Blu2Light system data sheet

Why Blu2Light?

B2L is currently the only truly open system for IoT builders with future guarantee as all system parameters are provided via an open neutral interface on the Gateway - not only for lighting but also for IoT BMS parameters such as temperature, humidity, CO_2 and the sending /receiving of Bluetooth® beacon messages.

The Blu2Light open system promise

Our promise to the whole market – **Blu2Light is an open system** – at the LAN side of the VS Gateway you can build any customized solution you like. You can download the whole documentation under the topic Gateway on our homepage, https://www.blu2light.de/de/gateways. With the Blu2Light Connect Zero Plus modules you can build your individual Bluetooth mesh devices on prefabricated basis, the standard meshnet protocol itself you will find here: https://github.com/mwaylabs/fruitymesh. Please note, however, that for security reasons all encryption/decryption and other security elements can only be provided after signing an NDA to protect the Blu2Light mesh network in any case.

The intelligent wireless lighting control solution

Blu2Light is the first completely open Bluetooth wireless technology system with mesh functionality for the professional lighting market, which, in addition to a variety of functions for lighting control, offers the luminaire manufacturer added IoT benefits with maximum system security - our cloud free meshnet system without any central system controller!

General safety instructions:

- Only qualified persons are allowed to install and start up Blu2Light products.
- Prior to installing and commissioning the system, read these instructions carefully. Only this will guarantee correct and safe handling. Please keep these instructions as you may need them later.
- Before working on the devices, they must always be disconnected from the power supply.
- The applicable safety and accident prevention regulations must be observed.
- Opening by unqualified personnel of the products is prohibited: Risk of death from electric shock!
  The devices must only be repaired by the manufacturer. Supply of external voltage to the DALI control line, e.g. 230 V mains voltage, may destroy the products.
- Product-specific instructions for the respective products can be found on our homepage. Please also refer to the installation instructions supplied with all Blu2Light products before commissioning the system.

General data security (cyber security):

Blu2Light is intended exclusively for private, public and industrial lighting control systems for use in combination with building management systems or smart home systems. It is not permitted to use Blu2Light components for safety-relevant systems, aircraft, railways, ships or any type of emergency system. The use on ships is permitted in individual cases if the DNV GL regulations are fulfilled. In this case, an individual approval must be requested.

In general, B2L is an offline working system, no data are stored, no personal rights / DSGVO rules are violated.

When using a gateway, it must be ensured that the data / BMS services exported from the system do not violate these rules (this is outside VS's area of responsibility). Blu2Light is designed for highest data security for 24/7 use in public areas.

The whole system functionality is protected against any manipulation due to a bunch of combined encryption technologies:

- An **unique QR code** for every device – the owner of the QR code is the product owner. We recommend removing the QR code from the Blu2Light device during use. This is particularly important for increased safety requirements.
- A **first moment** encryption due to QR-Code scan while commissioning – no sensor or luminaire hijacking possible, the whole system is safe from the first moment on.
- **Mesh connections** are encrypted.
- **Bluetooth® communication** is encrypted.
- In addition, there are several non-public mechanisms against illegal network attacks.

Security notice for systems with connected Gateways:

The VS Gateway will deliver – decrypted RAW data at LAN side of the mesh Gateway (media converter) ready to use for any third-party application. There are possible data tunnels from DALI bus / drivers and from Bluetooth beacon to the LAN side of the Gateway. All these data tunnels, like the whole system functionality are protected with the listed measures against any manipulation. But note that data stored due to any host system are NOT in the responsibility field of Vossloh-Schwabe. For data security and DSGVO rules in that case please contact the responsible cloud / BMS partner.

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General radio instructions

IMPORTANT: (All these Items will lead to poor or non connectivity!)

- For an optimal radio connection, all Blu2Light units must have a free communication field, without any metal shielding!
- Even concrete walls will influence the radio strengths!
- Installation of B2L sensors & Connect ME devices: Please note that when mounting these devices in metal or other housings, the signal strength may be affected. In particular, the entire dome of the B2L multi/movement sensors must be mounted outside the housing / luminaire.
- Keep all devices far away from other devices that also operate in the 2.4 GHz range, such as WIFI routers or access points!
- In the case of luminaire integration, the Blu2Light unit should be installed at the greatest possible distance from parts of the luminaire. The LiNA Connect app can be used to check the quality of each individual mesh connection. Detailed information on this topic can be found at the end of this document!

Setup and operation:

- The Blu2Light light in-luminaire devices will be configured with the LiNA Connect App and can be operated via the LiNA Touch App.
- For the exact configuration procedure of the Blu2Light devices, please refer to the instructions or the corresponding documentation.
- For setup of the devices a **iOS tablet** is required. Both tablets and smartphones, which are not included in the scope of delivery, can be used for operation.
- Free LiNA Connect Commissioning App for iOS tablets (full graphic setup):

- Free LiNA Touch User App for iOS / ANDROID devices:

Communication:

Stand-alone systems:

- We recommend a maximum size for B2L systems up to 200 devices per mesh.
- For systems with high traffic (mostly sensors) we recommend not to use more than 100 devices per mesh. In IoT buildings with a large number of companies with their own Wi-Fi networks, structural conditions such as reinforced concrete, lighting with appropriate lighting control and, if necessary, beaconing, fewer than 100 devices per gateway can also be a reasonable approach.

Systems with Gateway communication: (with building management systems)

- the Blu2Light universal BMS Gateway (for more information see the Gateway datasheet).
- IoT Ready: Open protocol for IoT partners and cloud services.

The Number of the devices per mesh is the same as for Blu2Light systems without Gateway.

Update:

Full over the air update is possible.

Device integration:

- Live configuration over iOS tablets (QR Code reading).
- Offline QR code scanning possible.

Extra regulation for energy harvesting switches:

- Energy harvesting BLE switches per device: 4* (* if 2 Blu2Light devices are connected, the switches only need to be programmed on one device in order to continue forming a mesh).
- When using several S4 switches in a room, we recommend that you teach them in at as few Blu2Light nodes as possible.

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Control functionality per device:

- Definable START UP behaviour (dedicated value or scene).
- Up to 64 scenes per device (a scene is a dedicated light level or colour related to a luminaire).
- Up to 64 sequence's per device (a sequence is a predefined order of called scenes that are executed one after the other in this state. Light control and movement are deactivated during this time).
- Up to 16 functional groups (the functional group is a main control element related to all lighting control function).
- Up to 6 sub-channels per functional group.
- When integrating an EnOcean push-button on a node, it is recommended that a Blu2Light repeater is also learnt into the existing system in order to maintain mesh performance..
- Follow Me Konfiguration
- A functional group can control the following Light level / modes:
    - Active
    - Passive
    - Basic value
    - OFF with RTA (after power off, system goes back to the last permanent state)
    - OFF with AUTO
    - OFF with SEMI AUTO
    - MANUAL mode
    - Colour control (TW, RGB, RGBW)
    - DALI DT8 support: IEC62381-209 ED1 standard
    - B2L system supports TC and X-Y for tested devices from DALI-Part 209 (Colour control)
    - DALI DT ED2 solutions for 209, 225 and 226 are not supported

Daylight & movement:

- **Daylight & movement control (only available for devices with integrated sensors).**

Time-switching, manual-switching and dimming functionality:

- Single press function (touch dim) for all input devices, excluding EnOcean switches (dimming is performed by pressing the button several times in adjustable dimming levels).
- Time-switching.
- Up to 32 timer points (daily / weekly / once).
- PLEASE NOTE: (The precision of time-switching is related to the used gear)
    - Blu2Light stand-alone devices up to: ±1 minute / day
    - Blu2Light Gateway up to: ±1 minute / month
    - Blu2Light cloud server: accurate realtime behaviour

IMPORTANT NOTE:
We don't recommend the stand-alone device solution for switching time critical applications!

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Supported DALI drivers:

- Up to 64 (only for devices with DALI interface), only 4 for NEMA with switchable DALI/1 - 10 V interface
- You can do a full backup and restore via the LiNA Connect App.
- You can copy / paste all devices via the LiNA Connect App.
- The LiNA Connect app supports you in configuring your projects with predefined profiles for lighting control (these profiles are templates for multiple use in your projects).
- Never switch off the power supply immediately after changing the configuration. Wait at least 1 minute.

Blu2Light Firmware Comparsion (VS Update Package Version 2861)

Funktionalität	B2L Standard Firmware	B2L Street Control Firmware
Functional group	16	1
Scenes	64	64
Sequences	64	-
Local Timer	32	32
DALI Adresses	64	4*
Colour Control / DT8	XY / TC	XY / TC
Daylight & Movement	Yes	- **
Twilight Function	-	Yes
Time / GPS time	- *** / -	- *** / Yes
Real Time Clock	via Gateway	via Gateway
Start Up Scene / Last Scene	Yes / Yes	Yes / Yes
Follow Me Mode	Yes	Yes
LiNA Connect App	Yes	Yes
LiNA Touch App	Yes	Yes
Devices per Mesh (depending on traffic)	100-200	100-200
Devices per Gateway (depending on traffic)	100-200	100-200

* depending on device hardware, see dedicated datasheets

** movement sensors can be connected via meshnet

*** Time update when the iPad connects to a stand-alone B2L system using the LiNA Connect app - recommendation: once a year (especially for programmed timers).

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Vossloh-Schwabe Deutschland GmbH · Stuttgarter Straße 61/1 · 73614 Schorndorf · Germany · Phone +49 7181/8002-0 · Fax +49 7181/8002-122 · www.vossloh-schwabe.com

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Blu2Light network analyses (Bluetooth connections & radio signal strength):
For normal communication a range up to -80 dBm is permissible!

If you find connections marked in orange or red, please check your installation and device positioning. Under those conditions you will not achieve a stable working system!

Please check your installation, device distances and possible improvements or optimization of the individual mesh connections.
If necessary, you can add a Blu2Light Repeater to improve the mesh functionality.
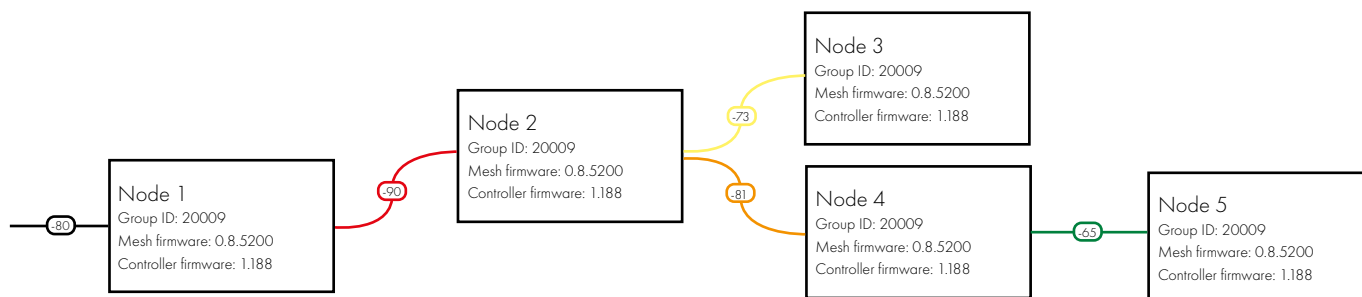≥-85dBm, to find in the LiNA Connect manual.

- 🟢 >= −65dBm
- 🟢 >= −70dBm
- 🟡 >= −75dBm
- 🟡 >= −80dBm
- 🟠 >= −85dBm
- 🔴 > −85dBm

For the configuration of a LiNA TOUCH profile it is mandatory to only create green or yellow connections as you see in the example below!

Node 1
Group ID: 20009
Mesh firmware: 0.8.5200
Controller firmware: 1.188

Node 2
Group ID: 20009
Mesh firmware: 0.8.5200
Controller firmware: 1.188

Node 3
Group ID: 20009
Mesh firmware: 0.8.5200
Controller firmware: 1.188

Node 4
Group ID: 20009
Mesh firmware: 0.8.5200
Controller firmware: 1.188

Node 5
Group ID: 20009
Mesh firmware: 0.8.5200
Controller firmware: 1.188

(-80) (-90) (-73) (-81) (-65)

Red connections are not allowed unless the mesh can form otherwise. CHECK YOUR INSTALLATION!
For more information please see the LiNA Connect manual.

Blink codes for devices with signal LED:

Built-in devices LED:

- Always flashing with channel identify with.
- 1s on 2s off when system key is missing for (Multi- and Movement sensors)
- 1s on, 1s off, with device identify
- Error flashing via B2L command
- 1s on, 1s off, at identify broadcast
- Fast flashing - bootloader error (in the event that a power cycle does not resolve the error, VS support must be contacted)

The blink codes are interrupted if:

- When changing to another device
- When leaving the node
- A device error occurs
- The system key is deleted (then possibly other blinking)
- A diagnosis is started
- (Restart / startup, it is unlikely that one of the two blink codes occurs before restart / startup)
- Power cycle (LED flashes 5 times, the PB4 emits 5 beeps)

Important note:

All Blu2Light devices, that are supplied via DALI may only be connected to one DALI power supply!
Therefore, it is not permissible to connect several Blu2Light devices to one power supply. In this case, malfunctions will occur.
ATTENTION: If these Blu2Light units are connected to several DALI drivers with active DALI interface (e.g. D4i), it can lead to permanent damage of these units immediately after applying the operating voltage if the sum of the individual supplies exceeds the maximum DALI current. Switching on the supply voltage without first checking the maximum current must therefore be prevented. If necessary, the supplies of individual DALI units must be deactivated individually before system commissioning. The steps required for this can be found in the manual of the respective manufacturer of the operating devices. The use of DALI products requires the fulfilment of the resulting requirements.

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