

# Microcontrollers for Advanced Lighting Solutions



*TI's MCU lighting solutions give designers efficient, flexible and scalable intelligent lighting management and control*

Intelligent lighting is the ability to reduce the amount of light and/or energy used so that only the right amount of light is delivered exactly where it is needed. Digitally controlled lighting using microcontrollers (MCUs) allows developers to take advantage of the

unique characteristics of LEDs and other light sources to develop efficient, scalable and flexible designs for intelligent lighting. With digital control, designers can scale and easily adjust designs to multiple applications, maximizing reuse and decreasing design

time. A digital approach also allows many hardware features, such as soft startup, delay and PWM phase shifting, to be implemented in software, eliminating extra components, cost and complexity. TI's communications and control solutions are for both wired and wireless systems supporting a wide selection of communication standards.

Texas Instruments offers a broad suite of microcontroller solutions for your LED and other lighting design and control needs as well as demonstration platforms and development kits. The table to the left is a sample of what is available now. For more information on these and new products throughout the year, visit [www.ti.com/mculighting](http://www.ti.com/mculighting).

| Solution/Protocol                       | Product  | Tool/Kit   | For more info   |
|---|--|--|---|
| DALI                                    | MSP430™ MCU/<br>Piccolo™<br>(C2000™ MCU)             | TPS62660 LED-338 EVM<br>TMDSIACLEDCKIT                   | <a href="http://www.ti.com/daliappnote">www.ti.com/daliappnote</a>  |
| DMX512                                  | MSP430 MCU/<br>Stellaris®/<br>Piccolo (C2000<br>MCU) | DMX512 apps note<br>Third-party design<br>TMDSIACLEDCKIT | MSP430 – Demo code and reference design is available upon request at <a href="http://www.ti.com/technicalsupport">www.ti.com/technicalsupport</a> ; Stellaris – Available through third-party Golden IC Technology Co., Ltd. <a href="mailto:support@golden-ic.com">support@golden-ic.com</a> |
| Power line communication                | C2000 MCUs   | TMDSPLCKIT-V3<br>TMDSIACLEDCKIT                          | <a href="http://www.ti.com/plc">www.ti.com/plc</a>  |
| ZigBee® / 802.15.4                      | MSP430F54xxA   | MSP430F5438 Experimenter's Board                         | <a href="http://www.ti.com/msp430f5438">www.ti.com/msp430f5438</a>  |
| 6LoWPAN                                 | CC430<br>(MSP430 MCU +<br>Low-Power RF)              | Third-party design                                       | Available through third-party Sensinode, <a href="http://www.sensinode.com/EN/contact">www.sensinode.com/EN/contact</a>   |
| Digital power                           | Piccolo<br>(C2000 MCU)                               | TMDSDCDCLEDKIT<br>TMDSRGBLEDKIT<br>TMDSIACLEDCKIT        | <a href="http://www.ti.com/led_devkit">www.ti.com/led_devkit</a><br><a href="http://www.ti.com/rgb_led">www.ti.com/rgb_led</a><br><a href="http://www.ti.com/tool/tmdsiacledckit">www.ti.com/tool/tmdsiacledckit</a>  |
| Digital signal control (with many PWMs) | Stellaris LM4F                                       | Evaluation kit with up to 40 PWM outputs                 | <a href="http://www.ti.com/cortexm4f">www.ti.com/cortexm4f</a>  |
| Control, sensing and dimming solutions  | MSP430 MCU   | Development and evaluation kits                          | <a href="http://www.ti.com/msp430">www.ti.com/msp430</a>  |

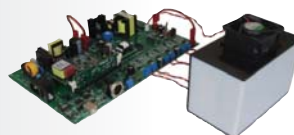
## Key benefits

- Support for industry-standard communications: Power line communications (PLC), DALI, DMX512, ZigBee®, 6LoWPAN, and many others
- Design flexibility and scalability for maximum reuse of designs and cost management
- High-efficiency control of LEDs and other light sources
- Intelligent lighting management enables smarter light fixtures to handle lumen maintenance to improve reliability and lifetime of LEDs
- Power supply integration through digital power for an adaptable, full-system design with fewer components
- Accelerated development with extensive array of evaluation tools and kits

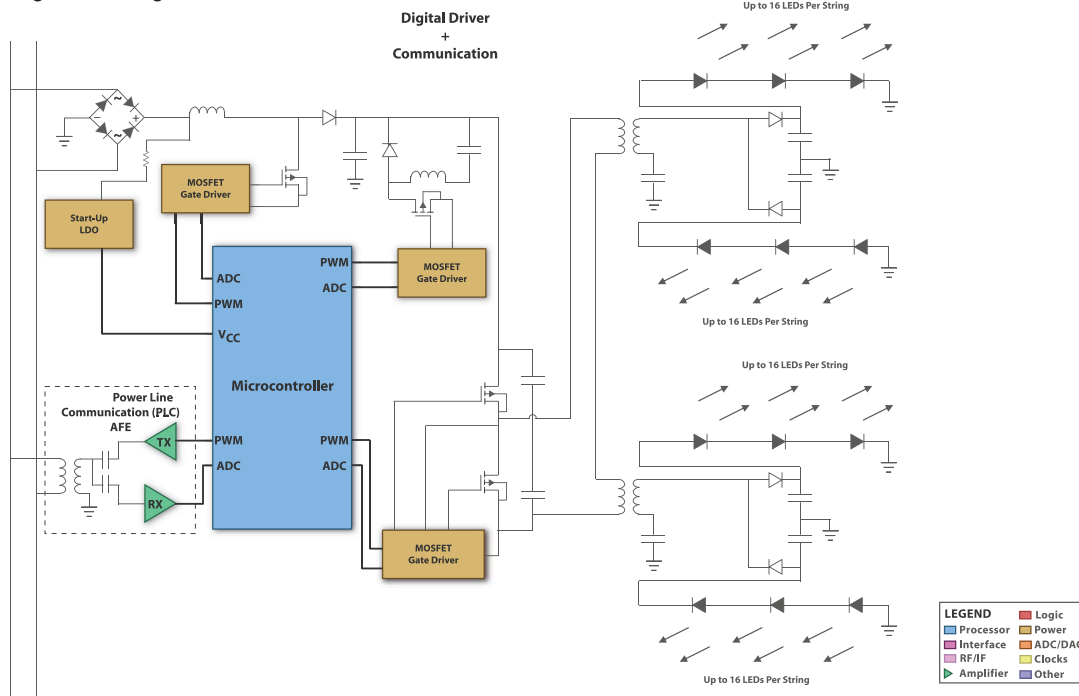
## Create intelligent lighting products with Piccolo MCUs:

- Independent dimming of 6 LED strings
- Communications support including: DALI, DMX512, and Power Line Communications (PLC)
- Intelligent MCU control of power stage, lighting, and communications
- Full AC mains-powered reference design

## Piccolo AC LED Lighting & Communications Kit TMDSIACLEDCKIT



## MCU Advanced Lighting: Multi-String LED Driver



▲ Digital control of LEDs using MCUs allows developers to take full advantage of the unique characteristics of LEDs. TI's C2000™ and Piccolo™ real-time MCUs can perform all power management functions needed in a lighting product, giving flexibility for regional products or quick design spins. MCUs have a low-cost adder for additional LED strings, a high-dimming ratio of greater than 20,000:1 and a high PWM-dimming frequency of >100KHz. Digital communications can be achieved via wired or wireless communications through a number of different communication standards including 6LoWPAN and power line communications. TI offers microcontroller solutions for all your LED lighting design and control needs, including demonstration platforms and development kits. Visit [www.ti.com/led](http://www.ti.com/led) for more information.

## TI Worldwide Technical Support

### Internet

#### TI Semiconductor Product Information Center Home Page

[support.ti.com](http://support.ti.com)

#### TI E2E™ Community Home Page

[e2e.ti.com](http://e2e.ti.com)

### Product Information Centers

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|-----------------|----------------|--|
| <b>Americas</b> | Phone          | +1(972) 644-5580   |
| <b>Brazil</b>   | Phone          | 0800-891-2616  |
| <b>Mexico</b>   | Phone          | 0800-670-7544  |
|                 | Fax            | +1(972) 927-6377   |
|                 | Internet/Email | <a href="http://support.ti.com/sc/pic/americas.htm">support.ti.com/sc/pic/americas.htm</a> |

### Europe, Middle East, and Africa

|  |  |  |
|--|--|--|
| Phone  |  |  |
| European Free Call   | 00800-ASK-TEXAS<br>(00800 275 83927)                         |  |
| International  | +49 (0) 8161 80 2121   |  |
| Russian Support  | +7 (4) 95 98 10 701  |  |
| <b>Note:</b> The European Free Call (Toll Free) number is not active in all countries. If you have technical difficulty calling the free call number, please use the international number above. |  |  |
| Fax  | + (49) (0) 8161 80 2045                                      |  |
| Internet   | <a href="http://www.ti.com/asktexas">www.ti.com/asktexas</a> |  |
| Direct Email   | <a href="mailto:asktexas@ti.com">asktexas@ti.com</a>         |  |

### Japan

|                |               |  |
|----------------|---------------|--|
| Phone          | Domestic      | 0120-92-3326   |
| Fax            | International | +81-3-3344-5317  |
|                | Domestic      | 0120-81-0036   |
| Internet/Email | International | <a href="http://support.ti.com/sc/pic/japan.htm">support.ti.com/sc/pic/japan.htm</a> |
|                | Domestic      | <a href="http://www.tij.co.jp/pic">www.tij.co.jp/pic</a>                             |

### Asia

|   |  |  |
|---|--|--|
| Phone   |  |  |
| International   | +91-80-41381665  |  |
| Domestic  | <b>Toll-Free Number</b>  |  |
| <b>Note:</b> Toll-free numbers do not support mobile and IP phones. |  |  |
| Australia   | 1-800-999-084  |  |
| China   | 800-820-8682   |  |
| Hong Kong   | 800-96-5941  |  |
| India   | 1-800-425-7888   |  |
| Indonesia   | 001-803-8861-1006  |  |
| Korea   | 080-551-2804   |  |
| Malaysia  | 1-800-80-3973  |  |
| New Zealand   | 0800-446-934   |  |
| Philippines   | 1-800-765-7404   |  |
| Singapore   | 800-886-1028   |  |
| Taiwan  | 0800-006800  |  |
| Thailand  | 001-800-886-0010   |  |
| Fax   | +8621-23073686   |  |
| Email   | <a href="mailto:tiasia@ti.com">tiasia@ti.com</a> or <a href="mailto:ti-china@ti.com">ti-china@ti.com</a> |  |
| Internet  | <a href="http://support.ti.com/sc/pic/asia.htm">support.ti.com/sc/pic/asia.htm</a>                       |  |

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|                        |  |
|------------------------|--|
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| Amplifiers             | <a href="http://amplifier.ti.com">amplifier.ti.com</a>                               |
| Data Converters        | <a href="http://dataconverter.ti.com">dataconverter.ti.com</a>                       |
| DLP® Products          | <a href="http://www.dlp.com">www.dlp.com</a>   |
| DSP                    | <a href="http://dsp.ti.com">dsp.ti.com</a>   |
| Clocks and Timers      | <a href="http://www.ti.com/clocks">www.ti.com/clocks</a>                             |
| Interface              | <a href="http://interface.ti.com">interface.ti.com</a>                               |
| Logic                  | <a href="http://logic.ti.com">logic.ti.com</a>                                       |
| Power Mgmt             | <a href="http://power.ti.com">power.ti.com</a>                                       |
| Microcontrollers       | <a href="http://microcontroller.ti.com">microcontroller.ti.com</a>                   |
| RFID                   | <a href="http://www.ti-rfid.com">www.ti-rfid.com</a>                                 |
| OMAP Mobile Processors | <a href="http://www.ti.com/omap">www.ti.com/omap</a>                                 |
| Wireless Connectivity  | <a href="http://www.ti.com/wirelessconnectivity">www.ti.com/wirelessconnectivity</a> |

### Applications

|                               |  |
|-------------------------------|--|
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| Communications and Telecom    | <a href="http://www.ti.com/communications">www.ti.com/communications</a>                 |
| Computers and Peripherals     | <a href="http://www.ti.com/computers">www.ti.com/computers</a>                           |
| Consumer Electronics          | <a href="http://www.ti.com/consumer-apps">www.ti.com/consumer-apps</a>                   |
| Energy and Lighting           | <a href="http://www.ti.com/energy">www.ti.com/energy</a>                                 |
| Industrial                    | <a href="http://www.ti.com/industrial">www.ti.com/industrial</a>                         |
| Medical                       | <a href="http://www.ti.com/medical">www.ti.com/medical</a>                               |
| Security                      | <a href="http://www.ti.com/security">www.ti.com/security</a>                             |
| Space, Avionics and Defense   | <a href="http://www.ti.com/space-avionics-defense">www.ti.com/space-avionics-defense</a> |
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