

IoT物联网

万物互联工程实例

广和通大学计划项目组

2023Q2



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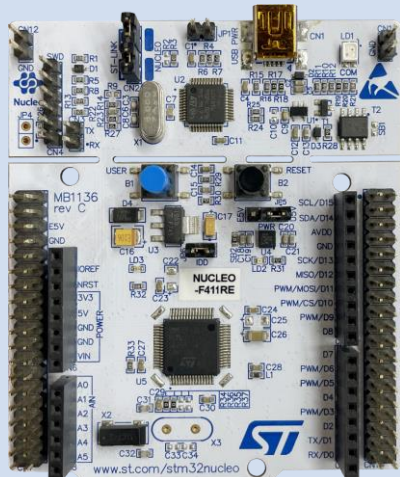
硬件说明

硬件说明

模块端
ADP-L610-
Arduino_V3.0.2



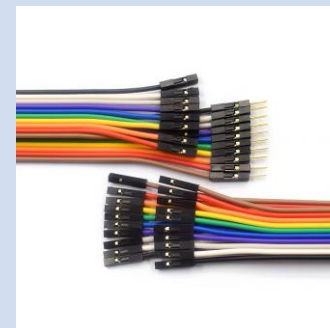
MCU
STM32F411



串口监测工具
USB转TTL



杜邦线若干

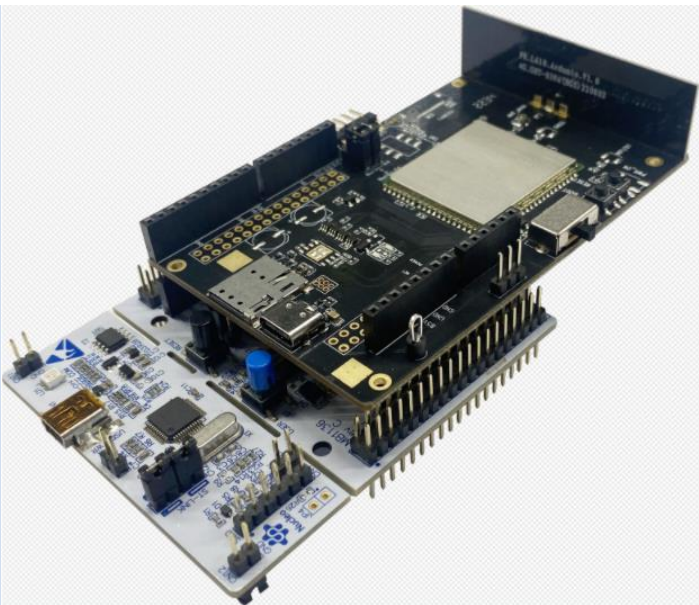


2

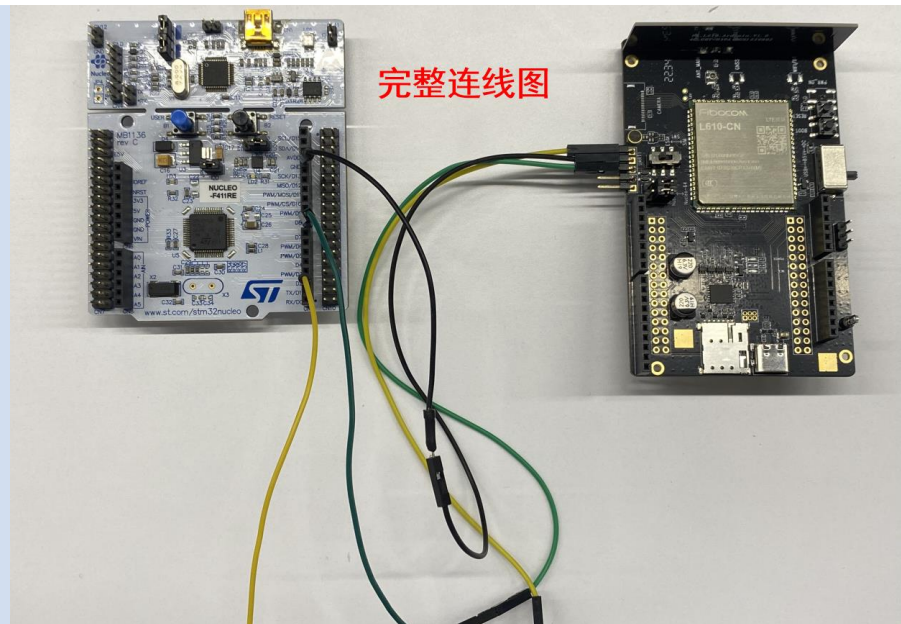
电路搭建

L610与STM32的电路搭建

方法一：Arduino接口对接



方法二：杜邦线连接



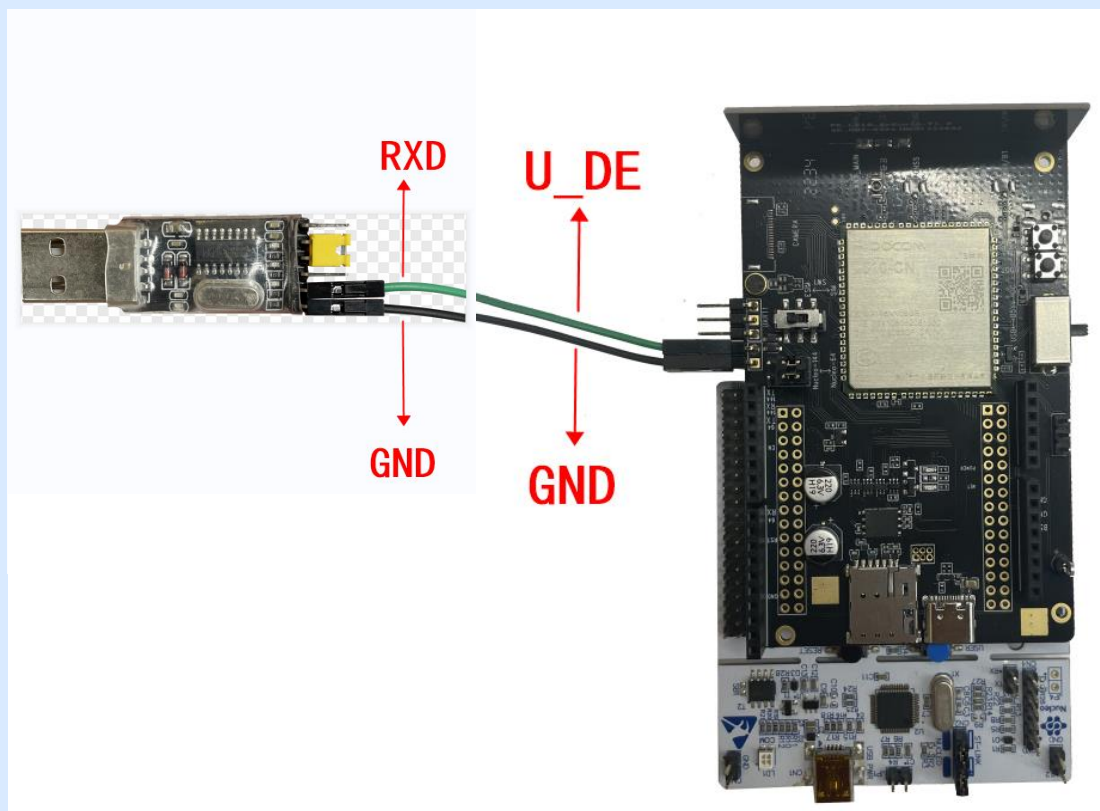
L610与STM32的电路搭建

电路搭建方法二的接口说明：

接口	ADP-L610- Arduino_V3.0.2	Nucleo-64
地	UART1/GND	CN6/PIN7/GND
UART-RX (面向ADP-L610-Arduino接收)	UART1/RX	CN5/PIN1/D8(PA9)
UART-TX (面向ADP-L610-Arduino发送)	UART1/TX	CN9/PIN3/D2(PA10)

串口监测的电路搭建

三代开发板配备有串口监测管脚，需要结合USB转TTL工具（可在网上的电子商城中购买，搜索关键词“USB转TTL”），可以监测L610与MCU之间的数据通信



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工程说明

工程说明

- 1、STM32工程编译软件以下两种供选择：



- 2、培训中示例的编译软件为Keil
- 3、关于两种编译软件编写的完整工程资料都在STM32技术资料中（技术资料链接在PPT最后一个章节提供），需要的同学自行下载

我的网盘 > MCU > 1--STM32 >

文件名	修改时间	类型	大小
12.A.1--STM32示例工程以及移植说明	2022-12-28 15:25	文件夹	-
12.A.2-- 【Keil】STM32数据收发工程实例	2022-12-28 15:25	文件夹	-
12.A.3--培训 【STM32 生态系统及开发示例】	2022-12-28 15:25	文件夹	-
12.A.4-- 【STM32CubeIDE】STM32F411连腾讯云收发...	2022-12-28 15:25	文件夹	-

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STM32工程创建

STM32工程创建

工程创建软件工具：**STM32CubeMX**（芯片配置工具）



STM32工程创建

工程创建步骤

▷ 芯片选取

▷ 晶振配置

▷ 串口配置

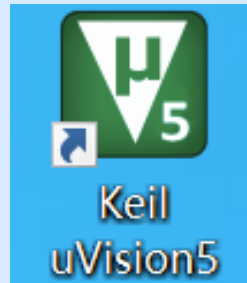
▷ 生成工程

5

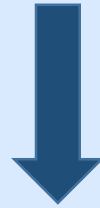
L610与STM32串口收发

L610与STM32串口收发

软件工具: Keil



代码编写烧录演示



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STM32解析L610数据

解析 步骤



▷ 添加数据接收buffer

▷ 开始解析数据

▷ 根据解析做出下一步动作

▷ 生成工程

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STM32连腾讯云工程演示

STM32连腾讯云收发数据代码讲解

The screenshot displays the Keil uVision IDE interface for a project named 'urat1'. The main window shows the source code for 'main.c', which includes a loop for receiving data from a UART device. The code is as follows:

```
229  /* USER CODE BEGIN WHILE */
230
231
232  //云端下发电灯开关属性，下发成功后，再上传至云端
233  Clear_Buffer();
234
235  while(1)
236  {
237      if(RxBuffer[0] != 0)
238      {
239          HAL_Delay(1000);
240          strx=strstr((const char*)RxBuffer,(const char*)"power_switch");
241          if (strx==NULL)
242              printf("电灯属性获取失败");
243          else
244          {
245              len = strlen(strx);
246              number = strx[14];
247              printf("电灯属性获取成功");
248              HAL_Delay(500);
249              printf("收到信息: power_switch=%c", number);
250              HAL_Delay(500);
251              Clear_Buffer();
252          }
253          Clear_Buffer();
254      }
255  }
```

The project tree on the left shows the following structure:

- Project: urat1
 - urat1
 - Application/MDK-ARM
 - startup_stm32f411xe.s
 - Application/User
 - main.c
 - gpio.c
 - usart.c
 - stm32f4xx_it.c
 - stm32f4xx_hal_msp.c
 - Drivers/STM32F4xx_HAL_Driver
 - stm32f4xx_hal_tim.c
 - stm32f4xx_hal_tim_ex.c
 - stm32f4xx_hal_uart.c
 - stm32f4xx_hal_rcc.c
 - stm32f4xx_hal_rcc_ex.c
 - stm32f4xx_hal_flash.c
 - stm32f4xx_hal_flash_ex.c
 - stm32f4xx_hal_flash_ramfunc.c
 - stm32f4xx_hal_gpio.c

The bottom status bar shows 'ST-Link Debugger' and 'L:253 C:22'.

STM32连腾讯云工程演示

```
[18:06:37.705]收←◆模块初始化
[18:06:38.784]收←◆模块初始化
[18:06:43.781]收←◆ATI

[18:06:44.781]收←◆查询信息失败
[18:06:45.783]收←◆ATI

[18:06:46.783]收←◆版本信息正确
[18:06:47.784]收←◆AT+MIPCALL?

[18:06:48.785]收←◆还未获取到IP
[18:06:49.786]收←◆AT+MIPCALL=1

[18:06:50.787]收←◆获取IP成功
[18:06:51.788]收←◆AT
+TCDEVINFOSET=1,"SAQ6EN34JF","weilaiRoad_Lamp001","ygQHsODR8qShQQ5kPnqRUw=="

[18:06:52.795]收←◆平台信息设置成功
[18:06:53.797]收←◆AT+TCMQTTCONN=1,20000,240,1,0

[18:06:54.796]收←◆连接成功
[18:06:55.797]收←◆AT+TCMQTTSUB="$thing/down/property/SAQ6EN34JF/weilaiRoad_Lamp001",1

[18:06:56.803]收←◆订阅标签成功
[18:06:57.805]收←◆AT
+TCMQTTPUB="$thing/up/property/SAQ6EN34JF/weilaiRoad_Lamp001",1,{"method":"report","clientToken":"123","params":{"power_switch":1}}

[18:06:58.817]收←◆上报成功
[18:07:06.817]收←◆电灯属性获取成功
[18:07:07.319]收←◆收到信息: power_switch=0
[18:07:11.822]收←◆电灯属性获取成功
[18:07:12.323]收←◆收到信息: power_switch=1
```

此LOG只监视了
STM32F411中的数据

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万物互联工程实例技术资料
链接

万物互联工程实例技术资料链接

STM32: https://bbs.elecfans.com/jishu_2327768_1_1.html

龙芯: https://bbs.elecfans.com/jishu_2327769_1_1.html

沁恒微电子: https://bbs.elecfans.com/jishu_2329533_1_1.html

兆易: https://bbs.elecfans.com/jishu_2328405_1_1.html

灵动微电子: https://bbs.elecfans.com/jishu_2326143_1_1.html

完美无线体验

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