PHILIPS

VitaUp

Design-in Guide

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Contents

Introduction

Applications

VitaUp modules are designed for indoor use.

Information and support

This Design-in Guide contains general important instructions and guidelines regarding the installation and use of the VitaUp module. For more information we refer to the following documents from the OEM technical download website, Technical Downloads | Philips lighting:

- Design-in guide of Linear and Area LED Systems
- Design-in guide of SR indoor drivers
- Installer Manual Philips MasterConnect App
- Datasheet of the VitaUp Module
- Datasheet of the driver(s)
- Optical files
- CAD files
- Certificates

Your account manager can provide more information, documents, and support

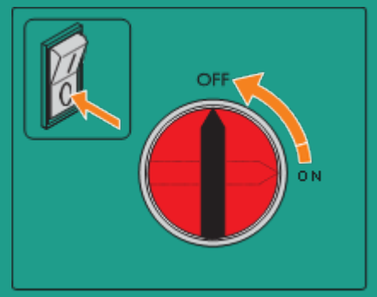
Safety warnings and installation instructions

Safety warnings

Exposure to excessive levels of UV-B radiation can pose a significant risk to both humans and animals, potentially resulting in skin damage and corneal injury. It is imperative that individuals take necessary precautions to avoid such exposure. Additionally, when installing the module, it is essential to ensure that the devices are installed according to this Design-in Guide and utilized correctly. The VitaUp modules come equipped with warning text and signs on their packaging to inform the installer that UVB is emitted by the module. It is crucial to follow these warnings and instructions to mitigate the risks associated with the use of these modules.

Installation and service phase of luminaires

- Do not use damaged or defective modules.
- Connect all electrical components first before switching on mains.
- Do not apply mains power to the module directly
- The luminaire should not be serviced while the mains voltage is connected.
- Hot switching of the luminaire is not allowed.



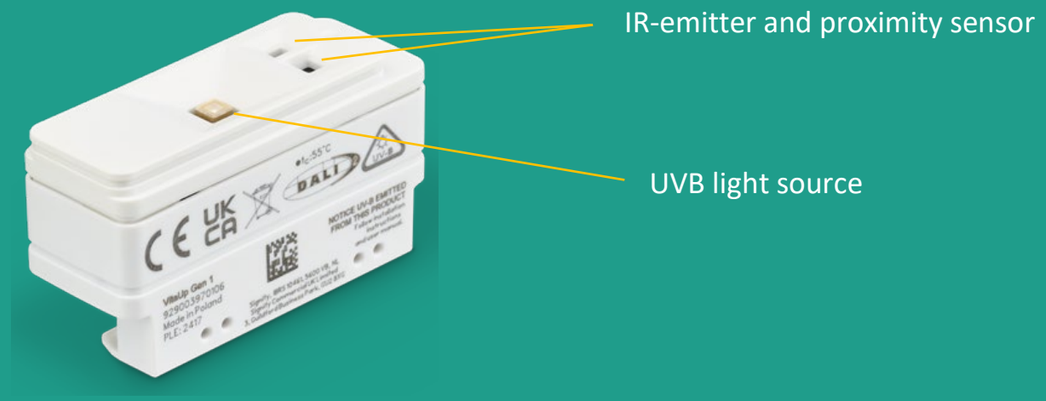
Other important instruction

- The general IEC recommendations for luminaire design and legal safety regulations (ENEC, CE, ANSI, etc.) are also applicable to the VitaUp module. Luminaire manufacturers should conform to the international standards for luminaire design (Class I, IEC 60598-Luminaires).

The VitaUp module

SNS form factor

The VitaUp module has the same form factor as the EasyAir SNS21x MasterConnect nodes. It contains an LED light source emitting UVB radiation. It requires a stable 24V DC CV input of about 1W. The module can be controlled via a wired DALI bus. An IR-based proximity sensor is included, which ensures that the UVB light source is switched off automatically when an object comes too close (less than 10 cm from the module).



VitaUp Module

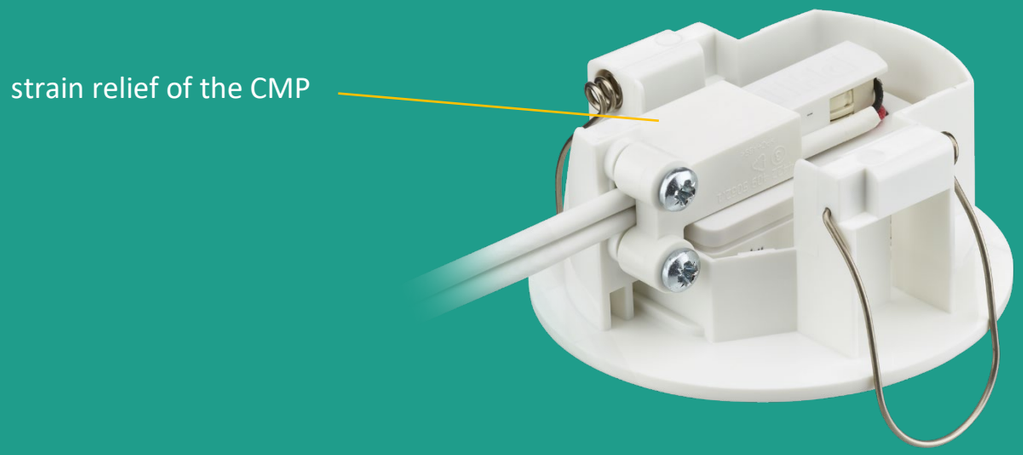
Since the module has the SNS form factor it can be easily integrated in a luminaire or used as an independent light source using the same holders as used for the SNS nodes:

SNS-bracket for integrated use in a luminaire (LEX-S Slot)

CMP: holder for a VitaUp Module in case of independent use

Connectors of the VitaUp module:
+ / -: connections to 24V DC CV power source
DA: connections to DALI control

Take care for a proper strain relief of the power and the DALI cables. If the CMP is used, these cables must be double isolated. We recommend 18 AWG cable. The strain relief of the CMP can be used as strain relief of both cables as shown below:



Luminaire System Configurations

Interfaces

The VitaUp module is connected via the following interfaces:

Mechanical: SNS form factor (fits independent CMP holder and the luminaire LEX-S slot bracket).
Electrical: CV input 24V DC providing 1W per module, more than one module can be connected to the driver.
The VitaUp module must not be connected to any switch or PWM-dimmer on the SELV input line.
Control: DALI (on/off only, no dimming, no Touch Dim, some diagnostic features are supported, see below).

Protection and diagnostic features

Timer function

At full startup of the module, two counters are activated. When the first counter reaches 8 hours of light on, the output is disabled. When the second counter reaches 16 hours (so 8 hours after switching off) the module is open for on-commands again.

Thermal protection

Thermal protection is integrated, triggering dimming of the output when the internal temperature of the LED is reaching temperatures that could limit the product's lifetime.

Diagnostic features

Complete DALI-2 stack, including parts 101, 102 and 207

Selected features from part 253 (D4i) including:

- 205 control gear: Operating time
- 205 control gear: Switching cycles
- 205 control gear: Failure condition & counter
- 205 control gear: Thermal derating & counter
- 205 control gear: Temperature
- 206 light source: Failure detection: open or short
- 206 light source: Operating time
- 206 light source: Switching cycles
- 207 luminaire: Information for OEM to store lifetime information of luminaire

Connection schemes

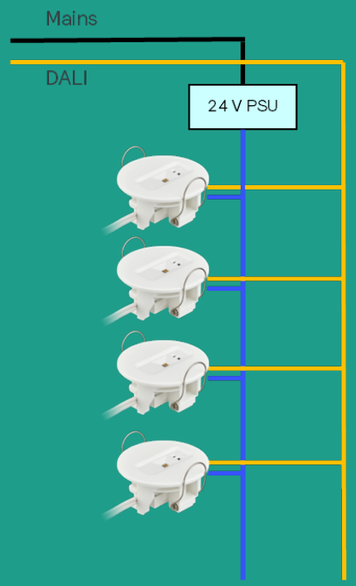
The connection scheme depends on:

1. Use of independent or luminaire integrated VitaUp modules: I or L
2. Wired (DALI) or wireless control (MasterConnect): D or MC

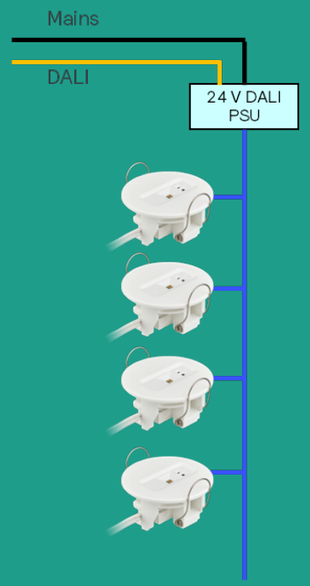
Independent VitaUp modules – connection schemes

DALI

I.D.1

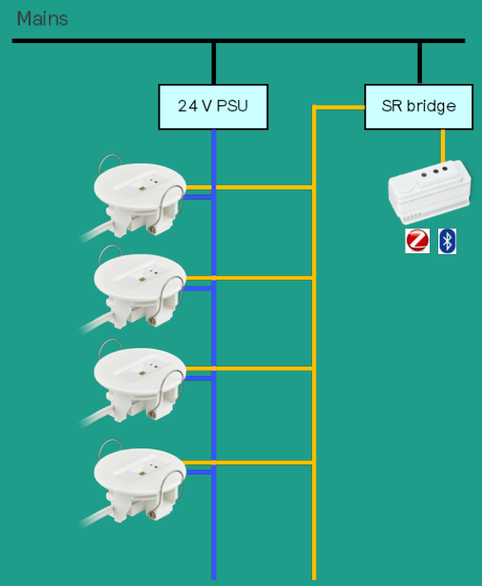


I.D.2

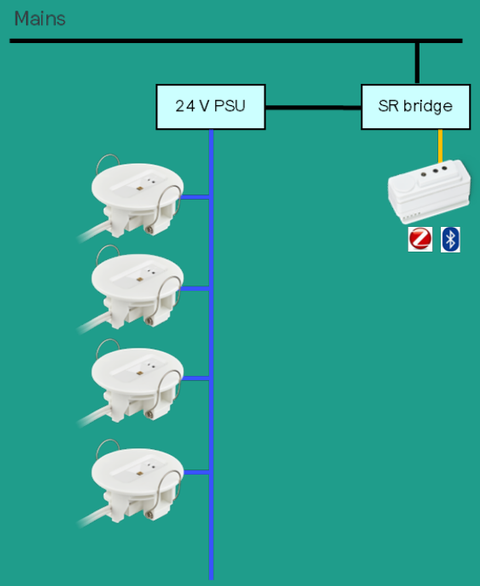


MasterConnect

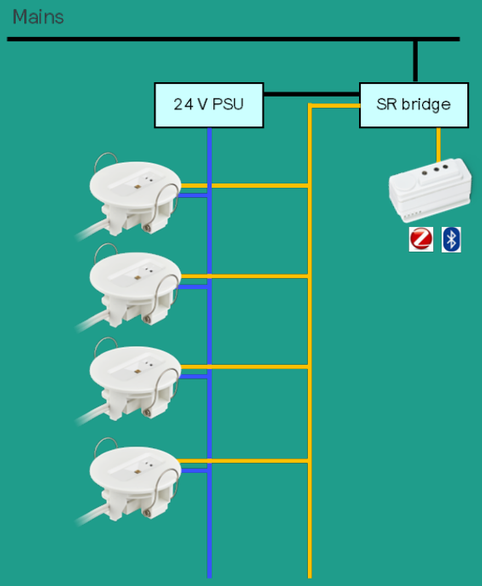
I.MC.1



I.MC.2



I.MC.3



Independent VitaUp modules – pro's and con's

DALI	Individual addressability	8 hours stand by	Diagnostics	System Cost	Wiring
Configuration I.D.1	Yes	Yes	Yes	+	-
Configuration I.D.2	Only CV driver	Yes[1]	No	-	+

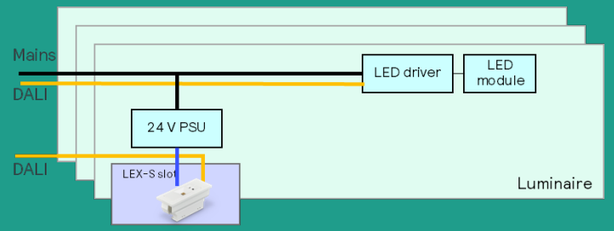
MasterConnect	Individual addressability	8 hours stand by	Diagnostics	Energy metering	Wiring
Configuration I.MC.1	No	Yes	SR bridge[2]	No	-
Configuration I.MC.2	No	Yes[1]	SR bridge[2]	Yes	+
Configuration I.MC.3	No	Yes[1]	SR bridge[2]	Yes	-

+: relatively less cost / wiring
-: relatively more cost / wiring
1: If power to the module is interrupted, the timer will be reset
2: SR bridge reports its own status, not the status of the VitaUp module

Luminaire-integrated VitaUp modules – connection schemes

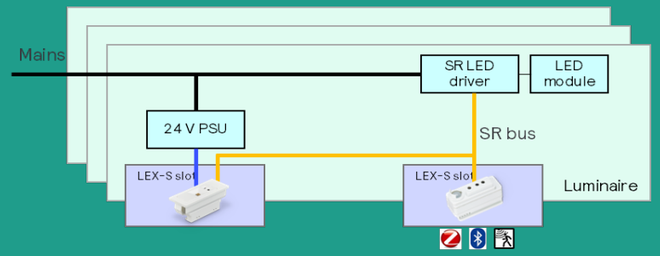
DALI

L.D.1



MasterConnect – SNS direct

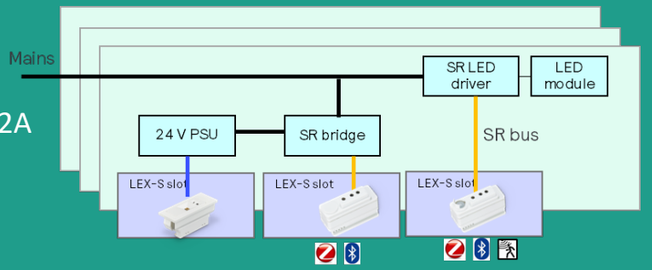
L.MC.1



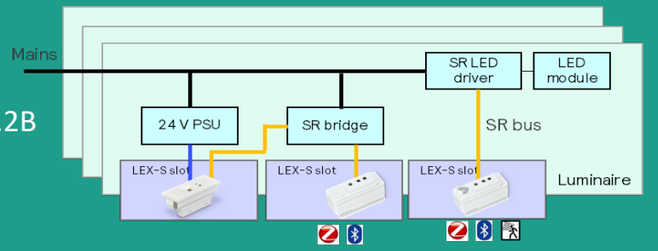
MasterConnect – SNS via SR-bridge

L.MC.2

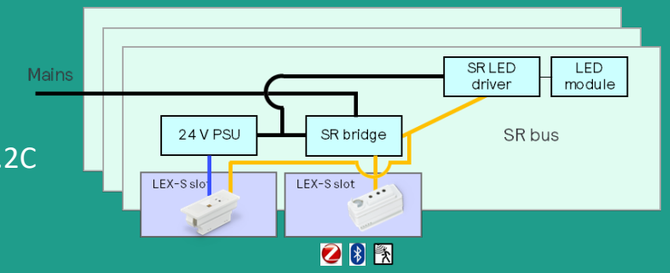
L.MC.2A



L.MC.2B



L.MC.2C



Luminaire-integrated VitaUp modules – pro's and con's

DALI	Individual addressability	8 hour stand by	Diagnostics	System Cost	Energy metering	Number of LEX-S slots
Configuration L.D.1	Yes	Yes	Yes	+	NA	1

MasterConnect	Individual addressability	8 hour stand by	Diagnostics	System Cost	Energy metering	Number of LEX-S slots
Configuration L.M.1	No	Yes	No[3]	+	No	2
Configuration L.MC.2A	Yes	Yes[1]	SR bridge[2]	--	Yes[4]	3
Configuration L.MC.2B	Yes	Yes[1]	SR bridge[2]	--	Yes[4]	3
Configuration L.MC.2C	No	Yes[1]	SR bridge[2]	-	Yes[4]	2

+: relatively less cost / wiring
-: relatively more cost / wiring
1: If power to the module is interrupted, the timer will be reset
2: SR bridge reports its own status, not the status of the VitaUp module
3: When multiple devices are connected to the SNS module, diagnostics will no longer function
4: Each SNS module provides energy metering of the device to which it is connected

UVB detection foil

The VitaUp module is delivered with a detection foil that converts the UVB to visible light.
UVB is not visible for the human eye. A photoreactive detection foil can be used to convert UVB into blue light. In this way, the installer can easily check if the light source is on, for example during commissioning in the field, and maintain a safe distance.

This foil must be removed after installation and commissioning.
Note that the LED of the VitaUp module also emits a bit of visible blue light as well, which also can serve as a status indicator that the light source is on.

Module with detection foil
Left: Off
Right: On

Module without detection foil
Left: Off
Right: On

Thermal Design-in

The VitaUp module is designed to be built-in in a luminaire or as a standalone device to be installed in a ceiling bracket. Heat dissipation is mainly from the front side of the module. However, it is recommended to leave some space around the module inside the luminaire and avoid proximate heat sources like drivers.

Application Instructions

The photobiological safety limit for ultraviolet lamp products, like the VitaUp module, is described in IEC 62471-6.
A distance of at least 75cm from the module to the occupants is required in all applications.
At this distance RG0 application is achieved which requires no restrictions or precautions to limit the exposure time.

Instruction	Ceiling	Other applications (e.g. pendant luminaires)
VitaUp installation height	≥2.75m	≥1m above the working area
RG0 area	≤2.0m	≥0.75m from the module

General note: All plants and/or animals that are subject to prolonged exposure to UV-B radiation may potentially suffer from damage and/or discoloration.
Similarly, materials that are exposed to UV-B radiation for a prolonged period may also be susceptible to damage and/or discoloration.

Electrical Design-in

The VitaUp modules requires 24V DC and a power of about 1W per module (0.2W in standby). Multiple VitaUp modules can be connected to a single driver. The VitaUp module is not dimmable and must not be connected to a PWM driver. We recommend several drivers to be used with VitaUp. Below is the list of drivers that can be used. In most cases it is required to add an EMI filter to meet the legislative requirements, if you need any further information or support, please, consult your local Signify office.

12NC	Product name
9290 034 63380 *1	Xi LED Transformer 30W 24VDC
9290 034 26480 *1	CertaDrive LED Transformer 30W 24VDC
9290 021 05580 *1	LED Transformer 20W 24VDC 120-277V
9290 022 00506 *2	LED Transformer 60W 24VDC TD 220-240V - Note: no dimming allowed!

*1 EMI filter required
*2 EMI filter not required

Other drivers can be used, but must meet at least the following minimum requirements:

- The CV output window matches the VitaUp input voltage range specified in datasheet (window of 18-26.4V).
- The peak-to-peak ripple of output voltage is less than 10% under any operating window conditions (e.g. including mains input variation).
- The output of the 24V CV driver of the module is stable within 5%, even if a mains variation occurs at the input side of this driver.
- The voltage overshoot is less than 48V during start-up, shutdown, or load regulation (e.g. when the load is actively switched for one or multiple devices from full to low power).
- During surge testing, the output voltage is less than 48V, the driver has automatic recovery.
- The turn on delay is less than 1s.
- No visual artefacts are observed, such as stroboscopic effects or effects due to other variations in driver output levels.
- There is no instability or drifting of any of the input or output voltage and current waveforms during operation.
- Harmonics meet the regulations.
- The discharge curve is <50ms from 9.0V to 5.6V. Not meeting this requirement could lead to data loss during shutdown. It should be checked with application load.

EMI must be validated on system level.
The drivers must be directly connected to the VitaUp without PWM dimmers or switches on the SELV wiring.

Signify disclaims any responsibility and liability for drivers other than the ones recommended in the table above.

Chemical Compatibility

Several chemicals have a negative impact on LEDs, especially Chlorine or Sulfur containing substances. Avoid the use of materials in a luminaire that contain such substances, as they may gas out and damage the LED in the module. Solvents can also have a negative impact on the LED or the plastic of the module. Examples of aggressive chemicals are given in the table below. Note that this list is not complete, since it is impossible to mention all chemicals that may affect LED performance.

Chemical Name	Normally used as
Acetic acid	Acid
Hydrochloric acid	Acid
Nitric acid	Acid
Sulfuric acid	Acid
Ammonia	Alkali
Potassium hydroxide	Alkali
Sodium hydroxide	Alkali
Acetone	Solvent
Benzene	Solvent
Dichloromethane	Solvent
Gasoline	Solvent
MEK (Methyl Ethly Ketone)	Solvent
MIBK (Methyl Isobutyl Ketone)	Solvent
Mineral spirits (turpentine)	Solvent
Tetracholorometane	Solvent
Toluene	Solvent
Xylene	Solvent
Castor oil	Oil
Lard	Oil
Linseed oil	Oil
Petroleum	Oil
Silicone oil	Oil
Halogenated hydrocarbons	
(containing F,Cl,Br elements)	Misc
Rosin flux	Solder flux
Acrylic tape	Adhesive
Cyanoacrylate	Adhesive

Photo biological safety (PBS)

The lamp standard, IEC 62471 ‘Photobiological safety of lamps and lamp systems’ gives guidance on evaluating the photobiological safety of lamps and lamp systems including luminaires. It specifically defines the exposure limits, reference measurement technique and classification scheme for the evaluation and control of photobiological hazards from all electrically powered incoherent broadband sources of optical radiation, including LEDs, in the wavelength range from 200 nm to 3000 nm.

Since early 2023 two additional standards are available that are related to the VitaUp proposition that may be relevant for the OEM’s luminaire design in and approbation.
IEC 62471-6 Photobiological safety of lamps and lamp systems –Part 6: Ultraviolet lamp products
IEC 62471-7 Photobiological safety of lamps and lamp systems –Part 7: Light sources and luminaires primarily emitting visible radiation
Part 6 is relevant for stand-alone ultraviolet lamp products which links to VitaUp in discrete installations. Important is that the evaluation distance for the PBS depends on the product and application. For the VitaUp module an evaluation distance of 50cm is appropriate.
Part 7 is relevant with respect to the integration of the VitaUp module into luminaires. Important here is that according to chapters 5.2 and 5.3, no further evaluation of the actinic risk is required on luminaire level if the relative output of the luminaire complies to having less than 2mW actinic radiation per 1000lm of visible light. Effectively this means any LED-luminaire with >1000lm output can contain 1 VitaUp module.

Electrostatic discharge (ESD)

Electrostatic Discharge (ESD) can damage electronic components, like LED chips, resulting in early failures. For handling and assembly of the VitaUp module, no extra ESD-measures need to be taken on top of what is required for luminaire assembly and handling and assembly of other LED modules.

Disclaimer

Note that the information provided in this document is subject to change.

This document is not an official testing certificate and cannot be used or construed as a document authorizing or otherwise supporting an official release of a luminaire. The user of this document always remains liable and responsible for all required testing and approbation prior to the manufacture and sale of any luminaire.

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