

BarcodeReader.h File Reference

The BarcodeReader is a software module written in C++ for the Arduino Nano 33 IOT development board. It enables reading the barcodes at the Carrera track with an IR line finder sensor. It realizes the following functions: [More...](#)

```
#include <Arduino.h>
```

[Go to the source code of this file.](#)

Data Structures

struct **barcodeConfig_t**

Configuration struct for the barcode reader. [More...](#)

Enumerations

```
enum barcode_error_t{  
    NO_CODE_DETECTED , READING_SUCCESSFUL , READING_IN_PROGRESS , PHASE_MISMATCH_ERROR  
    ,  
    TIMEOUT_ERROR  
}
```

Enum to define actual status from the barcode reader unit and errors that can occur during reading the barcode. [More...](#)

Functions

barcode_error_t **barcode_get** (uint8_t &value, uint32_t &velocity)

Polling function read the value and the calculated velocity from a barcode. Has to be called repeatedly.

void **barcode_init** (**barcodeConfig_t** config)

Initialize the pin configuration, the interrupt and the variables for the barcode reader.

void **barcodelsr** (void)

ISR function for the barcode reader.

Detailed Description

The BarcodeReader is a software module written in C++ for the Arduino Nano 33 IOT development board. It enables reading the barcodes at the Carrera track with an IR line finder sensor. It realizes the following functions:

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- Detecting the edges and levels of the binary sensor signal via interrupt
- Evaluate the edges and levels of the binary signal and calculate the barcode value
- Calculating the overrun car velocity out from the sensor reading times in the unit mm/s
- Detecting errors that can occur during reading the barcode

Version

1.0.5

Date

2025-07-09

Enumeration Type Documentation

◆ barcode_error_t

enum **barcode_error_t**

Enum to define actual status from the barcode reader unit and errors that can occur during reading the barcode.

Enumerator	
NO_CODE_DETECTED	No code detected since last request
READING_SUCCESSFUL	Reading was successful, barcode value and velocity are available
READING_IN_PROGRESS	Reading is still in progress, no value available yet. No error was detected until now
PHASE_MISMATCH_ERROR	Phase mismatch error, the detected surface was black when it should be white or otherwise.
TIMEOUT_ERROR	Timeout error, the interval between two detected edges was longer than the define reading tieout.

Function Documentation

◆ barcode_get()

```
barcode_error_t barcode_get ( uint8_t & value ,  
                             uint32_t & velocity )
```

Polling function read the value and the calculated velocity from a barcode. Has to be called repeatedly.

Parameters

value Pointer variable to store the barcode value to

velocity Pointer variable to store the velocity value in $\text{nm}/\mu\text{s} = \mu\text{m}/\text{ms} = \text{mm}/\text{s}$

Returns

barcode_error_t actual status of the barcode reader or error that occurred during reading the barcode

◆ barcode_init()

```
void barcode_init ( barcodeConfig_t config )
```

Initialize the pin configuration, the interrupt and the variables for the barcode reader.

Parameters

config config struct for configuration of the barcode reader