KEA128LEDLIGHTRD
Quick Start Guide

Lighting Control Module Reference
Design using Kinetis KEA128

NXP

freescale
Kinetis

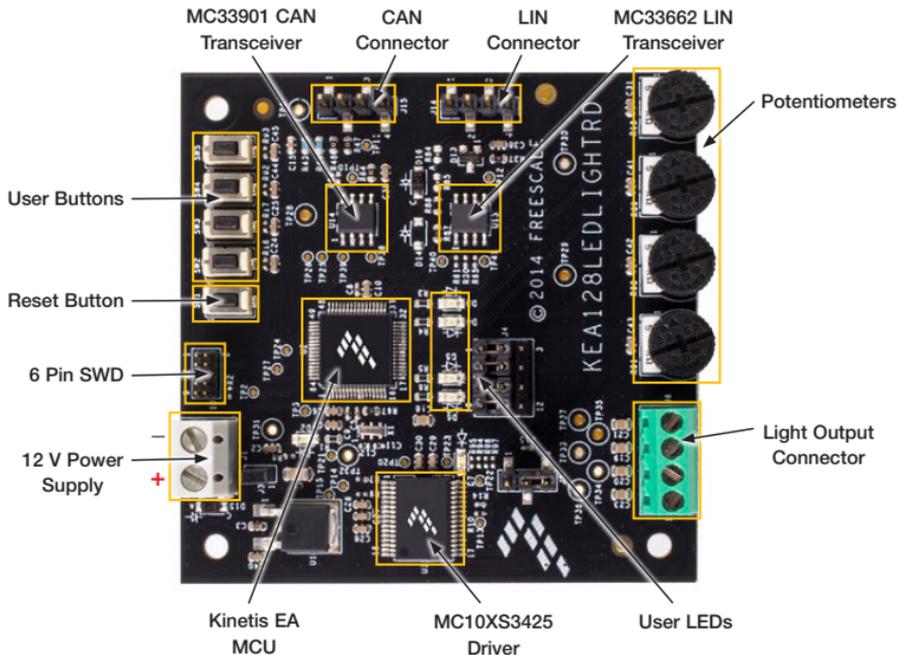# Get to Know the KEA128LEDLIGHTRD Board

Figure 1: Front side of KEA128LEDLIGHRD

KEA128LEDLIGHTRD Features

Hardware

- SKEAZ128 32-bit ARM® Cortex®-M0+ MCU (64-pin LQFP)
- MC33662 LIN transceiver
- MC33901 CAN transceiver
- MC10XS3425EK multi-chip high-side switch
- 4 LEDs
- 4 Potentiometers
- 4 User buttons
- SWD connector interface for debugging
- Light connector interface

Step-by-Step
Installation Instructions

1 Install CodeWarrior Development Studio

CodeWarrior Development Studio for Microcontrollers installation file is included in the supplied media for your convenience.

The most recent version of CodeWarrior for MCUs (Eclipse IDE) can be downloaded from **www.freescale.com/CodeWarrior**.

2 Install FreeMASTER

FreeMASTER run-time debugging tool installation file is included on the supplied media for your convenience.

For FreeMASTER updates, please visit **freescale.com/FreeMASTER.**

3 Download Application Software

Download and install the reference design application software available at **freescale.com/KEA128LEDLIGHTRD.**

4 Connect a Lamp

Connect up to 4 lamps in to the light output connector of the board.

5 Connect the Power Supply

Connect the 12 V power supply to the power supply terminals.

Step-by-Step Installation Instructions (cont.)

6 Connect the Debugger

Connect a P&E USB Multilink Universal debugger to the 6 pin SWD connector of the board. Both LEDs on the P&E debugger must turn on.

7 Reprogram the MCU using CodeWarrior Development Studio

Import the downloaded reference design application project in the CodeWarrior Development Studio:

1. Start the CodeWarrior application.

2. Click **File – Import.**

3. Select **General – Existing Projects into Workspace.**

4. Select "**Select root directory**" and click **Browse.**

5. Navigate to the extracted application directory: **KEA128LEDLIGHTRD/ KEA128_LIGHTING_RD** and click **OK**.

6. Click **Finish.**

7. Click **Run>Debug** to download the code to the KEA128. This starts the launching progress until the debugger perspective appears and stops at the line of main () in the source view. Click on the stop button.

8 FreeMASTER Setup

1. Start the FreeMASTER application.

2. Open the FreeMASTER Project **KEA128LEDLIGHTRD/KEA128_ LIGHTING_RD/KEA128LIGHTING.pmp.**

3. Click the red **STOP** button in the FreeMASTER toolbar or press Ctrl+K to enable the communication.

Application Control in FreeMASTER

The FreeMASTER run-time debugging tool is used to control the application and monitor application variables during run-time. An explanation on how to use the FreeMASTER user interface is given below.

1. Click the **Output Control** button in the **Output Channel** section or press switch **SW2, SW3, SW4, SW5** to control each output state. The output states are **OFF, ON** or **TOGGLE.**

2. To change the PWM duty cycle of the outputs using only the FreeMASTER sliders, click in the **FreeMASTER PWM Control** button located in the **General Settings** section. Button must be in **ON** state. When button state is **OFF** the duty cycle of the outputs can be controlled only using the potentiometers **R18, R89, R90,** and **R91.**

3. Change the PWM duty cycle of the outputs by moving the **PWM Duty Cycle** slider of each output.

4. In case of an output fault, the corresponding fault label will turn red in the **Diagnostic and Status Flags** section of each output.

5. General faults flags and operation mode of the system are indicated in the **General Settings** section. By default the operation mode is **Normal Mode.**

6. In case of an under voltage fault, stop the FreeMASTER communication by clicking the red **STOP** button. Remove the under voltage condition. Start the FreeMASTER communication by clicking the red **STOP** button. The **Fault Status** and the **Under Voltage** label will turn red and the outputs will be off. To remove this fault click on the **Clear Under Voltage Fault** button or press any switch **SW2, SW3, SW4, SW5** on the board, to return the system to its **Normal Mode.**

Jumper Options

The following is a list of all jumper options. The default installed jumper settings are shown in white text within gray boxes.

Jumper	Option	Setting	Description
J4	Inputs	**1-2**	Allows independent control of each high side switch output
		4-5	
		7-8	
		10-11	
J3	Wake up	**1-2**	Allows wake up function of MC10XS3425
J5	FSI	**2-3**	FSI selection: 1-2: FSI terminal connected through 6.8 kOhm resistor to ground 2-3: FSI terminal connected to ground

Headers and Connectors List

Header/Connector	Description
J1	12 V DC power input terminals
J2	Kinetis KEA128 Serial Wire Debug (SWD) header
J14	LIN physical interface signal header
J15	CAN physical interface signal header
J6	Lights output connector

et Started

Download installation software and documentation under
"Jump Start Your Design" at **freescale.com/CodeWarrior**.

Support

Visit **freescale.com/support** for a list of phone
numbers within your region.

Warranty

Visit **freescale.com/warranty** for complete
warranty information.

For more information, visit
freescale.com/KEA128LEDLIGHTRD