Bluetooth Products – Precautions for Product Installation and Operation

1. Due to the nature of the Bluetooth mesh network, the number of smartphones/tablets should not exceed the number of Bluetooth devices when entering the mesh network to control the device. E.g. If three smartphones are attempting to control two Bluetooth products at the same time, there will be only two of the three smartphones which can search for Bluetooth devices and enter the mesh network when opening the app. Put simply, the max. number of smartphones/tablets controlling the network at the same time should be no more than the max. number of Bluetooth devices.

2. We recommended distance between a smartphone and a Bluetooth device is around 10m, this distance ensures optimal signal transmission and reception between the two devices. However, Hytronik's Bluetooth device features a unique design of the Bluetooth antenna, enabling it to have strong sensitivity and an extended reaching distance. As a result, the signal transmission and reception capabilities of Hytronik's Bluetooth device can reach a total distance of 30m. This increased range allows for greater flexibility and convenience in using the Bluetooth device. It is important to note that while the extended range is possible, still advisable to keep the smartphone and Bluetooth device within a reasonable distance of ≤30m to ensure reliable and consistent connectivity, as the different Bluetooth capabilities of a smartphone/tablet and environmental factors.

3. There is a possibility that the communication range between two Hytronik Bluetooth units will be affected by the (things that are near and around something) and (blocking or stopping things), such as metals, concrete walls, and sheet steel. For example, installing a Bluetooth dimmer (HBTD8200 series) inside a junction box hidden behind a concrete wall might result in a shorter Bluetooth transmission range. The range could also be affected negatively/badly if a Bluetooth device is installed in a metal enclosure. Wi-Fi routers, microwave ovens, and other devices that give off strong wireless signals are examples of different types of interference that could reduce the range. These should be taken into the process of carefully thinking about something when installing. The Bluetooth transmission range can be up to 30m indoors and 50m outdoors. It is generally advisable to conduct communication tests with numerous signal-disturbing sources present. Moreover, several installation scenarios with hard conditions could lead to failures of communication tests, but the nature of Bluetooth mesh networks allows communication between Bluetooth devices to be relayed to expand the end-to-end communication range, such as the HTG01 and HTG02 devices as solution. To ensure network reliability and a good user experience, it is still recommended that Bluetooth units be kept at a distance of between 5m and 6m.

4. For Bluetooth products, we highly recommend calibrating the device real time every 6 to 12 months by simply accessing the app and connecting to the Bluetooth network. Time correction aims to eliminate accumulated time deviation errors and ensure all time-related functions work correctly, such as circadian rhythm, schedules, etc. As the software will automatically request the real-time whether from the internet or the RTC devices, there is no need for time calibration when device have an RTC inside, or gateways, or a mesh network connected regularly to the app.

5. In a normal application, the number of Hytronik Bluetooth devices per network can be up to about 200 sensors + 400 receiving devices (nearly 600 devices in total). In applications where the motion sensors are not too often triggered, and daylight sensors are not set to be working everywhere and sending daylight information too often by everybody, the total amount of devices may succeed to 400 sensors + 600 receiving devices (a total of 1000 devices). However, it is fully depending on the installation environment and installation distance. Different Bluetooth nodes also can affect this capacity, the fewer motion sensors the larger the capacity. We have a few tips to enhance the network's performance and efficiency:

– The gateway will perform data collection and syncing much more quickly and reliably when it is placed in the center of the network.

– Try to use as many dedicated light sensors as possible. This application will reduce data transmission by having each motion sensor also contain a daylight sensor, which will control its luminaries and won't share data with other luminaries or sensors.

– In case an external daylight sensor is required, we suggest having ≤ 20 external daylight sensors within one network. The "all devices in this scene uses the same daylight sensor" function can unify daylight control achieved in the same scene, all lighting luminaires in the scene will be controlled by the "target" external daylight sensor, which increases network data transmission. Please note that the limitation around 20 allows devices to perform at their fullest but exceeding 20 does not cause network problems.

– Try to disable the relay feature of some nodes. This "relay" term indicates the communication path between the nearby two nodes. The "transmission relay" can be turned off if the installation is extensive and all sensors are well connected, resulting in improved data transmission. To determine how many relay nodes are required for a space, please note that in real applications, it depends on the distance between Bluetooth nodes.