

Principle of Light-Controlled Atomization Module



Overview

In this mode the module operates without connecting to an external MCU, the water shortage protection is disabled.

Key Takeaways

A light-controlled atomization module uses electrical signals, often triggered by a light source, to drive a piezoelectric element that converts liquid into fine mist through ultrasonic vibrations. Working Principle

The core of a light-controlled atomization module is the atomizer, typically an ultrasonic piezoelectric transducer. When a high-frequency electrical signal is applied to the piezo element, it vibrates at ultrasonic frequencies. These vibrations create mechanical waves on the liquid surface, breaking it into micron-sized droplets (usually 1-5 microns), which are then dispersed as a fine mist into the air, enhancing humidification or scent diffusion .

Light Control Mechanism

In a light-controlled setup, the module is integrated with a lighting element or a light sensor. The light signal can act as a trigger for the module, either directly or via a microcontroller (MCU). For example:

- Direct control: The light intensity or a photodiode output can switch the module on or off.

- **MCU-based control:** The light signal is read by a microcontroller, which then simulates a button press or sends a high/low voltage signal to the atomizer to start or pause mist generation . This allows the atomization process to be synchronized with lighting conditions, such as turning on mist when a lamp is illuminated or adjusting mist output based on ambient light.

Integration with Lighting Devices

Some designs combine the atomization module with a lighting device, forming a composite unit that can be mounted like a standard light bulb. The heat from the lighting element can also enhance atomization efficiency, especially for volatile liquids like essential oils . The module typically includes:

- **Atomizer:** Generates mist via ultrasonic vibrations.
- **Liquid container:** Holds water or scented liquids.
- **Control circuitry:** Interfaces with light signals or MCU for automated operation.
- **Airflow module:** Helps disperse the mist effectively.

Applications

- **Humidification:** Produces fine mist for indoor air quality improvement.
- **Aromatherapy:** Atomizes essential oils for scent diffusion.
- **Electronics printing:** In specialized setups, atomization is used to deliver conductive or non-conductive inks in additive manufacturing .
- **Smart lighting:** Combines illumination and misting for aesthetic or functional purposes.

Key Considerations

- The atomizer must be placed on the liquid surface, not submerged, to prevent malfunction or overheating .
- Droplet size and mist quality depend on the piezo element design and mesh or perforation layer used in the transducer .
- Light-controlled operation allows automatic or programmable misting, enhancing energy efficiency and user convenience. In summary, a light-controlled atomization module leverages ultrasonic piezoelectric vibrations to atomize liquid, with light signals or sensors serving as the control input, enabling synchronized or automated mist generation for various applications .

Article Content

WO/2026/081801 ELECTRONIC ATOMIZATION DEVICE, AND

An electronic atomization device (1), and a control method for a light-emitting diode module, which are capable of controlling a light

Keyestudio Atomization Module — keyestudio WiKi documentation

Working principle: The module usually produce water mist through ultrasonic technology. It contains a piezoelectric ceramic sheet

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Water Atomization Module Operation Guide

In this mode the module operates without connecting to an external MCU, the water shortage protection is disabled. Only a few

3Pcs Humidifier Module, Spray Module Circuit Board, Atomization Module ...

Spray Principle: Piezoelectric ceramics drive the metal plate to oscillate at high frequency, and ultrasonic liquid atomization. Micron

Water Atomization Module BMZ00040

This module can work in stand-alone mode or with an external host MCU. Through the 1-wire bus, the host MCU can read/write

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