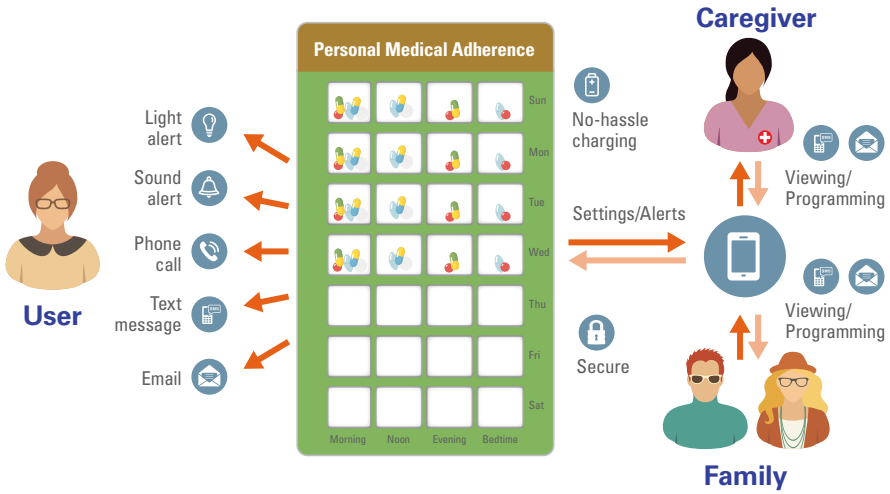
# Medication Adherence Solutions for Improved Healthcare at Lower Total Cost

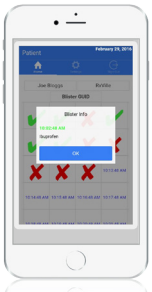



Renesas has developed two solutions to address the issue of medication non-adherence which show proof of concept and give our customers a head start for designing world-class products.

**The Smart Connector model** was designed keeping the requirements of a small form factor and low development cost in mind. The blister pack to be used with this model needs to have traces printed on the back foil. The user interface and setup are very simple and intuitive - the blister pack clips on to the smart connector and the device is ready to be powered up.

**The Smart Sleeve model** was designed for elegance and compatibility with off-the-shelf blister packs. The user interface and setup is still simple and intuitive - the blister pack slides into the smart sleeve and the device is ready to be powered up.

Smart Connector with Printed Foil Blister Pack



Mobile App

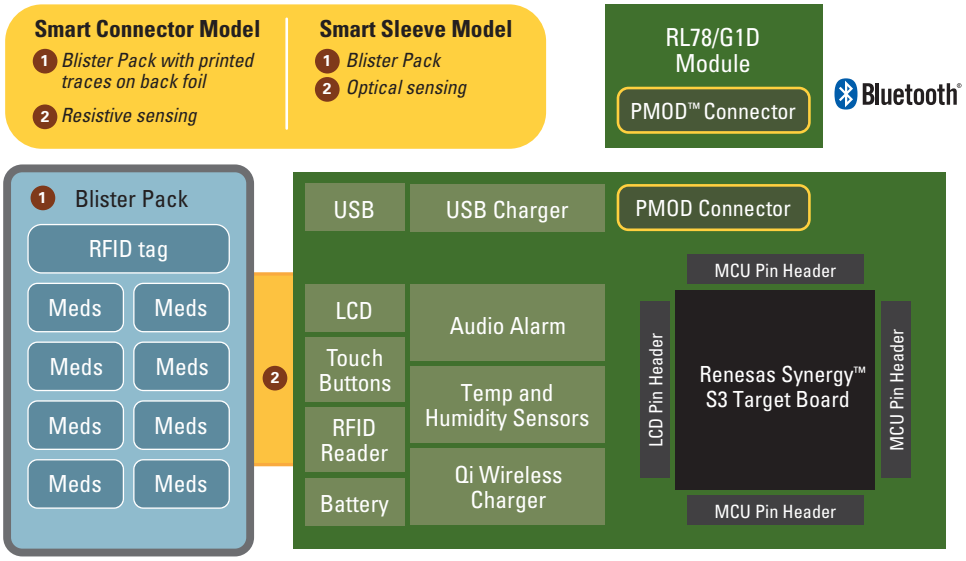
Smart Sleeve with Blister Pack

## Solution Highlights

- Verify, remind, log and report medicine usage
- Track medicine environmental exposure
- Form factor design for ease of use and quick adoption
- Mobile access via iOS and Android apps
- Capability for Wi-Fi or cellular connectivity along with cloud platform integration

Personal Medication Adherence (PMA), or lack of PMA compliance, is a $337 billion problem annually in the U.S. that bogs down our healthcare system(1). Patients forget to take or may confuse their medication, which can result in being readmitted to the hospital, a skilled nursing home or assisted-living facility, or with another visit to the doctor's office. Recent healthcare laws are emphasizing value-based healthcare and use of technology to improve quality of service. The advent of the Internet of Things (IoT) has brought various technologies to the forefront that, when applied to PMA devices, can help resolve some of the issues we currently face.

Note 1: Source: http://worldofdtcmarketing.com/non-adherence-costs-us/cost-of-healthcare-in-the-u-s/




## Features

- Wireless charging
- Fuel gauge
- Alert
- USB charging
- RFID (Blister detect)
- Bluetooth® Low Energy (BLE)
- Temperature sensor
- Humidity sensor
- LCD screen
- Touch buttons

On the mobile phone side, the user logs in to the app and enters the prescription information (blister pack ID and time table of dosage). Once that is done, the phone has to be paired via BLE to the smart connector/sleeve. Every time a new blister pack is inserted, it will be authenticated against the blister pack ID on the mobile app. This prevents the user from taking incorrect medication. When it is time to take a dose, the smart connector/sleeve will give an audio alert, and the LCD screen will display the blister number from which the dose has to be taken. The mobile phone can also be set up for visual, audio or vibrate alerts. Whether the user pops the blister or not, when its time to take the medicine, the action will be logged in the mobile app data log.

Wireless and USB charging capabilities are provided for flexibility, along with fuel-gauge function for the battery. Temperature and humidity sensors monitor environmental exposure for the medicine.

These solutions showcase the Renesas Synergy™ S3 MCU, which is part of the Renesas Synergy Platform, the RL78/G1D Intelligent Bluetooth Smart MCU and the USB Charger IC. Renesas Synergy is a complete and qualified platform that accelerates embedded development, inspiring innovation and enabling differentiation. The RL78/G1D is an industry-leading, low-power Bluetooth Smart v4.1 MCU. Renesas has a portfolio of USB battery charger ICs.

Customers have the option to use wireless or cellular technology for connectivity instead of the provided BLE function. The mobile app can be further enhanced by providing back-end connectivity to a cloud platform and building a dashboard in the cloud. The dashboard can be a single point of interaction between the doctor/care giver, pharmacy and patient/family.

For more information on the RL78/G1D and Renesas Synergy, please visit:

RL78/G1D: http://am.renesas.com/rl78g1d

Renesas Synergy: https://www.renesas.com/en-us/products/synergy/features.html

## Renesas MCU Ecosystem

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