

# 1 Hello\_NuMaker-M032BTAI

## 1.1 Prerequisites

Before proceeding with the commands, ensure you have the following installed:

- `make`
- `gcc-arm-none-eabi` or `docker`
- `Python` 3.7+ and `pip` (for flashing and debugging)

## 1.2 Quick Commands

The following quick commands are available for convenience:

- `make upgrade`: Executes `make clean`, `make`, and `make flash` sequentially.

## 1.3 Building the Firmware

### 1.3.1 Using Makefile

To build the firmware using Makefile, run:

```
1 make clean && make
```

## 1.4 Flashing the Firmware

We use pyOCD for cross-platform compatibility and to support the latest versions. OpenOCD is not used in this process.

### 1.4.1 Installing pyOCD

First, install `pyOCD` using `pip`:

```
1 python -m pip install -U pyocd
```

### 1.4.2 Installing the Required Pack

Next, install the pack for the target MCU:

```
1 pyocd pack install M032BTAIAAN
```

### 1.4.3 Flashing the MCU

Finally, flash the MCU with the following command:

```
1 make flash
```

## 1.5 Debugging the Firmware

To debug the firmware manually, use the following commands:

### 1.5.1 Starting the GDB Server

Start the GDB server with `pyOCD`:

```
1 pyocd gdbserver -t M032BTAIAAN --elf Source\build\TRSP_UART_Central.elf
```

### 1.5.2 Connecting GDB to the Target

In the GDB command line, connect to the target and load the firmware:

```
1 (gdb) target remote localhost:3333
2 (gdb) monitor reset halt
3 (gdb) load
```

## 1.6 Documentation

To build the documentation, run:

```
1 make docs
```

### 1.6.1 You need to install these software first

- On Windows:

```
1 choco install -y pandoc miktex
```

- On macOS:

```
1 brew install pandoc
2 brew install --cask mactex-no-gui
```

- On Linux:

```
1 sudo apt-get update && sudo apt-get install -y pandoc texlive-latex-
  base texlive-fonts-recommended texlive-fonts-extra texlive-latex-
  extra
```

- Then, install the required extensions:

```
1 make docs-install
```