

R7F0C80212ESP

R30AN0177CC0100

Rev.1.00

密码锁 示例程序

Nov 16, 2012

介绍

示例程序包括以下函数和功能:

- 微控制器的初始化
 - a. I/O端口初始化
 - b. 定时器输出方波功能初始化
 - c. 按键中断功能初始化
 - d. 设置选项字节(Option Byte)
- 主应用循环
 - a. MCU中断启动
 - b. 按键检查

目标器件

RL78 / R7F0C80212ESP

当应用此示例程序于其他微控制器时, 请根据目标微控制器规格修改程序, 并对修改的程序充分进行评估。

目录

1.	执行示例程序	2
2.	操作环境	2
3.	函数说明	3
4.	设置选项字节 (OPTION BYTE)	4
5.	使用 CS+内设 GUI 软件仿真器	5
5.1	启动 CS+内设 GUI 软件仿真:	5
5.2	密码锁示例程序操作	6

1. 执行示例程序

示例按以下顺序执行：

- (1) 打开工程”key-lock.mtpj”
 - (2) 连接CS+内设GUI软件仿真;
 - (3) 下载程序;
 - (4) 从新执行(Restart)程序;
 - (5) 用户可以在软仿真视窗里的”I/O Panel 1”,对按键进行操作.
- 软件仿真具有一定的局限性。用户程序发布前，请使用仿真器进行测试确认。
 - 在使用仿真器仿真前，请先明确E1/EZ-CUBE硬件设置和与目标连接是否正确。
 - 具体细节请参见E1/EZ-CUBE用户手册。并请检查E1/EZ-CUBE是否使用了最新固件。

2. 操作环境

工作频率	内部时钟
综合开发环境	瑞萨电子综合开发环境 CubeSuite+ V1.03.00
示例工程	Key-lock.mtpj

3. 函数说明

此节描述示例程序中的各个函数。

[函数名称] IO_Init	
概要	I/O断口初始化
头文件	无
声明	void IO_init(void)
说明	- 设定P00为输出 - 设定P01~P04, P40, P125为输入
返回值	无
备注	无

[函数名称] KR0_Init	
概要	按键中断初始化
头文件	无
声明	void KR0_init(void)
说明	- 设定KR0~KR5为按键中断 - 设定按键中断等级
返回值	无
备注	无

[函数名称] Main	
概要	主应用循环
头文件	无
声明	void main(void)
说明	- 检查按键带码 - 按按键代码控制P00输出
返回值	无
备注	无

[函数名称] interrupt_intkr	
概要	按键中断服务程序
头文件	无
声明	void interrupt_intkr (void)
说明	- 记录按键 - 清空按键标志位
返回值	无
备注	无

4. 设置选项字节 (Option Byte)

R7F0C80212ESP 闪存的00C0H、00C1H、00C2H 和00C3H 为选项字节区域。打开电源或从复位状态重启器件时，器件将自动参考选项字节设置指定功能。使用本产品时，必须使用选项字节设置下列功能。

选项字节以汇编码格式保存在“optionbyte.asm”汇编文档, 用户可按要求自行更改设置. 以下是本示例使用的设置.

OPT	CSEG	OPT_BYTE	
	DB	0E0H	; 看门狗定时器不操作 ; 看门狗定时器的溢出时间: 64/fIL, ; 禁止使用软件停止内部振荡电路不能通过软件。
	DB	0EBH	; P125/RESET脚为端口功能 ; 上电复位,上升电压值2.55V, 下降电压值2.50V
	DB	0FAH	; 内部高速振荡时钟频率 10 MHz
	DB	85H	; On-chip 调试允许操作。 On-chip 调试安全ID 认证失败 ; 时, 禁止清除闪存数据。

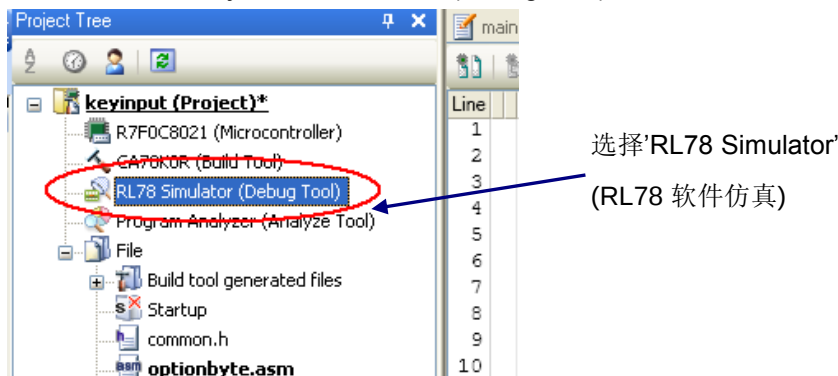
备注:

有关选项字节详情, 请参考微控制器的使用手册, 第十六章 选项字节

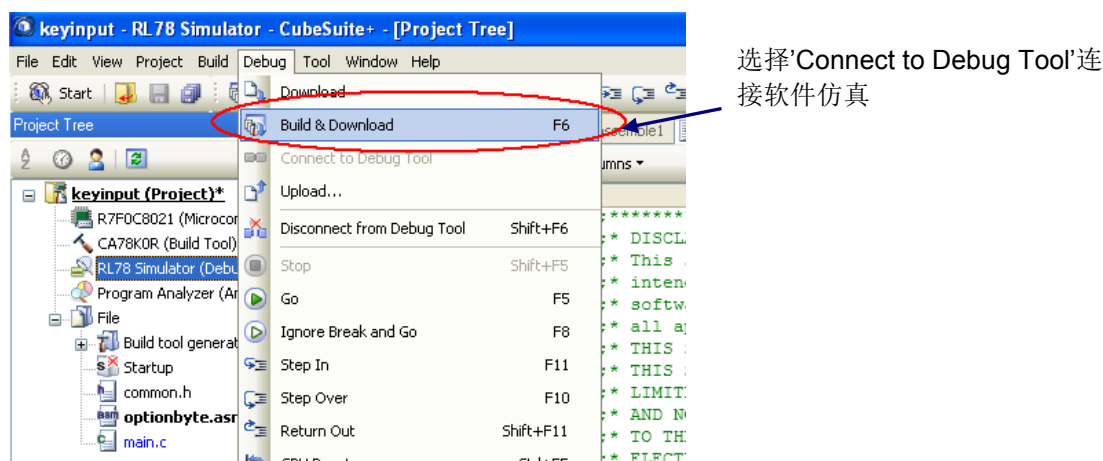
5. 使用 CS+ 内设 GUI 软件仿真器

5.1 启动 CS+ 内设 GUI 软件仿真:

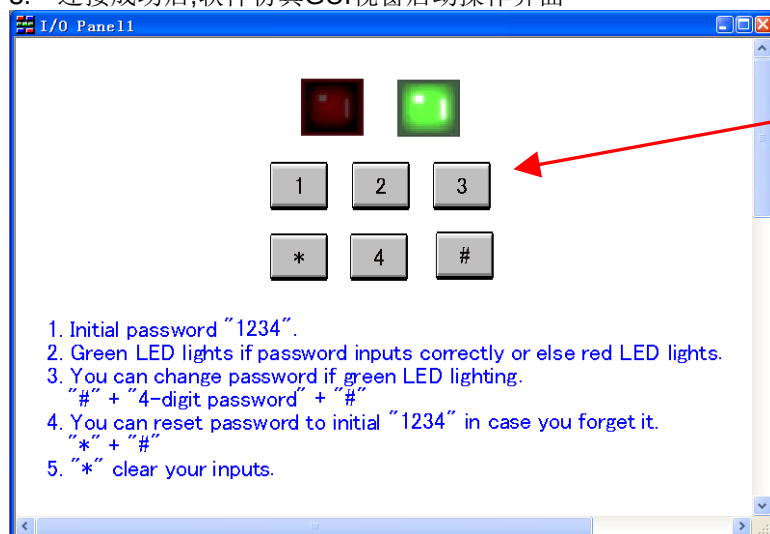
1. 打开工程后, 在'Project Tree'视窗里的'(Debug Tool)', 按鼠标右键, 选择'RL78 Simulator' (RL78 软件仿真).



2. 选择'Debug'内的选项'Connect to Debug Tool' RL78 软件仿真.



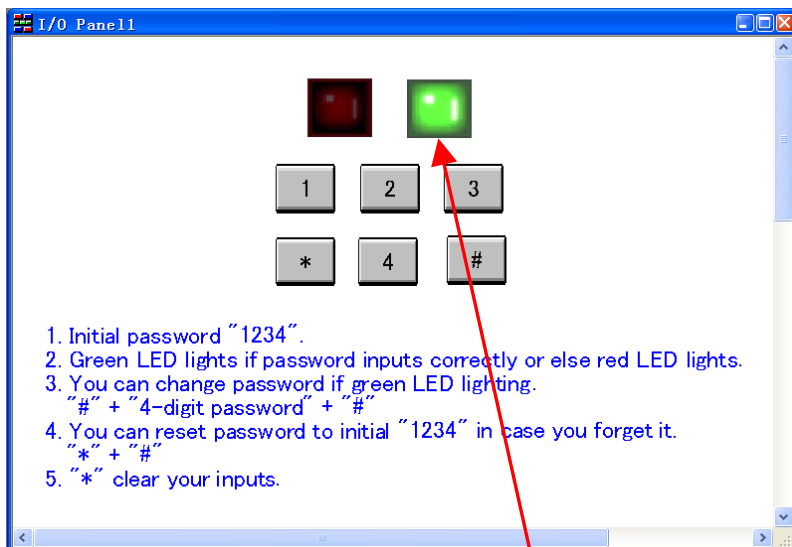
3. 连接成功后, 软件仿真 GUI 视窗启动操作界面



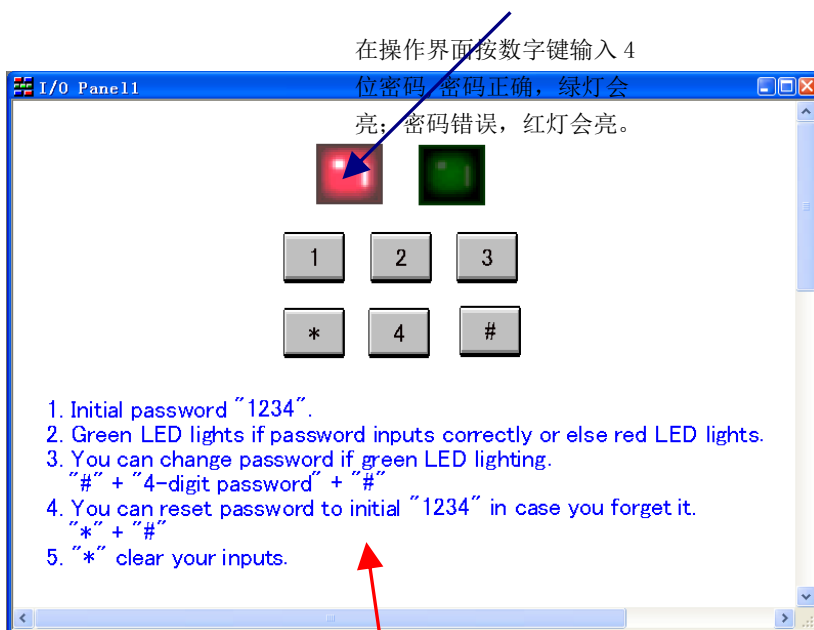
操作界面

- LED 灯为输出
- 按键为输入

5.2 密码锁示例程序操作



在操作界面按数字键输入 4
位密码, 密码正确, 绿灯会
亮; 密码错误, 红灯会亮。



在操作界面按数字键输入 4
位密码, 密码正确, 绿灯会
亮; 密码错误, 红灯会亮。

按图示中说明可以修改和重设密码。

备注: 使用 Simulator, 连续按同一键不要太快, 否则程序可能会不能及时响应。

网站和咨询

网站

<http://www.renesas.com/>

咨询

<http://www.renesas.com/inquiry>

所有商标和注册商标都属于其各自所有人所有。

修订记录

版本	日期	描述	
		页	概要
1.00	Nov 16, 2012	—	第一版发行

产品使用时的注意事项

本文对适用于单片机所有产品的“使用时的注意事项”进行说明。有关个别的使用时的注意事项请参照正文。此外，如果在记载上有与本手册的正文有差异之处，请以正文为准。

1. 未使用的引脚的处理

【注意】将未使用的引脚按照正文的“未使用引脚的处理”进行处理。

CMOS产品的输入引脚的阻抗一般为高阻抗。如果在开路的状态下运行未使用的引脚，由于感应现象，外加LSI周围的噪声，在LSI内部产生穿透电流，有可能被误认为是输入信号而引起误动作。

未使用的引脚，请按照正文的“未使用引脚的处理”中的指示进行处理。

2. 通电时的处理

【注意】通电时产品处于不定状态。

通电时，LSI内部电路处于不确定状态，寄存器的设定和各引脚的状态不定。通过外部复位引脚对产品进行复位时，从通电到复位有效之前的期间，不能保证引脚的状态。

同样，使用内部上电复位功能对产品进行复位时，从通电到达到复位产生的一定电压的期间，不能保证引脚的状态。

3. 禁止存取保留地址（保留区）

【注意】禁止存取保留地址（保留区）

在地址区域中，有被分配将来用作功能扩展的保留地址（保留区）。因为无法保证存取这些地址时的运行，所以不能对保留地址（保留区）进行存取。

4. 关于时钟

【注意】复位时，请在时钟稳定后解除复位。

在程序运行中切换时钟时，请在要切换成的时钟稳定之后进行。复位时，在通过使用外部振荡器（或者外部振荡电路）的时钟开始运行的系统中，必须在时钟充分稳定后解除复位。另外，在程序运行中，切换成使用外部振荡器（或者外部振荡电路）的时钟时，在要切换成的时钟充分稳定后再进行切换。

5. 关于产品间的差异

【注意】在变更不同型号的产品时，请对每一个产品型号进行系统评价测试。

即使是同一个群的单片机，如果产品型号不同，由于内部ROM、版本模式等不同，在电特性范围内有时特性值、动作容限、噪声耐量、噪声辐射量等不同。因此，在变更不认同型号的产品时，请对每一个型号的产品进行系统评价测试。

Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
 2. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
 3. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
 4. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from such alteration, modification, copy or otherwise misappropriation of Renesas Electronics product.
 5. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The recommended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.

"Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots etc.

"High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; and safety equipment etc.

Renesas Electronics products are neither intended nor authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems, surgical implantations etc.), or may cause serious property damages (nuclear reactor control systems, military equipment etc.). You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application for which it is not intended. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for which the product is not intended by Renesas Electronics.
 6. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
 7. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or systems manufactured by you.
 8. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
 9. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You should not use Renesas Electronics products or technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. When exporting the Renesas Electronics products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations.
 10. It is the responsibility of the buyer or distributor of Renesas Electronics products, who distributes, disposes of, or otherwise places the product with a third party, to notify such third party in advance of the contents and conditions set forth in this document, Renesas Electronics assumes no responsibility for any losses incurred by you or third parties as a result of unauthorized use of Renesas Electronics products.
 11. This document may not be reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
 12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.
- (Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its majority-owned subsidiaries.
- (Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.



SALES OFFICES

Renesas Electronics Corporation

<http://www.renesas.com>

Refer to "http://www.renesas.com/" for the latest and detailed information.

Renesas Electronics America Inc.

2880 Scott Boulevard Santa Clara, CA 95050-2554, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited

1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada
Tel: +1-905-898-5441, Fax: +1-905-898-3220

Renesas Electronics Europe Limited

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: +44-1628-651-700, Fax: +44-1628-651-804

Renesas Electronics Europe GmbH

Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-65030, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.

7th Floor, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100083, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.

Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd., Pudong District, Shanghai 200120, China
Tel: +86-21-5877-1818, Fax: +86-21-6887-7858 / -7898

Renesas Electronics Hong Kong Limited

Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2886-9318, Fax: +852 2886-9022/9044

Renesas Electronics Taiwan Co., Ltd.

13F, No. 363, Fu Shing North Road, Taipei, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

Renesas Electronics Singapore Pte. Ltd.

80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre Singapore 339949
Tel: +65-6213-0200, Fax: +65-6213-0300

Renesas Electronics Malaysia Sdn.Bhd.

Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

Renesas Electronics Korea Co., Ltd.

11F., Samik Laviel' or Bldg., 720-2 Yeoksam-Dong, Kangnam-Ku, Seoul 135-080, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141