

## CRYSTAL XE APPLICATION NOTE

Use the Arduino with Crystal XE

### 1 Introduction

This application note demonstrates how to control a servo motor with Crystal XE by using an Arduino UNO. Crystal XE communicates with the Arduino UNO through the USB by using the serial modbus RTU protocol.

This document will explain step by step how to proceed.

- Hardware requirements
- Download the Arduino software and install it
- Download the modbus library
- Connect the servo motor and connect the Arduino to the computer
- Compile and transfer the program to the Arduino
- Execute and configure Crystal XE
- Test

### 2 Hardware requirements and wiring

#### Arduino UNO

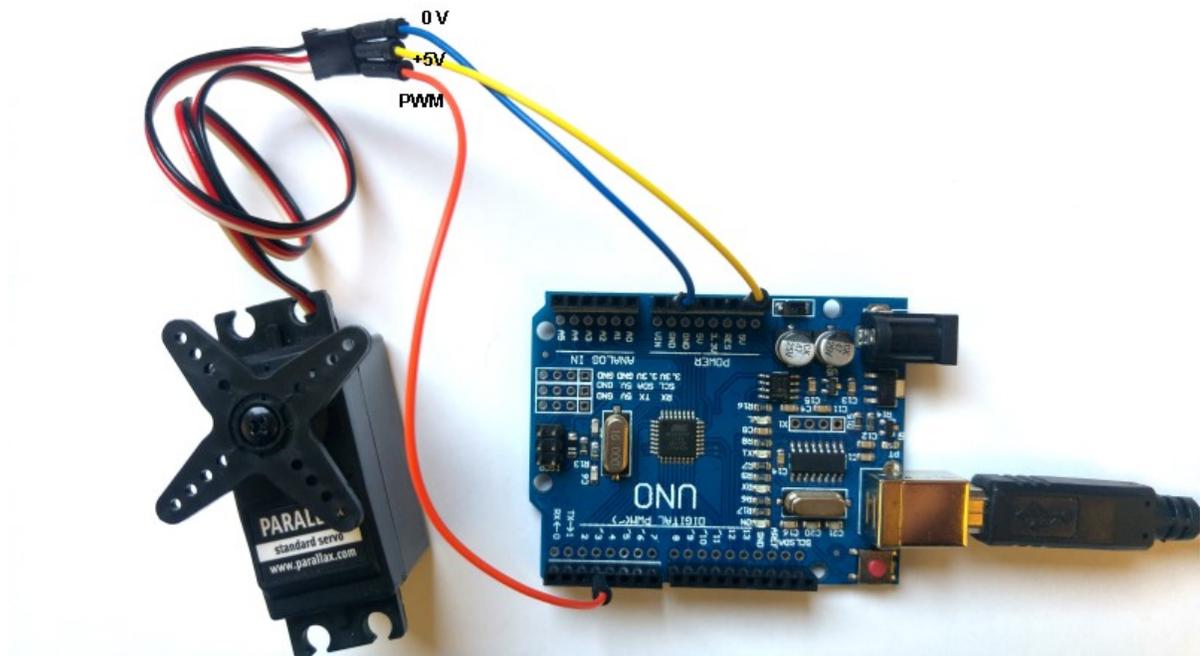


The Arduino must be connected to the computer on which Crystal XE is installed using a USB cable.

#### Servo motor



#### Wiring



The servo motor must be connected to the power supply 0V/+5V and the PWM wire must be connected to the DO3. The PWM (pulse wave modulation) outputs are located on the board by the sign ~ in front of the concerned pins. It is the case for outputs 3,5,6,9, 10 and 11.

### 3 Arduino Software

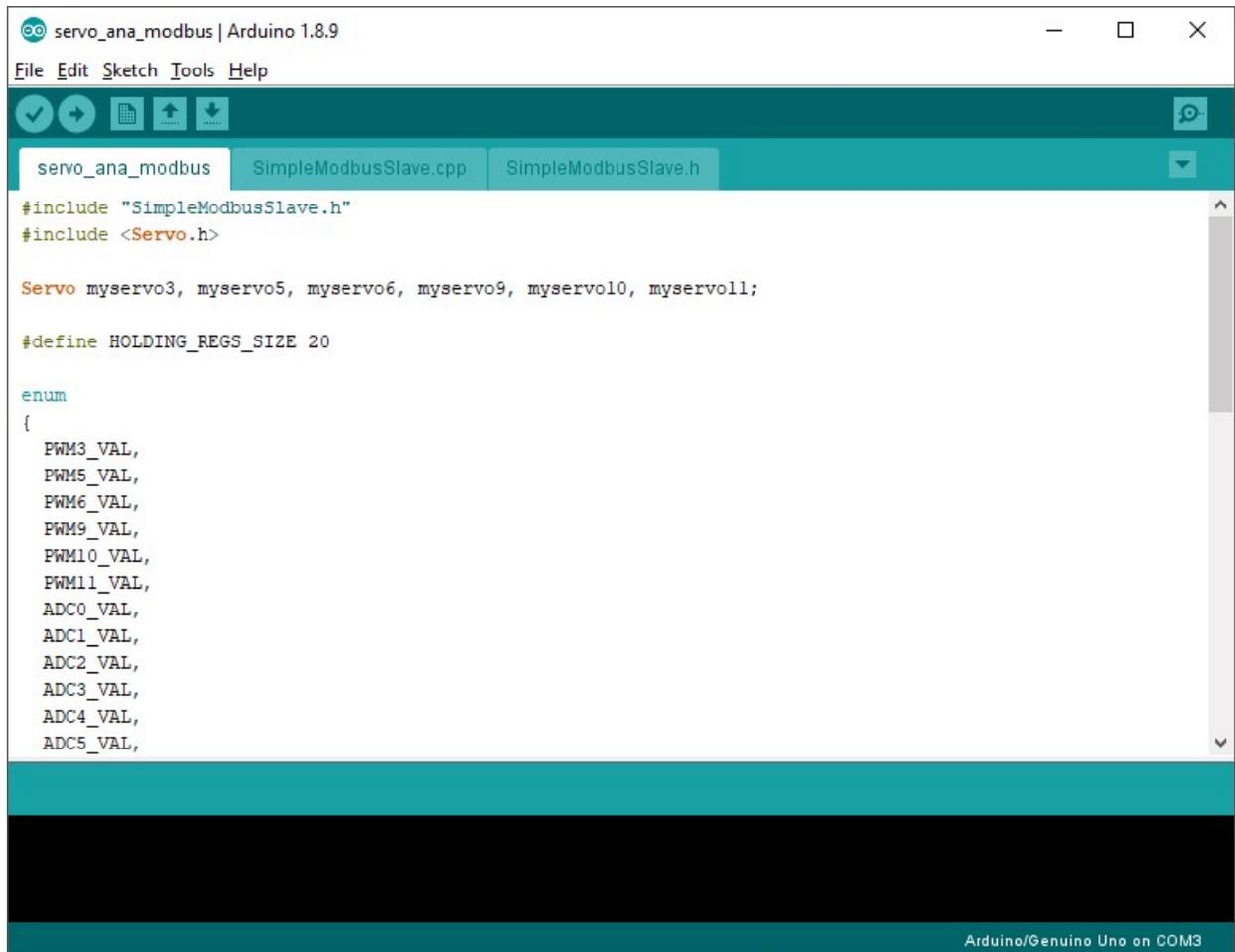
Download the Arduino software on the official web site <https://www.arduino.cc/> and click on the tab Software and Downloads.

Install the software on your computer with the default settings.  
In your desktop create a folder named “Arduino\_testing”

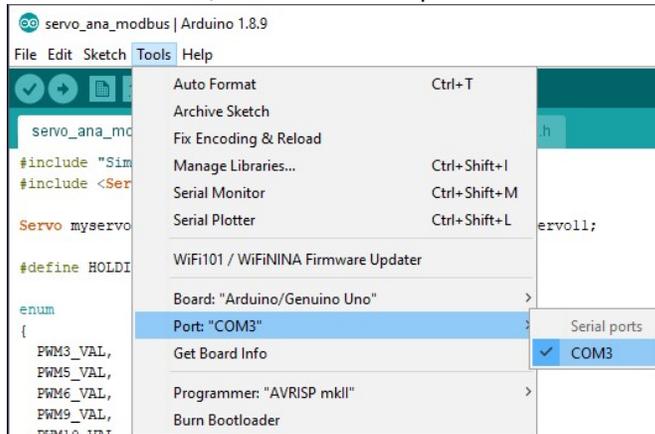
Download the demo resources here: [http://www.crystalxe.com/files/faq/AN005\\_resources.zip](http://www.crystalxe.com/files/faq/AN005_resources.zip)

Extract all the files in a directory named “Arduino\_testing”

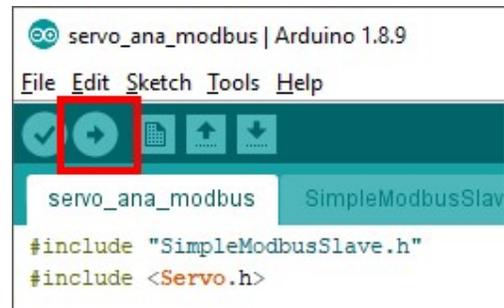
Click on the file *servo\_ana\_modbus.ino*.  
This will open the Arduino software.



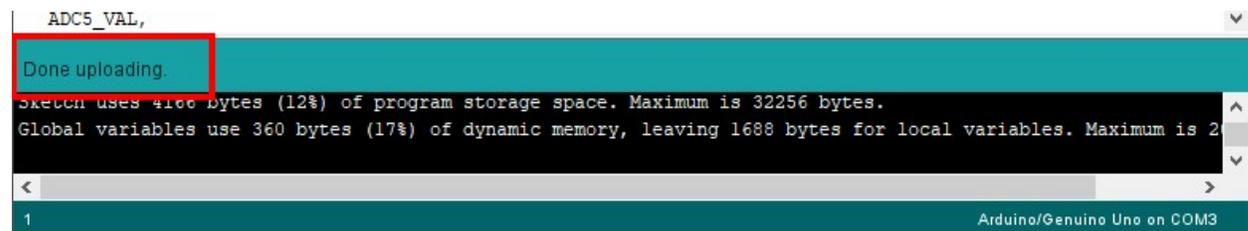
In the tool menu, check the serial port on which the Arduino is connected:



Then click on the button to upload the program into the Arduino:



Wait until the software indicates that the transfer is complete.



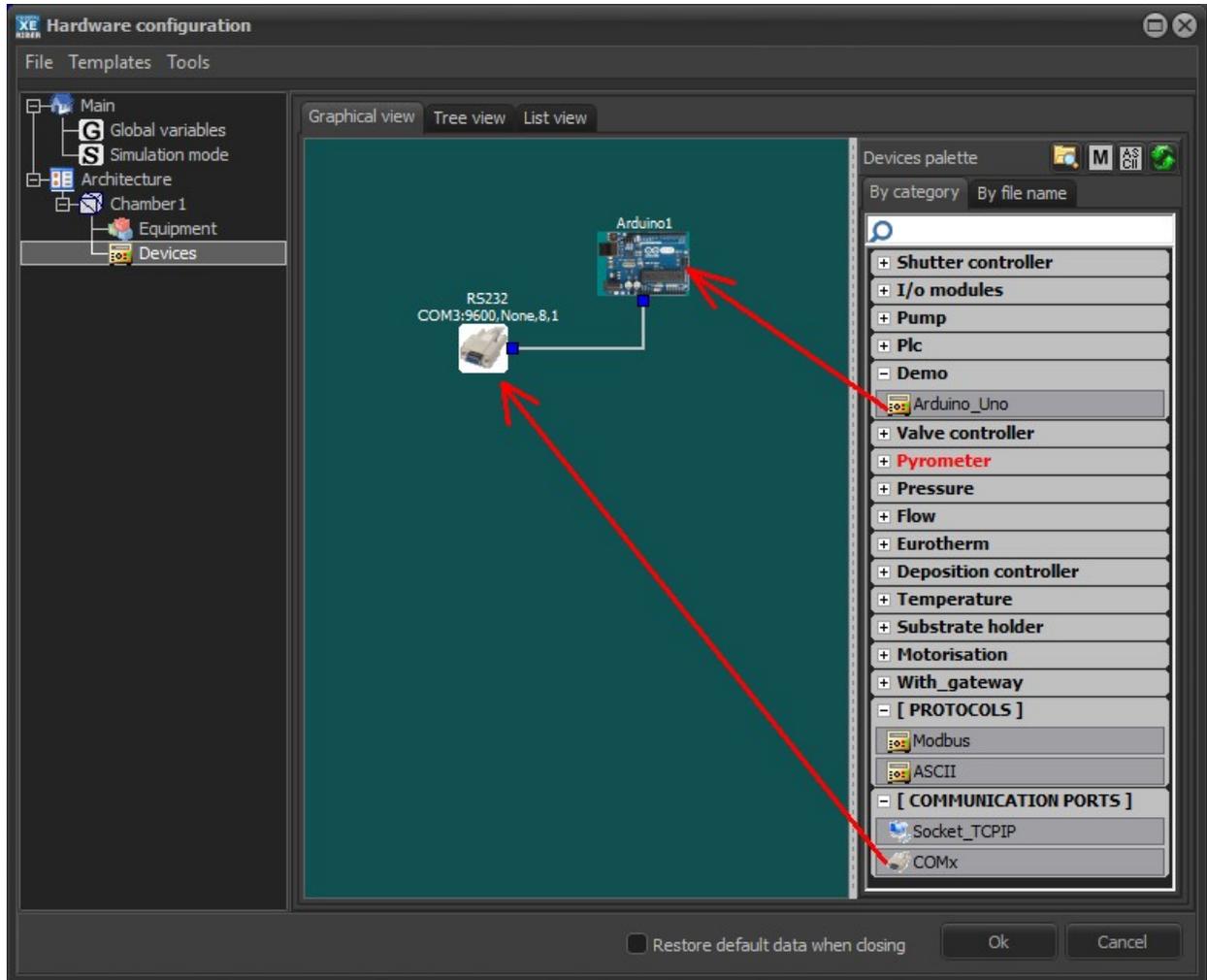
#### 4 [Configuration of Crystal XE](#)

Download and install Crystal XE from the web site <https://www.crystalxe.com/download>. You need a valid license to test this application note. If you don't have one, contact us to get a free limited license in time. If you do not have a valid license, you will not be able to communicate with the Arduino.

In Crystal XE, create a new project: in the menu select File/New/Project and give a name for this project : "Arduino\_project"

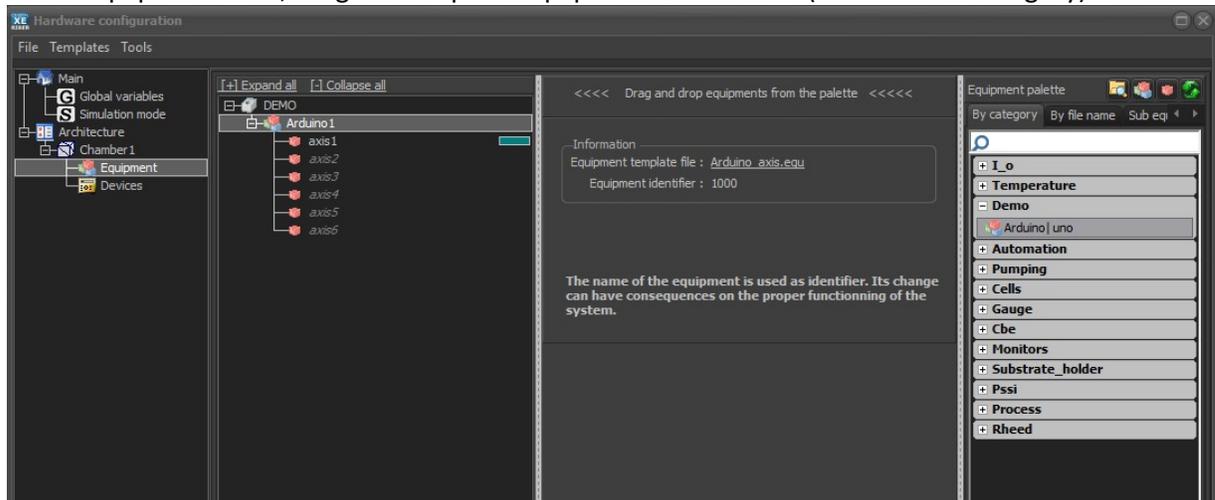
The hardware configuration window must be opened automatically after creating the new project. If not, or later if you want to access the hardware configuration, click on the menu **Setup/Hardware configuration** or click on the button located on the most top and right and click on the button hardware configuration.

In the item Devices, Drag and drop the device Arduino device (see image below). Drag and drop a serial com port and make a connection between both modules.



Double click on the serial com port and select the same number that one defined in the Arduino software, and setup the serial module to 9600, no parity, 8 data bits.

In the equipment item, drag and drop the equipment for Arduino (in the Demo category)

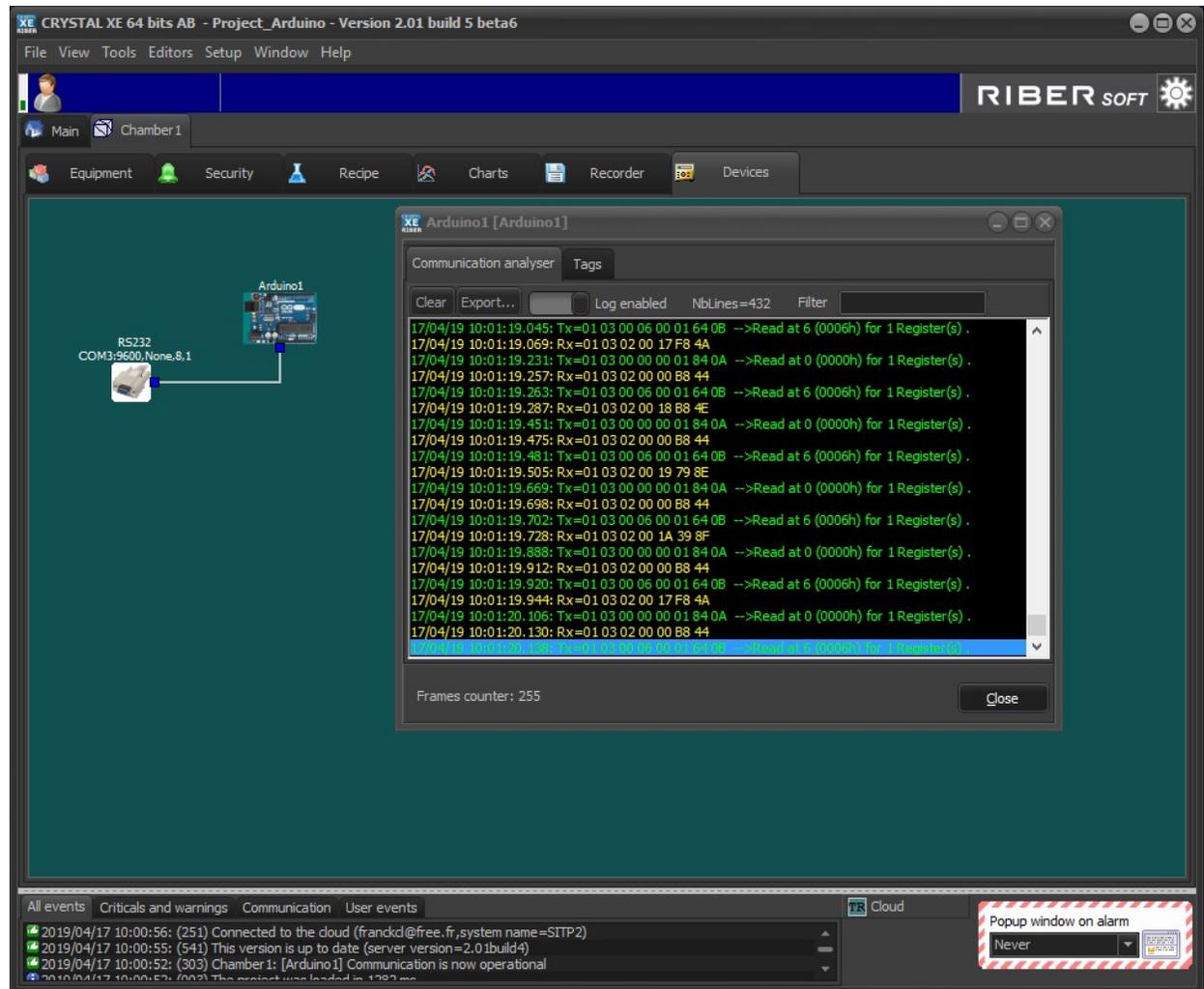


Make the link for the axis1 to the Arduino device.

Close the hardware configuration window by pushing on the OK button.

## 5 [Runtime](#)

You can check the communication with the Arduino by double clicking on the Arduino module in the Devices tab



You should be able to control the servo motor from Crystal XE

