

Renesas Synergy™, RL78/G1D

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Rev.1.00

In-Transit Medication Management (ITMM) Kit Quick Start Guide

June 26, 2018

Introduction

This quick start guide describes the Renesas In-Transit Medication Management (ITMM) Kit set up. Highlighted components in this solution includes a Renesas RL78/G1D BLE MCU, Synergy S3A7 MCU and Ultra-Small, Buck Boost Switching Regulator – ISL9120. Contact your nearest Renesas sales office to request a live demonstration.

Target Device

RL78/G1D and R7FS3A77C3A01CFB

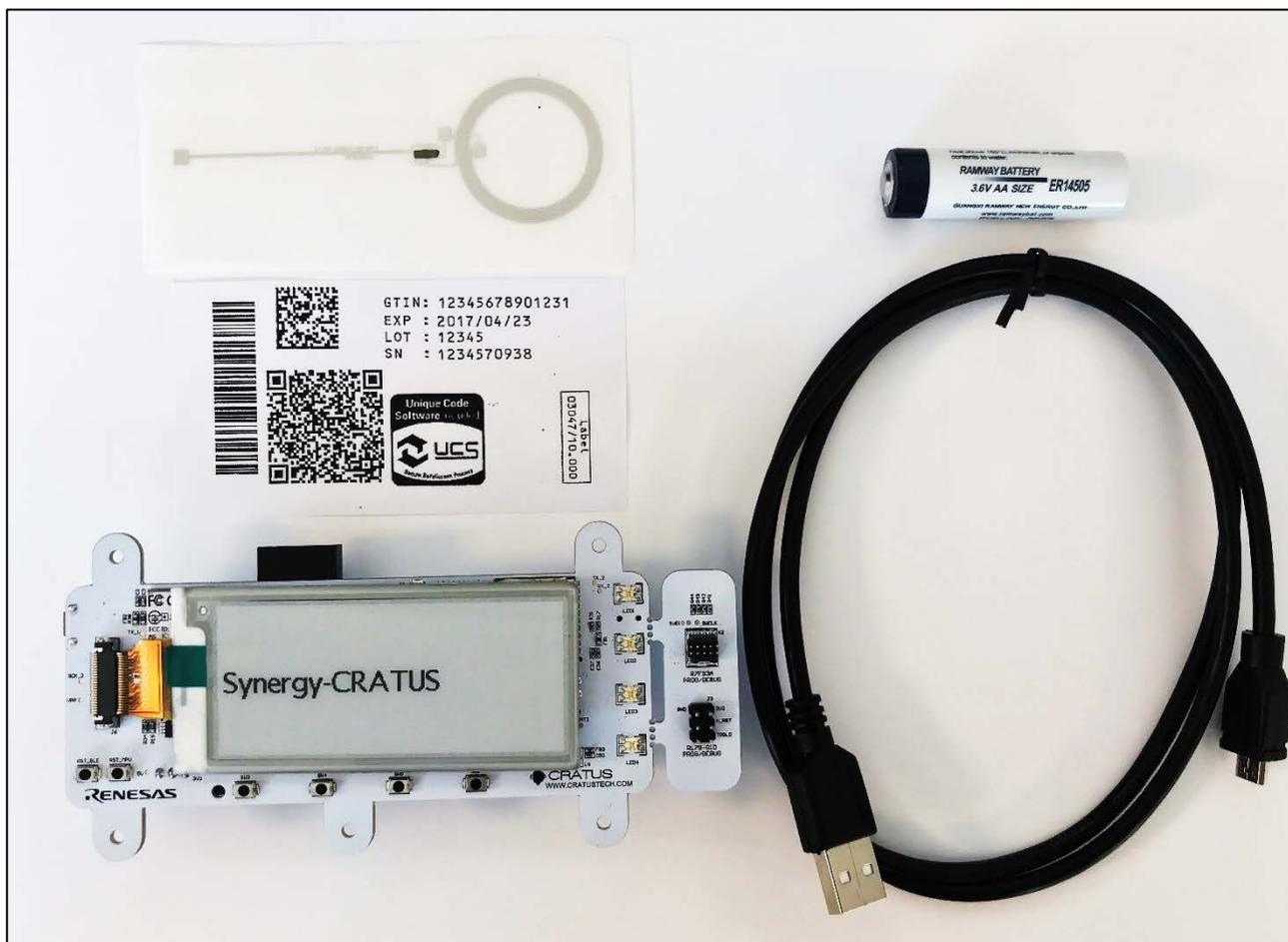
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1. Kit Contents

The following components are included in the kit:

- ITMM Reference Solutions Board
- 3.6 V Lithium Battery AA Size
- Micro USB Cable
- NFC Tamper Tag
- Linear and 2-D bar code Medicine Label
- Apple® iOS/ Google® Android™ Apps link.



2. Features

Feature	Benefit
Fuel Gauge	Accurate measure of the battery charge to avoid shutdown
USB	Standard micro-USB for data transfer and firmware upgrade
Alert	Out of range event in transit
Push Buttons	Toggle between human readable and bar code format on display, scan through different parameters displayed on the screen
LEDs	Power & Battery level status, Bluetooth connection and activity status, General ITMM solution status
Bluetooth	Secure, reliable and low power method to communicate to the mobile device
GPS	Track location history for the medicine
Temperature/Humidity/Pressure/Shock Sensor	To record if package contents were subjected to extreme conditions during transit
Tamper Sensor	To record if package contents were interfered during transit
E-ink Screen	Displays various sensor data in bar code format which can be read by traditional hand-held scanner
NFC tag or Barcode reading	Mobile app enables the mobile device to read NFC tag or bar code so that information at medicine package level can be combined with data logger data (GS1-GTIN format)
Mobile App	Forms Data base of Medicine information from labels, GPS history, Sensors data and has capability to report suspicious drugs to FDA

3. Images

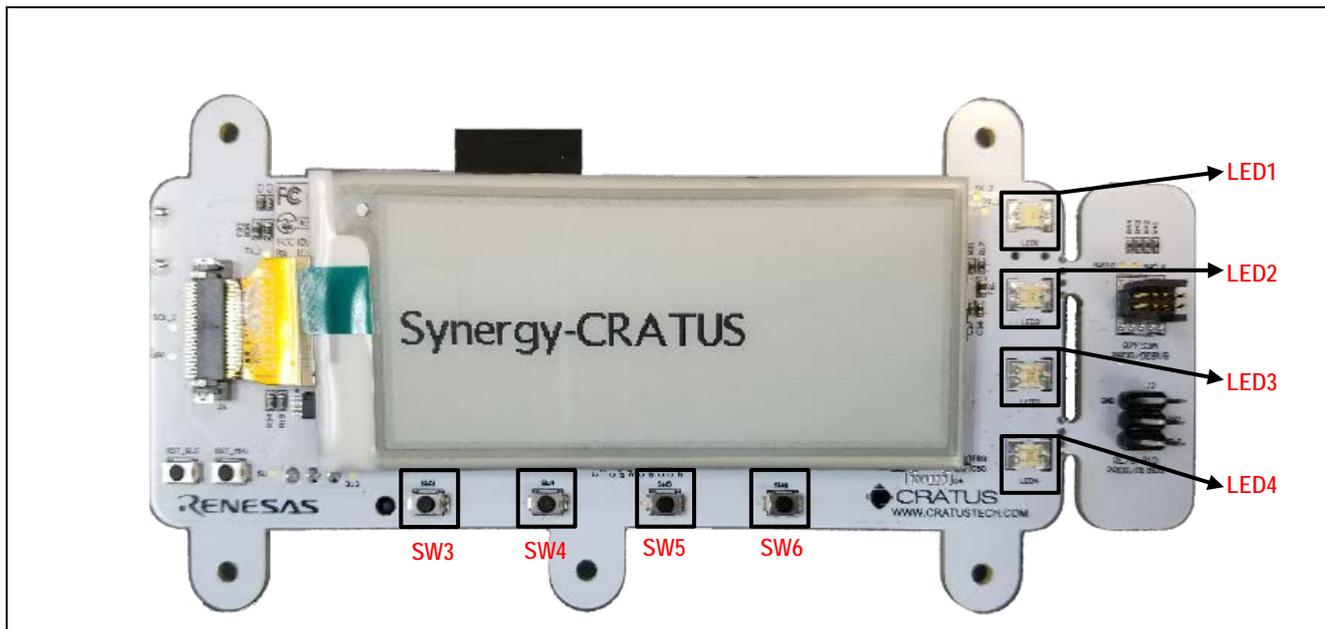


Figure 1 ITMM Reference Solution Board

4. Setting up ITMM Hardware

Powering the Hardware

The ITMM device can be powered using a micro USB or an AA battery. The battery provided with the kit is a Lithium Thionyl Chloride (Li-SOCl₂).

Turning on the Device

The device can be turned on using SW3 button. Once the device is turned on, the LED1 turns on and the device goes through a boot sequence. The device is ready for operation once “Synergy-CRATUS” appears on the EPD display.

Toggling the Display

The SW5 toggles the display between machine scannable barcode and human readable alphanumeric characters. The information on the display persists even after the device has been turned off.

Resetting the Device

The device can be reset by pressing the SW4 button. Resetting the device does not erase anything from the device memory.

5. Performing Data Logging Operations

Start Logging

Logging of environmental parameters can be started using SW6 button. Once the button is pressed, the LED4 turns green indicating that logging has started.

Stop Logging

The SW6 button is used to stop logging. LED4 turns orange which indicated that logging has stopped.

6. LED Color Codes

Power LED (LED1)

Green: Device is turned ON

Orange: Battery voltage is low

Red: Battery voltage is critically low

Bluetooth LED (LED2)

Green: Device is in advertising mode

Orange: device is connected to the app

Status LED (LED3)

Green (blink): A shock was detected

Red: Critical system error

Arm / Disarm LED (LED1)

Green: Data is being logged

Orange: Data logging stopped

7. Installing Mobile Application

Android™ device users can download the ROMA app from the Google® Play Store and iOS® device users can download the ROMA app from the Apple® App Store.

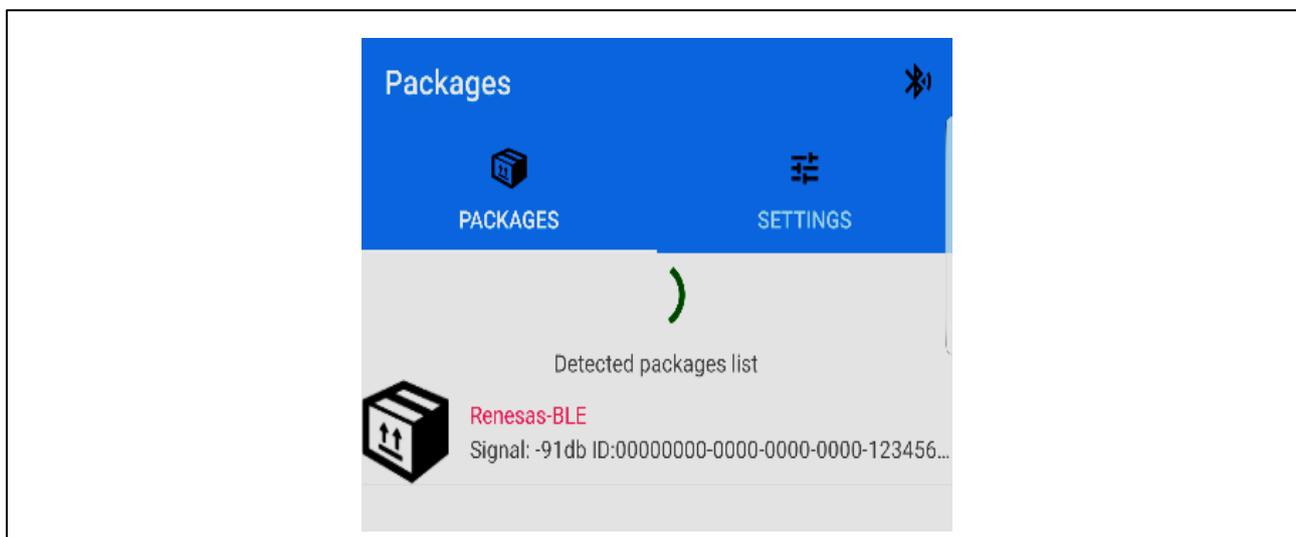
Click on below icons for download link



8. Using the Mobile Application

8.1 Connection to the Device

Make sure that Bluetooth on the mobile device is turned on. Upon opening, the ROMA app shows a list of available devices under the “packages” tab. Select the device that you want to connect to.

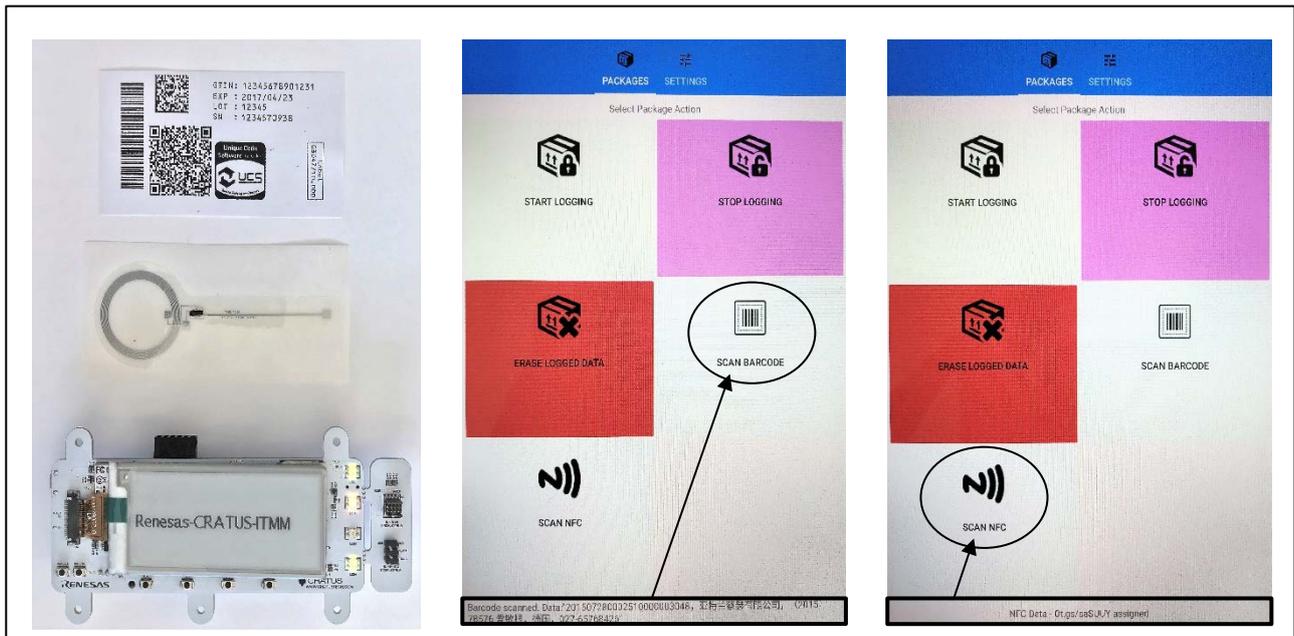


8.2 Scanning NFC Tag Data and Barcode to Identify the Package

Once the desired device is selected, the following screen appears. This screen displays the operations that can be performed.

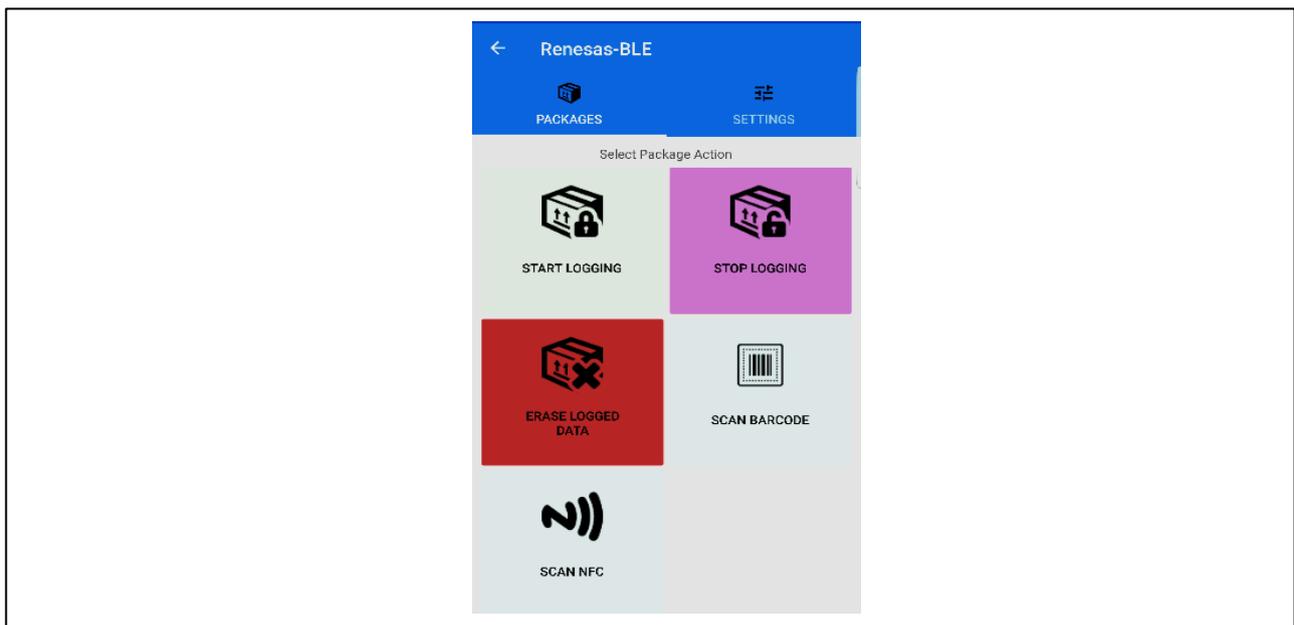
To scan an NFC code, make sure the NFC is turned on in the mobile device. Press the “scan NFC” button on the mobile app and bring the mobile device over an NFC tag. The app scans the code and displays it on the screen.

To scan a barcode, first make sure the mobile app has permission to use the camera. Press the “scan barcode” button and use the camera to scan the barcode. The barcode is scanned, and the information is displayed on the screen.



8.3 Performing Data Logging Operations Using Mobile Application

Logging of environmental parameters for the connected device can be started by pressing the “start logging” button. Once the button is pressed, the LED4 turns green indicating that logging has started.

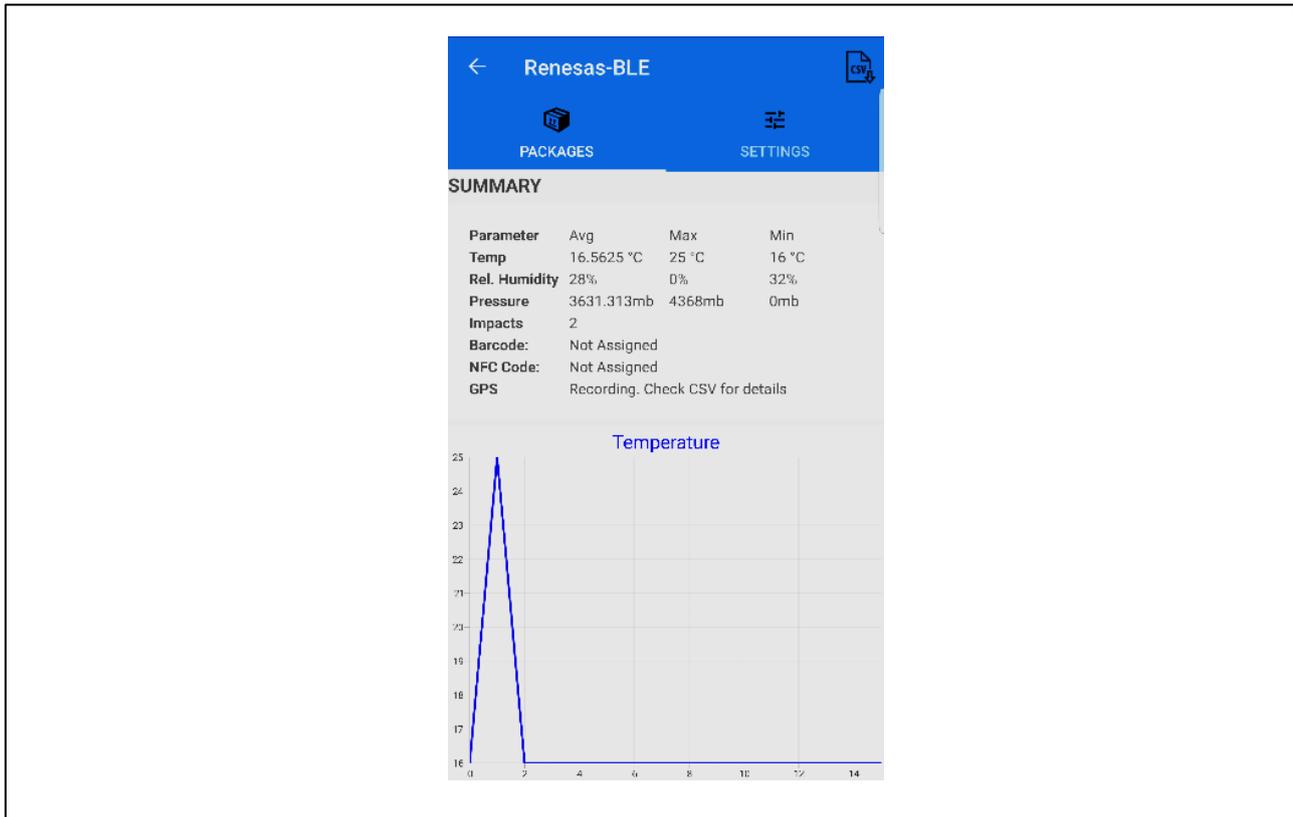


Logging of environmental parameters for the connected device can be stopped by pressing the “stop logging” button. LED4 turns orange which indicated that logging has stopped.

8.4 Viewing and Downloading Logged Data

Captured data can be viewed once logging has been stopped. To view logged data, press the “stop logging” button once again. A screen like the one pictured below displays the summary of logged data which was captured and parameter-specific data in the form of a graph.

To download logged data in the form of a CSV file, press the “CSV” button on the top right corner. A timestamped log of data is downloaded to the mobile device.

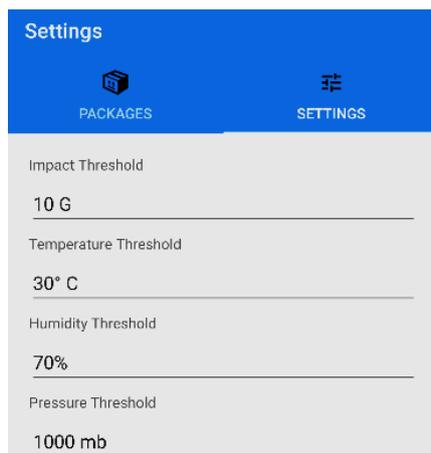


8.5 Erasing Data

When the “erase logged data” button is pressed, all logged data on the device is erased. This operation is irreversible. To make sure data is not lost, make sure you have transferred all the required data to the mobile device or a PC.

8.6 Settings

The alert settings of the device can be viewed under the “settings” tab. Impact threshold, temperature threshold, humidity threshold, and pressure threshold of the connected device can be viewed. For the scope of this solution the settings are fixed.



9. Safety Precautions

1. Do not expose the device to water and direct sunlight.
2. Do not use batteries that are not compatible with the device.
3. Connect the device only to a standard USB wall outlet or a PC.

10. Regulatory Information

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Revision History

Rev.	Date	Description	
		Page	Summary
1.00	June 26, 2018	-	Initial Release

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