es-RFID
RFID Reader / Driver — Datasheet

1 Overview

The es-RFID is a compact, ready-to-use expansion board designed to add NFC Read/Write and RGB LED control capabilities to any microcontroller platform. It integrates an NTAG213-compatible NFC interface and a chain of 16 WS2812B addressable RGB LEDs, providing both data interaction and lighting feedback in a single module. Fully compatible with Arduino, Raspberry Pi Pico 2, and MicroPython, the es-RFID can be controlled using standard libraries such as $Adafruit\_NeoPixel$ and $TwoWire$ (I^2C), making it ideal for interactive installations, product displays, and smart retail systems.

Figure 1: Front board view of es-RFID.

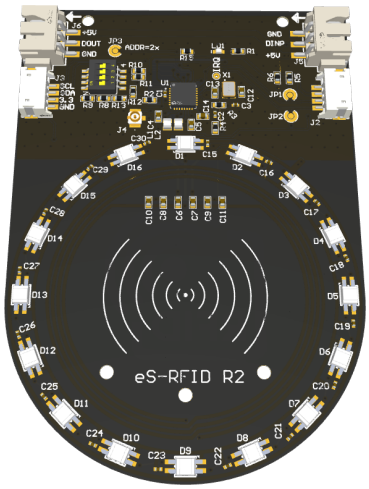


Figure 2: Back board view of es-RFID.

2 Typical Applications

The es-RFID is designed for products and systems that require a seamless combination of NFC tag interaction and visual feedback through RGB LEDs. Its compact form factor, I^{2}C daisy-chain capability, and compatibility with popular microcontrollers make it suitable for a wide range of interactive and embedded solutions. From smart retail installations to rapid prototyping and educational environments, es-RFID provides a reliable and flexible platform to build modern, responsive, and user-friendly experiences. Typical applications are:

- Interactive signage (Lift&Learn or Touch&Learn systems)
- Smart retail displays
- NFC-triggered lighting feedback
- Product authentication or access control
- Embedded training and demo platforms

Progel.net
Viale Palmiro Togliatti 1663
00155 Roma • Italia

T +39 06 99 78 79 15
E info@progel.net

3 Connectivity

The es-RFID provides straightforward, plug-and-play connections for both NFC and RGB LED control. Its I²C interface supports daisy-chaining multiple boards for NFC communication, while the WS2812B LED chain allows flexible extension of RGB lighting. All connectors are standard JST types, making integration with popular microcontrollers fast and reliable.

Function	Connector Type	Description
I²C IN/OUT	JST-ZH 1.5 mm 4-pin	I²C communication (SDA, SCL, VCC, GND) — supports daisy-chain
LED Chain IN/OUT	JST-XH 1.5 mm 3-pin	WS2812B RGB LED data output (Data, +5 V, GND)

4 Key Features

The es-RFID combines advanced NFC tag read/write capabilities with a vibrant chain of addressable RGB LEDs, providing a flexible platform for interactive projects and embedded systems. Designed for compatibility with popular microcontrollers like Arduino and Raspberry Pi Pico 2, the board offers plug-and-play I²C connectivity for the NFC interface and a single-wire interface for WS2812B LEDs, making it simple to integrate visual feedback and NFC interactions into your applications.

NFC Interface

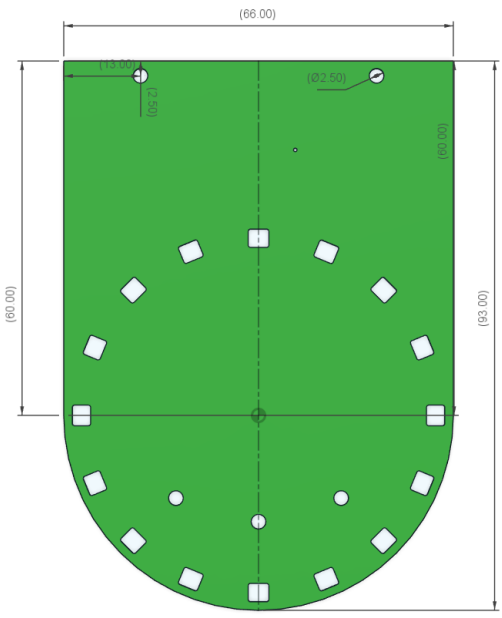
- Read/Write support for **NTAG213** tags
- Controlled over **I²C** bus
- Up to **32 unique I²C addresses**:
  - `0x30–0x3F` (default)
  - `0x20–0x2F` (with JP3 closed)
- Daisy-chain support via JST-ZH 1.5 mm 4-pin connectors
- Compatible with standard I²C libraries (`Wire.h`, `machine.I2C`)

RGB LED Array

- 16 × **WS2812B** addressable RGB LEDs (5 V logic)
- Chainable output for extended LED strips
- Single-wire digital input (DIN)
- JST-XH 1.5 mm 3-pin connector (VCC, GND, Data)
- Fully compatible with `Adafruit_NeoPixel` and `FastLED`

5 Mechanical Data

- Board size: **66 mm × 93 mm**
- Mounting holes: **M2.5**



Progel.net
Viale Palmiro Togliatti 1663
00155 Roma • Italia

T +39 06 99 78 79 15
E info@progel.net