NTx meter IC8 for Arduino

Introduction

NTx Meter is a multiparametric electrochemical meter from the IMACIMUS Series.

It can be used to obtain mV readings (electrochemical sensors – ion selective electrodes) with high impedance input.

The communication protocol through Rx,Tx, GND, is easily used for Arduino based Systems.

The NTxMeter is used with an Arduino in order to obtain the raw signal from 8 indepedent ion selective electrodes simultaneously.

This allow to obtain the results from the MultiION probe electrodes directly to your Arduino based System/ or similar.

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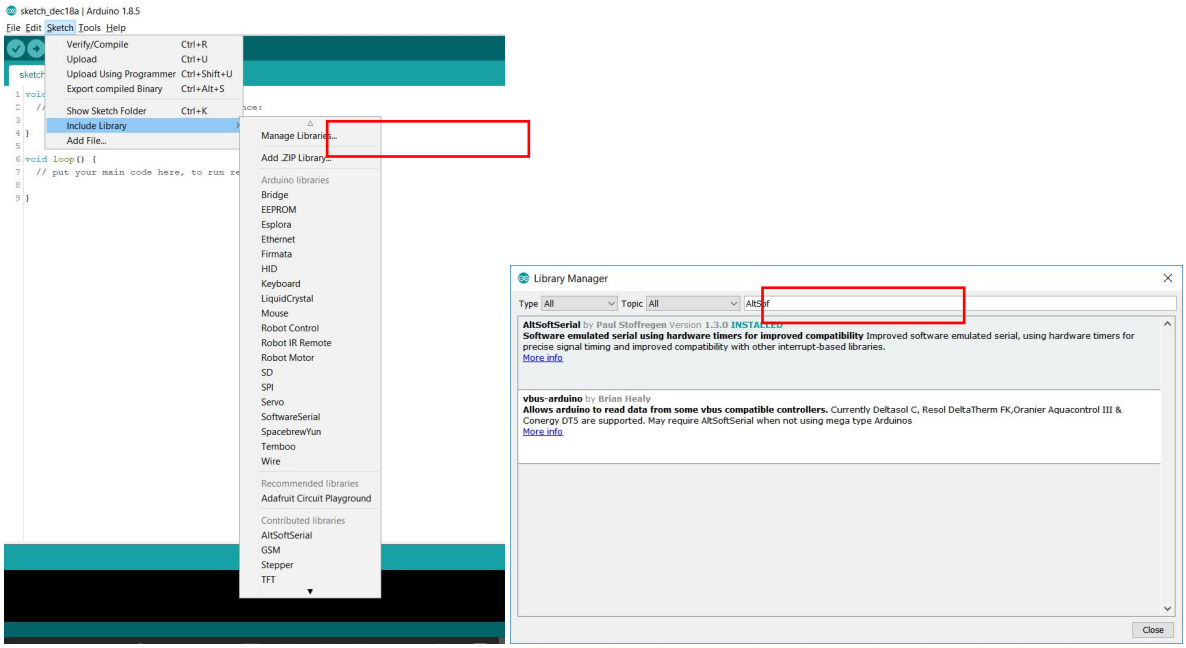
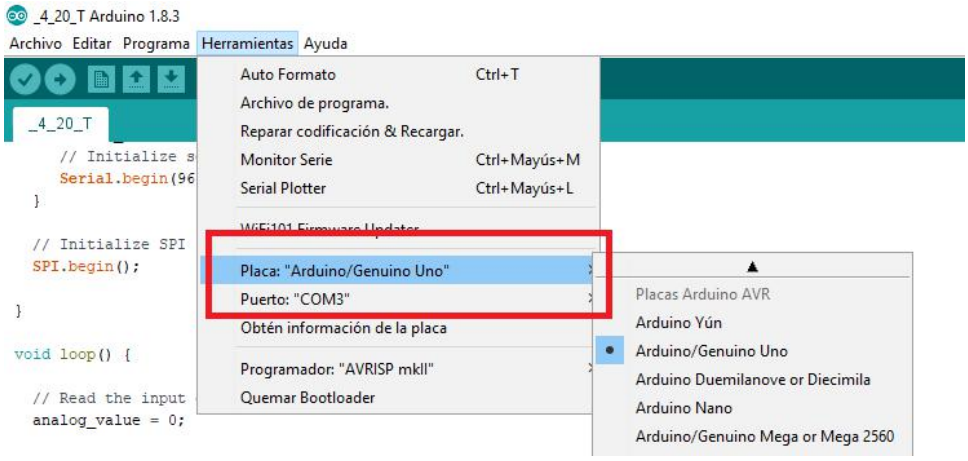
1. Arduino Software

- Download your Arduino IDE from Arduinos official website
- Open the Software Arduino.
- Go to Sketch, Include Library, select Manage Libraries
- Import library **AltSoftSerial**, by typing in the search
- Install AltSoftSerial Library.



2. Upload program your Arduino

- Connect your Arduino to the PC through an USB cable
- Go to TOOLS, and select your Arduino Board, and the Port (COM)
- Use the code for Arduino (see section 3) / import the project file*.ino
- Compile and upload.



3. CODE for ARDUINO

The ino code for arduino is:

```
#include <AltSoftSerial.h>
AltSoftSerial mySerial;

char toSend[4];
byte toRead[36];
byte toRecieve[4];
boolean measureState;
int i,len;
signed long tmp;
signed long m[8];
int num_ions=8;

void setup()
{
  measureState = false;
  Serial.begin(9600); // pc serial
  mySerial.begin(9600); //meter serial
}

void loop()
{
 Serialreceive();
 while (measureState == true)
 {
  rebre_Dades();
  delay(10);
 }
 delay(10);
}
void Serialreceive()
{
  if (Serial.available()>0)
  {
    Serial.readBytes(toRecieve, 4);    // get the new byte:
    if (toRecieve[0]==0x4D) //Mesurar 1 'M'
    {
      toSend[0] = 0x02;    // the value 02 represents the measure instruction.
      toSend[1] = 0x00;
      toSend[2] = 0x00;
      toSend[3] = 0x00;
      for(int i=0;i<4;i++)
      {
        mySerial.print(toSend[i]);
      }
      measureState=true;
      Serial.println("Measuring ...");
    }
  }
}

void rebre_Dades()
{
  if (mySerial.available()>0)
  {

    len = mySerial.readBytes(toRead,36 );
    Serial.print("HEX code: ");
    for (i=0; i<len; i++)
    {

      Serial.print(toRead[i], HEX);
      Serial.print(" ");
    }
    if (toRead[0]==0x01 && toRead[1]==0x02 && toRead[34]==0x03 && toRead[35]==0x04)//
    {
      for (i = 0; i < num_ions; i++)
          {
            tmp = toRead[2 + 4 * i]; // int tmp
            tmp <<= 8;
            tmp |= toRead[3 + 4 * i];
            tmp <<= 8;
            tmp |= toRead[4 + 4 * i];
            tmp <<= 8;
            tmp |= toRead[5 + 4 * i];
            m[i] = tmp/100;
            Serial.println();
            Serial.print("ION number ");
            Serial.print(i+1);
            Serial.print("\t");
            Serial.print("value: ");
            Serial.print(m[i]);
            Serial.print(" mV");

          }
         measureState=false;
         Serial.println();
     }
  }
}
```

4. Connect Arduino to Meter

The Arduino is going to be connected to the meter with Rx,Tx, using the Alternative Software Serial Library .

Different model of Arduino use different pins to receive and transmitte. Here is the example for the Arduino UNO and Arduino Mega 2560.- Please refer to the library when using other boards.

Item	Arduino UNO	Arduino Mega 2650	NtxMeter
receive- RX	8	48	RX
transmit -TX	9	46	TX
GND	GND	GND	GND
5V	5V	5V	5V

The output RX, Tx , 5Vand GND from the Nxtmeter will be Connected to the Arduino inputs digital, GND and 5V .

NTx Meter needs a power supply of 5V 0.5A. It can be used Arduino Board as described or use the microusb from the Ntxmeter to a 5V USB source.

5. Multiprobe - NTxMeter

Plug the probes to the NtxMeter:

-Multi ION Probe, using the USB available in the meter.

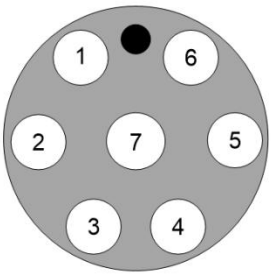
-pH Electrode, make a 90 degree turn

Just take into account that pH electrode must be dipped together with the multiprobe in order to obtain the measurement/calibration.

Please take a look on the complete userguide for multiprobe calibration and measurement.

- Each channel is according to your probes sketch.

Measurement will be prompted to read out after 60 seconds of immersing probes in a standard/sample.



6. Receive data from NTxmeter

- Open the Serial Monitor (TOOLS/ Serial Monitor)
- Type M and press Enter /Send (**please note M is in capital letter**)
- The Serial monitor will be updated as follows:
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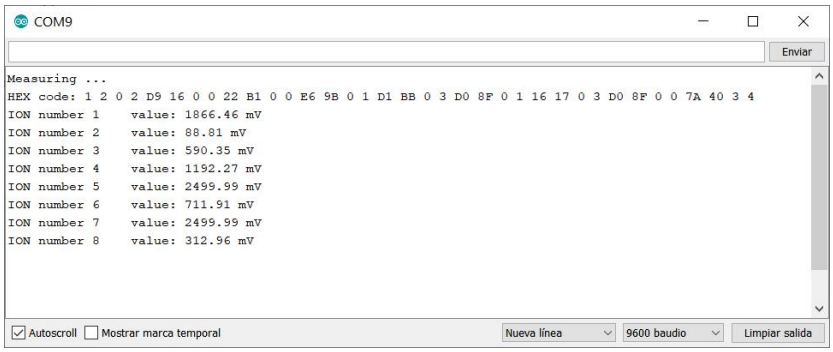
- The measurement will take around 60 seconds to appear.
- DATA will be printed in the screen.



Startframe is 0x01 and 0x02. Endframe is 0x03 i 0x04.

The data is according to Multiprobe channel, and BNC input.

ION number 1 value: Channel 1

ION number 2 value: Channel 3

ION number 3 value: Channel 3

ION number 4 value: Channel 4

ION number 5 value: Channel 5

ION number 6 value: Channel 6

ION number 7 value: Channel 7

ION number 8 value: pH /BNC Channel

*Please take note on mV is proportional to the logarithm on the concentration.

7. Assistance and technical support

With the acquisition of a IMA CIMUS, Multi ION and pH Analyser, you are not going to be alone doing the measurement.

A team of technical experts is available for:

Fit the best calibration solutions to your application

Doubt resolution in the installation and start-up

Please contact to the Technical Service Assistance for customers from NT Sensors.

E-mail: tech.support@ntsensors.com

Skype: atencion.cliente.ntsensors

Phone: (+34) 977 653 925