



# AP05-UWB 开发板与 Arduino 协同工作

# Version 1.2(2023.01.01)



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# 1 硬件连接

本文档以 Mini3 开发板接口为例子,介绍了与市场上三款主流的 Arduino 开发板连接的方法,并提供了 DEMO 演示程序代码,代码具有较强的可移植性。Mini3s / Mini3s Plus 模块接口 同 Mini3。

1.1 部署步骤硬件连接- Arduino Nano



图 1.1 UWB Mini 3 模块与 Arduino Nano 相连

1.2 硬件连接- Arduino UNO R3



图 1.2 UWB Mini 3 模块与 UNO R3 相连

# 1.3 硬件连接- Mega 2560 R3



图 1.3 UWB Mini 3 模块与 UNO R3 相连

# 1.4 Arduino 下载程序失败可能原因

给 Arduino 下载程序时, UWB 模块的串口线, 不能接在 Arduino 上。



# 2 软件下载与设置

# 2.1 Arduino IDE 简介

Arduino IDE 使得编写代码和将代码上传到板上变得容易。它运行在 Windows、Mac OS X 和 Linux 上。环境是用 Java 编写的,基于处理和其他开源软件。广泛应用于工程、物联网、 机器人、艺术和设计等领域的高中后教育(如大学、学院、研究机构)。此软件可用于任何 Arduino 板。致力于创建下一代 STEAM 计划-整合科学、技术、工程、艺术和数学-同时在 整个教育过程中支持教师和学生的需求。为课堂、工具包、捆绑包和板提供解决方案,并为 个人和合作的教育方法提供学习路径。学习者在使用工具包和探索每个板的创造性能力时,以实际操作和建设性的方式探索程序。无论你是一个电子学的新老师,想把物理计算和计算 思维引入你的教学计划,一个精通电子学的大学教授,还是一个研究生研究员,这里都有一 个适合你的 Arduino 工具包或板。

### 版本: ARDUINO 1.8.15

### 下载地址: https://www.arduino.cc/en/software



# Arduino IDE 1.8.15

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. This software can be used with any Arduino board.

Refer to the Getting Started page for Installation instructions.

#### SOURCE CODE

Active development of the Arduino software is **hosted by GitHub**. See the instructions for **building the code**. Latest release source code archives are available **here**. The archives are PGP-signed so they can be verified using **this** gpg key.

#### DOWNLOAD OPTIONS

Windows Win 7 and newer Windows ZIP file

#### Windows app Win 8.1 or 10 Get

Linux 32 bits Linux 64 bits Linux ARM 32 bits Linux ARM 64 bits

Mac OS X 10.10 or newer

Release Notes Checksums (sha512)

# 2.2 Arduino IDE 开发前的准备工作

在开发之前,因为研创 UWB 输出的数据量较多,您需要将开发环境的串口参数进行调整, 以适应最大接收速度。

1) 解压下载的压缩包, 打开 arduino.exe,初始界面如下所示



🥯 sketch_jun22a   Arduino 1.8.15	_	×
文件 编辑 项目 工具 帮助		
		Ø
sketch_jun22a		
void setup() {		^
<pre>// put your setup code here, to run once:</pre>		
}		
<pre>void loop() {     // put your main code here, to run repeatedly:</pre>		
}		

2) 鼠标移向左上角"文件"选项卡,选择打开,打开提供的 demo 文件夹,选择 UWB.ino 文件并打开。

🞯 UWB   Arduino 1.8.15		_		$\times$
文件 编辑 项目 工具 帮助				
				ø
UWB § trilateration.h uart.h				
//实现功能: 将UWB模块拿到的数据实时的拿	:出来,并进行三点:	或者四点:	定位	^
<pre>#include "uart.h" #include "trilateration.h"</pre>				
//#include "interrupt.h"				
<pre>void setup(){     //Seriall.begin(115200); //UWB模     Serial.begin(115200); </pre>	决对应的串口			
<pre>while(Serial.read()&gt;=0){}//clea: }</pre>	rserlaibuiier			
<pre>void loop(void) {</pre>				
<pre>decoding(); }</pre>				

 下载前将串口 buff 进行修改, 打开 Arduino 软件目录, ......arduino-1.8.15windows\arduino-1.8.15\hardware\arduino\avr\cores\arduino 右 击 编 辑 HardwareSerial.h, 修改所圈位置并保存



☐ HardwareSerial.h - 记事本			-		×
文件(F) 编辑(E) 格式(O) 查看(V) 释助(H)					
// location from which to read.					^
// NOTE: a "power of 2" buffer size is reccomended to dramatically					
// optimize all the modulo operations for ring buffers.					
// WARNING: When buffer sizes are increased to > 256, the buffer index					
// variables are automatically increased in size, but the extra					
// atomicity guards needed for that are not implemented. This will					
// often work, but occasionally a race condition can occur that makes					
// Serial behave erratically. See https://github.com/arduino/Arduino/issues/2405					
#if !defined(SERIAL_TX_BUFFER_SIZE)					
#if ((RAMEND - RAMSTART) < 1023)					
#define SERIAL_TX_BUFFER_SIZE 16					
#else					
#define SERIAL_TX_BUFFER_SIZE 130					
#endit					
#endif					
##It !defined(SERIAL RX BUFFER SIZE)					
#it ((RAMEND - RAMSTART) < 1023)					
#define SERIAL_RX_BUFFER_SIZE 16					
#else					
#denine SERIAL_RX_BUFFER_SIZE 130					
#II (SERIAL_1X_DUFFEK_SIZE>256)					
rypeder unitro_t tx_burier_index_t,					
Tread fuilet to the first to the state of th					
Handif					
#FIGUE					
Threader unit16 threader the					
Helse					
typedef uint8 t rx buffer index t					
					~
	第 46 行, 第 34 列	100% Unix (LF)	UTF-	8	



# 3 程序下载

## 3.1 下载到 Arduino Uno 开发板

## 3.1.1 选择下载的开发板,如下图所示



3.1.2 用 USB 线将电脑和 Arduino Uno 开发板相连,选择对应的串口端口,若没有端口显示,需下载安装 CH340 串口驱动





## 4) 将坐标改为实际 A0,A1,A2 的坐标

<pre>文件 编辑 项目 工具 帮助</pre>	🗢 UWB - trilateration.h   Arduino 1.8.15 —	$\times$
<pre>VWB § trilateration.h uarth int result = 0; vec3d anchorArray[4]; vec3d report; int Range_deca[4]; anchorArray[0].x = 0.000; //anchor0.x uint:m anchorArray[0].y = 0.000; //anchor0.y uint:m anchorArray[0].z = 1.400; //anchor0.y uint:m anchorArray[1].x = 2.400; //anchor1.x uint:m anchorArray[1].y = 0.400; //anchor1.x uint:m anchorArray[1].z = 1.400; //anchor1.y uint:m anchorArray[2].x = 2.400; //anchor1.z uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].z = 1.400; //anchor2.y uint:m anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].x = -1.60; //anchor2.y uint:m anchorArray[3].x = -1.60; //anchor2.y uint:m</pre>	文件 編輯 项目 工具 帮助	
<pre>UWB § trilateration.h uarth int result = 0; vec3d anchorArray[4]; vec3d report; int Range_deca[4]; anchorArray[0].x = 0.000; //anchor0.x uint:m anchorArray[0].y = 0.000; //anchor0.y uint:m anchorArray[0].z = 1.400; //anchor0.z uint:m anchorArray[1].x = 2.400; //anchor1.x uint:m anchorArray[1].y = 0.400; //anchor1.y uint:m anchorArray[1].z = 1.400; //anchor1.z uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].z = 1.400; //anchor2.x uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m</pre>		P
<pre>int result = 0; vec3d anchorArray[4]; vec3d report; int Range_deca[4]; anchorArray[0].x = 0.000; //anchor0.x uint:m anchorArray[0].y = 0.000; //anchor0.y uint:m anchorArray[0].z = 1.400; //anchor0.z uint:m anchorArray[1].x = 2.400; //anchor1.x uint:m anchorArray[1].y = 0.400; //anchor1.y uint:m anchorArray[1].z = 1.400; //anchor1.z uint:m anchorArray[2].x = 2.400; //anchor1.z uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].z = 1.400; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m</pre>	UWB § trilateration.h uart.h	
<pre>vec3d anchorArray[4]; vec3d report; int Range_deca[4]; anchorArray[0].x = 0.000; //anchor0.x uint:m anchorArray[0].y = 0.000; //anchor0.y uint:m anchorArray[0].z = 1.400; //anchor0.z uint:m anchorArray[1].x = 2.400; //anchor1.x uint:m anchorArray[1].y = 0.400; //anchor1.y uint:m anchorArray[1].z = 1.400; //anchor1.z uint:m anchorArray[2].x = 2.400; //anchor1.z uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].z = 1.400; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m</pre>	<pre>int result = 0;</pre>	<b>^</b>
<pre>vec3d report; int Range_deca[4]; anchorArray[0].x = 0.000; //anchor0.x uint:m anchorArray[0].y = 0.000; //anchor0.y uint:m anchorArray[0].z = 1.400; //anchor0.z uint:m anchorArray[1].x = 2.400; //anchor1.x uint:m anchorArray[1].y = 0.400; //anchor1.y uint:m anchorArray[1].z = 1.400; //anchor1.z uint:m anchorArray[1].z = 1.400; //anchor2.x uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].z = 1.400; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].z = 1.400; //anchor2.y uint:m</pre>	<pre>vec3d anchorArray[4];</pre>	
<pre>int Range_deca[4]; anchorArray[0].x = 0.000; //anchor0.x uint:m anchorArray[0].y = 0.000; //anchor0.y uint:m anchorArray[0].z = 1.400; //anchor0.z uint:m anchorArray[1].x = 2.400; //anchor1.x uint:m anchorArray[1].y = 0.400; //anchor1.y uint:m anchorArray[1].z = 1.400; //anchor1.z uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].y = -2.000; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m</pre>	vec3d report;	
<pre>anchorArray[0].x = 0.000; //anchor0.x uint:m anchorArray[0].y = 0.000; //anchor0.y uint:m anchorArray[0].z = 1.400; //anchor0.z uint:m anchorArray[1].x = 2.400; //anchor1.x uint:m anchorArray[1].y = 0.400; //anchor1.y uint:m anchorArray[1].z = 1.400; //anchor1.z uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].y = -2.000; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m</pre>	<pre>int Range_deca[4];</pre>	
<pre>anchorArray[0].y = 0.000; //anchor0.y uint:m anchorArray[0].z = 1.400; //anchor0.z uint:m anchorArray[1].x = 2.400; //anchor1.x uint:m anchorArray[1].y = 0.400; //anchor1.y uint:m anchorArray[1].z = 1.400; //anchor1.z uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].y = -2.000; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].z = 1.400; //anchor2.y uint:m</pre>	<pre>anchorArray[0].x = 0.000; //anchor0.x uint:m</pre>	
<pre>anchorArray[0].z = 1.400; //anchor0.z uint:m anchorArray[1].x = 2.400; //anchor1.x uint:m anchorArray[1].y = 0.400; //anchor1.y uint:m anchorArray[1].z = 1.400; //anchor1.z uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].y = -2.000; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].z = 1.400; //anchor2.y uint:m</pre>	<pre>anchorArray[0].y = 0.000; //anchor0.y uint:m</pre>	
<pre>anchorArray[1].x = 2.400; //anchorl.x uint:m anchorArray[1].y = 0.400; //anchorl.y uint:m anchorArray[1].z = 1.400; //anchorl.z uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].y = -2.000; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m /*anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].z = 1.400; //anchor2.y uint:m</pre>	<pre>anchorArray[0].z = 1.400; //anchor0.z uint:m</pre>	
<pre>anchorArray[1].x = 2.400; //anchorl.x uint:m anchorArray[1].y = 0.400; //anchorl.y uint:m anchorArray[1].z = 1.400; //anchorl.z uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].y = -2.000; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m /*anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].z = 1.400; //anchor2.y uint:m</pre>		
<pre>anchorArray[1].y = 0.400; //anchorl.y uint:m anchorArray[1].z = 1.400; //anchorl.z uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].y = -2.000; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m /*anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].z = 1.400; //anchor2.y uint:m</pre>	<pre>anchorArray[1].x = 2.400; //anchorl.x uint:m</pre>	
<pre>anchorArray[1].z = 1.400; //anchorl.z uint:m anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].y = -2.000; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m /*anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].z = 1.400; //anchor2.y uint:m</pre>	<pre>anchorArray[1].y = 0.400; //anchorl.y uint:m</pre>	
<pre>anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].y = -2.000; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m /*anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].z = 1.400; //anchor2.y uint:m</pre>	<pre>anchorArray[1].z = 1.400; //anchorl.z uint:m</pre>	
<pre>anchorArray[2].x = 2.400; //anchor2.x ulnt:m anchorArray[2].y = -2.000; //anchor2.y ulnt:m anchorArray[2].z = 1.400; //anchor2.z ulnt:m /*anchorArray[3].x = -1.60; //anchor2.x ulnt:m anchorArray[3].y = -2.40; //anchor2.y ulnt:m anchorArray[3].z = 1.400; //anchor2.z ulnt:m</pre>		
<pre>anchorArray[2].y = -2.000; //anchor2.y ulnt:m anchorArray[2].z = 1.400; //anchor2.z uint:m /*anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].z = 1.400; //anchor2.z uint:m*/</pre>	anchorArray[2].x = 2.400; //anchor2.x uint:m	
<pre>anchorArray[2].z = 1.400; //anchor2.z uint:m /*anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].z = 1.400; //anchor2.z uint:m*/</pre>	anchorArray[2].y = -2.000; //anchor2.y uint:m	
<pre>/*anchorArray[3].x = -1.60; //anchor2.x uint:m anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].z = 1.400; //anchor2.z uint:m*/</pre>	anchorArray[2].z = 1.400; //anchor2.z uint:m	
anchorArray[3].x = 1.400; //anchor2.x uint:m anchorArray[3].z = 1.400; //anchor2.z uint:m*/	/ xanchor2rrau[3] x = -1 60: $//$ anchor2 x uint m	
anchorArray[3].z = 1.400; //anchor2.z uint:m*/	anchorarray[3] $v = -2.40$ : //anchor2.v uint:m	
	anchorArray[3].z = 1.400: //anchor2.z uint:m*/	

# 5) 点击验证按钮进行编译

🔤 UWB - trilateration.h   Arduino 1.8.15	_	$\times$
文件 编辑 项目 工具 帮助		
📀 🖸 🛅 🔛 验证		ø
UWB s trilateration.h uart.h		
<pre>vec3d anchorArray[4];</pre>		
vec3d report;		
<pre>int Range_deca[4];</pre>		
<pre>anchorArray[0].x = 0.000; //anchor0.x uint:m</pre>		
<pre>anchorArray[0].y = 0.000; //anchor0.y uint:m</pre>		
<pre>anchorArray[0].z = 1.400; //anchor0.z uint:m</pre>		
<pre>anchorArray[1].x = 2.400; //anchorl.x uint:m</pre>		
anchorArray[1].y = 0.400; //anchorl.y uint:m		
anchorArray[1].z = 1.400; //anchor1.z uint:m		
<pre>anchorArray[2].x = 2.400; //anchor2.x uint:m anchorArray[2].y = -2.000; //anchor2.y uint:m anchorArray[2].z = 1.400; //anchor2.z uint:m</pre>		
<pre>/*anchorArray[3].x = -1.60; //anchor2.x uint: anchorArray[3].y = -2.40; //anchor2.y uint:m anchorArray[3].z = 1.400; //anchor2.z uint:m*,</pre>	n /	

6) 编译完成, 若没错误下一步将进行下载

< |



## 8) 显示上传成功即下载成功

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💿 UWB | Arduino 1.8.15 Х 文件 编辑 项目 工具 帮助 ÷ Ø + t UWB trilateration.h uart.h //实现功能: 将UWB模块拿到的数据实时的拿出来,并进行三点或者四点定位 ۸ #include "uart.h" #include "trilateration.h" //#include "interrupt.h" void setup(){ //Seriall.begin(115200); //UWB模块对应的串口 Serial.begin(115200); while(Serial.read()>=0){}//clearserialbuffer } void loop(void) { decoding(); } 上传成功。 项目使用了 22806 字节,占用了 (70%) 程序存储空间。最大为 32256 字节。 全局变重使用了526字节,(25%)的动态内存,余留1522字节局部变重。最大为2048字节。 Arduino Uno 在 COM78

9) 将任意基站的 TXD 连接到 开发板上的 RX0 上,打开串口监视器,波特率选择 115200



💿 UWB   Arduing	o 1.8.15		- 🗆 X						
文件 编辑 项目 日	L具 幕助 自动格式化	Ctrl+T							
	项目存档								
//实现功能: 将(	修正确的升重新加载 管理库	Ctrl+Shift+I	^						
#include "uar #include "tri	串口监视器 串口绘图器	Ctrl+Shift+M Ctrl+Shift+L	_						
//#include "i	WiFi101 / WiFiNINA Firmwar	re Updater	_						
	开发板: "Arduino Uno"	>	_						
void setup()	取得开发板信息	ŕ	_						
Serial.begi while (Seri	编程器: "AVRISP mkll"	>	_						
}	MOK3199027		_						
<pre>void loop(void) decoding();</pre>	) {		_						
3			_						
			_						
			_						
			_						
A March 1			¥						
工役成功。 项目使用了 22806	字节,占用了 (70%) 程序存储空(	间。最大为 32256 字节。							
全局変重使用了5263	字节,(25%)的动态内存,余留152	22字节局部变里。最大为2048字节。							
15			Arduino Uno 🛞 COM78						
# 💽 👼 I	S 🛛 S 🛗	🦉 😒 💭						^ 😘 👄 🏂 🛛 🖙	23:26 /// ↓×英 2021/6/22 ■
💿 сом	70								
-	/8							_	
-	/8							-	
	/8							_	
T3 range	78 A0:1064 ra	ange Al:2436	5 range A2:3598	range A3:0 x	к:0.12 y:0.0	56 z:0.	58	_	□ × 发送
T3 range T3 range	78 A0:1064 ra A0:1059 ra	ange Al:2436 ange Al:2446	5 range A2:3598 5 range A2:3621	range A3:0 x	x:0.12 y:0.0	56 z:0. 59 z:0.	58	_	ロ × 发送
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# 3.2 下载到 Arduino Mega 2560 开发板

步骤同 3.1,其中第 9 点修改为将任意基站的 TXD 连接到 开发板上的 RX1 上 代码需更改三处地方,如下所示



	📨 UWB   Arduino 1.8.15	_	$\times$
]	文件 编辑 项目 工具 帮助		
			Ø
	UWB trilateration.h uart.h		
	//实现功能: 将UWB模块拿到的数据实时的拿出来,并进行三点或者四点定位		^
	<pre>#include "uart.h" #include "trilateration.h"</pre>		
	//#include "interrupt.h"		
	<pre>void setup(){     Serial1.begin(115200); //UWB模块对应的串口     Serial.begin(115200);</pre>		
	<pre>while(Serial.read()&gt;=0){}//clearserialbuffer } void loop(void){ decoding(); }</pre>		

UWB trilateration.h uart.h	-
int a = 0, b = 0, c = 0,d=0; /******查看是否有完整的65byte数据****/	^
<pre>bool check() {</pre>	
int $i = 0;$	
<pre>int timeout = 0;</pre>	
while (i < 65 && timeout <= 500)	
{	
<pre>if (!Serial1.available())</pre>	
{	
<pre>timeout++;</pre>	
//delayMicroseconds(200);	
continue;	
}	
<pre>timeout = 0;</pre>	
<pre>buff[i++] = Serial1.read();</pre>	
if (i == 65)	
{	
<pre>buff[i] = 0;</pre>	
return 1;	
}	
}	
return 0;	
}	



### 3.3 下载到 Arduino Due 开发板

3.3.1 软件没有带 Due 开发板,需要下载 Due 开发板库,找到开发板管理器,搜索 Due,选择 1.6.12 版本进行安装

O UWB   Arduino 1	.8.15		- 🗆 X		
文件编辑项目工具	有助 自动格式化 项目存档	Ctrl+T	Q		
UWB § trilat //实现功能:将t	停正编码并重新加载 管理库	Ctrl+Shift+I	•		
#include "uar #include "tri	半口监视器 串口绘图器	Ctrl+Shift+M Ctrl+Shift+L			
//#include "i	WiFi101 / WiFiNINA Firmware Upda	later	17 (414-c at 19 19		
woid setup()	开发版: "Arduino Uno" 通口: "COM78" 取屈开分析信目	2	开友板吉理語 Arduino ARM (32-bits) Boards シ Arduino AVR Records		
//Seriall.b Serial.begi	编程器: "AVRISP mkll"	>	Arduno Avic Boards		
shile(seri	成录引导程序				
<pre>void loop(void){   decoding();   }</pre>					
上传成功。			~		
项目使用了 22806 字 全局交里使用了526字节	节,占用了 (70%) 程序存储空间。最步 节,(25%)的动态内存,余留1522字节局	大为 32256 字节。 导部变里。最大为2048	<sup>hosts</sup> ∓TI≎		
15			Arduine Une 在 COM78		
# 💽 🗖 🐧	🖻 🕅 😒 🏭 🐗	o 📀	J	^ 戦 🛥 🎍 🔮 🎟 //( 4× 英 _2021/6/23	2 5
🥯 开发板管	理器				×
类型 全部	~	- due			
Arduino	SAM Boards (	32-bits	ARM Cortex-M		^
by Arduir	no 版本 1.6.12 I	NSTALLE	D		
这个包包含	的开发板:				
Arduino E Online He	oue. elo				
More Info	2				
进择版本	- 安准			開催	
221+7X24	34.61				
					~

3.3.2 安装完成后,选择开发板,选择端口,其他步骤同 3.2







# 4 文档管理信息表

主题	研创物联 UWB 开发板与 Arduino 协同工作
版本	V1.2
参考文档	
创建时间	2019/01/01
创建人	Lynn
最新发布日期	2023/01/01

更改人	日期	文档变更纪录
lypp	2019 01 01	<u>V1.0</u>
супп	2019-01-01	1.0 版本发布
lunn	2021 07 29	<u>V1.1</u>
супп	2021-07-20	重写第2、3章,详细介绍软件下载步骤与注意事项
L. ma	2022 01 01	<u>V1.2</u>
Lynn	2023-01-01	修改格式,研创 23 年全新文档视觉