

# Embedded rust on microbit

## Install

```
rustup target add thumbv7em-none-eabihf
rustup component add llvm-tools
cargo install cargo-binutils
```

## Install probe-rs/cargo embed

```
cargo install probe-rs
```

## Init project

```
cargo init --bin
```

## Embed.toml

```
[default.general]
chip = "nRF52833_xxAA"
```

## Add crate for CPU

```
cargo add cortex-m-rt
```

## memory.x file

```
/* Linker script for the STM32F103C8T6 */
MEMORY
{
    FLASH : ORIGIN = 0x00000000, LENGTH = 512K
    RAM   : ORIGIN = 0x20000000, LENGTH = 128K
}
```

# General embedded setup

```
cargo add panic-halt
```

## main.rs

```
#![no_std]
#![no_main]

use cortex_m_rt::entry;
use panic_halt as _;

#[entry]
fn main() -> ! {
    loop {}
}
```

## Add to Cargo.toml

```
[[bin]]
name = "mb_bare"
path = "src/main.rs"
test = false
doctest = false
bench = false
```

## Set udev rules

[Download rules file](#)

```
sudo mv Downloads/69-probe-rs.rules /etc/udev/rules.d/
sudo udevadm control -reload
```

Unplug/plugin device

## Add .cargo/config.toml

```
[build]
target = "thumbv7em-none-eabihf"

[target.thumbv7em-none-eabihf]
rustflags = [ "-C", "link-arg=-Tlink.x" ]
```

## Compile and run

```
cargo embed
```

# Debugging

## Setup RTT for debug

```
cargo add cortex-m --features critical-section-single-core  
cargo add rtt-target
```

Add rtt to Embed.toml

```
[default.rtt]  
enabled = true
```

## Add rtt init to main.rs

```
...  
use rtt_target::{rprintln, rtt_init_print};  
use cortex_m as _;  
  
#[entry]  
fn main() -> ! {  
    rtt_init_print!();  
    rprintln!("Hello, world!");  
    loop {}  
}
```

## GDB (on Debian)

```
sudo apt install gdb-multiarch
```

## Modify Embed.toml

```
[default.rtt]
enabled = false

[default.gdb]
enabled = true

[default.reset]
halt_afterwards = true
```

Deactivate gdb and halt\_afterwards for using rtt again

## As rtt is disabled change main.rs

```
use cortex_m::asm::nop;
use cortex_m_rt::entry;
use panic_halt as _;

#[entry]
fn main() -> !{
    loop {
        let mut x: usize = 0;
        x += 1;
        for _ in 0..x {
            nop();
        }
    }
}
```

## Build and Run

```
cargo embed
gdb-multiarch target/...
```