Digital Dimming

Inventronics Proprietary Driver Health Solution

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What is Digital Dimming?

Inventronics wanted to offer a way for users to have access to crucial data needed for driver health monitoring in a simple, easy-to-use and selectable manner. By implementing this proprietary feature through Inventronics programming software, users can utilize the 0-10V dimming feature to read back data from the driver over a Universal Asynchronous Receiver Transmitter (UART). In this white paper, we will explain this feature a bit further and highlight the information that is communicated from the driver.

What is a UART?

A UART is not a communications protocol. Instead, it is a physical circuit in a microcontroller or a stand-alone integrated circuit. Its main purpose is to send and receive serial data. Serial communication has been around for decades and was even used in early telegraphic systems. No clock signal is needed with this type of communication, instead it adds start and stop bits to the data package being transferred. These bits are read at a specific frequency called baud rates (bd) which also determines the speed at which the data is communicated. In early transmissions, the standard rate of 75 bd was used when people received and transcribed messages by hand. When it went electronic in the 1970s it increased to 1200 bd. Today, baud rates of 9600, and even higher, are frequently utilized.

What Does Digital Dimming Do?

Digital Dimming provides a complete overview of the driver health diagnostics to allow users to reduce maintenance costs, perform preventative maintenance, asset tracking and power monitoring. Table 1 provides a breakdown of what data can be read from the driver.

Data
Temperature (Internal and External)
Thermal Derating
Set Max Output Current
Dim Driver
Energy Reporting
Read Output Current
Read Output Voltage
Read Driver Part Number
Read Rated Power
Controller-Driver Topology

Table 1: Health and diagnostics data that can be monitored by the LED driver

Benefits of Digital Dimming:

One of the biggest advantages to Digital Dimming is that it answers all the important questions that can help save money on maintenance and keep customers lights operating consistently:

- Which driver is malfunctioning?
- What is the Driver part number?
- When does it need to be replaced and has it already failed?
- Why did the driver fail and are there others showing signs of failure that can be replaced now?

Digital Dimming vs. DALI:

Digital Dimming is a great option for those working with or developing custom control solutions since many microcontrollers have an exposed UART bus. This makes utilizing Digital Dimming a simplified process. It is T/CSA-051 compliant for applications that require it. It also allows for a much faster data transfer than DALI (1200 bits/second vs. 9600 bits/second). A faster communication bus allows for dramatic lighting effects, such as quickly flashing lights, which is not possible with DALI.

Summary:

While there are many advantages to Inventronics proprietary Digital Dimming features, the main one is that users can optimize their lighting system by reading data in real-time to increase energy savings, reduce maintenance costs and ensure consistent lighting controls. To learn more about Inventronics Digital Dimming drivers, be sure to visit https://www.inventronics-co.com/outdoor-led-drivers-with-nfc-wireless-programming/ and https://www.inventronics-co.com/driver-health-monitoring-with-digital-dimming/

To learn more about Inventronics proprietary Digital Dimming Communications protocol, please read our more in-depth application notes: Digital Dimming Communication Protocol and Digital Dimming V2.0 Communication Protocol.

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Bobbie Grider is the marketing communications manager for Inventronics and is responsible for developing the company's marketing, advertising and public relations strategies for their broad portfolio of LED drivers and lighting accessories. Based in Oklahoma City, OK Grider manages the branding and messaging for Inventronics, a leading manufacturer of LED drivers for the solid-state lighting market. She has a bachelor's degree in journalism and business marketing. She has five years' experience in the power and lighting industry.