QUICK REFERENCE

PlatformIO CLI Cheat Sheet

Essential commands for embedded development • PlatformIO Core 6.x

🚀 PROJECT SETUP

`pio project init`	Init project in current dir
`pio project init --board esp32dev`	Init with specific board
`pio project init --ide vscode`	Init with IDE integration
`pio project config`	Show project config
`pio project metadata`	Dump project metadata

🔨 BUILD & UPLOAD

`pio run`	Build all environments
`pio run -e esp32dev`	Build specific environment
`pio run -t upload`	Build + upload firmware
`pio run -t clean`	Clean build files
`pio run -t uploadfs`	Upload filesystem image

📡 SERIAL MONITOR

`pio device monitor`	Open serial monitor
`pio device monitor -b 115200`	Set baud rate
`pio device monitor -p /dev/cu.usb*`	Specify port (macOS)
`pio device monitor --filter log2file`	Log output to file
`pio device list`	List connected devices

📦 LIBRARY MANAGEMENT

`pio lib install "WiFi"`	Install library by name
`pio lib install 13`	Install by registry ID
`pio lib uninstall "WiFi"`	Remove a library
`pio lib update`	Update all libraries
`pio lib search "sensor"`	Search library registry
`pio lib list`	List installed libs

🔌 BOARDS & PLATFORMS

`pio boards`	List all supported boards
`pio boards "esp32"`	Search for boards
`pio platform list`	List installed platforms
`pio platform install espressif32`	Install a platform
`pio platform update`	Update all platforms

🐛 DEBUGGING & TESTING

`pio debug`	Start debugger
`pio test`	Run unit tests
`pio test -e native`	Run tests on native
`pio check`	Static code analysis
`pio run -v`	Verbose build output

⚙️ PLATFORMIO.INI — CONFIGURATION EXAMPLE

```ini
; Common settings for all environments
[platformio]
default_envs = esp32dev

[env:esp32dev]
platform = espressif32
```

```
board = esp32dev
framework = arduino
monitor_speed = 115200
lib_deps =
    adafruit/Adafruit NeoPixel@^1.12
    bblanchon/ArduinoJson@^7.0
build_flags = -DCORE_DEBUG_LEVEL=3
```

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Advanced commands, flags, and workflow tips

🔄 SYSTEM & UPDATES

`pio --version`	Show PlatformIO version
`pio upgrade`	Upgrade PlatformIO Core
`pio system info`	System environment info
`pio system prune`	Remove unused data
`pio settings get`	Show all settings
`pio settings set auto_update_libraries No`	Disable auto-update

🌐 REMOTE DEVELOPMENT

`pio remote agent start`	Start remote agent
`pio remote run -t upload`	Upload to remote device
`pio remote device monitor`	Monitor remote serial
`pio remote device list`	List remote devices

🏁 USEFUL FLAGS

`-e <env>`	Target specific environment
`-d <dir>`	Specify project directory
`-v`	Verbose output
`-t <target>`	Run specific target
`--upload-port <port>`	Specify upload port
`-j <N>`	Parallel build jobs
`--no-ansi`	Disable colored output

🎯 BUILD TARGETS (-T)

`upload`	Build & flash firmware
`clean`	Clean build artifacts
`uploadfs`	Upload SPIFFS/LittleFS
`erase`	Erase flash memory
`size`	Show firmware size
`monitor`	Build + upload + monitor

📝 COMMON PLATFORMIO.INI OPTIONS

`platform`	Dev platform (espressif32, atmelavr...)
`board`	Target board ID
`framework`	arduino, espidf, mbed...
`lib_deps`	Library dependencies
`build_flags`	Compiler defines & flags
`monitor_speed`	Serial baud rate
`upload_port`	USB port for uploading
`upload_speed`	Upload baud rate
`board_build.partitions`	Custom partition table
`build_src_filter`	Include/exclude src files

⚡ COMMON WORKFLOWS

🔄 BUILD + UPLOAD + MONITOR

```
pio run -t upload && pio device monitor
```

Or use: `pio run -t upload -t monitor`

🧹 FULL CLEAN REBUILD

```
pio run -t clean && pio run
```

Useful when builds are acting strange

📋 **CHECK FLASH USAGE**

```
pio run -t size
```

Shows RAM and Flash usage breakdown

🔍 **FIND YOUR BOARD ID**

```
pio boards "nano"
```

Search by name, MCU, or framework

⌨️ SERIAL MONITOR SHORTCUTS

`Ctrl+]`	Quit monitor	`Ctrl+T`	Menu / command mode	`Ctrl+T → Ctrl+H`	Show help
`Ctrl+T → Ctrl+D`	Toggle DTR	`Ctrl+T → Ctrl+R`	Toggle RTS	`Ctrl+T → Ctrl+P`	Change port

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