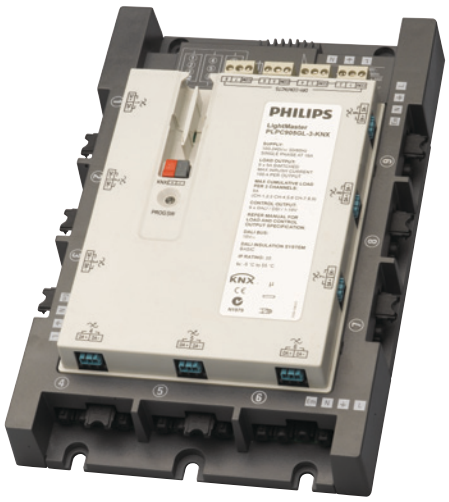
PHILIPS

PLPC905GL-3-KNX / PLPC905GL-3-HD-KNX / PLPC905GL-4-KNX / PLPC905GL-4-HD-KNX

LightMaster Dimmer Actuator

INSTALLATION MANUAL



WARNING

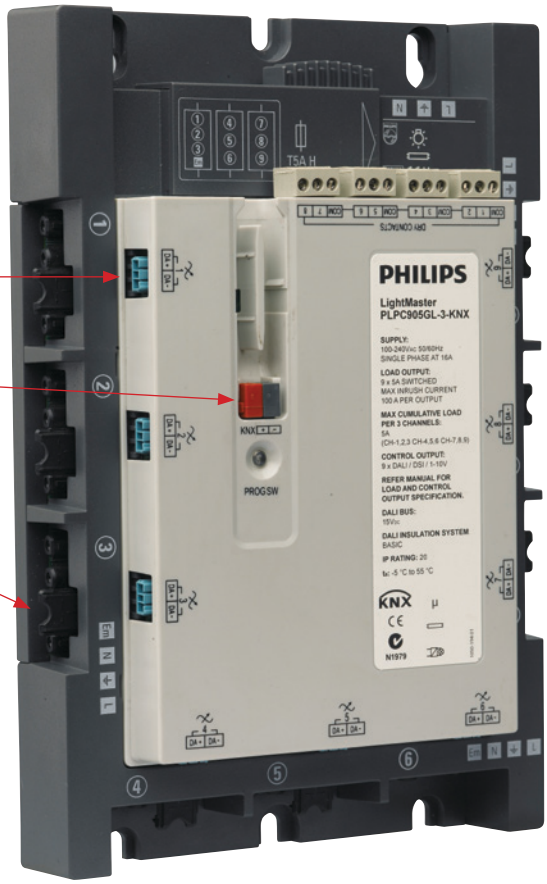
- Risk of Electric Shock.
- Do not cut or terminate live wires. De-energize and isolate all supply, load and control wiring prior to installation or servicing. Do not expose this device to rain or moisture. The device is only suitable for indoor installation and must be earthed. Check all wiring terminations prior to energizing the device. Installation, programming and maintenance must be carried out by qualified personnel only.
- Do not connect KNX TP1 bus to control output wires, dry contact circuits or mains.
- Do not connect control output wires to dry contact circuits or mains.
- Do not connect dry contact circuits to mains wires.
- KNX TP1 bus and dry contacts are SELV and they must be isolated and segregated from mains and other wiring as per the local wiring rules and KNX installation recommendations.
- Control Output cables must be isolated and segregated from mains and other wiring as per the local wiring rules and DALI installation recommendations. Control output circuits are not SELV and shall not be considered touch safe.

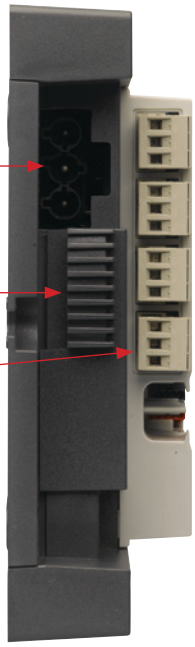
Features

- **Supply** – 100-240V 50/60Hz single phase at 16A.
- **Switched Outputs**
  9 x Maintained NC switched output
  9 x Switched outputs, total box load 16A
- **Standard & Heavy Duty (HD) models**
  Mains switched outputs, each with lighting load rated high in-rush current relays
- **9 x Control Outputs** – Each with in-built DALI power supply, no external supply required, output selectable to DALI broadcast, DALI addressed, DSI or 1-10V.
- **4 x 2 DC Inputs (4 pairs) for retractable switches** – 4 x voltage free single pole double throw (SPDT) switch inputs, momentary or latch
- **Many Control Options** – Control of this device can be either via the KNX control bus from other KNX devices, (e.g. sensors, pushbutton panels, time clocks etc.) or directly using the Dry Contact inputs.
- **Simple Installation**
  Placed in the ceiling space either via drop rod, wall slab or cable tray mounting. The device incorporates structured wiring connectors throughout, which enables the unit to be readily connected or disconnected without the use of tools.

Important Notes

- **System Software** – This device is designed for professional installation only and will only operate in basic modes unless programmed via a computer. If programming is required, contact your local agent for details.
- **Check Connections** – ensure all plugs are fully engaged in their mating connectors and securely locked.
- **Power Sources** – This device should only be operated from the type of supply specified in this manual. This device must be earthed.
- **Output Circuit** – The load on the switched circuits must not exceed those specified in this manual. Incoming supply feed shall be supplied via a max. 20A rated fuse / circuit breaker.
- **Load Control Circuit** – A 2 core control cable is required to be run to the loads, this cable is in addition to the mains feed. Control circuits must be isolated from mains. Ensure correct segregation between control and mains cables in accordance to the local electrical wiring rules.
- **Load Type** – This product is intended to control specified types of dimmable devices and switched indoor devices only.
- **Mounting Location** – Install in a dry, well-ventilated indoor location only. Controllers may emit some mechanical noise. Take this into account when deciding the mounting location.
- **KNX Data Cable** – Use approved KNX TPI data cable, Segregate from mains cable as per KNX installation recommendations and local wiring rules. Connect devices in a 'daisy chain'. Do not cut or terminate live cables.
- **Dry Contact Cable** – for distances less than 5 metres use twisted pair (UTP CAT5/6) cables with a mains rated outer jacket (min. 300Vac, 4kV rated) or mains rated 2 x 0.5 – 0.75mm sq TP cables, maintaining a minimum separation of 100mm from mains cables for noise immunity. For longer distances (up to 20 metres) or where a segregation of 100mm can't be practically achieved, use STP CAT5/6 cables with a mains rated outer jacket (min. 300Vac, 4kV rated) and terminate one side of the shield drain wire to the earth conductor of the nearest supply circuit. Ensure minimum segregation to other circuits as per the local electrical wiring rules.

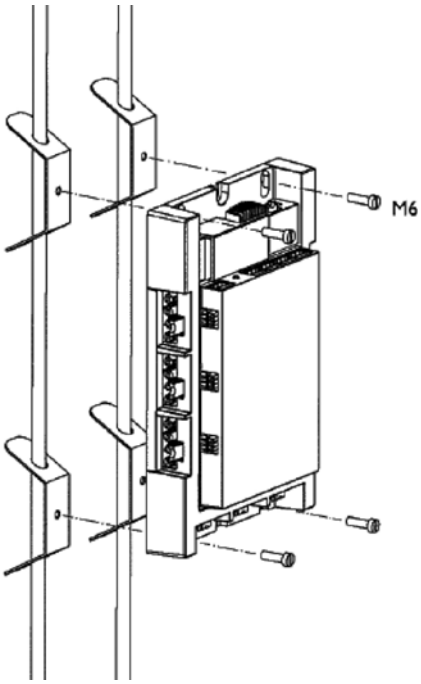

2 pole control output connector
Wieland BST 14i2 Female (9 in total)
Local KNX TP1 connector Wago 243
(Red/Grey) 0.6mm-0.8mm diameter
single core KNX cable
3 or 4 pole output connectors Wieland
ST 18i3 or 18i4 Female (9 in total)
PHILIPS
LightMaster
PLPC905GL-3-KNX
PROG SW


3 Pole mains input socket
Wieland GST 18i3 Male
Sliding fuse cover
Voltage free switched inputs,
3 pole pluggable terminal
(4 in total)

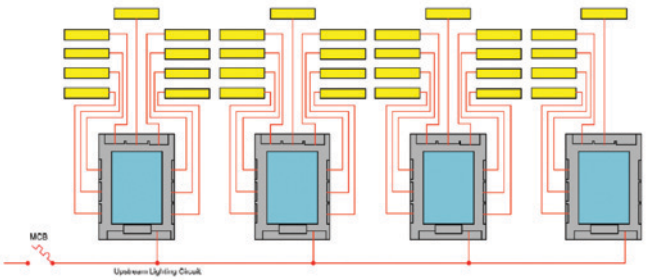
Installation Steps

Isolate Mains Supply, KNX bus and ballast control bus prior to wiring.

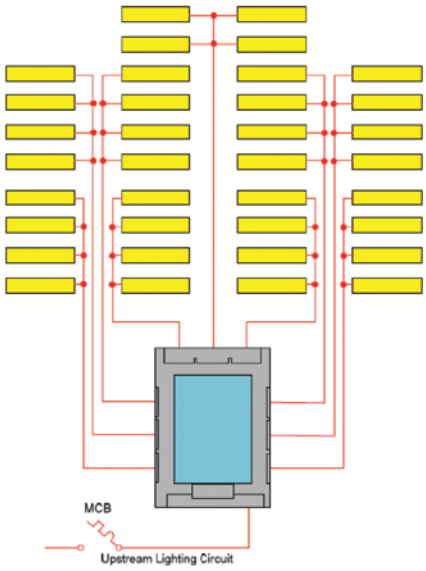
1. Ensure all supply, load and control cables are de-energized and isolated prior to installation and wiring.
2. Select a suitable location: this device is designed for indoor use only. If installing in an external location the device must be housed in a suitable enclosure. Choose a location that will be accessible after the installation is complete. To prevent dust or particle penetration the controller should be mounted is that connector apertures do not face directly upwards. Recommended mounting methods include surface wall, slab, cable tray or "drop rod" suspension installation.
3. Fixing the device: the controller has two keyhole slots located at each end of the housing, which can accommodate M6 fixing screws. The preferred method of mounting is shown below using "drop rods" with appropriate fastening clips.



4. Wiring Terminations: Removable connectors are utilised for all wiring terminations to simplify maintenance, installation and replacement.
5. The device is available with either 3 pole (Wieland ST 18i3 female) or 4 pole (Wieland ST 18i4 female) output connectors for upstream power connection. Both versions come equipped with 3 pole (Wieland BST 14i2 female) output connectors for upstream control connection. The connector vendor offers a range of wiring solutions and accessories for both the upstream supply and downstream load wiring. Please refer to the vendor for guidelines on connector and cable assembly selection.
6. Connect single phase mains supply and earth wiring to the supply connector (Wieland GST 18i3 Male). Do not energize the supply.
7. Check total load per channel to ensure current not exceeding nominal or inrush current limits (whichever comes first). Protection devices (fuses / circuit breakers) may require de-rating for high inrush current loads, consult the manufacturer.
8. Connect supply and load cables to each channel. An overload protection fuse / circuit breaker rated not more than 20A must be fitted on the incoming supply feed. A single feed can be shared between two or more controllers. The supply circuit can be on any phase. Device is suited for some delta supplies, refer Product Specification section. Do not energize supply.
9. Controller loading: This device is suitable for connection to a supply rated and protected up to 20A. This enables more than one controller to be connected to a single lighting circuit. Care should be exercised when considering circuit loading as lighting fixtures which incorporate electronic ballasts tend to draw high power-up inrush currents. Nuisance tripping of circuit breakers can result if loading is not carefully considered.
10. The device incorporates a control feature that staggers operation of the power relays by 100mS to minimise potential inrush currents. For a typical C characteristic thermal magnetic circuit breaker, it is recommended that a de-rating factor of 0.6 be applied when calculating total circuit loading. For example, a typical 2 x 28W T5 light fixture operating on 230V nominal supply will draw approximately 0.3A. When fed from a 16A protected lighting circuit, this permits a recommended total load of approximately 32 lighting fixtures (16 x 0.6 / 0.3). If using this device with a single fixture connected to each output it would be possible to connect four (4) controllers to one 16A lighting circuit as illustrated below.



11. The device can also support multiple light fixtures connected to a single output to deliver greater economy if required. Care should again be exercised with this approach to not exceed output capacity limitations. It should be noted that each group of three output channels (CH, 1,2,3 CH4,5,6, CH7,8,9) is protected by a replaceable slow blow 6.3A HRC fuse, allowing a maximum 5A load per group. See example below.



12. Check total Control Outputs to ensure not more than:
    – DALI broadcast / DSI: max. 5 DALI / DSI loads per channel. (7 for HD model).
    – DALI addressed: max. 5 DALI loads per channel (7 for HD model). Max 64 DALI loads per device.
    – 1-10V: max. 5 x 1-10V loads per channel (10 for HD model)

    Note: individual / group channel current rating, inrush current and total box load limits may further reduce the allowed number of loads
13. Energizing the device: If it is necessary to energize load circuits before any controls cables are connected, it is acceptable to power the device immediately, as the default factory programming is to have all channels set to 100% output. If there is no output on any or all channels check cable connections. This device must be de-energized before connecting the control cables.
14. Connect Control Output cables to each channel. Ensure correct polarity for 1-10V installation. Ensure cable lengths, insulation and cross section is appropriate. Ensure required cable segregation to other circuits.
15. Connect Dry Contact control cables. Ensure cable lengths, insulation and cross section are appropriate. Ensure required cable segregation to other circuits.
16. Connect KNX TP1 bus cables. Ensure correct cable type and lengths. Ensure required cable segregation to other circuits.
17. Re-check all connections prior to energizing.
18. Energize supply and KNX bus.
19. Check device supply and KNX bus voltage using a multimeter. Device supply shall be within 100-240Vac range, KNX bus between 21-30Vdc.
20. If required to program the device, a PC with ETS software needs to be connected to the KNX bus via a gateway. To enter programming mode, the programming button shall be pressed once. Programming LED shall illuminate. Follow the programming procedure steps.
21. To exit programming mode press the programming button again. Programming LED shall extinguish.

Device is now ready to operate.

Data Cable Termination

KNX TP1 cable termination:

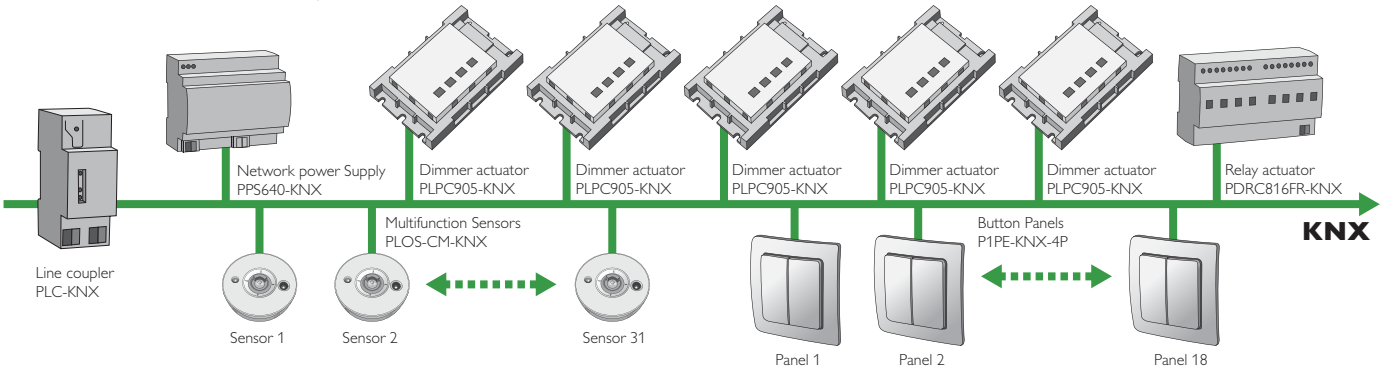
1. Strip-off between 25 – 40mm of outer jacket.
2. Cut shield, synthetic foil and tracer flush to the outer jacket.
3. Cut yellow-white pair if unused, insulate ends.
4. Apply a layer of wide insulating tape to cover the remaining exposed foil and cut area. Approx. 20mm of red-black pair shall be left exposed for termination.
5. Strip 5 to 6mm of insulation on both red and black wires.
6. Insert wires to the color matching KNX terminal respecting the polarity (red +, black -).
7. Ensure wires are segregated and fully inserted with no exposed copper outside terminals to prevent shorts.

TP1 cable shield termination to Earth can improve noise immunity. It is not mandatory except where a specific application and/or the local wiring rules require it.

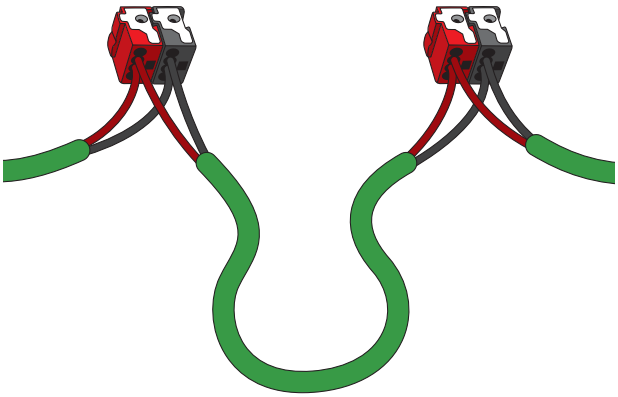
For future reference it's recommended to place a marker on the cable indicating "KNX TP1" or "BUS" with the area and line ID.

Connecting KNX Data Cabling

Connect Data Cable in a Daisy Chain

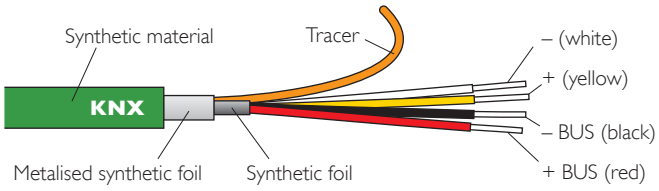


KNX Bus Permanent Connections



YCYM 2x2x0.8
Fixed installation;
dry, humid and wet rooms;
outdoor (if protected against direct sun radiation);
surface & flush mounted, in conduits
Test voltage: 4kV according to DIN VDE 0829

I Y(St) Y 2x2x0.8 VDE 0815
Fixed installation;
indoors only;
flush mounted, in conduits
Test voltage: 2.5kV according to DIN VDE 0829



Recommended Cable Color Coding

Used Wire Pair
Red: BUS +
Black: BUS -

It is not necessary to connect the shielding of the installed cable types

Recommended Cable Types

For the current list of KNX certified/approved cable types, please consult the KNX web site – www.knx.org

Installation Requirements:

- Free topology: linear, star, tree or mix
- Maximum cable length of a line segment: 1000m
- Maximum distance between two bus devices: 700m
- Maximum distance between a bus device and a power supply: 350m
- Minimum distance between two power supply units: 200m

For more information on installation requirements refer "KNX installation guidelines" document on our website.

Product Specifications

- **Supply**
  100-240V 50/60Hz single phase at 16A or 100-120/208-240VAC 50/60Hz delta supply not exceeding 250Vac phase-to-phase and phase-to-ground.
  All live supply wires must be protected with fuses / circuit breakers rated 20A or less. Supply over-voltage (surge) must not exceed 4kV, as per IEC category III classification.
  Connection: Wieland GST 18i3 Male
- **Switched Outputs**
  9 x Maintained NC switched outputs, 5A resistive load limit for all 9 outputs combined with CH1-3 load
  9 x Switched outputs, total box load 16A
  Standard model:
  Per Channel: 5A resistive / 1A electronic ballast load (inrush current max.100A per channel)
  Per group of 3 channels (CH1-3 & EM, CH4-6, CH 7-9): 5A resistive / 3A electronic ballast load (inrush current max. 100A per channel).
  HD model:
  Per Channel: 5A resistive / 2A electronic ballast load (inrush current max. 200A per channel)
  Per group of 3 channels (CH1-3 & EM, CH4-6, CH 7-9): 5A resistive / 5A electronic ballast load (inrush current max. 200A per channel).
  Note: de-rating may apply for upstream supply protection with high inrush loads.
  Connection: Wieland GST 18i3, 18i4 Female
- **Protection**
  3 x 6.3A replaceable HRC fuses. Fuse 1 feeds channels 1,2,3 and maintained switched output (max. load allowed for sum of channels 1,2,3, MO is 5A). Fuse 2 feeds channels 4,5,6. (max. load allowed for sum of channels 4,5,6. Is 5A). Fuse 3 feeds channels 7,8,9. (max. load allowed for sum of channels 7,8,9 is 5A)
- **KNX Bus**
  TP1, 21 – 30Vdc, max. 10mA bus load. KNX bus spring terminals – Wago 243 (Red/Grey) 0.6mm-0.8mm diameter single core KNX cable
- **Control IO**
  9 x control outputs each selectable to:
  DALI broadcast / DSI: max. 5 DALI loads per channel (7 for HD model). DALI power supply built in.
  DALI addressed: max. 5 DALI loads per channel (7 for HD model). DALI power supply built in.
  1-10V: max. 5 1-10V loads per channel (10 for HD model)
  Note: individual / group channel current rating, inrush current and total box load limits may further reduce the allowed number of loads.
  Connection: Wieland BST 14i2
- **Control Inputs**
  4 x voltage free single pole double throw (SPDT) switch inputs, momentary or latch
  4 x 3 pole pluggable terminal,
  2 x 0.75mm^2 maximum conductor size per pole
- **User Controls**
  KNX programming button & LED
- **Environment**
  –5 to 55°C operating ambient temperature
  –25 to 70°C storage temperature
  0% to 90% RH non condensing
- **Compliance**
  CE, C-Tick, KNX
- **Enclosure**
  PC, UL94-V0 rated
- **Protection Class**
  IP20
- **Dimensions**
  H 52mm x W 172mm x L 263mm
- **Weight**
  Packed Weight 1kg

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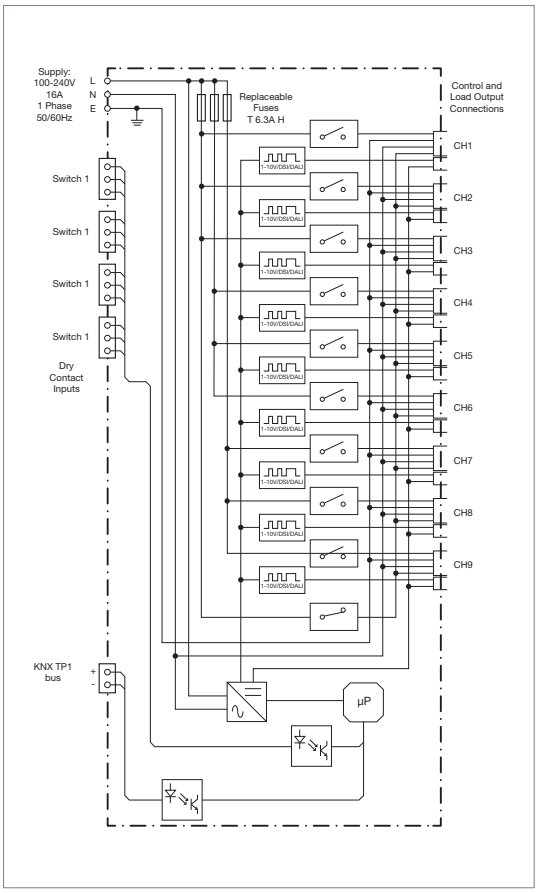
Electrical Diagram



Load Compatibility

DALI, DSI and 1-10V HF ballasts

DALI, DSI and 1-10V transformers

DALI, DSI and 1-10V LED drivers

DALI, DSI and DSI Relay Modules

Switched loads

Options

3 or 4 pole Wieland connector

Available with standard or Heavy Duty (HD) relays

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