Parallax USB RFID Reader

Hans-Petter Halvorsen

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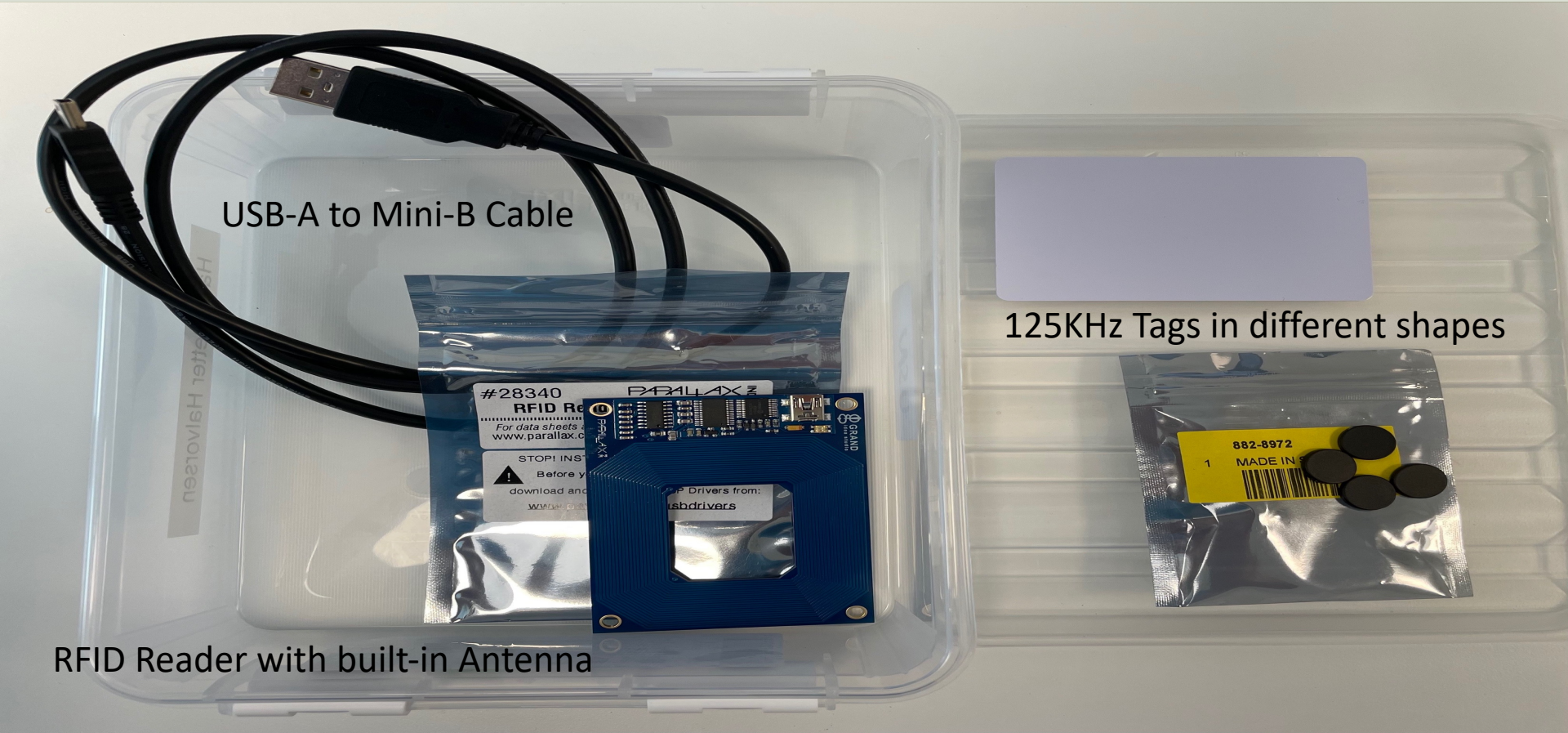
Parallax USB RFID Reader

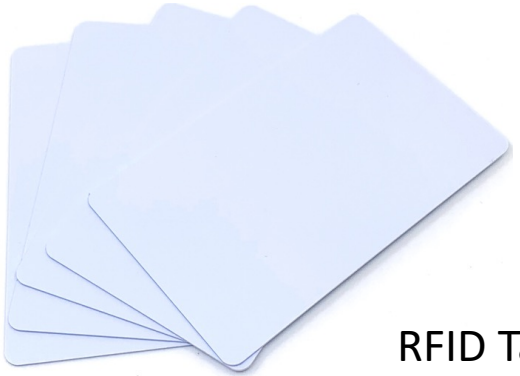


RFID 125KHz

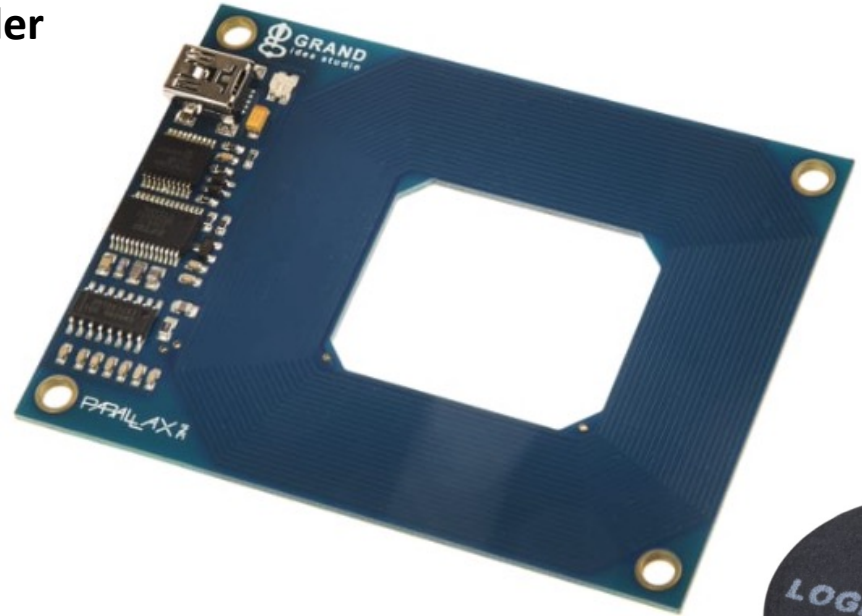
Reads 125kHz Tags with EM4100 protocol

Parallax Inc 28340 RFID Reader

USB RFID Reader



RFID Tags



RFID Tags

https://www.parallax.com/product/rfid-card-reader-usb/

https://no.rs-online.com/web/p/rf-modules/7813061/

Parallax USB RFID Reader

From Parallax USB RFID Reader Documentation

- It reads passive **125 kHz** RFID transponder tags
- The Parallax RFID Card Reader USB version can be connected directly to any PC, Macintosh, or Linux machine that has a USB port and the appropriate drivers installed. The module is powered from the host computer's USB port and uses an industry-standard **FTDI FT232R** device to provide the USB connectivity
- A visual indication of the state of the RFID Card Reader is given with the on-board LED. When the module is successfully powered-up and is in an idle state, the LED will be **GREEN**. When the module is in an active state searching for or communicating with a valid tag, the LED will be **RED**.
- The RFID Card Reader USB version is activated via the **DTR** line of the USB Virtual COM port. When the DTR line is set HIGH, the module will enter the active state. When the DTR line is set LOW, the module will enter the idle state.
- RFID Tag read distance of approximately 4 inches (**10cm**).

Parallax USB RFID Reader

Communication Protocol:

- The RFID Card Reader USB version transmits the data through the USB Virtual COM Port driver
- All communication is 8 data bits, no parity, 1 stop bit, and least significant bit first (8N1) at 2400 bps.
- When the RFID Card Reader is active and a valid RFID transponder tag is placed within range of the activated reader, the tag's unique ID will be transmitted as a 12-byte printable ASCII string serially to the host in the following format:

Parallax USB RFID Reader

Communication Protocol:

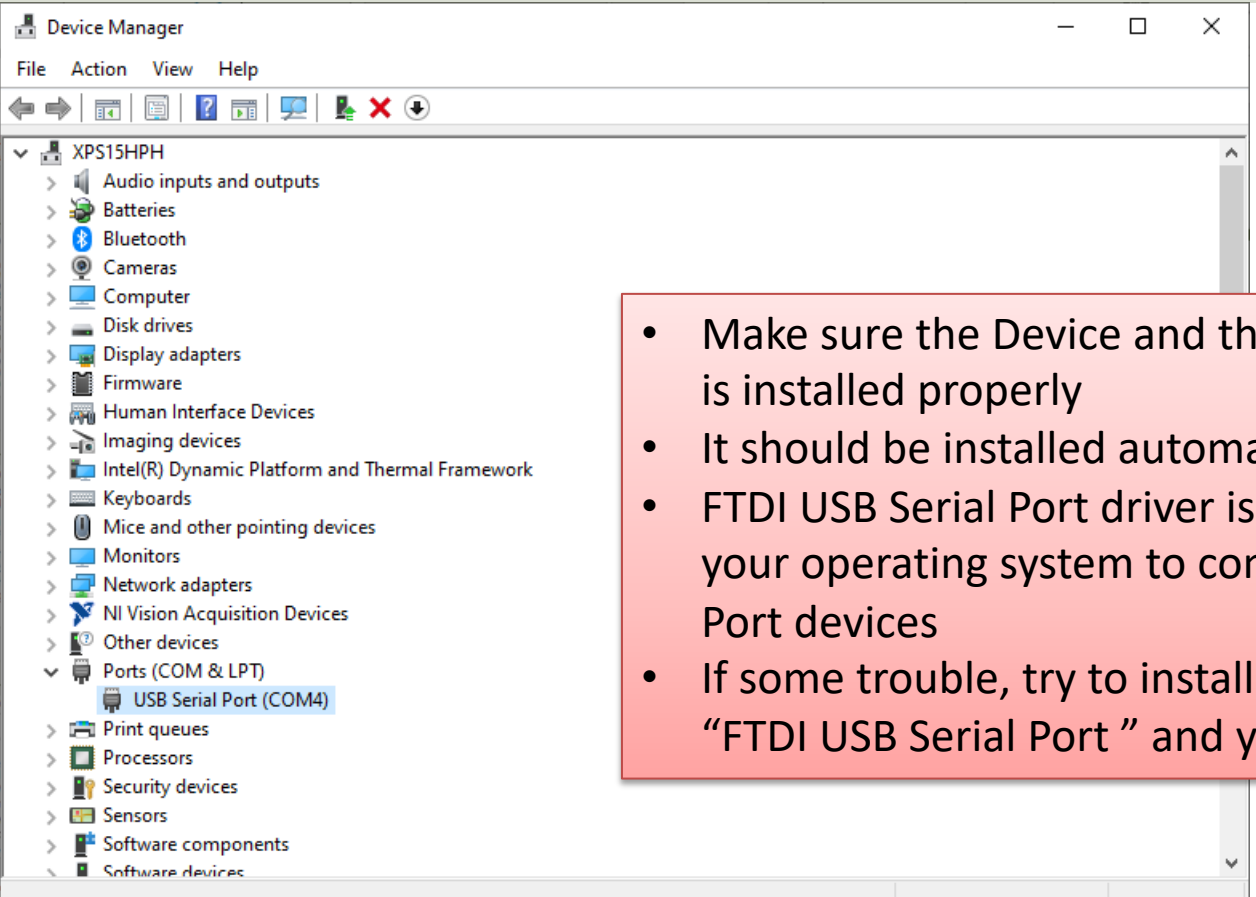
Start Byte (0x0A)	Unique ID Digit 1	Unique ID Digit 2	Unique ID Digit 3	Unique ID Digit 4	Unique ID Digit 5	Unique ID Digit 6	Unique ID Digit 7	Unique ID Digit 8	Unique ID Digit 9	Unique ID Digit 10	Stop Byte (0x0D)

The start byte and stop byte are used to easily identify that a correct string has been received from the reader (they correspond to line feed (\n) and carriage return (\r) characters, respectively).

The middle ten bytes are the actual tag's unique ID.

For example, for a tag with a valid ID of 0F0184F07A, the following bytes would be sent: 0x0A, 0x30, 0x46, 0x30, 0x31, 0x38, 0x34, 0x46, 0x30, 0x37, 0x41, 0x0D.

Setup and Configuration



Device Manager

- Make sure the Device and the FTDI USB Serial Port driver is installed properly
- It should be installed automatically y Windows
- FTDI USB Serial Port driver is the software that helps your operating system to communicate with USB Serial Port devices
- If some trouble, try to install the diver manually (Google “FTDI USB Serial Port ” and you will find it)

Serial Terminal Software

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Serial Terminal Software

Examples:

- RealTerm
- YAT
- Hterm
  - https://www.der-hammer.info/pages/terminal.html
- ..

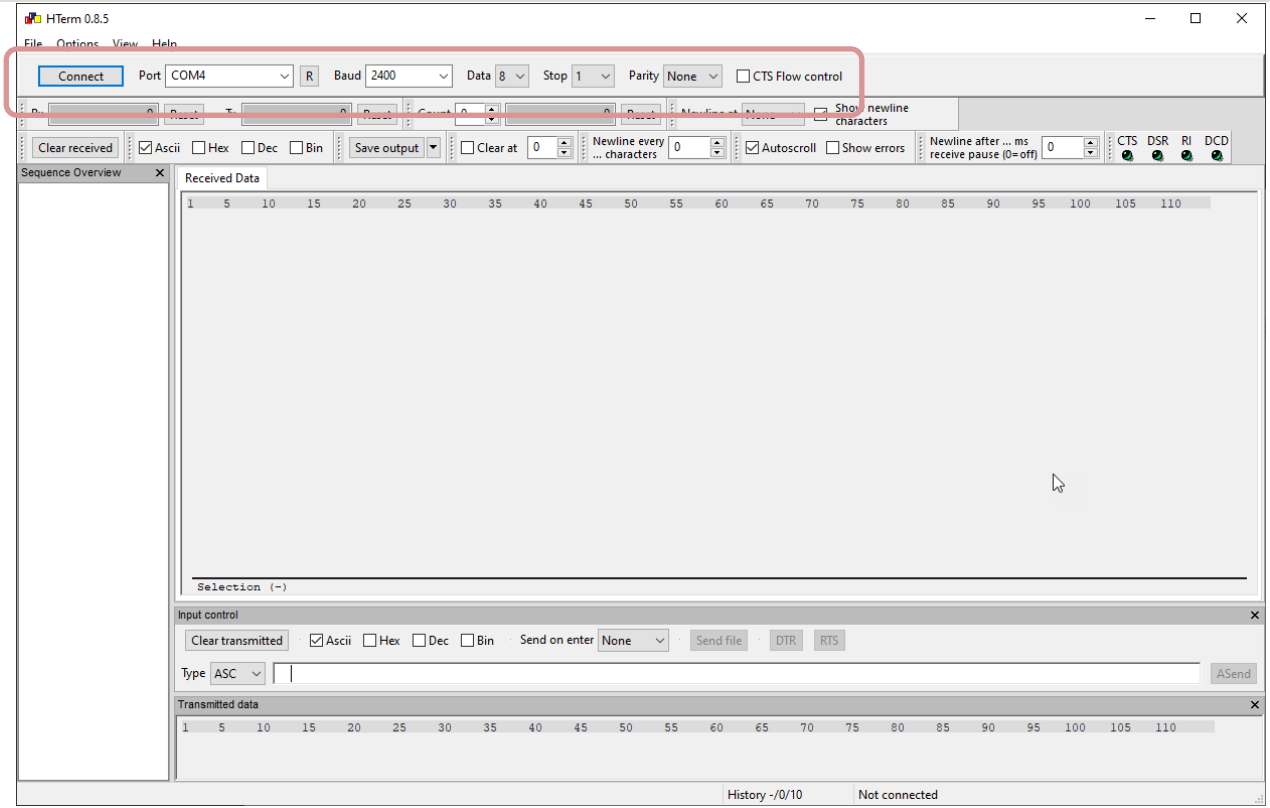
Parallax USB RFID Reader

Communication Protocol for Parallax USB RFID Reader:

- Baud rate **2400 bps**
- **8** data bits
- **1** stop bit
- no parity

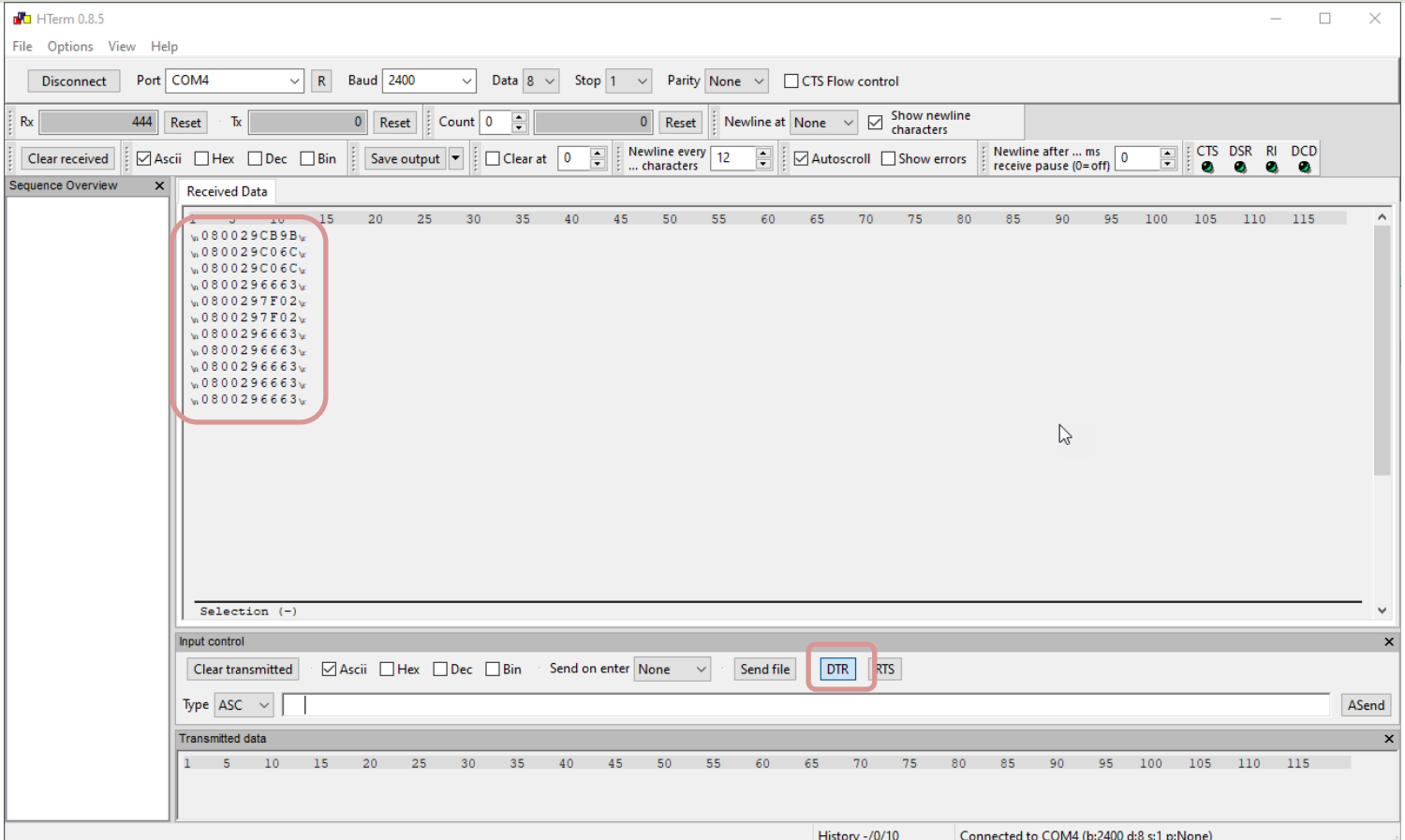
Parallax USB RFID Reader

HTerm



https://www.der-hammer.info/pages/terminal.html

HTerm – Retrieving Tag Id



Code Examples

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Code Examples

Note!

- The examples provided can be considered as a “proof of concept”
- The sample code is very simplified for clarity and doesn't necessarily represent best practices.

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Python

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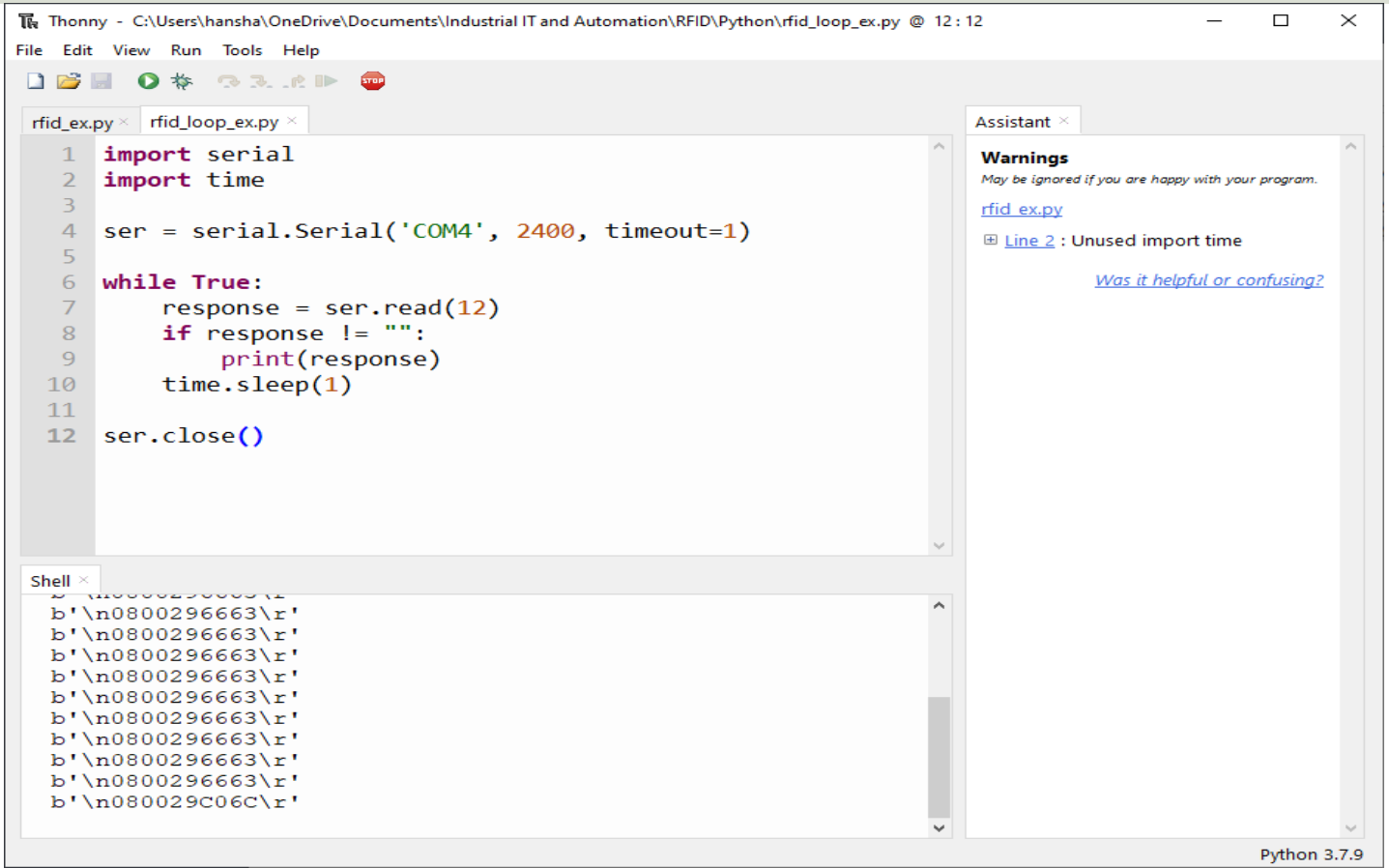
Python Example

Python Example



LabVIEW

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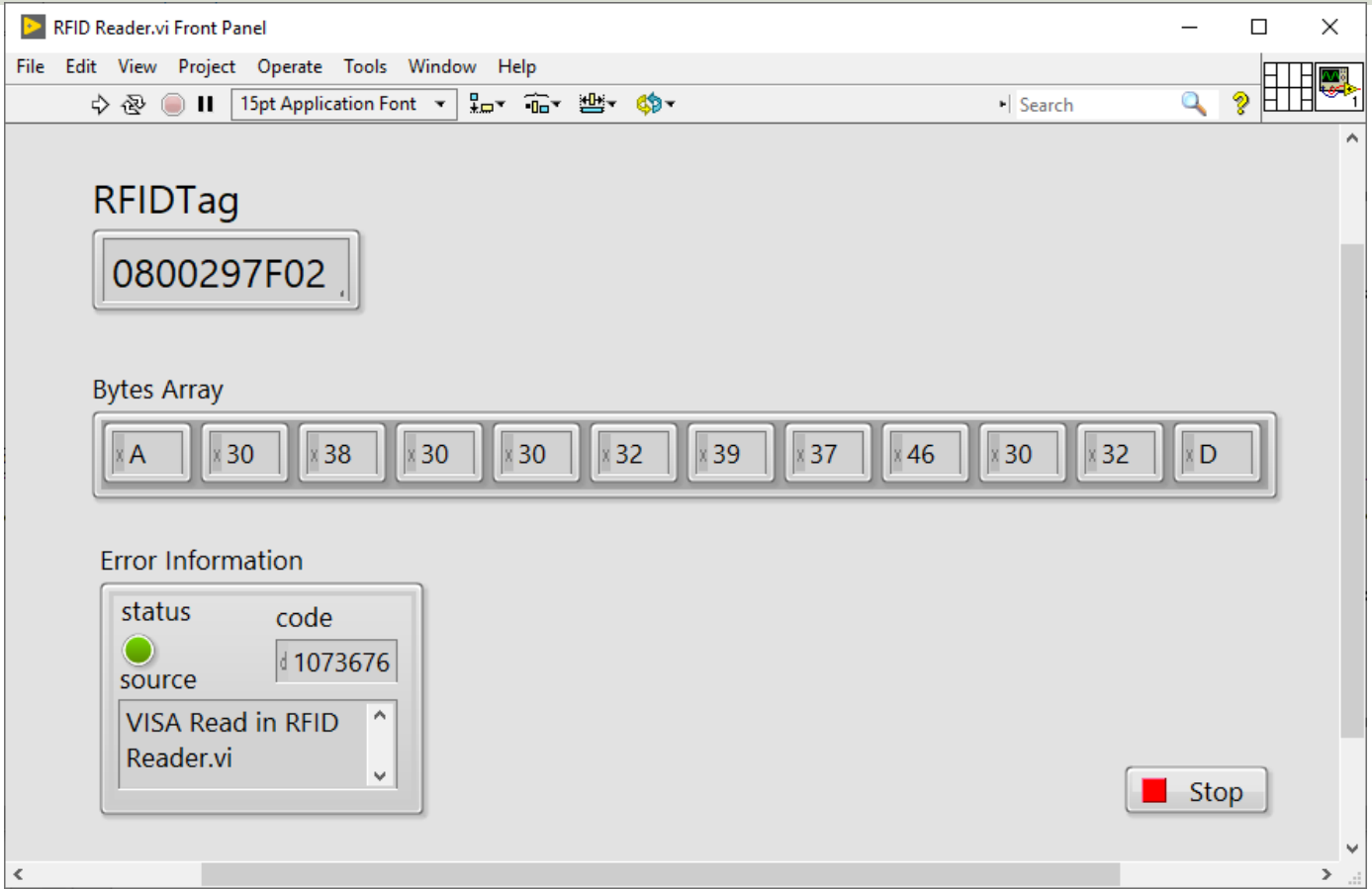
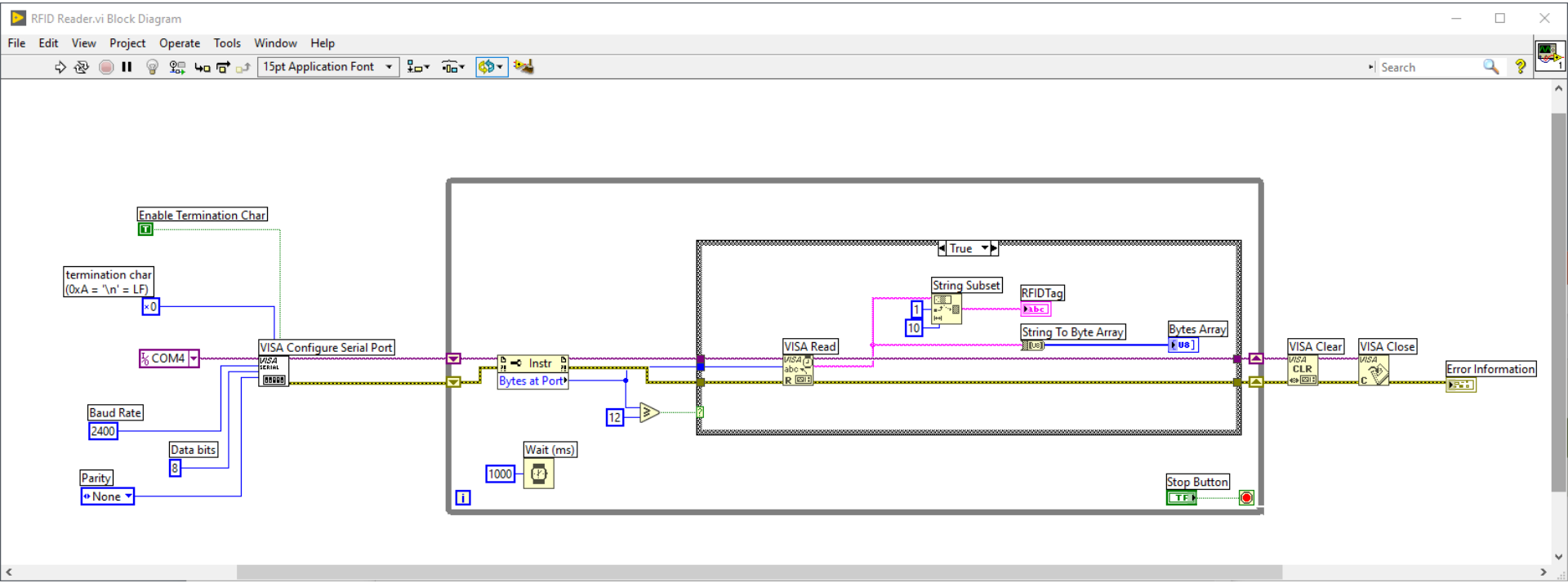
LabVIEW Example



LabVIEW Example



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Visual Studio/C#

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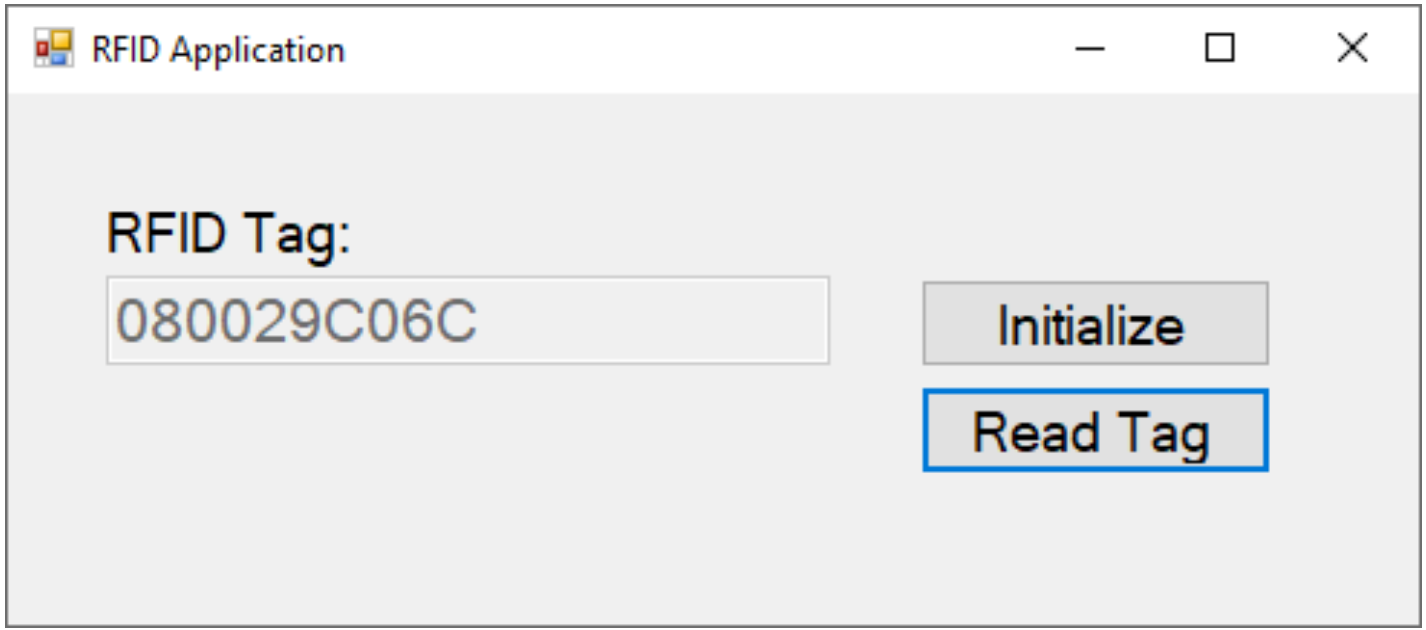
Read RFID Tag with C#

```
using System.IO.Ports;

SerialPort port = new System.IO.Ports.SerialPort("COM4", 2400, System.IO.Ports.Parity.None,
                                                 8, System.IO.Ports.StopBits.One);

port.Open();
port.DtrEnable = true;

int numberBytesToRead = 12;
byte[] data = new byte[numberBytesToRead];
port.ReadTimeout = 1000;
port.Read(data, 0, numberBytesToRead);

string rfidTag;
rfidTag = System.Text.Encoding.UTF8.GetString(data, 0, data.Length);

rfidTag = rfidTag.Replace("\n", "");
rfidTag = rfidTag.Replace("\r", "");

port.Close();
```

Visual Studio/C# Example



C# Example

```
using System;
using System.IO.Ports;
using System.Windows.Forms;


namespace ReadRfidApp
{
   public partial class Form1 : Form
   {
      string rfidTag;
      SerialPort port = new System.IO.Ports.SerialPort("COM4", 2400, System.IO.Ports.Parity.None, 8, System.IO.Ports.StopBits.One);

      public Form1()
      {
         InitializeComponent();
      }

      private void Form1_Load(object sender, EventArgs e)
      { }

      private void btnInitialize_Click(object sender, EventArgs e)
      {
         port.Open();
         port.DtrEnable = true;

         txtTagData.Text = "";
      }

      private void btnReadTag_Click(object sender, EventArgs e)
      {
         int numberBytesToRead = 12;
         byte[] data = new byte[numberBytesToRead];
         port.ReadTimeout = 1000;
         port.Read(data, 0, numberBytesToRead);

         rfidTag = System.Text.Encoding.UTF8.GetString(data, 0, data.Length);

         rfidTag = rfidTag.Replace("\n", "");
         rfidTag = rfidTag.Replace("\r", "");

         txtTagData.Text = rfidTag;

         port.Close();
      }
   }
}
```

Resources

- https://en.wikipedia.org/wiki/Barcode
- https://en.wikipedia.org/wiki/Radio-frequency_identification
- https://www.atlasrfidstore.com/rfid-beginners-guide/
- https://no.rs-online.com/web/p/rf-modules/1262181/
- https://eccel.co.uk/product/oem-micode-usb/

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