Intelligent Lighting & Control Solutions

Enabling Innovation in Lighting

Summary
Intelligent Lighting & Control solutions from Microchip can meet the technical needs of lighting engineers with a large array of 8-, 16-, 32-bit PIC® microcontrollers, analog, wireless, and human interface products. With advanced peripheral integration and support for all lighting technologies, a scalable Microchip solution provides significant flexibility versus that of pure analog or ASIC implementation. Designing with Microchip based lighting solutions enables innovation that expands lighting product capabilities and provides product differentiation.

At the forefront of the most efficient incandescent alternatives are LED and Fluorescent technologies. Both have advantages and technical challenges and provide significantly improved efficacy (lumens/watt) over incandescent lighting. In addition to reduced energy consumption, both technologies also provide opportunities to add intelligence beyond simple incandescent light bulb replacement.

With alternate lighting technologies providing similar perceived light quality to incandescent—simply having longer life and increased energy savings may not always be enough to motivate changes in the market. Advanced lighting solutions with PIC microcontrollers offer the opportunity to present non-traditional capabilities.

Features such as predictive failure & maintenance, energy monitoring, color & temperature maintenance, and remote communications & control, are just some of the advanced capabilities that can make intelligent lighting solutions even more attractive. These advanced capabilities along with reduced operating, maintenance, and energy costs can quickly translate to significant savings—particularly for corporate and commercial facilities.

Intelligence
- Communication & networking
- Lumen & color control
- Environmental sensing
- Thermal management
- Predictive failure & maintenance
- Day light harvesting & dimming
- Custom user interface & control
- Smooth dimming control
- Color mixing
- Closed loop lighting control
- Remote fault detection

Flexible Power
- Flexible topology support
- High efficiency power conversion
- Fail safe monitoring
- Energy monitoring & control
- Energy harvesting (solar, etc.)
- Battery management & charging

Scalable Design
- Scalable performance
  - Analog, 8-, 16-, 32-bit PIC MCUs
  - Wireless, Human interface products
- Customizable solutions
- Ease of use
  - Easy to use development tools
  - Reference designs & collateral
  - Lighting design partner specialists

Communication & Networking

Wired Protocols
- DALI
- DMX512A
- 0-10V
- PLC
- LIN
- CAN
- RS232/RS485
- USB LS/FS
- Ethernet

Wireless Protocols
- Transceivers and Modules
  - Wi-Fi 802.11 modules
  - Bluetooth®
  - ZigBee®
  - MiWi 802.15.4 modules
  - Stacks for PIC MCUs
  - Infrared/IrDA®
Efficient Power Conversion

Microchip based solutions can support any lighting technology as well as add additional capabilities beyond that of traditional lighting solutions. The flexibility of these solutions allows for simplified attachment to existing designs or the development of full Switch Mode Power Supply (SMPS) based intelligent solutions.

**PIC MCU Attached to Basic Power Supply**

- Simplified design-in
- Customizable features
- Simplified modifications via firmware updates
- Intelligent control capabilities

**SMPS with PIC MCU & Microchip Analog**

- Increased MCU integration
- Fully customizable
- Increased efficiency
- Power Factor Correction (PFC)
- Flexible topologies
- Simplified modifications via firmware updates
- Closed loop control feedback
- High performance PWM and current control
- Intelligent control capabilities

**Energy Harvesting & Battery Charging**

- PIC MCU controlled power conversion & battery storage
- Peak power tracking control, charging, & power delivery
- Customizable MPPT & battery charging algorithms
- Support for various power supply topologies
- Intelligent control capabilities

**Scalable Product Solutions**

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<tbody>
<tr>
<td>- Luminaire ballast &amp; LED drivers</td>
<td>- Advanced controllers &amp; luminaires</td>
<td>- Up to 40V Analog products</td>
<td>- Wi-Fi® 802.11 modules</td>
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<td>- Wall &amp; remote controls</td>
<td>- Advanced communication &amp; networking</td>
<td>- Discrete power conversion</td>
<td>- ZigBee® RF4CE</td>
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<td>- Intelligent control capabilities</td>
<td>- RF gateway &amp; translators</td>
<td>- Complementary PIC MCU attach</td>
<td>- MIWi™ Wireless Networking Protocol 802.15.4 modules</td>
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<td>- Communication &amp; networking</td>
<td>- Power line carrier (PLC)</td>
<td>- Voltage regulators MOSFET drivers</td>
<td>- Infrared/IRDA®</td>
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<td>- &lt; 100W Optimized power conversion</td>
<td>- Advanced intelligent control capabilities</td>
<td>Temperature sensors</td>
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<td>- Lowest cost</td>
<td>- &gt; 100W Advanced power conversion</td>
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<td>- Smallest form factors</td>
<td>- Increased performance</td>
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<td></td>
<td>- Increased lighting channels</td>
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Microchip based lighting solutions provide opportunities to further enhance your lighting application through product differentiation and increased user experience. Learn more about Intelligent Lighting and Control solutions from Microchip by visiting us on the web at: [www.microchip.com/lighting](http://www.microchip.com/lighting) or email us at: lighting@microchip.com.

- Lighting Development Platforms
- Lighting Reference Designs
- Lighting Application Notes
- Lighting Products & Peripherals

**Microchip**

Visit our web site for additional product information and to locate your local sales office.

Microchip Technology Inc. • 2355 W. Chandler Blvd. • Chandler, AZ 85224-6199

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