

# Quick Start Guide

**EZ-0008**

Lighting Communication Master Evaluation Board

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# Safety Precautions




This document explains matters to be noted for safe use of Lighting Communication Master Evaluation Board. Be sure to read this document before using Lighting Communication Master Evaluation Board.

- Be sure to observe all dangers, warnings, cautions, and other instructions contained herein when using this evaluation board.
- This document should be kept handy at all times for ready reference.







## Symbols used

This document uses the following symbols for matters to be observed for the safe use of the unit.

The symbols are followed by a brief explanation of the possible extent of problems which may occur if the notices are not observed.

 <b>Danger</b>	The user may suffer death or serious injury and it's risk is high if the warning is not observed.
 <b>Warning</b>	The user may suffer death or serious injury if the warning is not observed.
 <b>Caution</b>	Human injury or property damage may occur if the caution is not observed.


The following symbols express matters which are prohibited in order to prevent injury or accident.

 <b>General prohibition</b> The action mentioned is prohibited.	 <b>Do not touch</b> Touching the specified location may cause injury.	 <b>Do not disassemble</b> Disassembly may cause a problem such as electrical shock or product failure.
 <b>Keep away from water</b> Use near water poses the risk of electrical shock or product failure if moisture were to contact the unit.	 <b>Flammable</b> A nearby flame may cause the unit to catch fire.	 <b>Do not touch with wet hands</b> Touching with wet hands may cause electric shock or product failure.









The following symbols are used for cautions to prevent product failure and accidents.

 <b>General caution</b> Unspecified general cautions.	 <b>Caution Hot</b> Human injury by high temperature may occur.
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The following symbols are used for instructions to prevent product failure and accidents.

 Compulsory action based on an instruction for the user.	 Instruction to unplug the AC adapter.
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## Warnings

 <b>Warning</b>	
	<p><b>Do not use this board in the purpose except the evaluation of MCU.</b> This board does not take safety measures or anti-EMI measures required for lighting equipment.</p>
	<p><b>Do not heat the board or expose it to fire, and do not short the terminals.</b> Doing so may cause product failure, generation of heat, fire, or rupture.</p>
	<p><b>Do not disassemble or modify the board.</b> Doing so may cause product failure, emission of smoke, fire, or electric shock.</p>
	<p><b>Do not touch with wet hands.</b> Doing so while power is supplied cause product failure or electrical shock.</p>
	<p><b>Do not drop or jolt the board.</b> Doing so may break or damage the board, causing fire or electric shock.</p>
	<p><b>Do not turn on power switch in insufficient state of cable connection such as USB cable, interface cable.</b> Doing so may cause product failure, generation of heat, fire or electric shock.</p>
	<p><b>Do not plug in or unplug a connector or cable with power applied to the board.</b> Doing so may cause product failure, generation of heat, fire or rupture.</p>
	<p><b>Do not carry this board with connecting USB cable and any cable.</b> Doing so may cause damage of cable and cause product failure, generation of heat, fire or electric shock.</p>
	<p><b>Use this board with spacer and on the isolated bench.</b> In case conductor contact to the board, it may cause product failure, generation of heat, fire or electric shock.</p>
	<p><b>If smoke or an abnormal smell or sound is emitted, or heating occurs, promptly unplug USB cable.</b> Using the board in such a state poses a risk of fire, burning, or electric shock.</p>

# Cautions

 <b>Caution</b>	
	<p><b>Do not use or store this board in any of the following locations.</b></p> <ul style="list-style-type: none"><li>- Environments with copious water, humidity, steam, dust, fumes, etc.</li><li>- Environments where static electricity or electrical noise is readily generated.</li></ul> <p>Such influences can lead to electric shock or product failure.</p> <p>In case liquid enters the board, cut the power supply, and consult your dealer or NEC Electronics sales representative.</p> <p>Even if the unit appears to be dry, internal moisture may remain.</p>
	<p><b>To prevent static electricity damage, guard against energizing when touching metal parts such as the connector.</b></p> <p>Static electricity can cause product failure.</p>

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# 1. Overview

This board can be used as communication master in case controlling each lighting evaluation board by communication. DMX512, DALI(digital addressable lighting interface), and IR are supported.

Each lighting evaluation board can be controlled via this communication master board by using GUI. Control GUI can be downloaded from NEC Electronics WEB site.

This board is using USB bus power for its operation.

Note: Following boards can be controlled

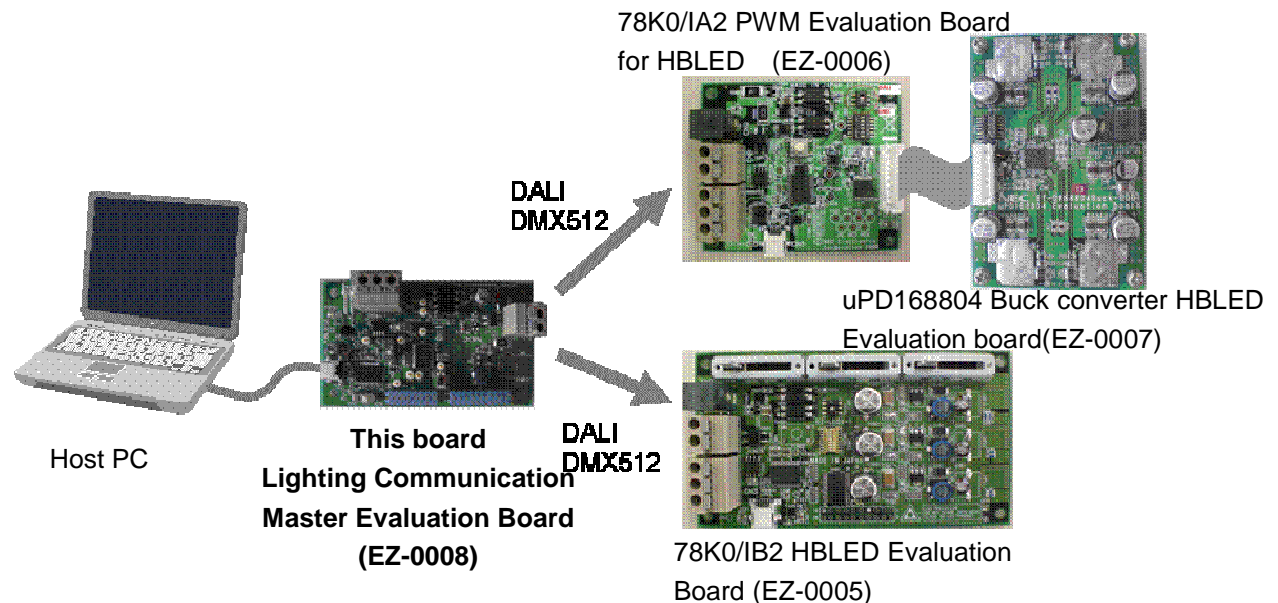
78K0/IB2 HBLED Evaluation board (EZ-LED1-002)

Part number: EZ-0005

78K0/IA2 PWM Evaluation board (EZ-LED2-001)

Part number: EZ-0006

**Figure 1. System setup example**



## 1.1 Feature

- USB power supply.
  - 5V supply voltage
  - 15V for DALI communication generated by switching regulator
- 3 kinds of operation mode supported
  - DMX512 protocol communication interface
  - DALI protocol communication interface
  - IR remote control interface

## 1.2 Related product information

As for the information of related products for this board, please see NEC Electronics Web site.

URL <http://www.necel.com/micro/en/solution/lighting/index.html>

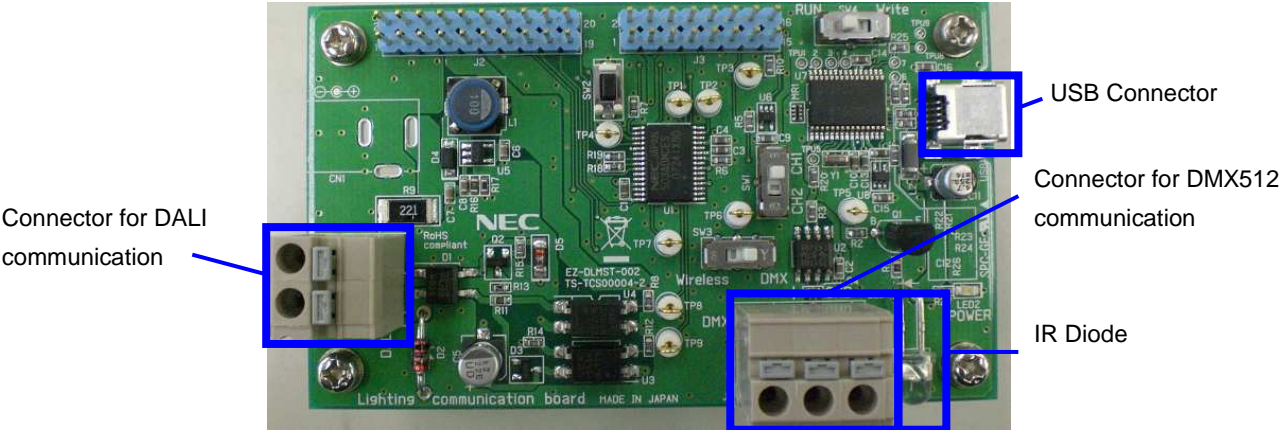
## 2. Specification

This chapter described the specification of Lighting Communication Master Evaluation Board.

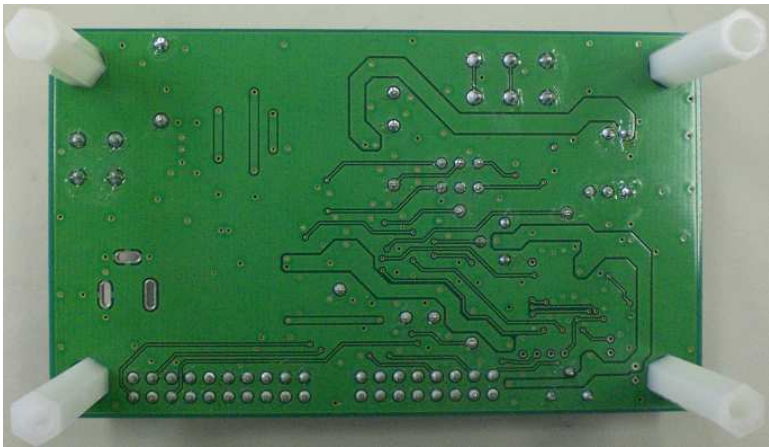
### 2.1 Appearance of the board

The following figure shows the appearance of Lighting Communication Master Evaluation Board.

Figure 2. Appearance of Lighting Communication Master Evaluation Board



Surface appearance (Top view)



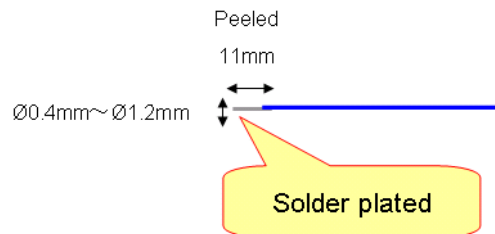
Surface appearance (Bottom view)



## 2.2 Detail specification

Board name : EZ-DLMST-002  
Power supply : DC5[V]  
Microcontroller : UPD78F0503AD  
Connector : ML-800-S1V-nP (n=2, 3)  
Recommend communication cable: refer to figure 3

**Figure 3. Recommend communication cable specification**



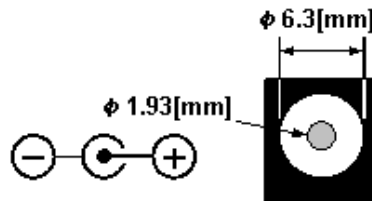
## 2.3 Power supply

Lighting Communication Master Evaluation Board uses USB cable for power supply as well as communication.

Note: When more than 10 slaves are supposed to be connected, please mount a DC plug to CN1 by yourself and get power supply from CN1.

Power supply : DC15[V]  
DC plug : Switchcraft RAPC722 (Center pin  $\phi$  1.93mm, Plug  $\phi$  6.3mm (max))

**Figure 4. Polarity and shape of DC plug**



## Warning



**Use AC adapter adapted to safety standard of each county.**

Using non-adopt AC adapter cause product failure, generation of heat, fire or electric shock.

## 2.4 Switch setting

**Table1. Switch setting**

No.	Description
SW1	IR remote control code selecting switch. "CH1": Send custom code 0x0000 + data code 0x5AA5 "CH2": Send custom code 0x0000 + data code 0xDA25
SW2	Push button. Send remote control signal by IR diode
SW3	DMX512 mode selecting switch "DMX": Enable DMX512 communication operation "Wireless": Disable DMX512 communication operation
SW4	Operation mode switch "RUN": Enable communication operation. "Write": Disable communication operation. Reserve for USB microcontroller firmware updating

Note1. NEC format is used as IR remote control signal.

Note2. Setting of SW3 and SW4 for each communication protocol evaluation should be set as follows.

Communication protocol	SW3	SW4
DMX512 protocol	"DMX"	"RUN"
DALI protocol	Don't care	"RUN"
IR remote control	Don't care	"RUN"

## 3. Operation

### 3.1 Preparation

#### 3.1.1 Driver installation

Install the driver when connecting the Lighting Communication Master Evaluation Board (EZ-0008) to the PC by using a USB cable for the first time.

- ① Download driver from following URL.  
URL [www.necel.com/micro/en/solution/lighting/download.html](http://www.necel.com/micro/en/solution/lighting/download.html)
- ② When connecting this board to PC by using USB cable, "Found New Hardware Wizard" dialog box is displayed.  
Select "Yes, now and every time I connect a device", and click [Next].
- ③ Select "Install from a list or specific location (Advanced)", and click [Next].
- ④ Select "Include this location in the search" and then click [Browse]  
Specify the folder to which download files are saved, and click [Next]
- ⑤ Installation starts  
Click [Continue Anyway] while "Hardware Installation" dialog is displayed.
- ⑥ Click [Finish]. Installation is complete.

#### 3.1.2 Communication GUI installation

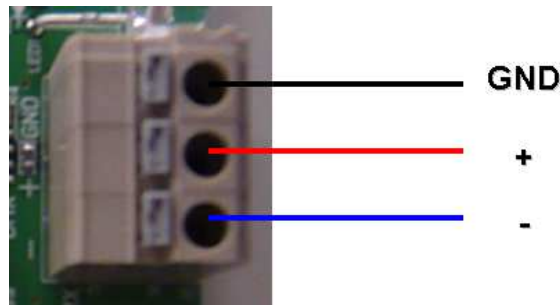
- ① Download DMX512 or DALI GUI from the following URL.  
URL [www.necel.com/micro/en/solution/lighting/download.html](http://www.necel.com/micro/en/solution/lighting/download.html)
- ② Install the GUI for the communication protocol which is supposed to be used.  
For detail, please refer following User's Manual  
DALI master controller GUI User's Manual (U19607)  
DMX512 master controller GUI User's Manual (U19596)

## 3.2 Operation

### 3.2.1 Operate with DMX512 interface

- ① Confirm SW4 is set to "RUN" side and SW3 is set to "DMX" side.
- ② Connect the lighting communication master evaluation board (EZ-0008) with DMX512 slave board or your own evaluation board supporting DMX512 protocol via interface J1.

Figure 5. DMX512 interface (J1)



- ③ Connect lighting communication master evaluation board with PC by a USB cable.
- ④ Insert power supply to the slave board.
- ⑤ Send DMX512 codes to slaves by DMX512 Master Controller GUI or your own software.
- ⑥ Disconnect the DC power of slave board.
- ⑦ Disconnect the lighting communication master evaluation board and the host PC.
- ⑧ Disconnect the lighting communication master evaluation board and the slave board.

Note1: To find details of DMX512 Master Controller GUI, please refer to User's Manual of DMX512 Master Controller GUI (U19596).

Note2: If the communication line is supposed to be longer than 1 meter, a twisted pair wire is recommend to be used for "+", "-" pin.

### Warning

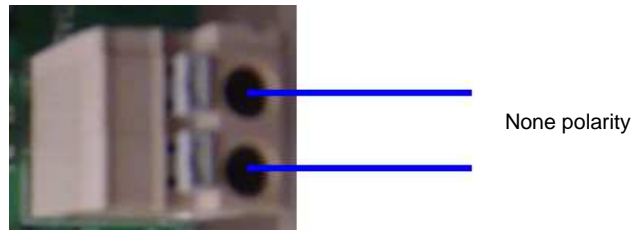


**Do not plug in or unplug a connector or cable with power applied to the board.**  
Doing so may cause product failure, generation of heat, fire or rupture

### 3.2.2 Operate with DALI interface

- ① Confirm SW4 is set to "RUN" side.
- ② Connect the lighting communication master evaluation board (EZ-0008) with DALI slave board or your own evaluation board supporting DALI protocol via interface J4.

**Figure 6 . DALI interface (J4)**



- ③ Connect lighting communication master evaluation board with PC by a USB cable
- ④ Insert power supply to the slave board.
- ⑤ Send DALI codes to slaves by DALI Master Controller GUI or your own software.
- ⑥ Disconnect the DC power of slave board.
- ⑦ Disconnect the lighting communication master evaluation board and the host PC.
- ⑧ Disconnect the lighting communication master evaluation board and the slave board.

Note1: To find details of GUI, please refer to the User's Manual of DALI Master Controller GUI (U19607).

### **Warning**



**Do not plug in or unplug a connector or cable with power applied to the board.**  
Doing so may cause product failure, generation of heat, fire or rupture

### 3.2.3 Operate with IR remote control interface

- ① Confirm SW4 is set to "RUN" side.
- ② Set SW1 to the expected channel.  
The output code is based on NEC IR remote control protocol  
CH1: Send custom code 0x0000+data code 0x5AA5  
CH2: Send custom code 0x0000+data code 0xDA25
- ③ Connect lighting communication master evaluation board with PC by a USB cable
- ④ Insert power supply to the slave board which has IR receiving interface and support the code set in step ②
- ⑤ Push SW2 to send IR code.
- ⑥ Disconnect the lighting communication master evaluation board and the host PC when finished evaluation.
- ⑦ Disconnect the USB cable.



## Warning



**Do not plug in or unplug a connector or cable with power applied to the board.**  
Doing so may cause product failure, generation of heat, fire or rupture.

# Appendix A      Revision History

Revision	Modified Points	Page
Rev.1.0	First edition	

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