

Docker Containers User Manual (Windows & Linux)

1. Overview

The **FEMulator Pro** can be distributed as a containerized application using **Docker**.
To simplify usage, all Docker operations are wrapped in **platform-specific helper scripts**.

NOTE: Users never need to type Docker commands manually.

There are **two sets of scripts**:

- **Windows users** → use `.bat` files
- **Linux users** → use `.sh` files

The scripts are **functionally equivalent**, differing only by operating system.

2. File Naming Convention (IMPORTANT)

Throughout this document:

- **Windows users** must use files ending in `.bat`
- **Linux users** must use files ending in `.sh`

Purpose	Windows	Linux
Start application	start.bat	start.sh
Stop application	stop.bat	stop.sh
Update application	update.bat	update.sh
Full rebuild	rebuild_all.bat	rebuild_all.sh
Full removal	remove_all.bat	remove_all.sh

NOTE: Do not mix file types (e.g. `.bat` files do not work on Linux).

3. Directory Structure (High Level)

```
project-root/
|
├─ docker-compose-cpu.yml      # CPU-only container definition (all OS)
├─ docker-compose-gpu.yml      # GPU-enabled container definition (all OS)
|
├─ femulator.Dockerfile        # Main application image (all OS)
├─ femulator.server.Dockerfile # Base/server image (all OS)
|
├─ start.bat                   # Windows start script
├─ stop.bat                    # Windows stop script
├─ update.bat                  # Windows update script
├─ rebuild_all.bat             # Windows full rebuild
├─ remove_all.bat              # Windows full cleanup
|
├─ start.sh                    # Linux start script
├─ stop.sh                     # Linux stop script
├─ update.sh                   # Linux update script
├─ rebuild_all.sh              # Linux full rebuild
├─ remove_all.sh               # Linux full cleanup
|
└─ README.md
```

Dockerfiles and compose files are **shared across platforms**.

Only the scripts are OS-specific.

4. Prerequisites

4.1 Windows Users

- Windows 10 or newer
- **Docker Desktop** installed and running
- (Optional) NVIDIA GPU with WSL2 GPU support enabled

NOTE: Windows users only use `.bat` files.

4.2 Linux Users

- Linux system with Docker installed
- Docker Compose plugin available
- (Optional) NVIDIA GPU with `nvidia-container-toolkit`

NOTE: Linux users only use `.sh` files.

Before first use, Linux users must run once:

```
chmod +x *.sh
```

5. Core Concepts (No Docker Knowledge Required)

- **Image:** Packaged version of the application
- **Container:** A running instance of the application
- **CPU mode:** Works on all systems
- **GPU mode:** Used only when NVIDIA hardware is available

You do **not** need to understand Docker to use the scripts.

6. Script Reference (User-Level)

Each section below clearly states **which file Windows users run and which file Linux users run**.

6.1 Start the Application

Purpose:

Starts FEMulator Pro.

Windows users:

```
start.bat
```

Linux users:

```
./start.sh
```

What it does:

- Creates a Docker network (first run only)
- Starts the application container
- Uses CPU mode by default
- Uses GPU mode only when explicitly supported

When to use:

- Normal daily usage
- After a system reboot
- After stopping the application

6.2 Stop the Application

Purpose:

Stops the running container without deleting anything.

Windows users:

```
stop.bat
```

Linux users:

```
./stop.sh
```

What it does:

- Gracefully stops the application
- Keeps images intact
- Allows fast restart later

6.3 Update the Application (Soft Rebuild)

Purpose:

Rebuilds the main application image while keeping the base image.

Windows users:

```
update.bat
```

Linux users:

```
./update.sh
```

What it does:

- Stops the container
- Rebuilds the application image
- Uses cached layers when possible
- Faster than a full rebuild

When to use:

- Application code changes
- Minor updates

6.4 Full Clean Rebuild (Hard Reset)

Purpose:

Rebuilds **everything from scratch**.

Windows users:

```
rebuild_all.bat
```

Linux users:

```
./rebuild_all.sh
```

What it does:

- Stops containers
- Removes containers
- Removes all FEMulator images
- Rebuilds everything with no cache

When to use:

- Dependency changes
- Environment corruption
- Before formal review or evaluation

6.5 Remove Everything (Uninstall)

Purpose:

Completely removes FEMulator Pro from Docker.

Windows users:

```
remove_all.bat
```

Linux users:

```
./remove_all.sh
```

What it does:

- Stops containers
- Deletes containers
- Deletes images
- Leaves no FEMulator artifacts behind

7. CPU vs GPU Behavior

This behavior is identical on Windows and Linux.

CPU Mode

- Always available
- Requires no special hardware
- Safe default on all systems

GPU Mode

- Requires NVIDIA hardware
- Requires Docker GPU support

- Never forced on unsupported systems

Users do **not** need to choose manually.

8. Typical Usage Scenarios

First-Time User

- **Windows:** `start.bat`
- **Linux:** `./start.sh`

Daily Use

- Start → Use → Stop

Update Application

- Stop → Update → Start

Something Went Wrong

- Stop → Rebuild All → Start

Remove Everything

- Run Remove All script for your OS