFF. The unit performs as if an override has been caused by the override input connection.

Note 1: By switching this setting to ON, it will not be possible to manually edit the channel levels in the 'Status Display / Set Channel Level' menu.

Note 2: To change the channel levels, ensure that override is switched off.

Restore to Factory Default

Hold the up or down buttons for 10 seconds in this menu.

The decimal points will light up in sequence, and then all LEDs will be on for 1 second to confirm that factory settings have been restored.

Note: Restore to Factory Default will permanently delete all the existing manually configured settings.

Troubleshooting and Error Messages

If an error occurs, please contact Helvar Support (see www.helvar.com for details).

These details may be of assistance should an error message be displayed:

Communications Error (SDIM/DMX only)

ErC indicates a problem with the SDIM or DMX communications. Check wiring and terminations. Make sure no two channels have the same addresses on the network, and that the SDIM/DMX mode is selected correctly.
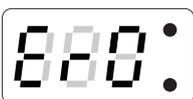
Outputs Error

ErO indicates a problem with the output stages. Please contact Helvar Support for assistance.

Important Considerations

- Do not connect DALI and SDIM/DMX at the same time.
- If DMX does not work, make sure that it has been switched on in the dMX menu.

DALI Physical Selection

Physical selection mode is activated using a Helvar remote control unit. It allows loads and controls to be grouped together without the use of programming software. Refer to the equipment instructions for details.

Follow these steps to use the module to identify a piece of equipment using physical selection mode.

Note 1: *Use the Helvar remote control unit with a Digidim control device to put the device into 'Physical Selection' mode. Refer to the ' Digidim Lighting Control – Designing, Specifying and Installing' System Manual.*

Note 2: *The 'Physical Selection' display is identical to the 'Status Display / Set Channel Level' display, except for the decimal point flashing.*

1. Put the device into physical selection mode.
   The centre decimal point on the display screen will flash to indicate that the device has entered 'Physical Selection' mode.

2. From the control panel, repeatedly press 'up' or 'down' button to scroll between channels.
   The selected channel mimic (s) will flash.

3. To physically select the channel, hold the 'up' or 'down' button.
   The centre decimal point will stop flashing for two seconds to indicate a successful programming.

4. Repeat step 2 and 3 for each channel, as necessary.

5 End 'Physical Selection' mode (at the device).
   The 'Status' display will appear.

Quick Start Guide

Navigation

👆 Press both buttons at the same time to cycle through the menu.

👆 Press up or down button to scroll through the channel destinations.

👆 Hold up or down button to alter the levels, settings, fade times, output modes (dependent on active mode).

👆 Hold both buttons together to store the setting.

Back to 'Status' display

🚫 10 seconds ⟶ `HELI`

Output table

Output	Output type
t 0	0–10 V (Switched. OFF = 0 V ; ON = 10 V)
t 1	1–10 V sink
t 2	0–10 V source
t 3	N/A
t 4	N/A
t 5	DALI broadcast
t 6	DSI®

Notes

`ALL` Select ALL channels
Where available, select 'ALL' to set all available channels.

`UAr` Variable level notice
A UAr level notice occurs in certain modes if you are changing levels for ALL channels (via the ALL function) but the individual channel levels vary.

`SEP` Separate channel
In ChP, select SEP to separate the selected paired channel

`bAS` Set DALI or SDIM/DMX base addresses
From the Add menu, select bAS to set the DALI base address.
From the AdS menu, select bAS to set the SDIM or DMX base address.

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474 Power On

Status / Set Channel Level — When the desired level has been set, wait one second for the 'Status' display to reappear.

Set SDIM or DMX Address

Set DALI Address

Enable DMX — See 'Output table' (on this page)

Output mode selection

Fade Time

Channel pairing

Override Level

Override Test

Restore to Factory Default — All LEDs flash. Reset complete.

Return to Status Mode
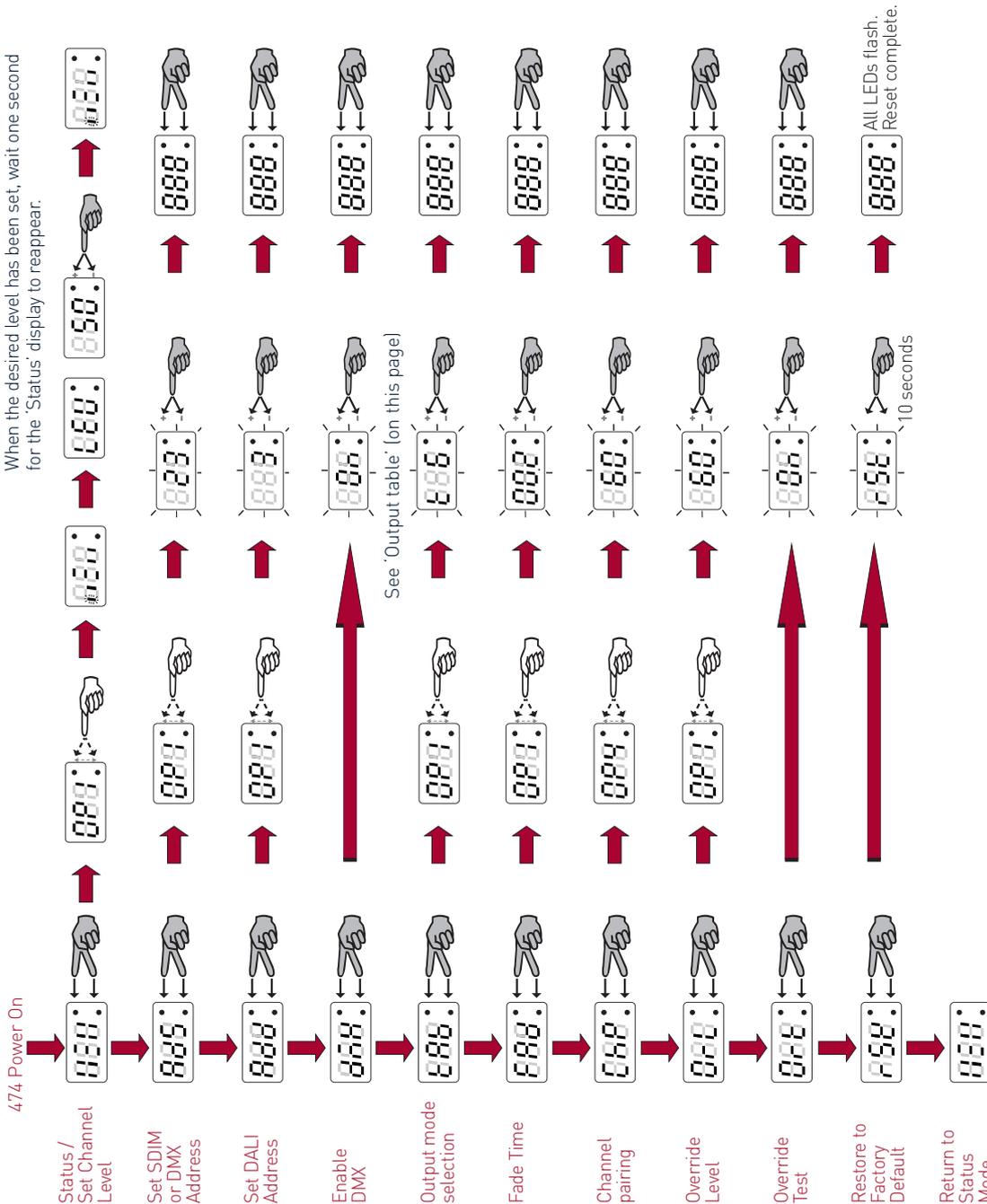
Technical Data

Connections

Mains/relay/output:	Solid core: up to 4 mm² Stranded: 2.5 mm²
DALI:	0.5 mm² – 1.5 mm² Max. length: 300 m @ 1.5 mm²
SDIM/DMX:	0.22 mm² – 1.5 mm² low-loss RS485 type (multistranded, twisted and shielded). Max. length: 1000 m (low-loss cable). Examples: Belden 8102 or Alpha 6222C. *Note: One twisted pair for A and B (85 Ω to 100 Ω impedance), one core or twisted pair for 0 V, and shield for screen.*

Power

Mains supply:	100 VAC – 240 VAC (nominal) 85 VAC – 264 VAC (absolute) 45 Hz – 65 Hz
Power consumption:	2.4 W (minimum) to 11 W (all outputs fully loaded)
External protection:	The mains supply must be protected at 6 A maximum. The relays must be protected by a 16 A Type C MCB maximum.
DALI consumption:	2 mA

Inputs

Communication:	DALI, SDIM and DMX
Override:	Wired override input
User interface:	2 push buttons for configuration

Outputs

0–10 V:	Source 10 mA
1–10 V:	Sink 100 mA
DALI/DSI®:	(50 ballasts) Source 100 mA

Relays

Channels:	4
Relay contacts:	High inrush (800 A at 200 µs), single pole normally open (SPNO)
Max. load per contact:	16 A resistive/incandescent; 10 A HID (cos y = 0.6). For ballasts, quantity is limited by MCB: refer to the manufacturer's data.

Operating and storage conditions

Ambient temperature:	0 °C to +40 °C
Relative humidity:	Max. 90 %, noncondensing
Storage temperature:	–10 °C to +70 °C

Mechanical data

Dimensions:	160 mm × 90 mm × 58 mm
Housing:	DIN-rail case; 9U
Weight:	280 g
Mounting:	DIN rail (installation in switchgear/controlgear cabinet)
IP code:	IP30 (IP00 at terminals)

Conformity and standards

EMC emission:	EN 55015
EMC immunity:	EN 61547
Safety:	EN 61347-2-11
DALI:	According to DALI standard IEC 62386, with Helvar additions
SDIM:	According to Helvar SDIM protocol
DMX:	DMX512-A protocol (max. refresh rate: 33 Hz)
Isolation:	All connectors are isolated from each other, except for SDIM/DMX to Override, and ballast output 1–2 to ballast output 3–4.
Environment:	Complies with WEEE and RoHS directives.

Dimensions