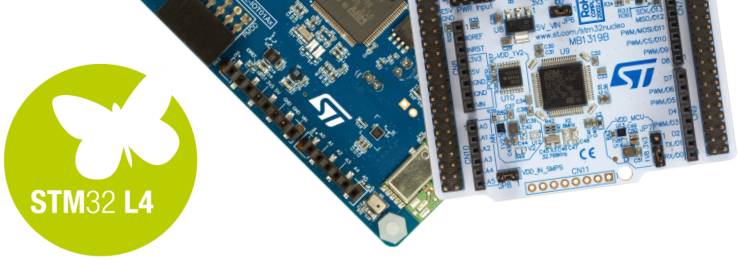

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Step 3:

34 min

UART and new board introduction

Target description

Following this tutorial, you will:

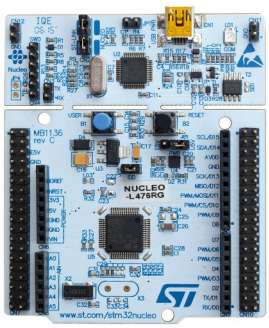
- get familiar with the L475 IoT Node Discovery Board,
- learn how to program and use a RS232 serial link on
  - previously used **NUCLEO-L476RG**
  - **L475 IoT Node Discovery Board (B-L475E-IOT01A).**

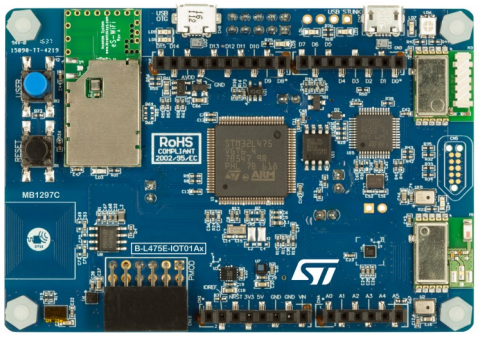
Prerequisites

Previous tutorials:
Step 1: Tools installation and first test
Step 2: Blinking LED with STM32CubeMX and HAL

Hardware

- **NUCLEO-L476RG** board (64-pin), available on www.st.com/en/evaluation-tools/nucleo-l476rg.html
- **STM32L4 Discovery kit IoT node** (B-L475E-IOT01A), available on www.st.com/en/evaluation-tools/b-l475e-iot01a.html
- USB cables 'Type-A to Mini-B' and 'Type-A to Micro-B'





Literature

- **STM32L4 Online Training: STM32L4 Peripheral USART**
- **UM1F727** Getting started with STM32 Nucleo board software development tools

Stages

- 1: Introduction to the UART I/F on NUCLEO-L476RG
- 2: Introduction of L475 IoT Node Discovery Board
- 3: Introduction to the UART I/F on L475 IoT Node Discovery Board

UART I/F usage Introduction

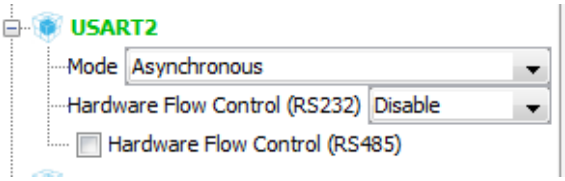
1: UART I/F INTRODUCTION ON NUCLEO-L476RG

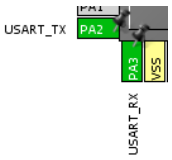
This tutorial will explain you how to configure and program RS232 on NUCLEO-L476RG.

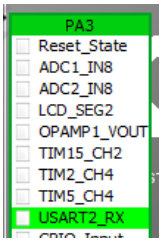
12 min

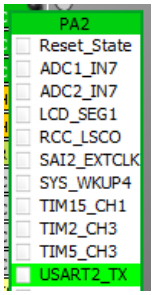
CREATE NUCLEO-L476RG UART PROJECT USING CUBEMX

- Create a new project using STM32CubeMX.
- Select NUCLEO-L476RG board using board selector.
- Answer *Yes* to *Initialize all peripherals with their default Mode ?* popup.
- In *Pinout* tab that USART2 mode in configured to Asynchronous, PA2 is connected to USART2_TX and PA3 is connected to USART2_RX.

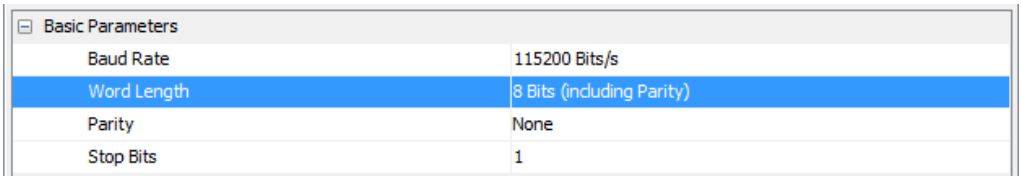




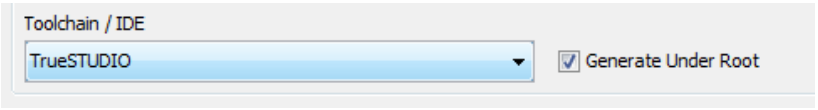




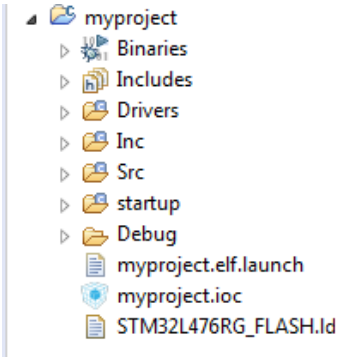
- Click on *USART2* button in *Configuration* tab and set *Word Length* to *8 Bits* .
- Make sure that the settings are as in the screenshot below:



- Disable all other USARTs.
- Click on *Apply* then *OK*.



- Go to *Project* menu and click on *Settings*. Select *TrueSTUDIO* as *Toolchain / IDE*, give a name to your project then click *OK* .
- Click on *Project* then *Generate Code* and accept to open your project in TrueSTUDIO.




```
huart2.Instance = USART2;
huart2.Init.BaudRate = 115200;
huart2.Init.WordLength = UART_WORDLENGTH_8B;
huart2.Init.StopBits = UART_STOPBITS_1;
huart2.Init.Parity = UART_PARITY_NONE;
huart2.Init.Mode = UART_MODE_TX_RX;
huart2.Init.HwFlowCtl = UART_HWCONTROL_NONE;
huart2.Init.OverSampling = UART_OVERSAMPLING_16;
huart2.Init.OneBitSampling = UART_ONE_BIT_SAMPLE_DISABLE;
huart2.AdvancedInit.AdvFeatureInit = UART_ADVFEATURE_NO_INIT;
```

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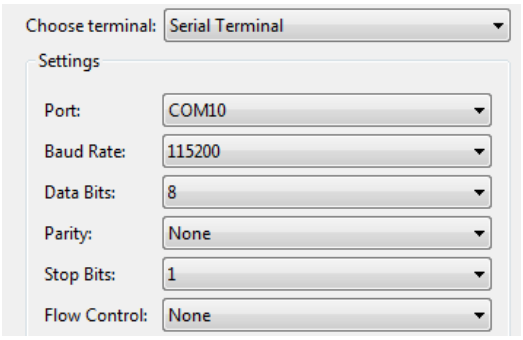
EDIT AND COMPILE NUCLEO-L476RG UART PROJECT USING TRUESTUDIO

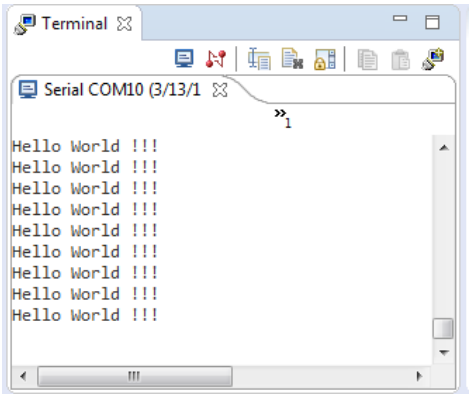
- Open *main.c* in Project Explorer / myproject / Src / main.com.
- Insert the following lines:

```
uint8_t Test[] = "Hello World !!!\r\n"; //Data to send
HAL_UART_Transmit(&huart2,Test,sizeof(Test),10);// Sending in normal mode
HAL_Delay(1000);
```

  between /* USER CODE BEGIN 3 */ and /* USER CODE END 3 */

- Click on *Build* button to compile the project.
- Click in *Debug* button to run the software.
- Click on *Console* button to open a console, select *Data bits: 8* and click *OK* . Port name may differ on your PC.
- TrueSTUDIO will open Debug perspective. Click on *Resume* button to execute your code.
- *Terminal* Window will display *Hello World !!!* string confirming you were able to program and use RS232.





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IoT Node Board Introduction

2: IOT NODE BOARD INTRODUCTION

10 min

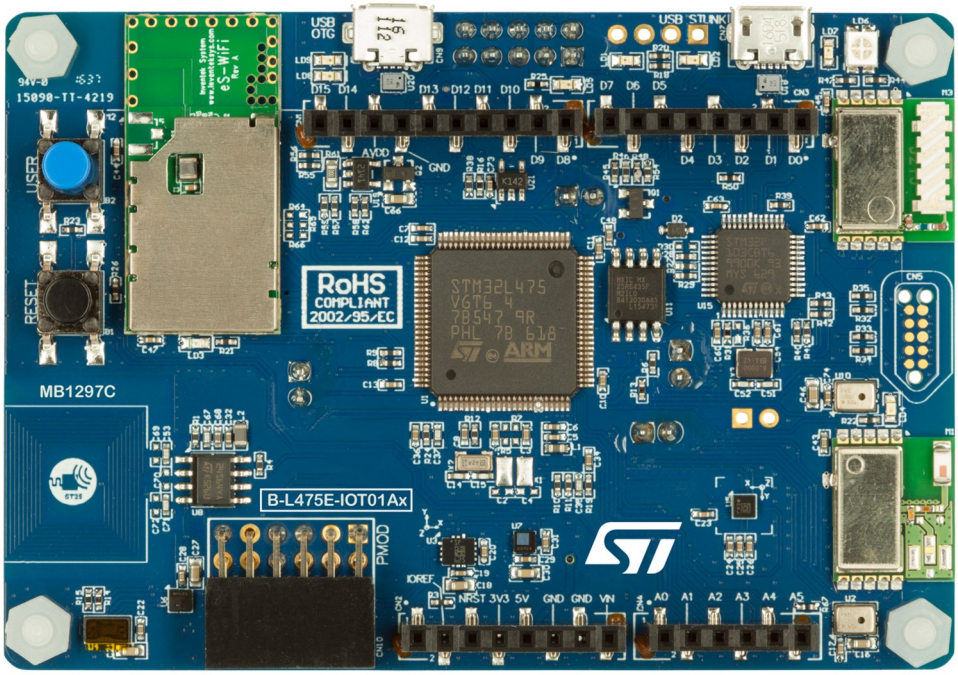
QUICK VIEW

The B-L475E-IOT01A Discovery kit for IoT node allows users to develop applications with direct connection to cloud servers.

KEY FEATURES

The Discovery kit enables a wide diversity of applications by exploiting low-power communication, multiway sensing and ARM® Cortex®-M4-core-based STM32L4 Series features.

MORE INFORMATION ON ST WEBSITE



arm MBED Enabled

STM32 L4

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UART I/F on IoT Node Board

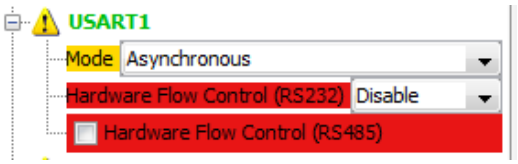
3: UART I/F INTRODUCTION ON B-L475E-IOT01A

12 min

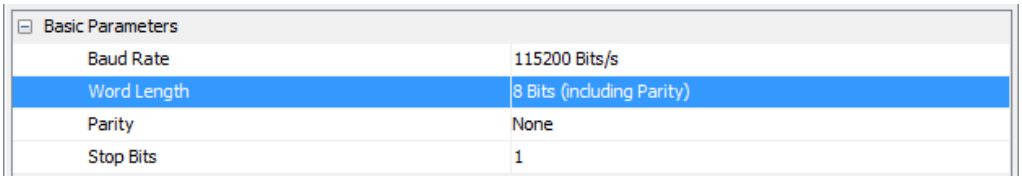
This tutorial will explain you how to configure and program RS232 on B-L475E-IOT01A .

CREATE B-L475E-IOT01A UART PROJECT USING CUBEMX

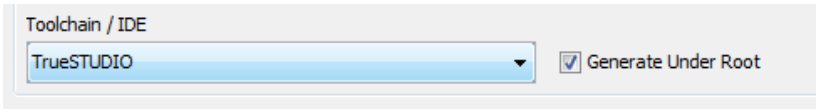
- Create a new project using STM32CubeMX.
- Select B-L475E-IOT01A board using board selector.
- Answer *Yes* to the following popup *Initialize all peripherals with their default Mode ?* .
- Verify in *Pinout* tab that USART1 mode in configured to Asynchronous.
- Click on *USART1* button in Configuration tab and set *Word Length* to *8 Bits* .

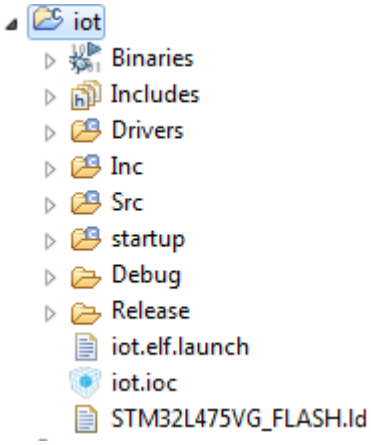


- Verify that *Baud Rate* is *115200 Bits/s*, *Parity* is *None* and *Stop Bits* is *1* .
- Disable all other USART.
- Click on *Apply* then *OK* .



- Go to *Project* menu and click on *Settings*. Select *TrueSTUDIO* as *Toolchain / IDE* , give a name to your project then click *OK*.
- Click on *Project* then *Generate Code* and accept to open project in TrueSTUDIO.






```
huart1.Instance = USART1;
huart1.Init.BaudRate = 115200;
huart1.Init.WordLength = UART_WORDLENGTH_8B;
huart1.Init.StopBits = UART_STOPBITS_1;
huart1.Init.Parity = UART_PARITY_NONE;
huart1.Init.Mode = UART_MODE_TX_RX;
huart1.Init.HwFlowCtl = UART_HWCONTROL_NONE;
huart1.Init.OverSampling = UART_OVERSAMPLING_16;
huart1.Init.OneBitSampling = UART_ONE_BIT_SAMPLE_DISABLE;
huart1.AdvancedInit.AdvFeatureInit = UART_ADVFEATURE_NO_INIT;
```

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EDIT AND COMPILE B-L475E-IOT01A UART PROJECT USING TRUESTUDIO

- Open *main.c* in Project Explorer / myproject / Src / main.com .
- Insert the following lines:

```
uint8_t Test[] = "Hello World !!!\r\n"; //Data to send
HAL_UART_Transmit(&huart1,Test,sizeof(Test),10);//Sending in normal mode
HAL_Delay(1000);
```

  between /* USER CODE BEGIN 3 */ and /* USER CODE END 3 */

- Click on *Build* button to compile the project.
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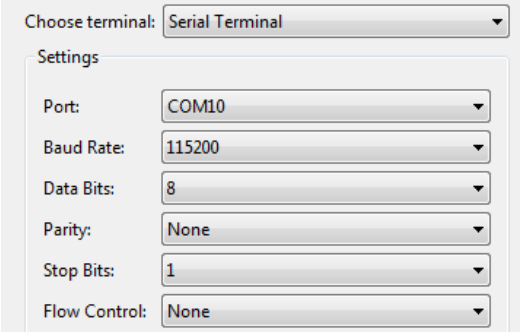
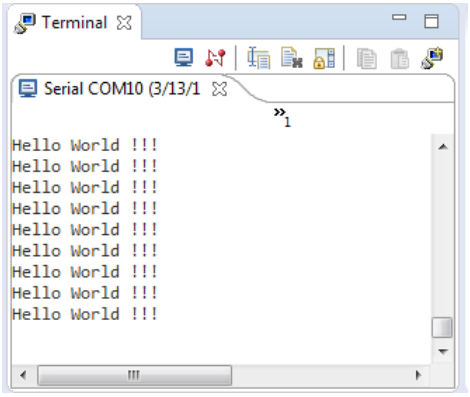
- Click on *Console* button to open a console, select *Data bits: 8* and click *OK*. Port name may differ on your PC.
- TrueSTUDIO will open Debug perspective. Click on *Resume* button to execute our code.
- Terminal Windows will display *Hello World !!!* string confirming we were able program and use RS232.





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Conclusion

Now you are able to:

- use the UART I/F on NUCLEO-L476RG
- use L475 IoT Node Discovery Board
- use the UART I/F on L475 IoT Node Discovery Board