

DALI/DSI/ DMX to DimSlim PWM*¹ Translator

This data sheet covers the general requirements for Feelux DimSlim fixtures when used in conjunction with the Feelux DALI/DSI/DMX to PWM Power Translator - part no:DTOPWMO1

Feelux DimSlim dimmable T5 is the World's smallest T5 fluorescent fixture that is entirely self contained within a cross section that is only 38mm high by 24mm wide.

Although DimSlim fixtures have 3-pin plug input and a 3-pin socket output, the centre contact is reserved for the control signal.

The centre pin is **NOT** an earth connection! - **DO NOT** earth these DimSlim double insulated fixtures.



Plug power input



Socket end view with added protective cover fitted



Socket power output



Socket end view with added protective cover removed

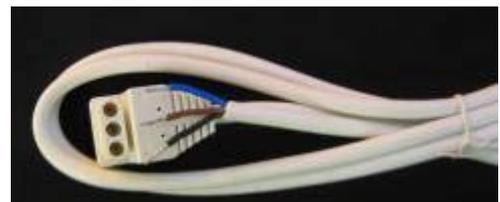
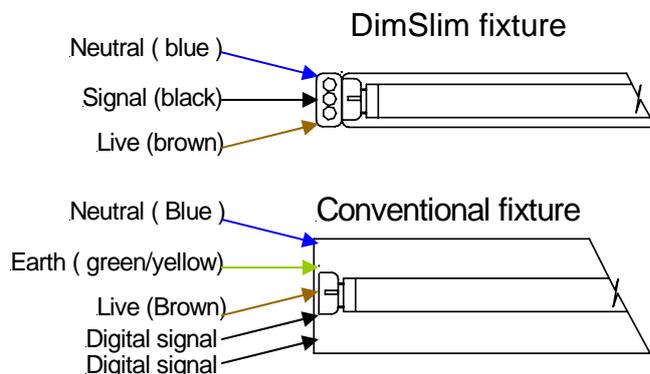
This is unlike a standard DALI ballast/fixture where each DALI ballast requires a continuous mains supply Live, Earth and Neutral, plus 2 control signal wires.

Feelux PWM DimSlim fixtures only require a total of 3 wires.

Live – Signal – Neutral.

DimSlim uses “standard electrical cable” – no special screened signal cable is required.

Please NOTE: To comply with electrical wiring regulations, the signal wire must **NOT** be green, green/yellow or yellow. The leads supplied from are Live – Brown cable, Neutral – Blue cable, signal – Black cable



Input Supply cable showing black control conductor

*¹ PWM – Pulse Width Modulation. DALI - Digital Addressable Lighting Interface
DSI- Digital Serial Interface. DMX- Digital MultipleX

DALI/DSI/DMX –to– PWM DimSlim Translator

Feelux part no:DTOPWMO1

Dimensions:

H 86mm x W 209mm x D 66mm

Mechanical fixing:- DIN rail clip lock

Input:

- ❖ 198-264VAC 50/60Hz
- ❖ 20 amp – 4mm² terminals
- ❖ Translates standard DALI four device protocol with DALI in – out looping – 2.5mm² terminals
- ❖ Translates standard DMX 512 Protocol
- ❖ Translates DSI protocol



Output for DALI, DSI or DMX signal protocols

- ❖ Four independent PWM out put signals for DimSlim fixtures.
- ❖ Four independent sets of three channel output terminals (4sq mm) for Live – Signal – Neutral.
- ❖ Individual line outputs. Maximum connected load is 10 amps/1,750 lamp watts per circuit, or up to 50 fixtures per channel (which ever is the greater) and respecting that the total translator load shall not exceed 20 amps / 3,500 DimSlim lamp watts per translator.
- ❖ PWM signal - 200mA peak per channel. (maximum of 16 volts with respect to neutral conductor)
- ❖ Channel ON override.
- ❖ Four channel push button DALI device location (set up)
- ❖ 1st channel start address DIP switches 1- 508 for DMX four independent consecutive DMX channel protocol
- ❖ Failsafe no signal - lamps on full.

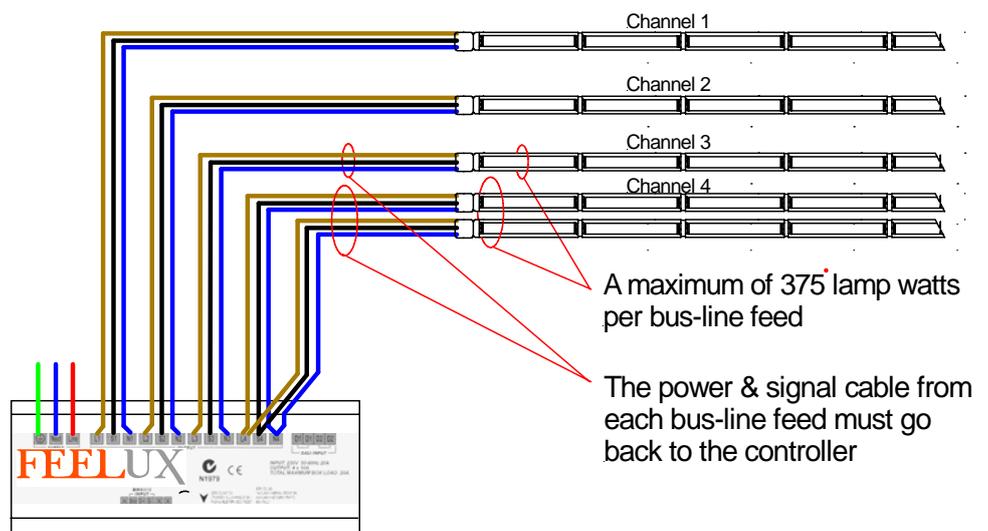
Output for DSI signal protocol (variation to above)

- ❖ One **Feelux** DimSlim PWM translator is required per DSI channel. All four outputs are auto-set as parallel outputs.

DimSlim fixtures can be in-line mounted using DimSlim bus wire connectors. This will allow up to 365 fluorescent tube watts to be in-line connected per single line.

For very large installations where more than one line of DimSlim fixtures are to be located on the same channel, the power and the signal cables shall be brought back to the DimSlim PWM translator as shown on the diagram opposite.

For further options see over the page.



DimSlim DALI-PWM translator view of terminal - wiring layout

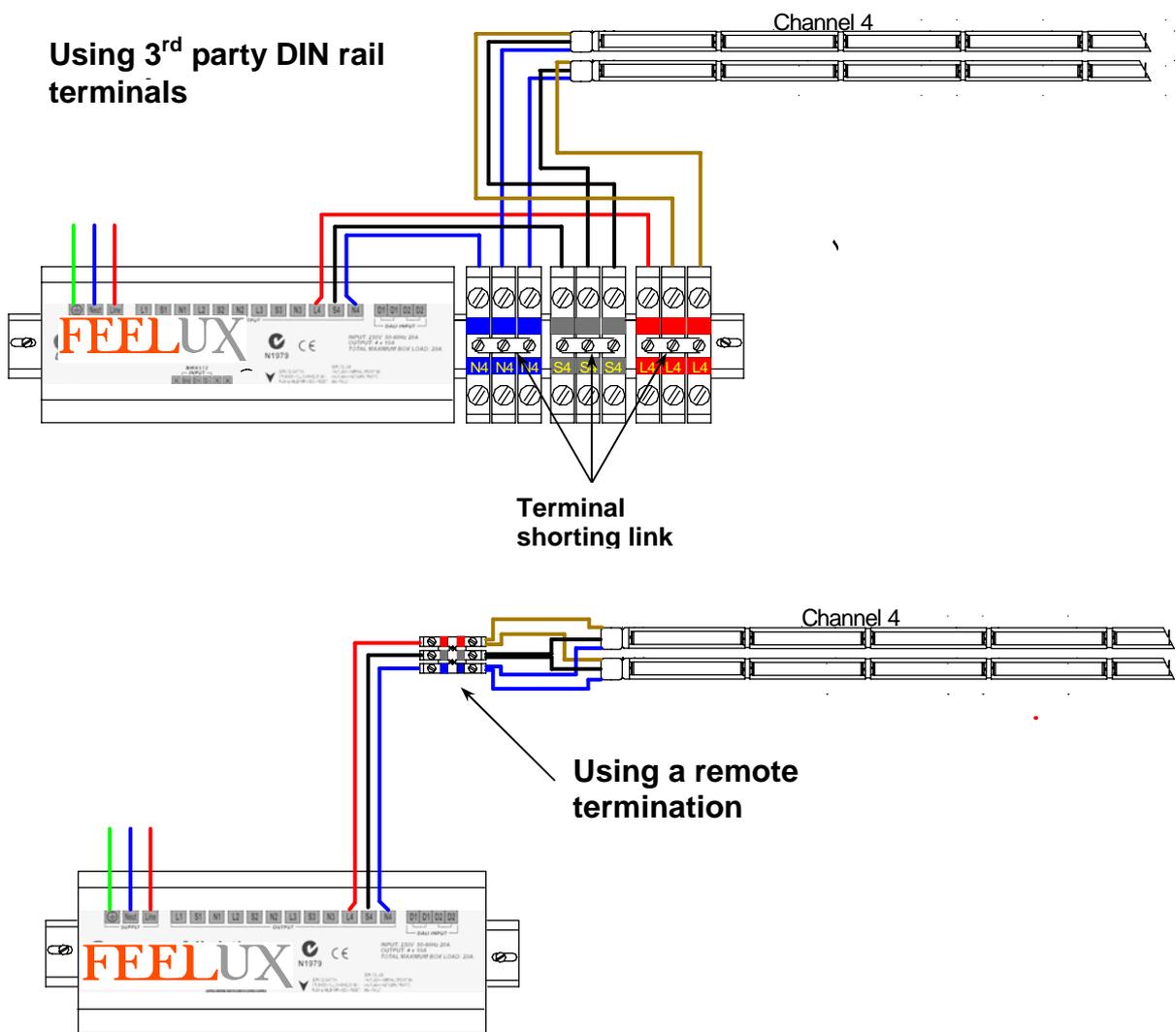
Alternative Electrical Power Connections:

To avoid corruption of the control signal, both the power supply and the signal cable to the DimSlim fixtures **has to be derived** from the appropriate DimSlim DALI-PWM translator output channel.

Terminal Rails:

Where multiple DimSlim Bus Lines are returned to the DimSlim DALI-PWM translator, terminal rail links can be used. The example shows an alternative connection for channel 4 only on a translator for clarity.

Maximum distance from the DimSlim PWM translator to the terminal rail: -
No theoretical limit.

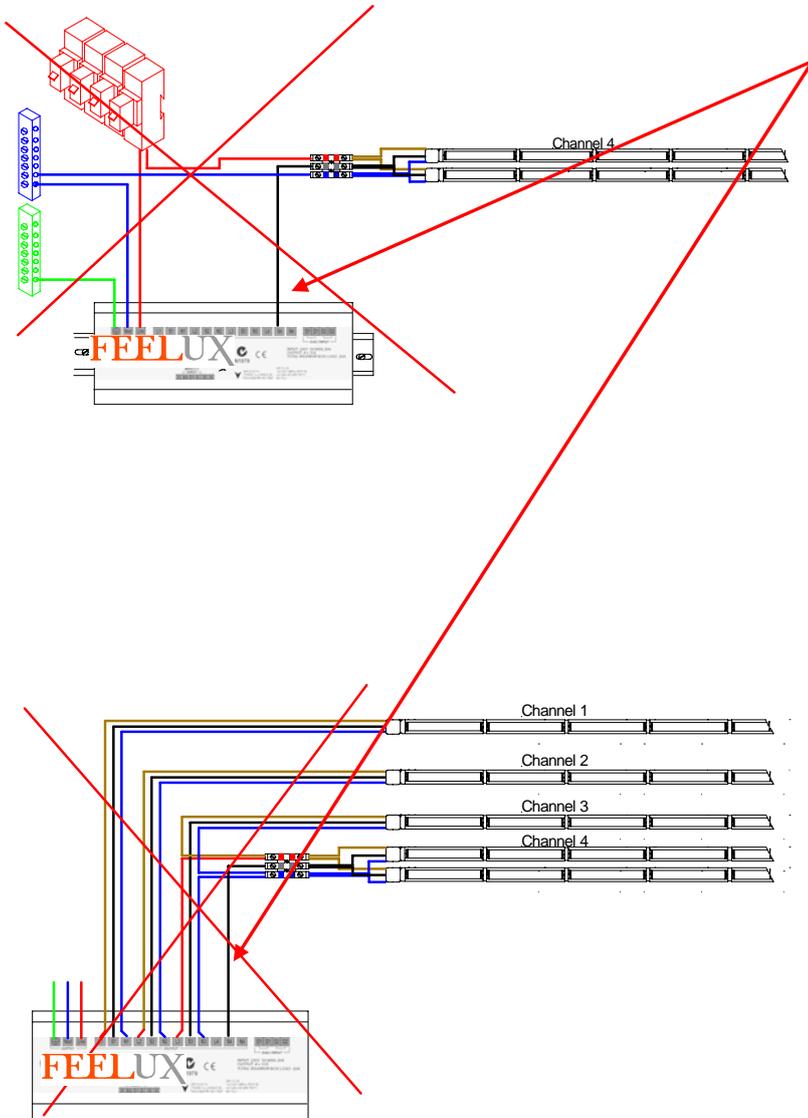


Alternative connection for multiple DimSlim Bus Lines – using remote and/or linked terminals. There is no theoretical restriction to the length of cable or position at which the termination is made.

All cables **MUST** be rated to carry mains AC voltage.

On no account is the live and/or neutral conductors be run from any supply point other than from the designated DimSlim DALI-PWM output $N_x S_x L_x$ channel.

Failure to comply will result in either erratic and/or non-dimmable control.



Not permitted!

The power and signal cables **must** originate from the appropriate DALI/DMX-PWM $N_x S_x L_x$ output!

*N= Neutral AC power
S= Signal
L= Line AC power*

Note: To comply with current wiring regulations, the signal wire must NOT be green, green/yellow or yellow. Feelux DimSlim connectors and input cables use a black cable for the signal wire, but other colours, (excluding green/yellow) can be used if required.

The Translator output signal is at neutral potential so must be afforded the appropriate insulation.

Mounting clips



Vertical mount (standard included)

EMC/RFI Compliance:

DimSlim fixtures are fully compliant with current EMC/RFI requirements at time of manufacture. To maintain installation compliance, the DimSlim fixtures **shall not** be allowed to come into contact with earthed surfaces. Mount on insulated surfaces, or use the clips provided with the fixture. (Alternative mounting clips are available from **Feelux**)

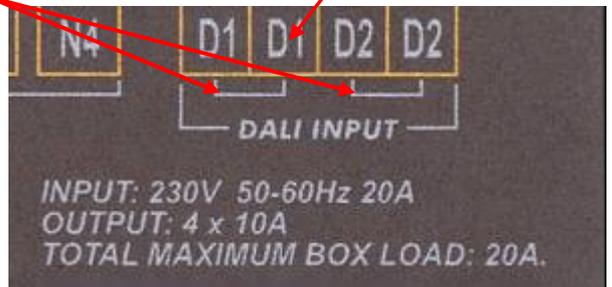
DALI Protocol compliance:

The DimSlim DALI-PWM translator employs a fully isolated DALI input. This ensures that under failure mode, mains supply cannot cross over the isolation barrier onto the DALI signal line, however, as third party ballasts can also be connected onto the DALI network, most ballasts only have secondary insulation between active components and signal. The DALI protocol requires all cabling **including DALI signal cabling** (D1-D2) to be afforded insulation for compliance with low voltage (240v) installations. (SELV is not granted to DALI/DSI devices operating on a DALI network)

The **Feelux** DimSlim PWM translator has four terminals for DALI signal control.

To make large scale installations simpler for the installer, the translator has “loop-in loop-out terminals.

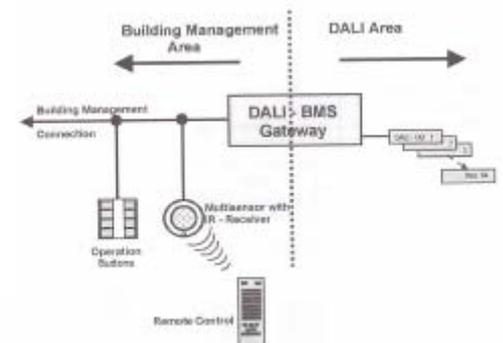
It can be seen from the picture on the right that “D1-D1” and “D2-D2” show on-board links. The two wire DALI Signal input should be connected between one D1 and one D2 terminal. If required, the remaining D1-D2 terminals can then be used for looping to the next DALI device.



Connection to a 3rd party DALI system:

The **Feelux** DimSlim PWM translator provides four independent dimmable control channels. The unit is a fully compliant DALI compatible unit complying with IEC60929 Annex E. (DALI protocol)

Whatever DALI universe the **Feelux** DimSlim PWM translator is connected onto, each translator unit connected will appear in the “DALI properties window” as four “DALI devices”. It is therefore possible to install upto 16 Translators (16 x 4 channels) on one DALI universe. (64 channels)

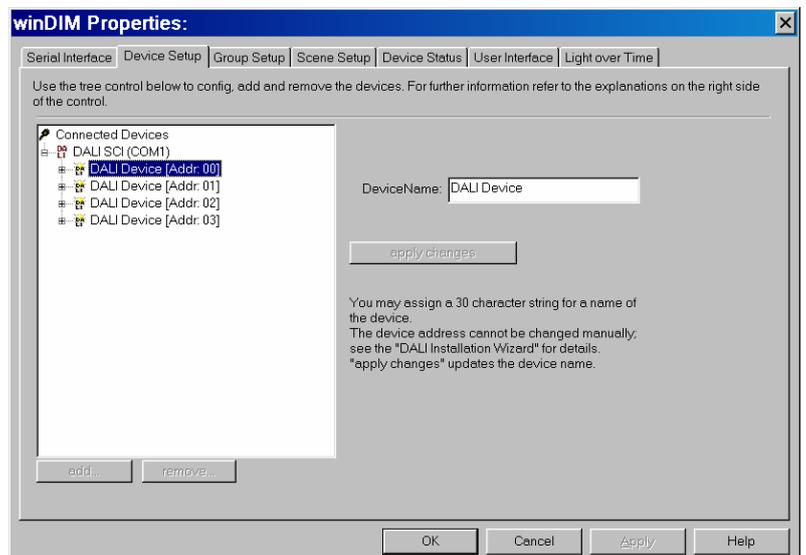


The **Feelux DimSlim PWM** translator is not a “ballast” but an interface, the DALI protocol recognises each translator channel as a “DALI Device”.

Each “DALI Device” (DimSlim channel) can then be configured into any of the DALI groups on the DALI universe it has been connected to.

For DALI system configuration, Regard the DALI device in the same way you would a DALI ballast (with multiple lamp output)

One **Feelux DimSlim PWM** translator provides four DALI devices (four DimSlim channels)



DMX – Theatre and Event lighting control

The standard unit will accept the Entertainment Industry standard DMX 512¹ protocol for direct operation off any DMX 512¹ data line. (DMX is SELV compliant)

For operation, simply connect a suitably compliant DMX data cable to the DMX input (the DALI input terminals **must** be left open circuit)



For pin connection onto a DMX circuit, the pin out code is:
D+ (plus) XLR pin 3, D – (minus) XLR pin 2, shield (ground) XLR pin 1

The DimSlim PWM translator is a four channel device. It is configured in the same way as a Theatre dimmer pack. Once the start channel is defined, the remaining channels follow as consecutive channel numbers.

To Set the translator up:

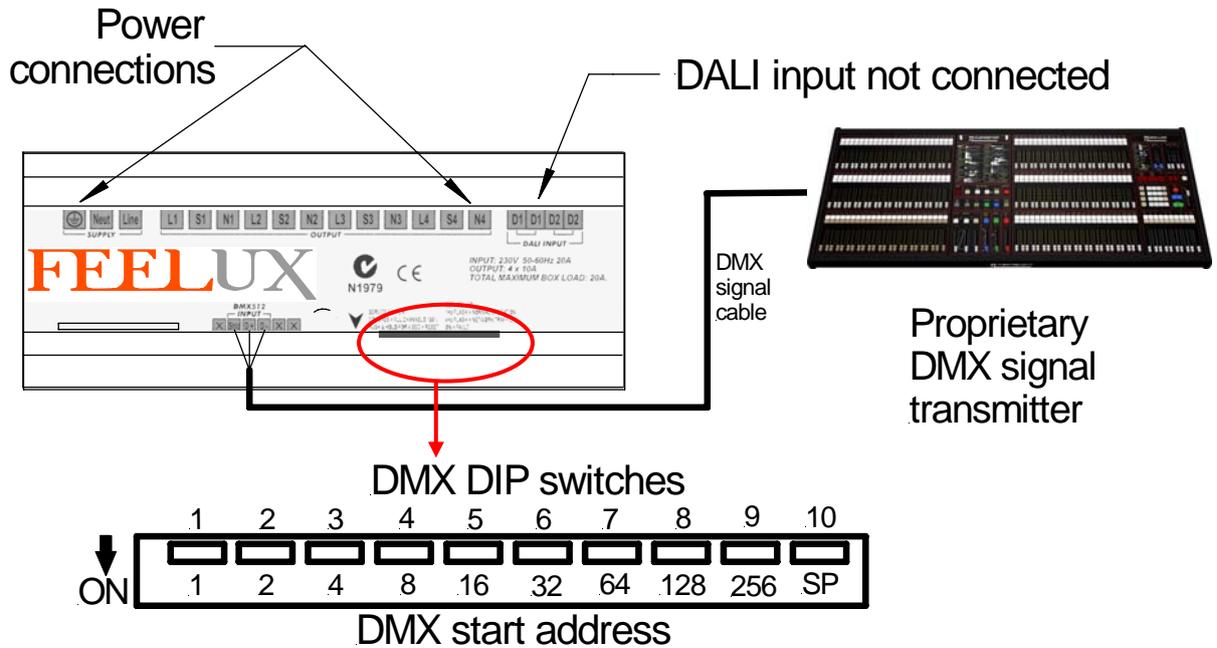
With the power OFF, set the binary DIP switches to the **start** channel required. The remaining 3 channels will then follow as consecutively numbered channels.

Last four channel group possible to configure has a start address channel # 508.

Powering up the unit will set the DIP switch channel as addressed.

Note that the MAXIMUM dimming speed possible using DimSlim fixtures is internally preset within the fixture at 0.5 second between the minimum and maximum level. There is no restriction to longer fade speeds as required.

¹ The Translator is fully compliant with USITT DMX512 (1990) theatre lighting protocol



The DIP switches are coded for binary number setting. The start address may be set from 1 – 508.

As with all DMX system design, to stop signal reflections, please use a 120 ohm 1/4w termination resistor on last device DMX output. The resistor is placed across D+, D-.

Use industry standard DMX cable for the control signal.

Note:

When using the device on a DMX network, both the **Feelux DimSlim PWM translator** and the DMX network are SELV compliant. DMX cable must **NOT** be used for a DALI/DSI network

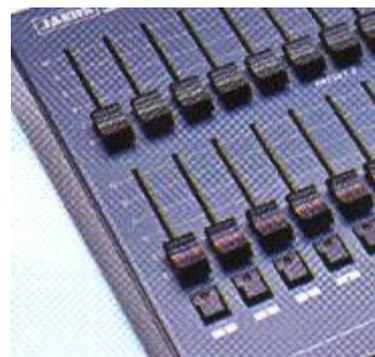
**Theatre Desk
Fade operation**

When operating from a standard theatre DMX desk, the fader control levels are:-

Less than 1 %, lamp will switch off.
Decimal 0-3

More than 1% lamp will switch on at minimum level. (allow a 2 second wait for cathode pre-heat)
Decimal 4-6

2-100% lamp will be under dimming control.
Decimal 7-255



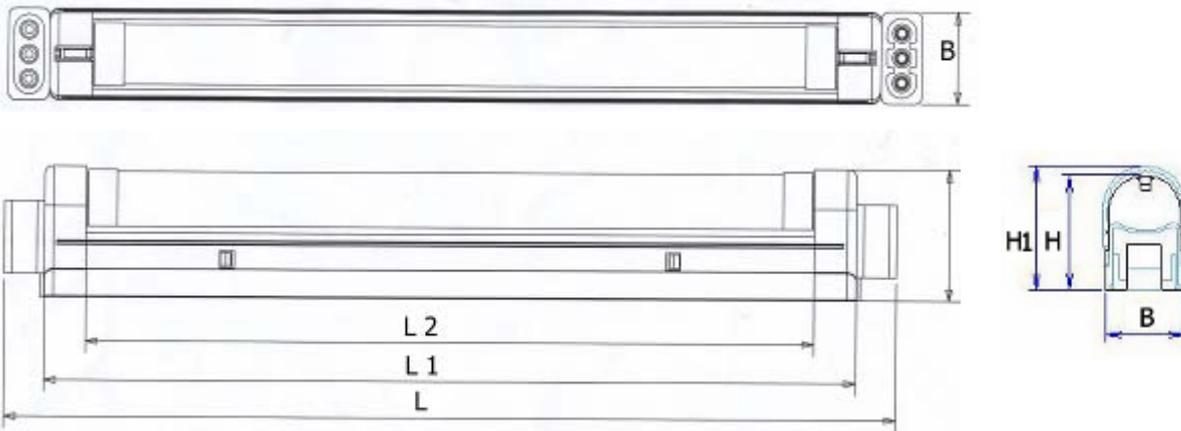
Feelux DimSlim

The World's smallest dimmable T5 fixture

Available in three "T5" wattages 21, 28 and 35 watt

		UNIT	21 watt	28 watt	35 watt
Input power	Full intensity	W	26±2.5	33±2.5	40±2.5
	Low level (Dimmable)	W	9±0.5	10±0.5	11±0.5
	Standby (off)	W	<1	<1	<1
Input Volts		V	180~260	180~260	180~260
Input frequency		HZ	50~60	50~60	50~60
Input Current	Full intensity	mA	110±10	150±10	180±10
	Low level (Dimmable)	mA	45±10	52±10	59±10
	Full intensity	Lagging	>97	>97	>97
Power factor	Low level (Dimmable)	Lagging	>70	>70	>70
	Restart type		warm	warm	warm
Over voltage protection			yes	yes	yes
Under voltage protection			yes	yes	yes
Open circuit /filament protection auto shut down			yes	yes	yes

DimSlim vital statistics:

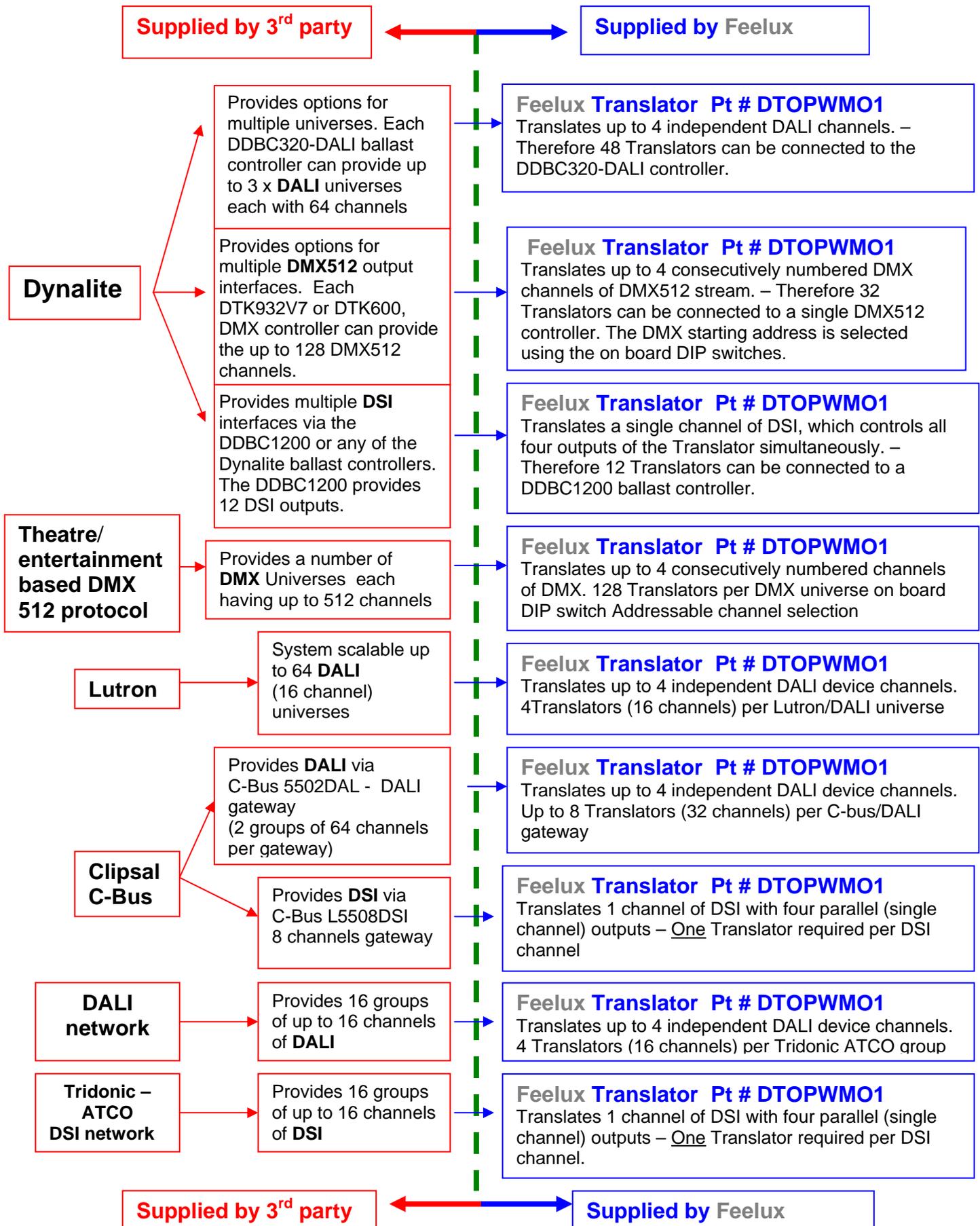


	L 2 (mm)	L 1 (mm)	L (mm)	H 1 (mm)	H (mm)	B (mm)
DSL21W	850	873	895	38	37.6	24.5
DSL28W	1150	1173	1195	38	37.6	24.5
DSL35W	1450	1473	1495	38	37.6	24.5

H1 = includes diffuser

Interface options between proprietary Dimming Systems and **Feelux** DimSlim fixtures using the **Feelux** DALI/DSI/DMX translator.

Feelux Part no: DTOPWMO1



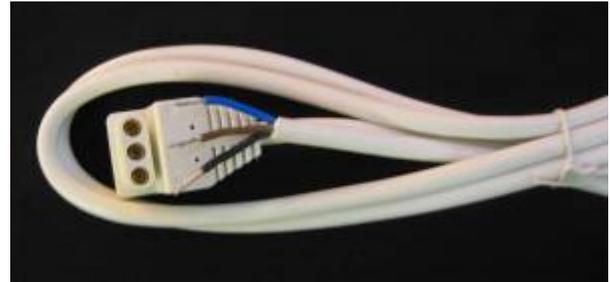
Frequently Asked Questions:

Q1: *Can I drill through the fixture to fix it?*

A1: No, there is a circuit board and cabling running internally the whole length of the fixture. Use the mounting clip option available. Other mounting methods such as double sided tape and bonding materials can be used, provided the bond is strong enough to hold the fixture and that the fixture does not come into direct contact with an electrical conducting material. (see question 11 regarding earthing)

Q2: *What cable do I use to control DimSlim fixtures?*

A2: The termination into DimSlim fixtures is by a special **Feelux** 3-pin connector with integral lead. The lead is available in several lengths up to 1.8 meters. After terminating the cable on the DimSlim connector, it will be noticed that the DimSlim



connector's cable has 3 conductors: **Brown - Live**, **Blue - Neutral**, Black - PWM signal. Any standard power cable capable of handling the power requirements of the DimSlim fixtures can be used between the DimSlim fixtures and the PWM translator.

Please Note: The PWM signal terminal is at neutral potential and is not necessarily at earth potential. To comply with Australian, New Zealand and International wiring standards, green, green/yellow, or, yellow cable must NOT be used as the PWM signal wire.

Q3: *Can I use any type of cable for the PWM signal?*

A3: Yes, so long as it is afforded the same insulation protection as AC mains voltage cable. However, we would advise that the cable should have a current rating of not less than those of the accompanying fixture supply cables. Please see the answer to question 2 regarding cable identity.

Q4: *How long can the cable runs be from the DimSlim PWM unit to the fixtures?*

A4: As the PWM signal is at low frequency (400Hz), there is no theoretical maximum length limit to the cable run.

Q5: *Can I mix tube wattage's on the same dimming channel?*

A5: Yes, this is possible, but depending upon the lamp colour/manufacturer, the lamps may dim at different rates between full and minimum light output.

Q6: *Can I strobe the lamps ON/OFF?*

A6: No, the internal circuit of the DimSlim fixture limits the speed of fade between zero and full to approximately 0.5 second.

Frequently Asked Questions continued:

Q7: *Can I use any type of fluorescent lamp with the DimSlim fixture?*

A7: Yes, provided it is a “standard” T5 lamp of the appropriate wattage.

Q8: *Can I cut inter-connecting bus wires to make them longer?*

A8: Yes, but please use an interconnecting cable that does not use an earth-coloured wire for the signal connection. (Please see answers to questions 2 and 3.) Also please observe mains wiring insulation requirements.

Q9: *Can I dim these fixtures on a leading or trailing edge dimmer?*

A9: No! DimSlim fixtures only respond to a 400Hz PWM low voltage digital signal. Installing them on dimming circuits will invalidate the warranty and could permanently damage the fixture.

Q10: *Can I run these fixtures on any other BMS/control/dimming system?*

A10: Yes, the standard DALI/DMX/DSI translator will interface with any other DALI/DSI/DMX manufactured control proprietary system. For non-DALI/DSI/DMX applications, there are several excellent 3rd party off-the-shelf “xxx-protocol to DALI” interface units. Please see the previous pages for **Feelux DimSlim** interface options, or contact **Feelux Co.,Ltd** for further advice.

Q11: *Can I earth the fixture for added safety?*

A11: No, this is of no benefit and there is no earth provision on the fixtures. DimSlim fixtures are fully compliant “**double insulated**” units conforming strictly with “C-Tick” EMC interference standards. Earthing the fixture can invalidate the EMC compliance, and has no added safety advantage.

Q12: *Can I install DimSlim fixtures outdoors?*

A12: No, the fixture is designed for normal indoor applications. The whole fixture can be placed inside a suitable weather proof enclosure as required, provided the fixture ambient temperature is maintained between 10- 45° C.

Q13: *Can I use DimSlim inside another housing?*

A13: Yes provided the DimSlim fixture(s) is insulated from earthed metalwork. The standard DimSlim fixing clips could provide this isolation. The DimSlim unit(s) placed inside a 3rd party housing would remain fully EMC compliant.

Q14: *Can I fade the lamps up from zero?*

A14: No, like all dimmable fluorescent fixtures there is a minimum pre-set light level. For DimSlim, the minimum is set at 7.5% light output. Fading below the minimum level will switch the lamp OFF. The lamp will return to its minimum level (or any other level) on switch ON as requested by its control signal.

Please Note: As will all dimmable fluorescent fixtures, there is a delay of approximately 2 seconds from switch ON, for the lamp to ignite due to the cathode pre-heat circuit, therefore, any fade from zero must take this delay into account.

Frequently Asked Questions continued:

Q15: *Can I use DimSlim from a theatre style control desk?*

A15: Yes, the **Feelux** translator also has a DMX 512 (theatre lighting) interface. Each translator will provide upto 4 consecutive channels DMX channels. The start channel is addressable via the DIP switches on the **Feelux** translator unit.
– Remember that level 0.11 (1%) on the DMX desk will allow the lamp to dim to 7 ½ % intensity, the lowest ON level. Moving the fader below level 1 will turn the lamp off.

Please Note: As will all dimmable fluorescent fixtures, there is a delay of approximately 2 seconds from switch ON, for the lamp to ignite due to the cathode pre-heat circuit, therefore, any fade from zero must take this delay into account.

Q16: *Does the translator have talk-back to indicate a ballast fault or lamp out indication like a standard DALI ballast?*

A16: No, the translator is **not** a DALI ballast it is a “DALI device.” A single **Feelux** translator will appear as four independent “DALI devices” in the DALI software schedule/short addresses. Remember that each DALI device can control up to 50 **DimSlim** fixtures, therefore, it is impractical for interrogation of each sub-unit, and DALI protocol is not capable of interrogation at the sub-circuit level. DALI is limited to 64 DALI ballasts per universe. Using the **Feelux** translator option, 2,656 **DimSlim** fixtures (166 x 21 watt fixtures x 16 translators (64 channels)) can be run on one DALI universe.

Q17: *How many lamps can I run off the translator?*

A17: Each translator can handle a total of 3,500 lamp watts. Individual outputs each have a maximum load of 1,750 lamp watts.

Q18: *What do I do if I need to control more than 1,750 lamp watts on one channel?*

A18: Separate the load over two channels (they don't have to be equally divided) and “soft patch” in the control circuit to operate the 2 channels as a single “tandem” circuit.

Q19: *Lamps will only turn off and on full but won't dim when connected to the translator.*

A19: Check that there is a signal present. No signal, and the fixture defaults to full light output.

Should the output Live and Neutral be reversed at any point along any channel, then all the fixtures will go to full. To find the error, disconnect all fixtures on that line. Check if the first fixture dims. Add the next fixture and check for dimming, continue until the fault is found.

Q20: *Is it safe to install the translator onto a proprietary digital network?*

A20: Yes, it is safe. All **Feelux** translators have 500 volt optical isolation between the DALI/DSI/DMX input so even if there is an accidental short of any of the translators outputs, mains voltages cannot enter onto the isolated digital input lines.