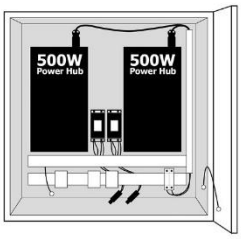
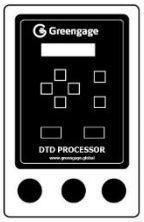
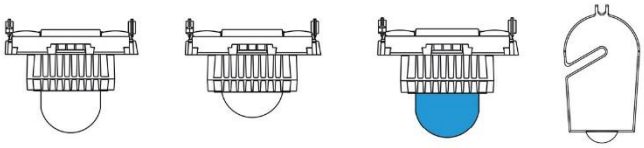
ALIS | Greengage

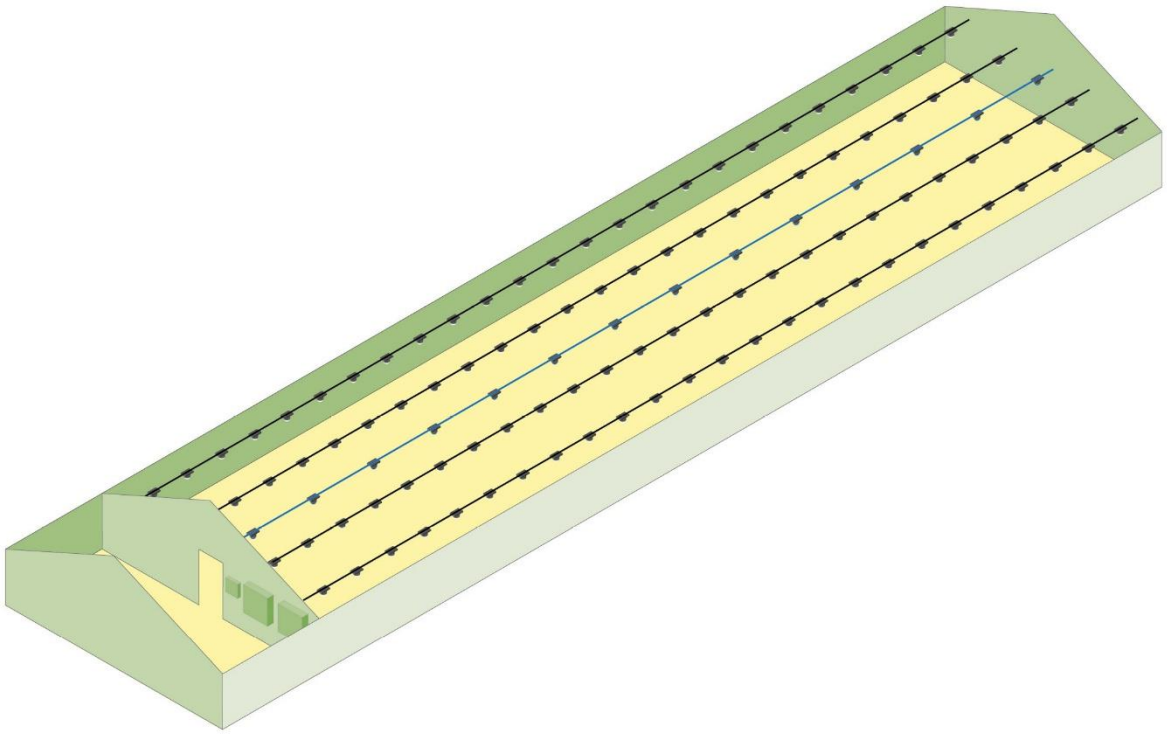
Installation Manual

ALIS power, control and lighting platform









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CE cULus

Version 5.2 CE and UL

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ALIS Barn Lamp best practice clip on procedure

The new ALIS Barn Lamp has been designed with improved durability and ingress protection against dust and high-pressure water jets. To ensure the longevity of the lamp it is important to follow the correct fixing procedure.

1. At the desired lamp position un-twist, the ALIS-Bus by approximately 20cm (8”).

Undo the end clips by holding the lamp and applying gentle pressure to the hook part of the clip and pushing away from the body of the lamp.

Excessive pressure may cause the clip to come out of the hinge.

This is designed to happen as this is a replaceable field part. If this happens then simply push the clip back into the hinge.

2. Undo the side clips by holding the lamp firmly and applying equal pressure with thumb to the clip, one corner at a time.

3. Lift the upper coupler back on its hinge and check the position of the seal.

Due to the compression the seal may have stuck to the upper coupler.

If this has occurred, then peel the seal off and position it in the lower coupler ensuring it has seated correctly.

4. Ensure the ALIS Bus is clean, free from grit and undamaged.

Position the ALIS bus cable on the seal in the lower coupler, ensure it is correctly seated then push it firmly into the guide clips.

5. Ensure that all the clips on the coupler are fully disengaged before closing the upper coupler.

Position the coupler lid squarely and press down in place to ensure correct fit.

6. Once correctly seated maintain firm pressure clamping the couplers closed before first closing the end clips.

7. To close the side clips, press firmly with equal pressure both ends of opposed clips to ensure the clips lock into position securely.

8. To close the side clips, press firmly with equal pressure both ends of opposed clips to ensure the clips lock into position securely.

9. Check that the four side clips are completely closed.

Disclaimer

These instructions are provided for information purposes only.

Installation must be carried out by experienced/qualified professionals.

All electrical installation work must conform to all local and international electrical wiring and safety regulations such as those published by CENELEC member organisations or those covered by IEC60364.

Greengage Lighting Ltd is not responsible for safety on site and installers should contact Greengage Lighting Ltd technical support with any queries they may have at **support@greengage.global**

Please follow these instructions carefully as deviation from them may invalidate the product warranty.

Safety

Be safety conscious. Working with electrical circuits can be dangerous if you don't take adequate safety precautions.

Always shut off the power to a circuit or device that you are working on.

Avoid wet areas when working with or on anything electrical.

If you are working on the service panel or a circuit, be sure to place a warning label on the face of the panel. This will warn someone not to turn on the circuit that you are working on.

Contents

Tools

Below is a list of basic tools necessary for carrying out your installation.

Other tools may be required depending on the exact suspension, mounting method used and the composition of the surface mounting material.

Tape Measure

Screwdrivers inc. terminal driver

Cable cutters, crimpers and wire strippers

Pliers

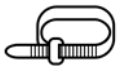
Multi Meter

Light Meter

Mounting accessories

Catenary cable

Twist Buckle



Cable ties

Eye hook

Suspension chain

Wire rope clamps

System description

The Greengage induction system (ALIS) is a 'contactless' power technology that allows LED fixtures (ALIS Lamps) to be clipped onto the cable (ALIS Bus) without an actual physical electrical connection.

It works on the principle of distributing a highly regulated alternating current at 50 kHz along the ALIS Bus to the ALIS lamps.

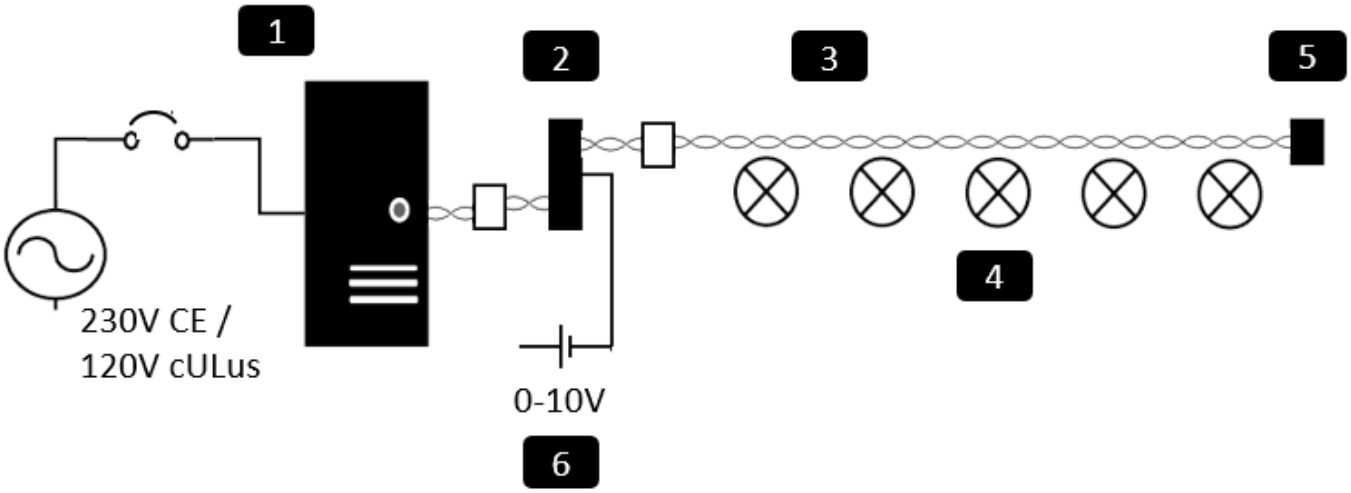
This document serves as guidance for an ALIS installation within an intensive livestock rearing building. Installers must also follow all applicable local electrical installation standards and wiring regulations when carrying out the installation.

ALIS system components

ALIS is shipped as component parts for assembly on site. There is an option to purchase a pre-configured Power Hub panel ready for direct install.

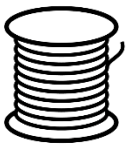
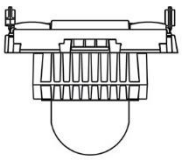
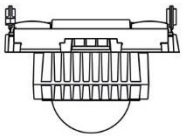
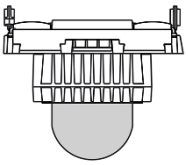
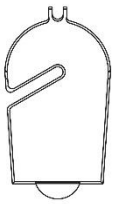
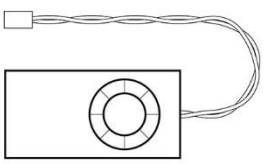
The main components of the ALIS system are

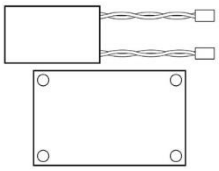
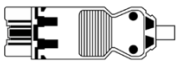
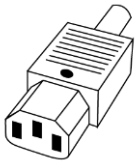
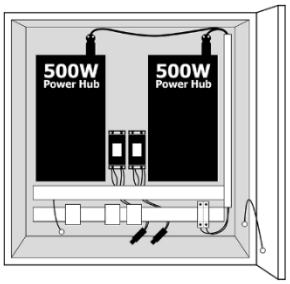
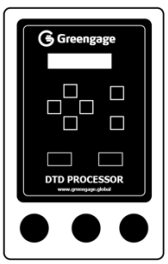
1 ALIS Power Hub
2 ALIS Dimmer
3 ALIS Bus
4 ALIS Lamp
5 End Termination Module
6 ALIS Pot (dimmer control input)



Note: For further connection detail please see appendix connection diagram.

For use only with parts as indicated

Component parts		Model CE	Model cULus	Additional UL Requirements/Use
1. ALIS Power Hub (500W)		IPH500230	IPH500110	Install only in dry locations. (or suitable enclosure to meet local regulations)
2. ALIS Bus		ALS0018 (available in 500m reels)	ALS0035 (available in 1000m reels)	Type USE-2 cable or Type RHH-2 wire marked VW-1.14AWG standard type rated 90℃ min and 300V minimum.
3. ALIS Barn Lamp Wide Beam		ALS0003	ALS0003	Suitable for wet location use. Do not submerse. (IP66)
4. ALIS Barn Lamp Narrow Beam		ALIS0001	ALIS0001	Suitable for wet location use. Do not submerse. (IP66)
5. ALIS Barn Lamp Blue		ALS0017	ALS0017	Suitable for wet location use. Do not submerse. (IP66)
6. ALIS Nest Lamp		ALS0004	ALS0004	Suitable for wet location use. Do not submerse. (IP69K)
7. ALIS Potentiometer		ALS0007	ALS0007	Install only in dry locations. (or suitable enclosure to meet local regulations)

Component parts		Model CE	Model cULus	Additional UL Requirements/Use
8. ALIS Dimmer component ALIS Dimmer Plastic Enclosure Kit Assembly ALIS Dimmer in Plastic Enclosure		IPD1230 ALS0040 ALS0045	IPD1110 ALS0040 ALS0046	Install only in dry locations. (or suitable enclosure to meet local regulations)
9. ALIS Bus End termination module and enclosure		ETM	ETM	Must be housed within a suitably sealed enclosure (IP66) see section 3.2
10. P2M Supply Connector		P2M	N/A	Not applicable CE Only (requires suitable enclosure to meet local regulations)
11. ALIS IEC13 Power to Mains Connector		N/A	IEC13	Install only in dry locations. (or suitable enclosure to meet local regulations)
12. ALIS Power Hub Panel		ALS0006 (2 x 500W) ALS0010 (1 x 500W)	Not available in North America.	Not applicable CE Only
13. DTD Controller		ALS0049	ALS0049	

Installation procedures

Introduction

This installation procedures section is divided in three parts; mechanical, lamp connection and electrical. These require two distinct levels of technical competency. Here the mechanical and lamp sections are classified as semi-skilled, i.e. suitable for most agricultural mechanical fitters, whilst the electrical section is classified skilled, i.e. only suitable for competent and qualified electricians and fitters with experience and knowledge of local electrical wiring standards and regulations.

1. Mechanical Installation

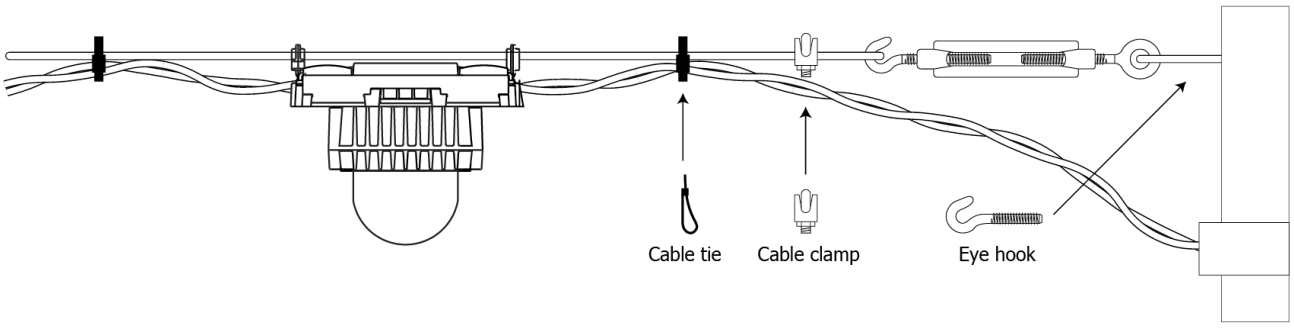
1.0 General Guidance

In this section you will find all the necessary information for the mechanical installation. This is the process of physically fitting the components within the building. During this process no electrical connections are made.

The importance of correct mechanical fitting from the start should not be underestimated as it can be very difficult, costly and at times impossible to correct afterwards. It is therefore worthwhile discussing the mechanical fitting at an early stage with either the house builder or architect to ensure that correct placement of the ALIS lamps within the house is possible. If not, a redesign of the lighting plan may be required.

1.1 ALIS Bus Cable Suspension

Reference the lamp positioning information found within the lighting design plan. It is recommended that the ALIS Bus cable is supported by cable ties to a catenary wire, or other carrier type, which is itself supported every three to four metres (10 to 13 feet) and tensioned by use of a turnbuckle also ensuring that the supporting infrastructure is sufficient to support the lamps and suspension.



As the ALIS system works inductively it is important to avoid sharp bends, returns, kinks and knots in the ALIS Bus cable. Excess cable should be removed and certainly not be coiled or wrapped especially around metal elements.

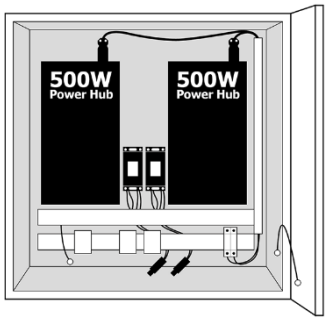
1.2 ALIS Power Hub Mounting

The ALIS Power Hub must be mounted vertically on a metal base plate within a suitable enclosure in close proximity to the ALIS Dimmer, away from all combustible materials, sources of heat and out of direct sunlight. Clearances of 100mm (4 inches) from the top and bottom of the ALIS Power Hub and 75mm (3 inches) from the sides must be allowed for. Please contact **support@greengage.global** if this is not possible.

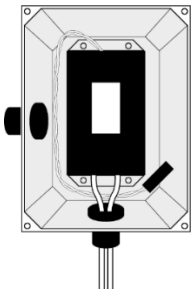
1.3 ALIS Dimmer Mounting

The ALIS Dimmer must be mounted within the same enclosure as the ALIS Power Hub, either horizontally or vertically in close proximity to the ALIS Power Hub. If this is not possible then the ALIS Dimmer enclosure must be used, mounted away from all combustible materials, sources of heat and out of direct sunlight.

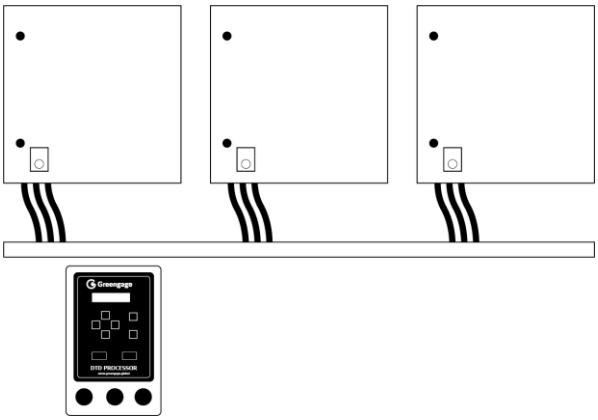
ALIS Power Hub Panel
2 Channel x 500W



ALIS Dimmer
in enclosure



ALIS Power Hub Panels
(shown with DTD Controller providing 0-10V input)



Please note: Diagrams above for illustration purposes.

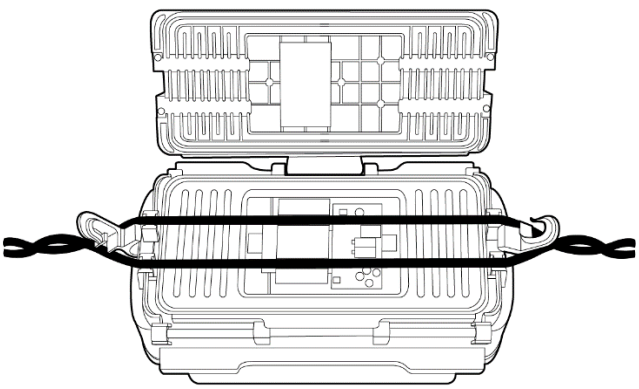
Both the ALIS Power Hub and ALIS Dimmer must be mounted within a dry and dust free location acceptable to local wiring regulations. If this is not possible then they must be housed within a suitably sealed enclosure as per local wiring regulations. Due to the heat generated by the ALIS Power Hub please contact **support@greengage.global** for further advice if required.

2. Lamp connection

2.1 ALIS Barn Lamp

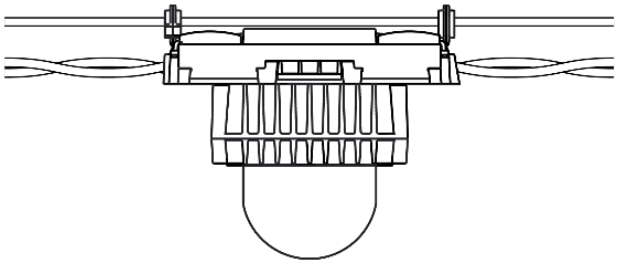
Reference the lamp positioning information, found within the lighting design plan in conjunction with section 6 of this manual. If there is not any positioning information available, then contact your supplier for further advice.

If the reference information places the lamp in the vicinity of an obstruction such as a roof truss, ensure the lamp is placed 15cm (6 inches) from this point to allow movement during washout. Take note of the lamp position and place the first lamp as follows. At the desired lamp position, un-twist the ALIS Bus by approximately 20cm (8 inches) by inserting your thumbs in the twist and sliding left and right equally. Fully open the ALIS Barn Lamp and place the ALIS Bus into the coupler housing as shown below, ensuring the ALIS Bus is clean and free from grit. Press the ALIS Bus firmly within the guide clip channels.



Once the ALIS Bus is positioned within the coupler housing, carefully bring the two lid sections together and close. It is recommended to close the end clips first and then close the side clips by pressing on their outside surfaces rather than the thumb levers.

Ensure that the ALIS Bus is not trapped when closing the coupler and the ALIS Barn Lamp ferrite surfaces are clean and free from grit.



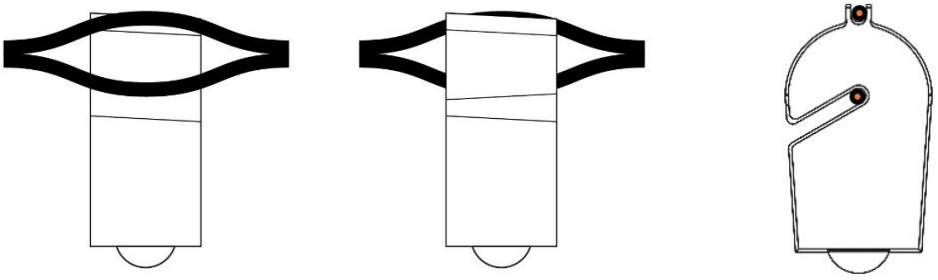
Ensure a minimum 3cm (1¼ inches) of ALIS Bus remains untwisted at the coupler entry holes. Too tight a twist at this point can cause a lift in the coupler lid resulting in a broken seal.

Attach all the remaining ALIS Barn Lamps to the desired position along the ALIS Bus. Once completed, cable tie the ALIS Bus to the catenary wire.

Place the first two cable ties a minimum of 20 cm (8 inches) each side of the ALIS Coupler ensuring the catenary wire supports the ALIS Barn Lamp on its clip. Add the remainder of the cable ties between 30cm to 40cm (12 to 16 inches) apart to ensure the ALIS Bus does not droop at any point.

2.2 ALIS Nest Lamp

Reference sections 1. and 6. of this manual and the lamp positioning information, found within the lighting design plan. If there is not any positioning information available, then fit to achieve the required lighting level within the nest box. Take note of the lamp position and place the first lamp as follows. At the desired lamp position un-twist, the ALIS Bus by no more than 5cm (2 inches). Place one wire from the ALIS Bus into the lamp coupler slot, as shown below, ensuring the ALIS Bus is clean and free from grit.



Without untwisting the ALIS Bus any further, as the cable twist tension is used to hold the lamp in place, slide the second wire over the lamp housing as shown below, locating and pressing the ALIS Bus wire firmly within the guide clip channel.

Ensure the first wire has remained fully inserted within the coupler lamp slot. Attach all the remaining ALIS Nest Lamps to the desired position along the ALIS Bus.

3. Electrical installation

3.0 General Guidance

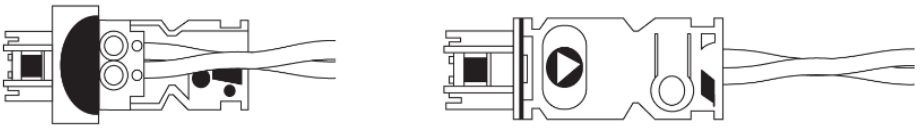
In this section you will find all the necessary information for the electrical installation. This is the process of electrically connecting the components within the livestock building construction. Each of the components of the system will be handled in a separate paragraph. Please also reference section 6. of this manual.

3.1 ALIS bus termination

Route the ALIS Bus to the ALIS Power Hub location, paying attention to the section 6. of this manual.

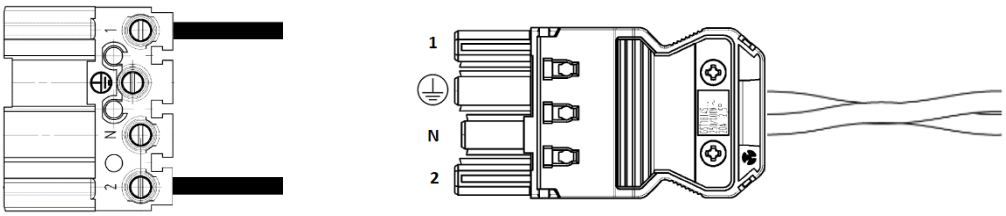
ALIS Dimmer Model IPDI110. Strip the ends of the ALIS Bus to 5mm (0.2 inch) of exposed conductor, ensuring there is not any conductor loss.

Attach the ALIS Bus to the Bus Connector into the screw terminals provided, as shown below. Ensure there are no frayed copper strands.



ALIS Dimmer Model IPDI230. Strip the ends of the ALIS Bus to 5mm (0.2 inch) of exposed conductor, ensuring there is not any conductor loss.

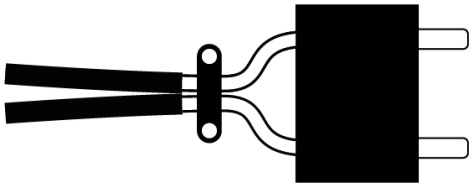
Attach the ALIS Bus to the Bus Connector into the screw terminals provided, as shown below. Ensure there are no frayed copper strands.



Note: The cable must be connected to the pin 1 and 2.

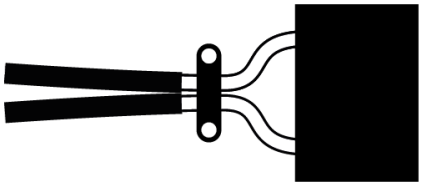
ALIS Dimmer Model AGL0004. Strip the outer insulation of the ALIS Bus to 30mm (1¼ inches) taking care not to damage the inner insulation. Strip the ends of the ALIS Bus inner insulation to 8mm (0.3 inch) of exposed conductor, ensuring there is not any conductor loss.

Slide the orange connector cover labelled **PLUG** over the ALIS Bus. Attach the ALIS Bus to the orange connector **PLUG** into the screw terminals provided, as shown below. Ensure there are no frayed copper strands. Slide and fix the cover in place over the connector.



Remove the existing ALIS Bus connector from the ALIS Power Hub and cut off the remaining exposed copper conductor. Slide the orange connector cover labelled **SOCKET** over the ALIS Power Hub ALIS Bus. Strip the outer insulation of the ALIS Bus to 30mm (1¼ inches) taking care not to damage the inner insulation. Strip the ends of the ALIS Bus inner insulation to 8mm (0.3 inch) of exposed conductor, ensuring there is not any conductor loss.

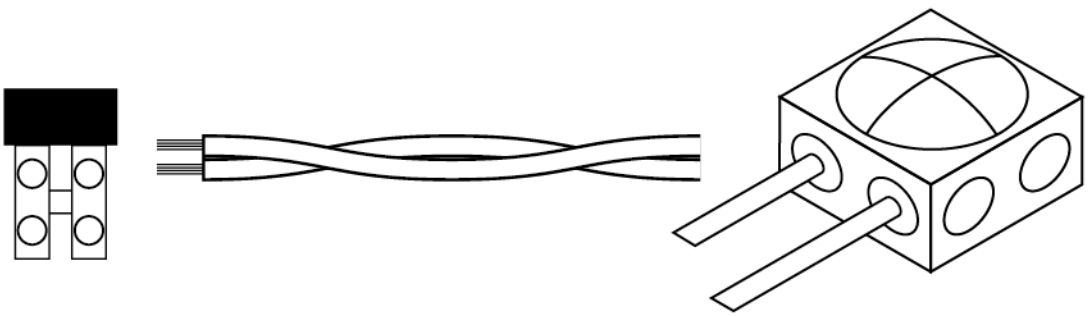
Attach the ALIS Power Hub ALIS Bus to the orange connector **SOCKET** into the screw terminals provided, as shown below. Ensure there are no frayed copper strands. Side and fix cover in place over the connector.



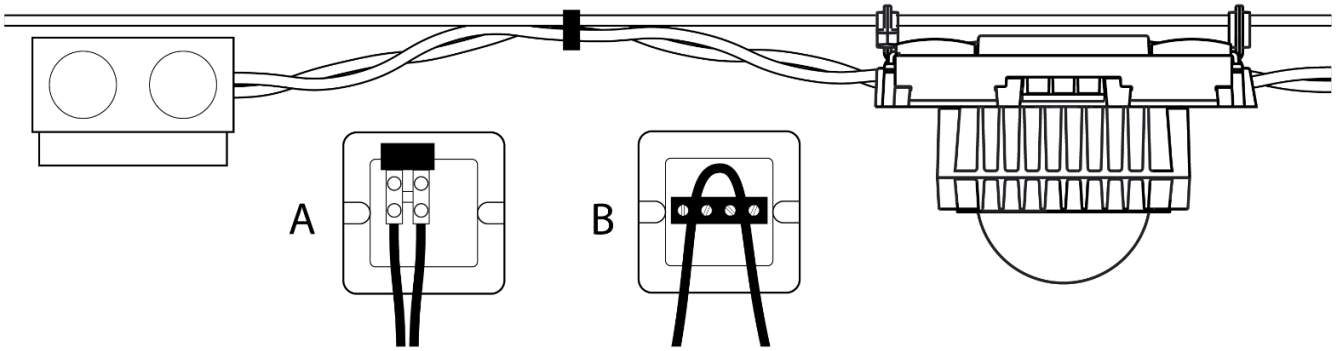
3.2 End termination

All ALIS Dimmer Models. The correct termination of the ALIS BUS is critical to the overall system performance. See also section 3.3 of this manual. Connect the ALIS End Termination Module (ETM) or shorting terminal block to the far open end of the ALIS Bus. The ALIS bus insulation must be properly stripped to ensure there is no to damage the cable conductors.

Strip the ends of the ALIS Bus to 5mm (0.2 inch) of exposed conductor, ensuring there is not any conductor loss as shown below. Twist the exposed copper cable strands.



Insert the cable into the terminator fully, ensuring no bare cable can be seen as shown and tighten connections. This must be a perfect connection with no frayed copper strands. The ETM or short must be housed within an IP66 terminal enclosure, example below.



A. ETM (68nF) ALIS Bus connection
B. Short ALIS Bus connection

Note: All cable points must have glands fitted for strain relief and to maintained IP rating.

3.3 End termination rules

The ALIS systems works on an induction principle with lamps powered by a modulated AC waveform on the ALIS Bus. To ensure optimal performance, the ALIS Bus needs to be kept in resonance with the output of the ALIS Power Hub. As the length of the ALIS Bus and number of lamps increases its impedance changes and with that its resonance frequency.

An ALIS Bus and lamp combination which is out of resonance can cause of the ALIS Power Hub to trip and require a manual reset and may also reduce the operational life of the ALIS Power Hub.

To ensure optimum operation and stability of the system, the following recommendations should be observed.

If the length of the ALIS bus is less than 100m then the ALIS Bus must be terminated by means of a shorting connection to keep the ALIS Bus in resonance with the Hub.

When the length is greater than 100m, the ALIS Bus must be terminated using the supplied ETM (68nF) to keep the ALIS Bus in resonance with the Hub.

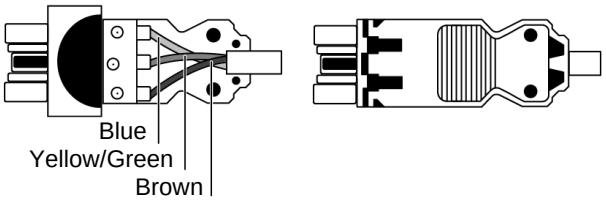
Cable Length	Termination
≤100m	Short
101m to 150m	ETM (68nF)
>150m	Contact **support@greengage.global**

Model	Version	Cable Length (m)	Cable Length (feet)	Max continuous Load (W)	Max surge Power (W)	Cable Loss (W)	Remaining Power for Lamps (W)	Max no. ALIS Barn (10W)
ALIS Power Hub 500W	230VAC (CE)	≤100	≤328	475	500	12	463	46
		101-150	329-492	475	500	18	457	45
		>150	>492	Contact **support@greengage.global**				
	120VAC (cULus)	101-150	≤328	450	475	12	438	43
		150	329-492	450	475	18	432	43
		>150	>492	Contact **support@greengage.global**				

For continuous use it is recommended to have a minimum load >50W (or 6 ALIS Barn Lamps) on even a length of cable using a short termination.

3.4 Hub supply cable termination (CE)

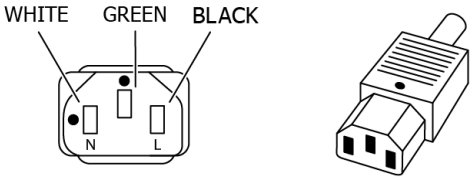
Connect the P2M Connector to a 3-core adequately rated mains supply cable by inserting into the screw terminals as shown below. Ensure there are no frayed copper strands and the supply is adequately protected to meet all local wiring regulations. Not applicable if installing a Greengage Power Hub Panel.



Note: For assembly instructions of P2M connector see appendix: Assembly instruction – P2M connector supply.

3.5 Hub supply cable termination (UL)

Connect the IEC C13 Connector to a 3-core adequately rated mains supply cable by inserting into the screw terminals as shown below. Ensure there are no frayed copper strands and the supply is adequately protected to meet all local wiring regulations.



3.6 System Connection

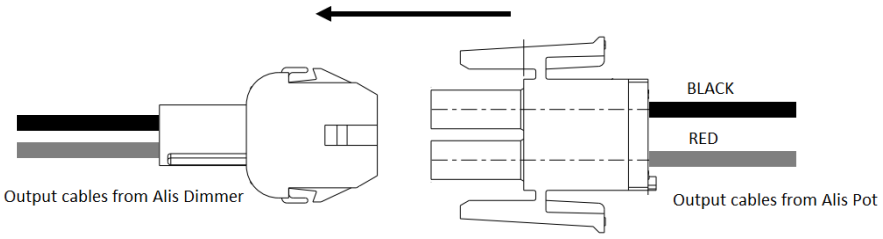
a. Connect the ALIS Bus to the ALIS Dimmer as shown in the ALIS system components diagram (page 5).

b. Connect the ALIS Dimmer to the ALIS Power Hub as shown in the ALIS system components diagram (page 5).

c. Connect the selected dimming control method to the ALIS Dimmer. Dimming is possible via either an ALIS Dimmer Pot or a 0-10VDC control signal, ensuring polarity is maintained, as shown in the ALIS system components diagram (page 5).

Connecting ALIS Dimmer to ALIS Pot/0-10VDC (Not applicable if installing the Greengage Power Hub Panel).

Connectors of the same shape can be connected.



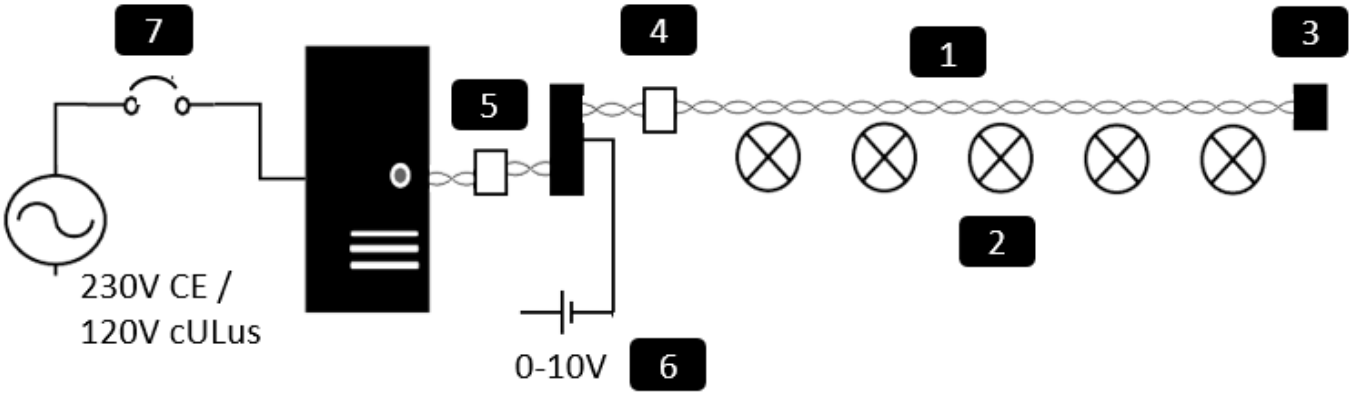
Multiple ALIS Dimmers can be controlled with a single ALIS Pot, Greengage DTD Controller or another 0-10VDC supply.

The potentiometer connection to the hub can also be used to extinguish the lamps via the use of a timer switch or on/off switch, which avoids the necessity of disconnecting the mains supply.

Please contact **support@greengage.global** for additional information as required.

4. Installation checklist and system test

After the successful installation of the ALIS system onsite, the following checks **must** be carried out by a qualified electrician, adhering to local standards and regulations, prior to applying power to the system.



1. Double check the ALIS Bus cable length connected to the ALIS Power Hub. This should not exceed 150 metres. If in doubt contact **support@greengage.global**
2. Count the number of lamps per ALIS Bus per ALIS Power Hub. This should ideally not exceed 40 x 10W ALIS Barn Lamps (see also section 3.3). If in doubt contact **support@greengage.global**
3. Check the ALIS ETM termination. Ensure the ALIS Bus cable is properly terminated.
4. Ensure the ALIS Dimmer is properly connected to the ALIS Bus.
5. Ensure the ALIS Dimmer is properly connected to the ALIS Power Hub.
6. Ensure the control cable (ALIS Dimmer Pot or independent 0-10VDc screened analogue voltage cable) is properly connected to the ALIS Dimmer.
7. Connect mains power cable to the ALIS Power Hub

Once these points have been positively verified, power can then be applied to the ALIS system.

Please ensure that there are no open circuits within the ALIS Bus cable installation. This can be achieved by ensuring all the connections of the Bus cable are correctly terminated.

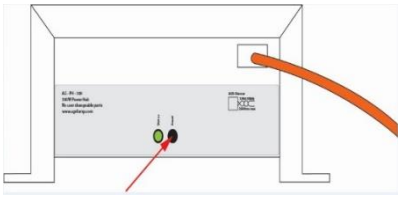
If a problem is encountered, then we suggest a multi-meter is used to check continuity between the two cables at the hub end. Please remove the ETM and join ALIS Bus to test. Ensure the ETM is reconnected after completing the continuity test.

The 230VAC or 120VAC supply must be disconnected before continuity testing is attempted.

5. Fault finding

If the ALIS Lamps flash ON and OFF, this means you have too much load on the system. Start unclipping the ALIS Lamps one at a time until the flashing stops. Recheck the recommended maximum number of lamps as shown in section 3.3 and 4.

5.1 Led Status Indicator and Reset Button.



To facilitate fault diagnosis, the ALIS Power Hub has a bi-colour (red & green) status indicator. To remove a fault, press the reset button. The diagram here shows the indicator and reset button position (arrowed) on the 500W hub.

When the ALIS Power Hub is performing normally the status indicator is steady GREEN. If another indication is observed, please see the chart below for status.

LED Status Indicator	Operating Mode	Description	Action
Steady Amber	Input voltage too low	Automatic lockout when input supply drops below 160 VAC for a 230VAC (CE) ALIS Power Hub or Hub shuts down between 92-98VAC for a 120VAC (cULus) ALIS Power Hub.	The ALIS Power Hub resets when supply returns to normal.
Flashing amber, 1 Flash per second, 50% Duty cycle	Input voltage too high.	Automatic lockout when input supply exceeds 270 VAC for a 230VAC ALIS Power Hub or Automatic lockout when input supply exceeds 132 VAC for a 120VAC (cULus) ALIS Power Hub.	The ALIS Power Hub resets when supply returns to normal.
Flashing alternate red and green, 2 flashes per second 50% duty cycle.	Power required exceeds power available.	Too much load fitted to the ALIS Bus	Remove excess load. The system automatically resumes normal mode of operation
Solid red (with system OFF)	Output voltage too high.	ALIS Bus is open circuit.	Repair fault in the ALIS Bus. Reset the system by pressing the reset button.
Solid red (with system OFF)	ALIS Power Hub only. Ground fault protection.	ALIS Power Hub has detected a power imbalance in the output current (residual current) >80mA rms	Disconnect from AC supply until LED is extinguished. Examine the ALIS Bus for possible earth leakage. Reset button will not allow re-start.
Flashes red, 1 flash per second, 50% duty cycle	Temperature too high.	ALIS Power Hub case temperature exceeds 90°C (+/- 5°C), shutting itself down.	The ALIS Power Hub resets when temperature returns to normal. This may take several minutes.

The reset button on the ALIS Power Hub can only be pressed three times. Thereafter the ALIS Power Hub must be reset by disconnecting it from the AC mains supply, waiting until the status indicator has extinguished and then reconnecting it.

5.2 Fault Finding Guide

1. Firstly, ascertain what is or is not happening with the system. There are commonly two scenarios.
    i. ALIS Lamp(s) are completely extinguished.
    ii. ALIS Lamp(s) are flashing or flickering.
2. Once i or ii has been ascertained the next step is to find the reason.
3. ALIS Lamp(s) are completely extinguished. If there is just one or more, but not all, ALIS Barn Lamps extinguished open and remove it from the ALIS Bus at the same time inspecting the cable for damage. Check the ALIS Barn Lamp is free of contaminates and if required clean with a soft cloth. If the ALIS Bus is OK, refit the lamp. If the problem has not been resolved, replace the lamp.
4. If all ALIS Lamps are extinguished continue as follows.
    i. Check the ALIS Power Hub status LED as described in section 5 (previous page) and attempt to resolve the problem by carrying out the listed actions.
    ii. If the ALIS Power Hub status LED is showing a steady green light, and a technically competent person is present, bypass the ALIS Dimmer by first disconnecting the 230VAC / 120VAC supply to the ALIS Power Hub. Then disconnect the ALIS Dimmer from the ALIS Power Hub and ALIS Bus and reconnect the ALIS Power Hub directly to the ALIS Bus. Reconnect the 230VAC /120VAC supply to the ALIS Power Hub will confirm whether the ALIS Dimmer has a problem.
    iii. If the status LED is completely extinguished, check there is an adequate mains supply present. Once the correct supply voltage level is ascertained attempt a power up reset. If this does not resolve the fault carrying out the check list on page 16 before proceeding to replace the ALIS Power Hub.
5. ALIS Lamp(s) flashing or flickering. If this is the observed fault, then it is most likely that the ALIS Power Hub is not the problem. Ascertain whether it is a few lamps or all the lamps on the ALIS Bus. Is it continuous or only occurs at certain times of day? Has it only just started to happen?
    i. If there are only a few of the ALIS Lamps showing fault systems, then it is likely a local problem to those lamps. Open the ALIS Barn Lamp and remove it from the cable, at the same time inspecting for cable damage. Check the lamps for contaminates and if required clean with a soft cloth. If the cable is OK, refit the lamp. If the problem has not been resolved, replace the lamp.
    ii. If it is all the lamps on the ALIS Bus and the ALIS Power Hub shows no signs of fault, then it is most probably an external issue such as electrical noise which can be very difficult to pin point. Firstly, try to ascertain if there have been any changes in the immediate area such as new equipment installed or any cable rerouting. As a process of elimination try to locate the problem item by switching off other equipment. As this is a process of elimination a considerably amount of time may be required, but in the end, the fault should be easily remedied.
6. If any problems or faults occur that are outside any of the above, or you are having difficulties, please do not hesitate to contact **support@greengage.global** for further guidance.

6. General points and good practices

1. All electrical installation work **must** be carried out in accordance with all applicable local wiring regulations, such as those published by CENELEC member organisations, or those covered by IEC60364. Failure to do so will invalidate any associated Product Warranty.
2. The ALIS Power Hub or Power Hub Panel **must** be earthed/grounded via a securely wired electrical connection. It is not sufficient to rely solely on the bonded chassis alone.
3. Ensure that all external cables are of a suitable cross-sectional diameter for the intended use. All external signals carrying cable for uses such as 0/10v must be of a suitably screened/shielded type, with the screen/shield connected to earth at the supply end only, **never** both ends.
4. For the connection of external wires **always** use insulated 'bootlace' terminals, which provide a safe and good connection, and which are well suited for the purpose.
5. Splices and cable joints **must** be housed within a junction box, which has an IP rating suitable for the environment. All cables **must** pass through suitable glands to maintain the rating.
6. **Never** use solid communication style wires such as telephone cable, even if making low voltage/current connections, it is not suitable for any of the connectors within the ALIS range and will in time fail.
7. Cable trunking and conduit. In certain instances, ALIS Bus cable may have to be routed through lidded electrical wire carriers. Should this situation arise please **ensure** that all ends are sealed, and lids correctly fitted to stop fauna (rodent) ingress.
8. Installations should **never** use no more than the required length of ALIS Bus for each ALIS Power Hub. Remove any excess end of line ALIS Bus cable at approximately 30cm (12 inches) past the final lamp.
9. ALIS Bus cable should **never** be knotted or looped. it is also **important** to avoid sharp bends, returns, and kinks. The minimum recommended bend diameter is 75mm (3 inches).
10. Please **note** that poorly made electrical connections are often the main cause of equipment failure, which in turn leads to livestock fatalities.
11. If the ALIS Bus passes through a hole or aperture (metal or otherwise) a suitable insulating grommet or gland **must** be fitted.
12. ALIS Bus cable should **never** be un-twisted, apart from through the lamp coupler.
13. **Under no circumstances** must the ALIS Bus be switched by any means, be that relay, contactor, isolator or circuit breaker, unless parts are supplied by Greengage Lighting for that purpose. If this is attempted the subsequent damage caused to the ALIS Power Hub will be irreparable and will not be covered by any Product Warranty.
14. Disconnecting the main electrical supply to the ALIS Power Hub as a means of regularly extinguishing the ALIS Lamps **must** always be avoided.
15. If switching the 0/10V control signal, the selection of the switching component is extremely important, please adhere to the instructions on the relevant circuit diagram, obtainable from **support@greengage.global**. Contact degradation can lead to the situation, particularly at low current levels, where the switching device operates mechanically but effectively remains open circuit causing the ALIS lamps to remain at full brilliance.

7. Specifications

7.1 ALIS Power Hub electrical

7.1.1 Input Specifications 230VAC (CE)

Parameter	Description	Minimum	Nominal	Maximum
VAC RMS	Input Supply	198	230	264
Frequency	AC RMS (Hz)	47	50	60
AC Start Up	Input Start Voltage (V)	178	180	182
AC Shut Down	Input Stop Voltage (V)	157	159	161
Current	Current RMS (A)	-	-	3.7

Insulation information:
Secondary output circuit of IPH500 is separated from its Primary input circuit by basic insulation; Control circuit (SELV) is separated from Primary/Secondary circuits by reinforced insulation.

7.1.2 Input Specifications 120VAC (cULus)

Parameter	Description	Minimum	Nominal	Maximum
VAC RMS	Input Supply	108	120	132
Frequency	AC RMS (Hz)	47	50	66
AC Start Up	Input Start Voltage (V)	103	105	108
AC Shut Down	Input Stop Voltage (V)	92	95	98
Current	Current RMS (A)	-	-	5.5

7.1.3 Output Specifications 230VAC and 120VAC (CE and cULus)

Parameter	Description	Minimum	Nominal	Maximum
Power Rating 230VAC (CE)	Max Power	-	-	500W
Power Rating 120VAC (cULus)	Max Power	-	-	475W
Load Regulation	0-500W Output	+/- 0.95%	+/- 1.45%	+/- 1.95%
O/P Frequency	ALIS Bus	49 kHz	50 kHz	51 kHz
O/P Current	ALIS Bus	1.805A	1.9A	1.995A
Start Time	Turn On Time	460mS	480mS	500mS

475W output rating is only guaranteed for US mains supplies. The 475W rating must be de-rated to maximum 425W for supplies below 100 VAC.Voltage

7.2 ALIS Power Hub environmental

Parameter	Description	Minimum	Nominal	Maximum
Operating Temperature	Thermal Environment	-40˚C	25˚C	40˚C
Non-operating Temperature	Thermal Environment	-40˚C	-	70˚C
Storage Temperature	ALIS Bus	-40˚C	-	100˚C
Operating Humidity	Non-condensing	0%	-	85%
Non-operating Humidity	Non-condensing	0%	-	95%
Operating Altitude Maximum	3,000m or 10,000 feet			
Non-operating Altitude Max	15,000m or 50,000 feet			
Enclosure rating. Indoor use	IP10 or NEMA Type 1.			

95% RH is achieved with a dry bulb temperature of 55˚C and a wet bulb temperature of 54˚C.

7.3. ALIS Dimmer 230VAC

7.3.1. **Input and Output Specifications 230VAC and 120VAC (CE and cULus)**

[8]

Parameter	Description	Minimum	Nominal	Maximum
Frequency	ALIS Bus	49 kHz	50 kHz	51 kHz
Current	ALIS Bus	1.805A	1.9A	1.995A
Voltage	ALIS Bus	-	-	264V

Additional information for ALIS Dimmer 230V:

Insulation information:
0-10V circuit (FELV) of optional dimmer IPDI230 is separated from Secondary circuit by basic insulation
0-10 V circuit (FELV) of optional dimmer IPDI230 is separated from Primary circuit by basic insulation.

FELV terminals marked "Risk of electric shock" are not safe to touch. Circuit connected to any FELV control terminal shall be insulated for the LV voltage of the control gear and any terminals connected to the FELV circuit shall be protected against accidental contact.

7.3 ALIS Barn Lamp

Parameter	Specification
Light Source	10W High Power CoB LED (3500K)
Luminous Flux	1000 lumens (ALIS Barn Lamp Narrow beam) 1100 lumens (ALIS Barn Lamp Wide beam)
Optics	Optical grade milky white polycarbonate lens.
Connection Type	Clip on
Dimmer Option	100K potentiometer or 0-10V
Environmental Rating	IP66 Suitable for Wet Locations. Do not Submerse.
Rated Life	100,000 Hours
Ambient Temperature	-20 to +55˚C
Humidity Range	0 to 95%

7.4 ALIS Nest Lamp

Parameter	Specification
Light Source	0.8W High Power LED (3000K)
Luminous Flux	30 lumens
Optics	Clear polycarbonate lens.
Connection Type	Clip on
Dimmer Option	100K potentiometer or 0-10V
Environmental Rating	IP69K Suitable for Wet Locations. Do not Submerse.
Rated Life	+60,000 Hours
Ambient Temperature	-20 to +55˚C
Humidity Range	0 to 95%

The specifications contained herein are believed to be correct at the time of publication and are subject to change without notice.

8. Compliance

8.1 ALIS Power Hub 230VAC (CE)

This equipment complies with 2014/30/EC Electromagnetic Compatibility Directive and 2014/35/EC Low Voltage Directive as demonstrated by conformity with the applicable requirements of the following documents:

Title	Description	Edition/Date
EN 55015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment	2013 + A1:2015
EN 61547	Equipment for general lighting purposes. EMC immunity requirements	2009
EN 61000-3-2	Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current? 16 A per phase)	2014
EN 61000-3-3	Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current? 16 A per phase and not subject to conditional connection	2013
EN 62493	Assessment of lighting equipment related to human exposure to electromagnetic fields	2015
EN 61347-1	Lamp controlgear - Part 1: General and safety requirements	2015

The device shall be Class I type insulation, with a metal chassis, assumed to be connected to protective earth. Equipment classification: Domestic and Light industrial.

8.2 ALIS Power Hub 120VAC (cULus)

Parameter	Standard	UL file No.
Light Emitting Diode (LED) Equipment for use in Lighting Products	UL8750	E470619
Power Units other than Class 2	UL1012	
Light Emitting Diode (LED) Equipment for Lighting Applications	CSA C22.2 No.250.13-12	
General Use Power Supplies	CSA C22.2 No.107.1-01	

8.3 ALIS Lamps (CE)

This equipment complies with 2014/30/EC Electromagnetic Compatibility Directive and 2014/35/EC Low Voltage Directive as demonstrated by conformity with the applicable requirements of the following documents:

Title	Description	Edition/Date
EN 55015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment	2013 + A1:2015
EN 61547	Equipment for general lighting purposes. EMC immunity requirements	2009
EN 62493	Assessment of lighting equipment related to human exposure to electromagnetic fields	2015
EN 60598-1	Luminaires - Part 1: General requirements and tests	2015
EN 60598-2-4	Luminaires. Particular requirements. Portable general purpose luminaires	1998
EN 61347-2-13	Lamp controlgear. Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules	2014 + A1:2017
EN 62031	LED modules for general lighting. Safety specifications	2008 + A1:2013 + A2:2015
EN 60598-2-24	Luminaires - Part 2-24: Particular requirements - Luminaires with limited surface temperatures	2013
EN 61347-2-13	Lamp controlgear - Part. 2: d.c or a.c supplied electronic controlgear for LED module	2017

ALIS Nest Lamp is designated to have Class II type insulation and Barn Lamp to have Class III.

8. 4 ALIS Lamps (cULus)

Parameter	Standard	UL file No.
Light Emitting Diode (LED) Equipment for use in Lighting Products	UL8750	E471464
Portable Electric Luminaires	UL153	
Portable Luminaires	CSA C22.2 No.250.4	

Warranty validation

To validate the three-year's warranty of the ALIS system, please complete the form below and send to **warranty@greengage.global** or/and

Warranty Registration
Greengage Lighting Limited
Sir Alexander Robertson Building,
University of Edinburgh
Easter Bush Campus,
Midlothian,
EH25 9RG,
United Kingdom

Date of Installation:	

Site Information

Client	
Address	
Country	
Post/Zip code	

Telephone (inc. country code)	
Mobile/Cell	
E-mail	

Installer Information

Name	
Address	
Country	
Post/Zip code	

Telephone (inc. country code)	
Mobile/Cell	
E-mail	

Barn Type

Poultry		Swine		Other		Type of barn	

Install Information

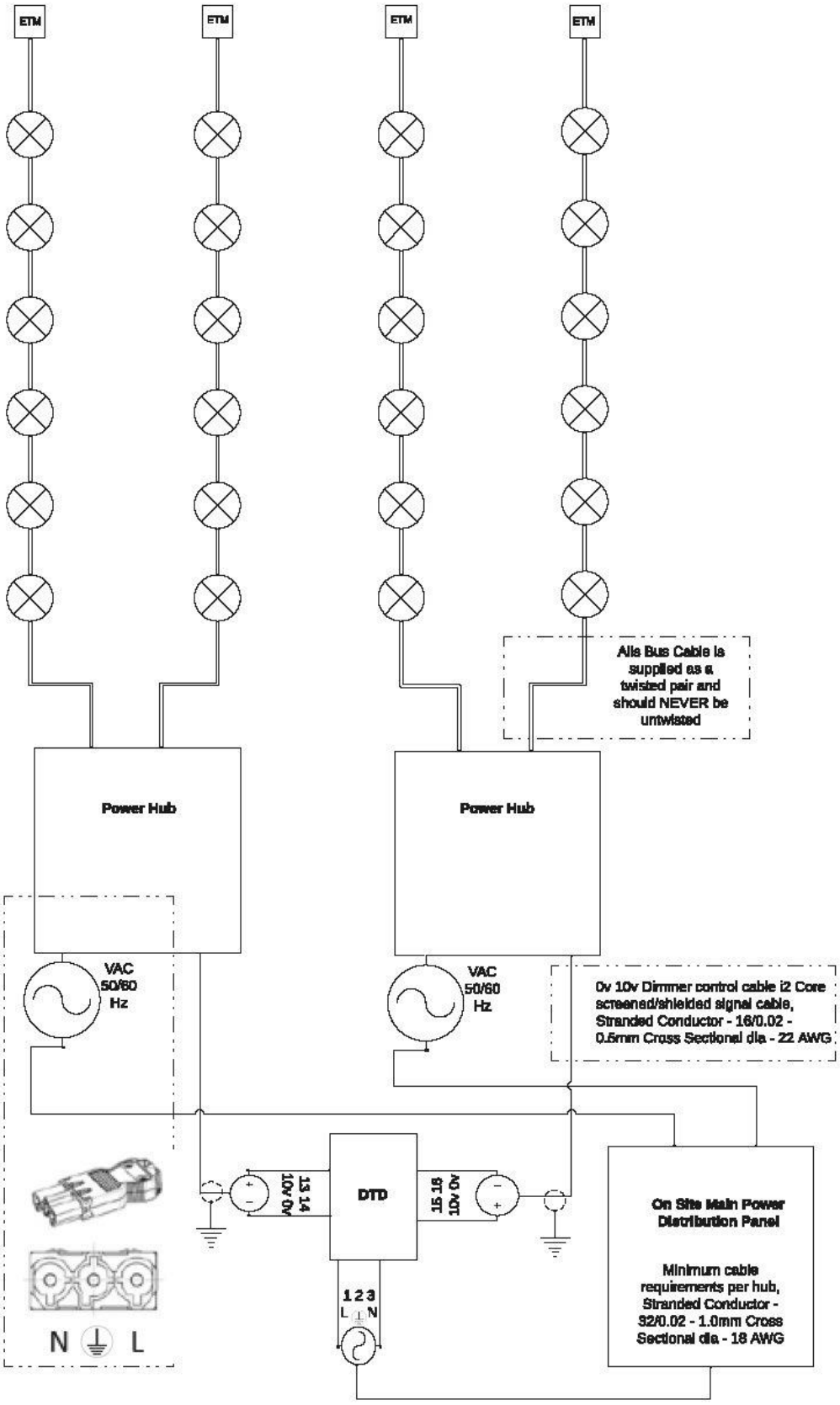
ALIS Power Hub Serial Number	ALIS Dimmer Serial Number	Length of Cable	Number of ALIS Barn Lamps	Dimming Facility	
				ALIS Pot	0-10VDc

Pictures
Please send pictures of the following

a. The installed ALIS Power Hubs and ALIS Dimmers
b. The ALIS Bus end termination

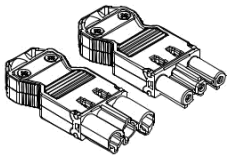
Appendix

Connection diagram



Assembly instruction – P2M connector supply

92.931.3053.0/1 (BLK/WHI)
92.932.3053.0/1 (BLK/WHI)
gesis GST 18i3
ENG
Screw Connection
Low Profile

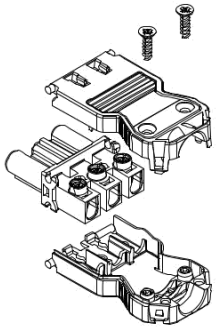


Wieland Electric GmbH
Brennerstraße 10-14
96052 Bamberg
+49 (951) 9324-0
+49 (951) 9324-198
Internet: www.wieland-electric.com
Email: info@wieland-electric.com

wieland

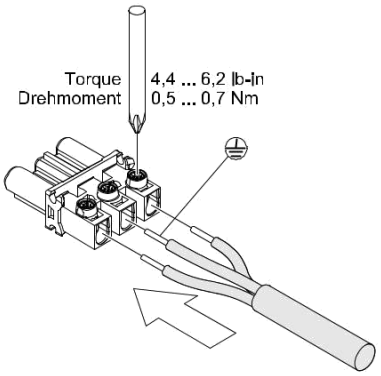
Mounting Instruction
gesis GST 18i3 (July 2004)

Items delivered (shown 92.031.3053.0/1)

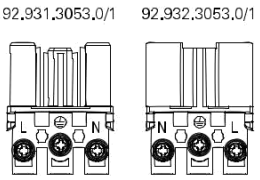


Mounting Steps

1



Conductor Assignment



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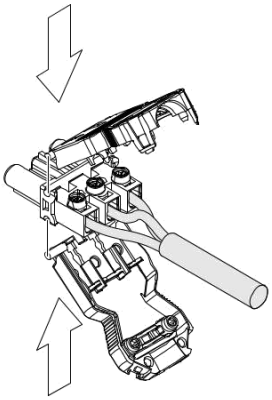
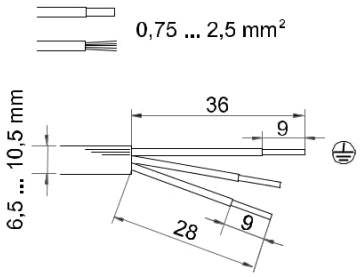
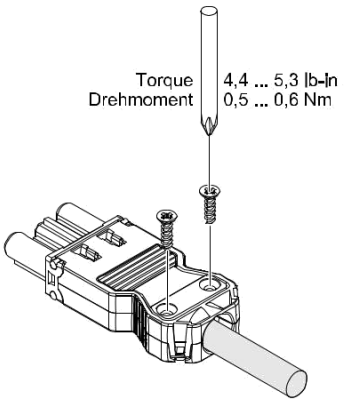


Conductor Preparation



3



Dokument **BA000180** (Montageanleitung ***gesis*** GST 18i3—Art.-Nr. 92.93x.3053.x)

Notes


Greengage
www.greengage.global