

FAQ 01

What is TRILL?

TRILL is a radio remote control system for LED luminaires and LED lighting systems. TRILL allows energy savings and CO2 reduction of up to 90%.

TRILL works with a proprietary, secure radio protocol, which originates in the aerospace industry. The addressing corresponds to the standard IPv4.

FAQ 02

Which are the elements of TRILL?

TRILL consists of

The hardware:

The lighting modules TRM TRILL radio modules



The control module TCU Trill Control Unit



The remote control module 4-Key-Remote



The LRR modules, long range radio modules



The sensor modules, light sensor, radar sensor
The GSM modules GSM / GPRS modules

The software: TRILLStarter or server software

FAQ 03

Which LED brightness can be set with TRILL?

TRILL adjusts the brightness in approx. 0.5% steps.

The brightness levels of the remote control and the automatic brightness control are set to 10% steps.

FAQ 04

How many LED lights can be controlled with TRILL?

Because of the 4-byte IP addressing (IPv4), theoretically several billion addresses are possible to select.

FAQ 05

What is the area that can be covered with TRILL?

There is no area limitation as far as the spark gaps are not interrupted as far as the radio path is not interrupted
The maximum distance from luminaire to luminaire (TRM to TRM) is about 200m, in view, free of obstacles.

FAQ 06

Which radio frequency and which protocol does TRILL use?

TRILL works in license-free 868 MHz or 915 MHz band.
This makes it possible to use it in all EU countries and North America.
It is a proprietary, secure radio protocol as a MESH-Net.
The origin of satellite communication and the IPv4 standard.

FAQ 07

How is it ensured that several installations do not interfere?

Each user is assigned an own IP range (**IP 1st byte**). This can not be changed for safety!
Within this IP address, 250 projects can be defined (**IP 2nd byte: 001-250**).

FAQ 08

How are LED groups controlled?

The **TRILL control is mainly done with group control (IP 3rd byte: 001-250)**.
That means 250 groups can be defined in each project.
The address 255 is a broadcast and all groups are addressed.

In each group, **240 lighting addresses can be addressed (IP 4th byte: 001-240)**.
The PC software and the server software **controls only the defined groups**.
If the lighting address is addressed with 255, then it is a broadcast to all lights of the selected group.

FAQ 09

How do I connect TRM to PWM drivers?

The TRILL TRM modules are available with a PWM/1-10V and DALI output. The PWM output of the TRM is pulse-width-modulated with a frequency of approximately. 1.000 Hz
For information: 1-10V is only an integration of a PWM signal from 10% -100%
The voltage levels are
0V = LED-OFF to
10V = LED 100% brightness
In between, up to 255 brightness levels can be set.

Because of some PWM/1-10V drivers do not allow a setting below 10% due to flickering, a relay of the TRM module can completely switch off the PWM driver.
This relay function can be deactivated.

FAQ 10

How do I connect TRM to DALI drivers?

The TRILL TRM modules are available with DALI output. The output of the TRM module is connected to the DALI input of the driver. Up to 10 DALI drivers can be connected in parallel.

A linearization function required for automatic brightness control
Is normally active in the TRM for DALI.

The TRM sends a DALI broadcast with brightness setting to all cable-connected DALI drivers.

A feedback on intermittent LED currents can be send to the TCU.

FAQ 11

How do I connect TRM to 1-10V analog drivers?

Usually, the TRILL PWM modules can also be connected to 1-10V analog drivers.

For information: 1-10V is only an integration of a PWM signal from 10% -100%

FAQ 12

Which types of TRM are available?

There are different PCB-board sizes with and without housing.

The controller software and the transfer protocol is always compatible.
For special luminaires and LED drivers are variants without power supply and with other circuits.

FAQ 13

How is the data transfer from the TCU to the computer?

With LED brightness controls in the industry, a computer is usually not necessary. After the luminaire assembly and all settings, the system operates self-sufficient without any Computer, only controlled by the TCU.

The transfer to the computer / Server can be done via GSM / GPRS or LRR.

FAQ 14

What is the function of the TCU, TRILL Control Unit in the system?

The TCU is equipped with a powerful RISC processor, a real time clock, and a FRAM (non-volatile memory).

With the PC / Server software, different brightness scenarios are created in the TCU FRAM memory.

The TCU executes the brightness settings assigned to the time via the wireless radio network. All TRMs are addressed or all TRMs are used for forwarding.

The TCU is equipped with USB or RS232 interface. When operating without a computer, the TCU is supplied by a USB power supply.

No computer is required for normal operation.

The TCU also manages the sensors operated in the wireless network (brightness sensors and RADAR motion sensors). Failures of lights can be registered by the TCU and the data can be read out.

FAQ 15

How works the BRIGHTNESS sensors in the system?

**A BRIGHTNESS sensors can be inserted into the system.
The BRIGHTNESS sensor sends the measured LUX value to the TCU.**

The TCU increased or decreased the brightness of all lamps which are activated for broadcast (default setting) in the IP 3rd byte (group-byte).

FAQ 16

How works the RADAR sensors in the system?

**Unlimited numbers of RADAR sensors can be inserted into the system.
If a movement is detected by a RADAR sensor, it sends a signal to the TCU.**

The TCU sends the command:

“All lamps of the selected group set to brightness maximum”

At the end of a timer the TCU sends the command:

“All lamps of the selected group set to brightness minimum!”

All RADAR-controlled lamps must be

de-activated for broadcast in the IP 3rd byte (group-byte).

The default group is group10 which can be changed.

Also the minimum/maximum-level of the brightness as well as the timer can be changed.

FAQ 17

What is LRR, Long Range Radio?

LRR is an independent radio data transmission system with a working range of 20km (radius).

Due to the growing uncertainty in the operation of GSM / GPRS / Internet many users rely on self-sufficient LRR systems.

