1 Hello_NuMaker-M032BTAI

1.1 TL;DR

This repository demonstrates how to develop projects for the NuMaker-M032BTAI using gcc-arm-none-eabi with a makefile.

We use pyOCD for flashing and debugging because OpenOCD does not fully support the NuMaker-M032BTAI.

The example used is SampleCode/NuMaker-M03xBT/BLE/Demo/Central/TRSP_UART_Central.

Use make help to quickly see available commands.

1.2 Requirements

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

- Required
  - make
  - gcc-arm-none-eabi 13.2.Rel1+ or docker
- Optional
  - To install pyOCD:
    1. Install Python 3.7+ and pip
    2. Use make install to install pyOCD and required setup
  - To build documentation:
    1. Install node.js 18+ and npm
    2. Install pandoc and tinytex
    3. Use make docs-install to install required extensions

1.2.1 Windows

```
choco install -y make gcc-arm-embedded python3 nodejs-lts pandoc
    tinytex
```

1.2.2 Linux / macOS

```
# Linux
sudo apt update && sudo apt install -y curl git
```

```
# macOS
brew install coreutils curl git
```

```
git clone https://github.com/asdf-vm/asdf.git ~/.asdf --branch v0.14.0
echo ". $HOME/.asdf/asdf.sh" >> ~/.bashrc
echo ". $HOME/.asdf/completions/asdf.bash" >> ~/.bashrc
source ~/.bashrc
```

```
asdf plugin add make
asdf plugin add gcc-arm-none-eabi
asdf plugin add python
asdf plugin add nodejs
asdf plugin add pandoc
asdf plugin add tinytex
```

```
asdf install make latest
asdf install gcc-arm-none-eabi latest
asdf install python latest
asdf install nodejs 18.18.0
asdf install pandoc latest
asdf install tinytex latest
```

```
asdf global make latest
asdf global gcc-arm-none-eabi latest
asdf global python latest
asdf global nodejs 18.18.0
asdf global pandoc latest
asdf global tinytex latest
```

1.3 Quick Start

- Compile

```
make
```

- Recompile

```
make clean && make
```

```
make rebuild
```

- Flash

```
make flash
```

- Recompile and Flash

```
make upgrade
```

- Generate Documentation

```
make docs
```

1.4 Debugging with pyOCD

To debug the firmware manually, use the following commands:

1.4.1 Starting the GDB Server

Start the GDB server with pyOCD:

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

1.4.2 Connecting GDB to the Target

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

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

1.5 More Information

- OpenNuvoton/M031BSP