

ACK/LPC55S16 EVK Quick Start Guide

Quickstart Guide

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QSG

Document information

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Abstract	Quick start guide for LPCXpresso55S16 development board with Amazon ACK Module



Revision history

Rev	Date	Description
0.1	20200720	Initial version

Contact information

For more information, please visit: <http://www.nxp.com>

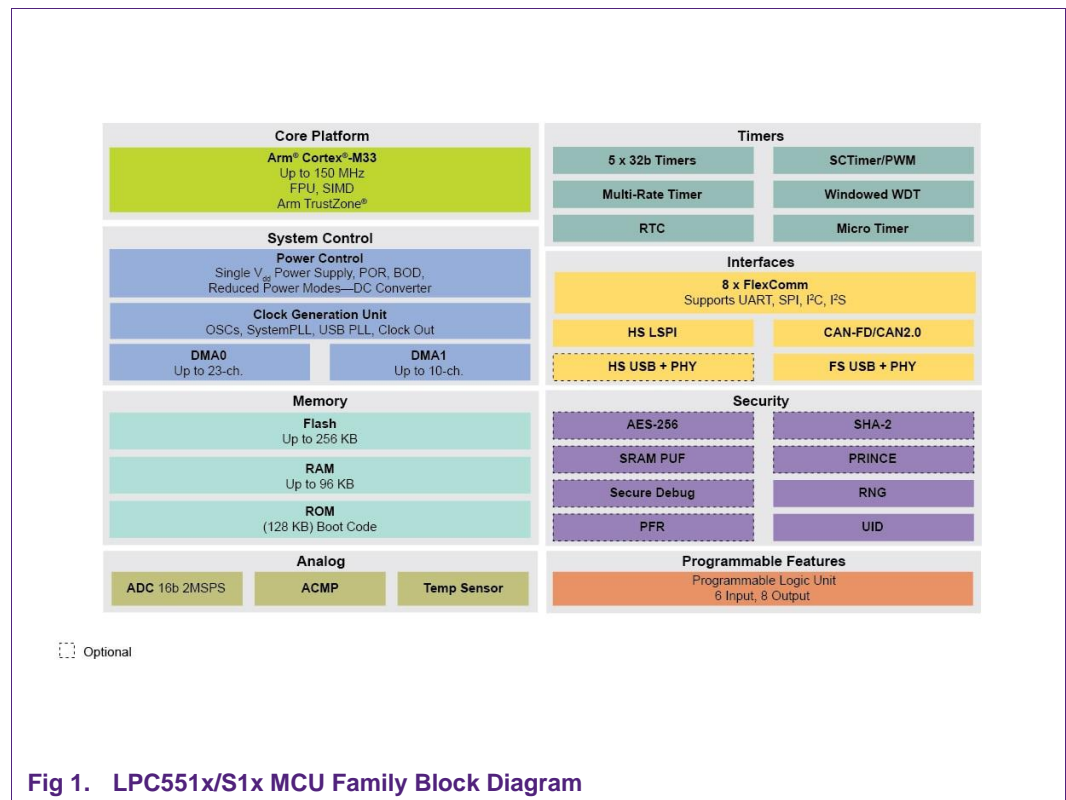
1. Introduction

1.1 LPC551x/S1x

The LPC551x/S1x MCU family expands the world's first general purpose Cortex-M33-based MCU series, offering significant advantages for developers, including pin-, software- and peripheral-compatibility for ease of use and to accelerate time to market, while leveraging the cost-effective 40-nm NVM process technology.

The LPC551x/S1x is the baseline family within the LPC5500 MCU series, providing new levels of cost and performance efficiency in addition to advanced security and system integration for industrial and general embedded markets.

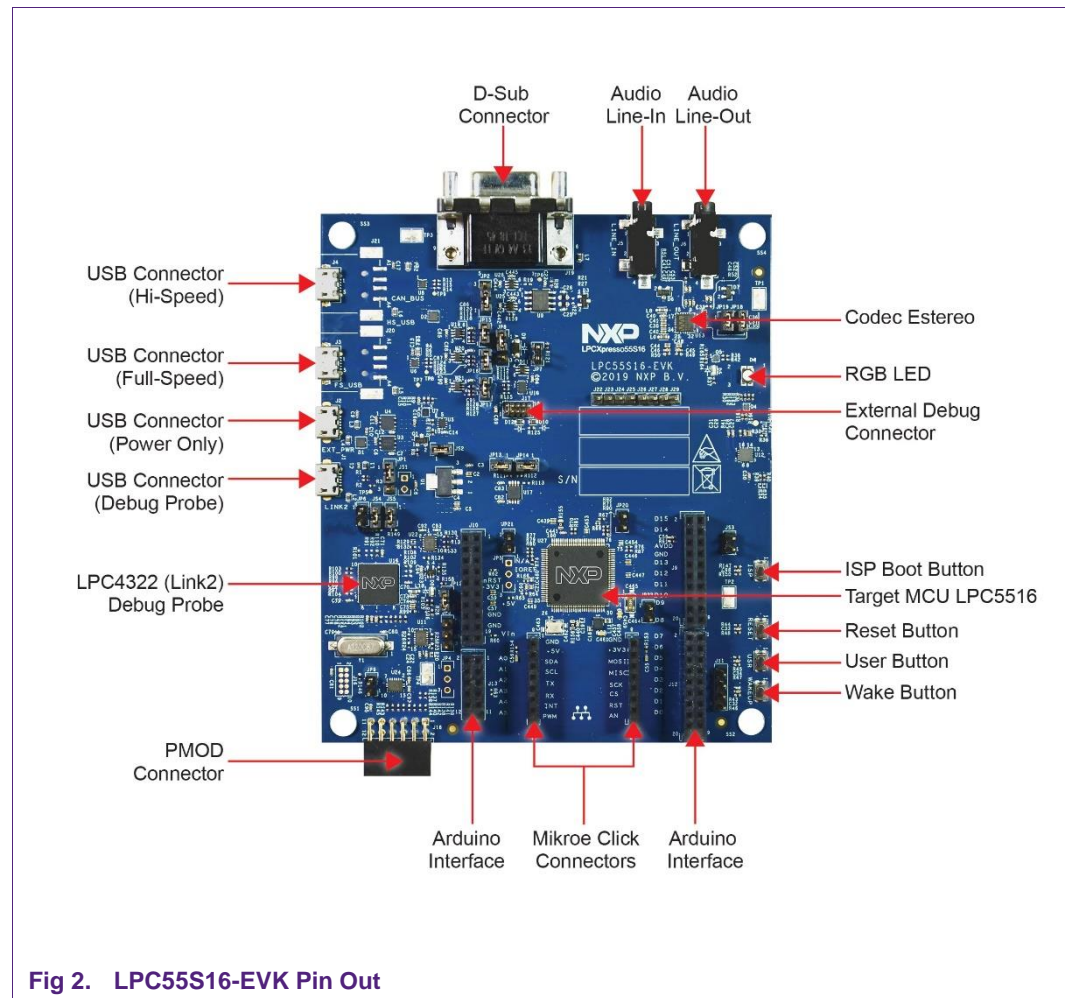
More information can be found at [here](#).



1.2 LPC55S16-EVK: LPCXpresso55S16 Development Board

The LPCXpresso55S16 board provides the ideal platform for evaluation of the LPC55S1x/LPC551x MCU family, based on the Arm® Cortex®-M33 architecture. Arduino® UNO compatible shield connectors are included, with additional expansion ports around the Arduino footprint, along with a PMod/host interface port and MikroElektronika Click module site. The board features an on-board LPC-Link2 debug probe based on the LPC4322 MCU for a performance debug experience over high-speed

USB, with easy firmware update options to support CMSIS-DSP or a special version of J-link LITE from SEGGER. The board can also be used with an external debug probe such as those from SEGGER and P&E Micro.



More information can be found at [here](#).

1.3 Alexa Connect Kit (ACK)

Alexa Connect Kit (ACK) is a managed service that makes it easy to integrate Alexa into your product. With ACK, you don't need to write an Alexa skill, manage a cloud service, or develop complex network and security firmware to connect your product to Alexa. Instead, you integrate the ACK module into your product and pay a one-time fixed cost. ACK provides the managed services, software, and tools you can use to develop and manage your Alexa-connected products on an ongoing basis. Your users benefit from Alexa device control and other features, such as Amazon's Wifi Simple Setup (WSS).



More information can be found at [here](#).

2. Hardware connection

Now you will physically connect the ACK Board to the LPC55S16 EVK.

Carefully insert the ACK board pins on the underside of the board into the Arduino headers. Make sure that the pins line up perfectly with the headers, and that the pins aren't bent.

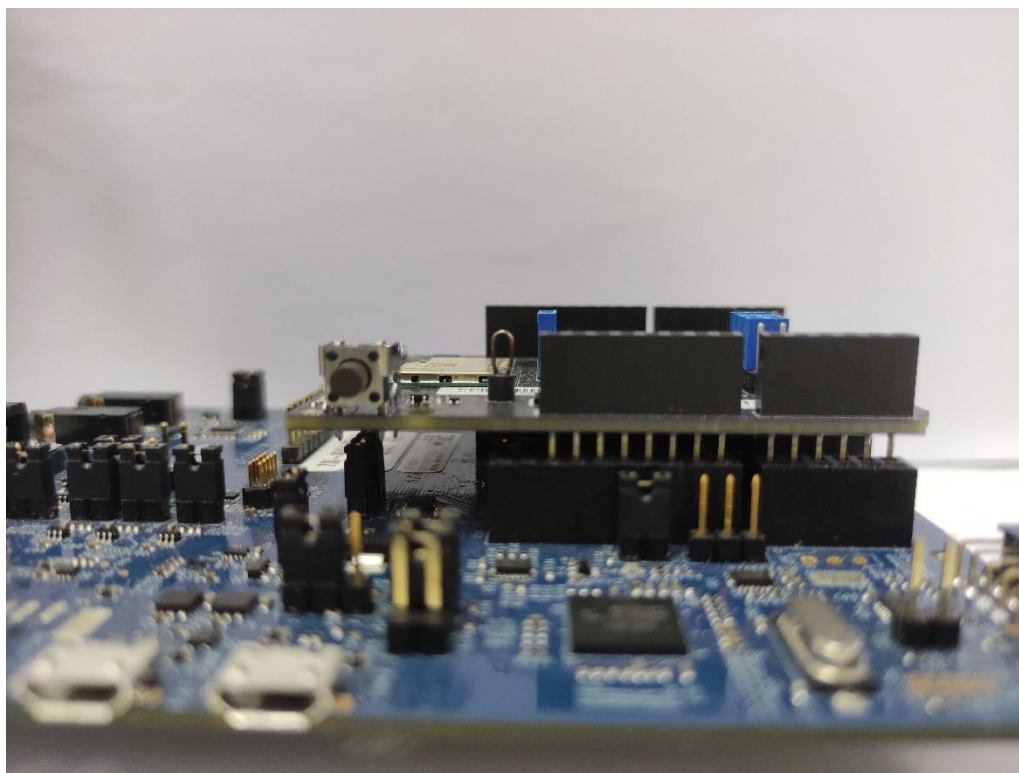


Fig 4. Hardware Connection

Insert the Micro-USB cable that came with the kit into the LPC55S16 EVK J1 Port (LINK2 Port), and connect it to your computer. You should see the USI Development Board's status and power LEDs light up.

Connect the LED long pin (+) into header 8, and then connect the LED short pin (-) into header 14 (GND), as shown in the following image.

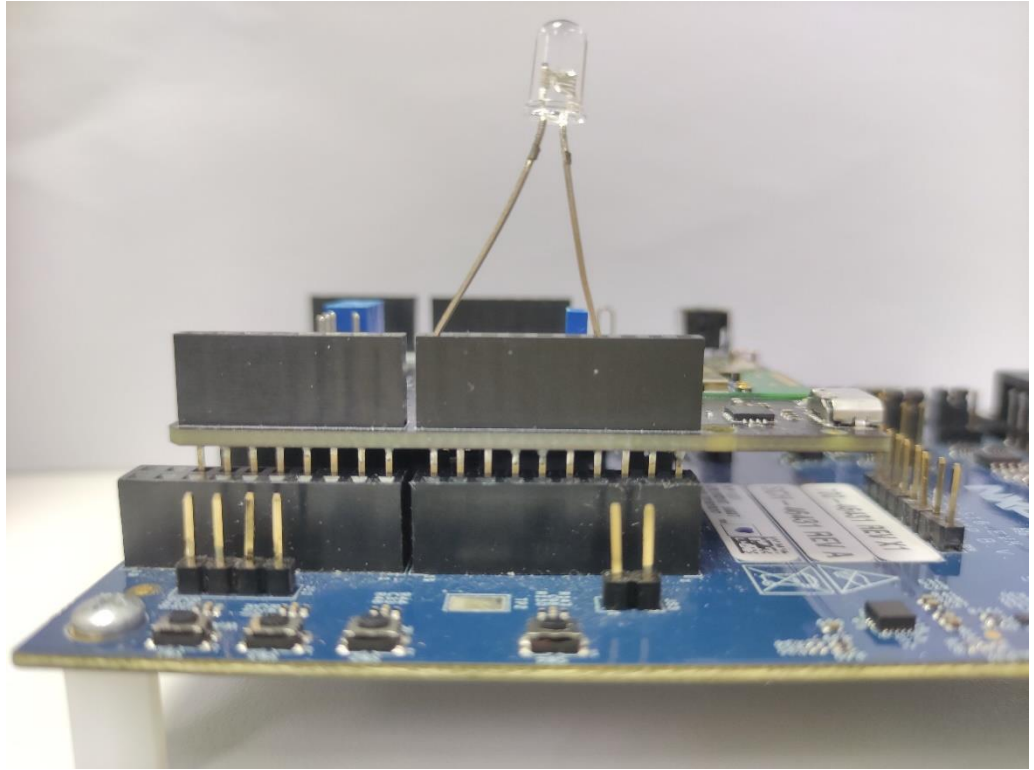


Fig 5. LED Connection

3. Program Code to the LPC55S16 EVK

The following procedure shows you how to compile the code, and then program it to the LPC55S16 EVK.

Download ACK Device SDK from [here](#). Unzip the LPC platform package to ACK_Device_SDK\user\platform.

1. Connect the LPC55S16 EVK J1 Port (LINK2 Port) to your computer by using the micro-USB cable port, if the port isn't already connected.
2. Compile customerloader project (ACK_Device_SDK\user\platform\lpc\lpc55s16-evk\customloader) and then download it.
3. Compile SmartLight project (ACK_Device_SDK\user\platform\lpc\lpc55s16-evk\applications\SmartLight) and then download it.
4. Reset the LPC55S16 EVK by RESET button.

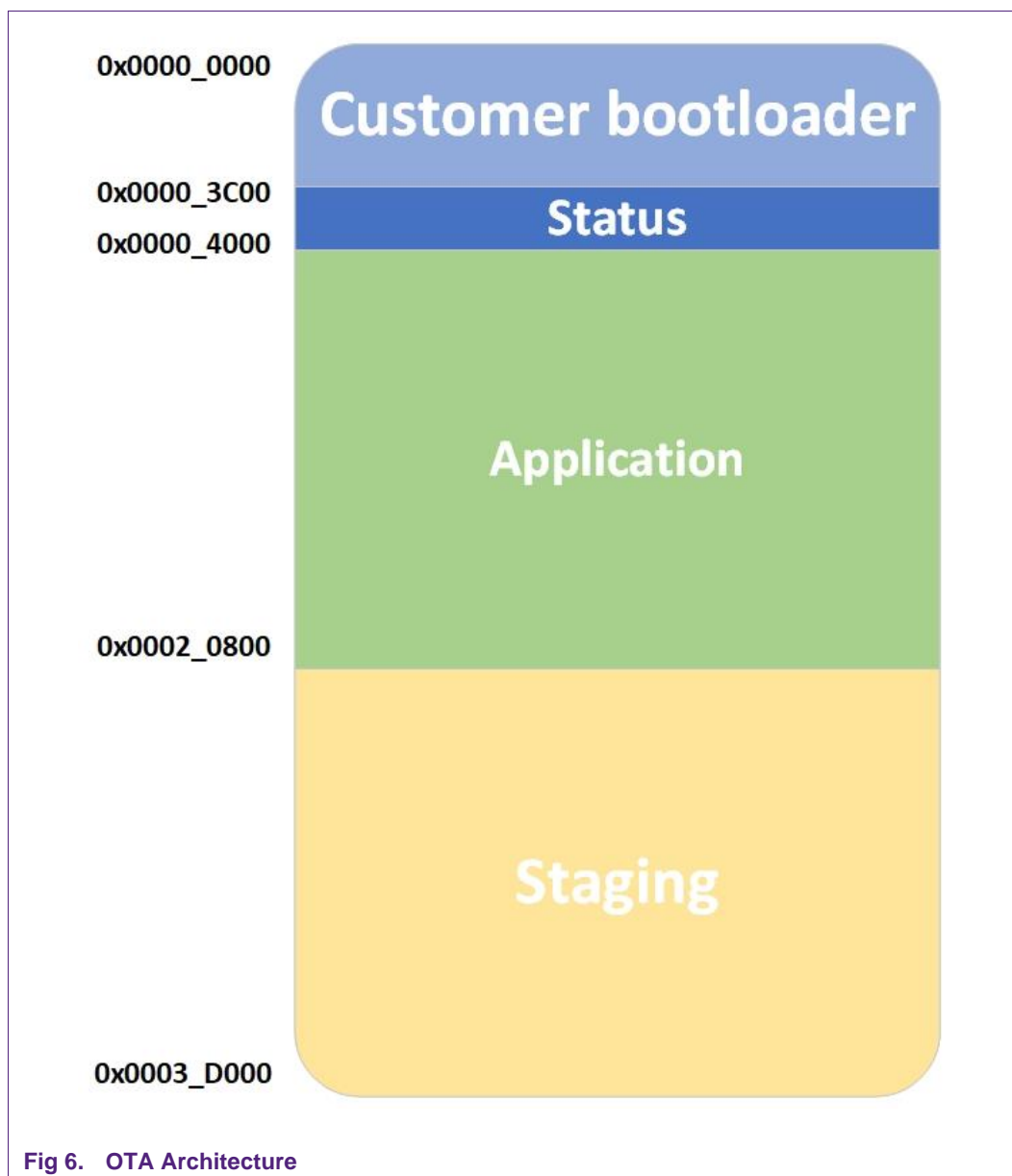
4. Validation

Please follow [Step 5: Register your Device](#) and [Step 6: Control the Smart Light](#) to validate the function.

5. OTA and Development Guide

If an application's `ack_user_config.h` contains **#define** **ACK_HOST_FIRMWARE_UPDATE**, ImplCore is configured for OTA, and OTA support is enabled.

To prepare an OTA image, customers use the Python scripts in the `otautility` directory (Python3 required). Those scripts prepend the header expected by ImplCore's state machine, to a `.hex` file created by building an MCU application.



LPC55S16 code package currently implements a simple OTA. The OTA architecture for LPC55S16 EVK is shown above. No need to follow it blindly. You can add more features and modify the architecture as needed.

OTA update function can be validated using scripts in test/validation folder.

Make sure **#define CIRCULAR_BUFFER_SIZE** in **ack_circularbuffer.h** is ≥ 128 , otherwise, the OTA validation will fail.

Note:

During the development, when the application image is programmed into the flash, please ensure that the programming doesn't modify customer bootloader in flash.

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