TMC ROBOTICS
ROBOT • COBOT • AMR

TECHNICAL GUIDE: FIRST STARTUP, NETWORK, UPDATE & BACKUP

Fairino Cobot Series (FR3 / FR5 / FR10 / FR16 / FR20) — Web App Interface V4.0.1

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1. FIRST STARTUP & NETWORK CONFIGURATION

This section covers establishing the initial Ethernet connection between an engineering laptop and the Fairino control box, logging into the Web App for the first time, entering the robot activation code, configuring IP parameters, recovering an unknown IP address, and enabling the Teach Pendant hardware keys.

1.1 Connecting a Laptop & Default IP Subnets

Use a standard Cat5e/Cat6 RJ45 Ethernet cable (direct connection or via an unmanaged network switch) to connect your laptop to one of the two Ethernet ports on the Fairino control box (see Figure 1). By default, the controller exposes two factory-configured static IPv4 interfaces:

Control Box Port / NIC	Default Robot IP	Recommended Laptop Static IP	Subnet Mask & Default Role
LAN1 (NIC 1 / Eth1)	192.168.58.2	192.168.58.100 (any .3 to .254, avoid .2)	255.255.255.0 — Primary WebAPP interface (http://192.168.58.2), SDK control, and commissioning.
LAN2 (NIC 0 / Eth0)	192.168.57.2	192.168.57.100 (any .3 to .254, avoid .2)	255.255.255.0 — Secondary Ethernet interface (WebRecovery default port, vision camera, or auxiliary PC).

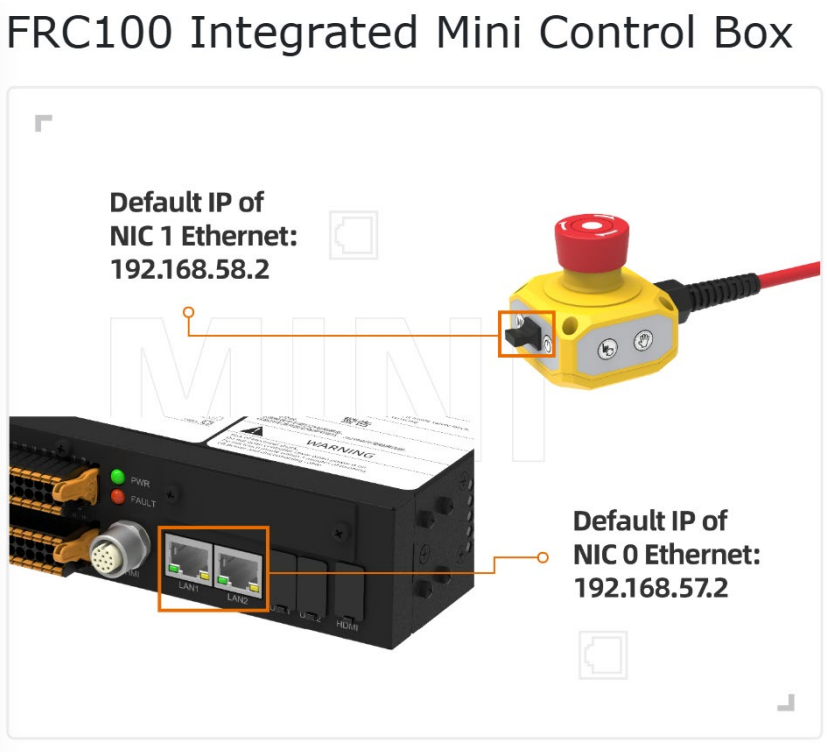


Figure 1: Fairino Control Box Ethernet Ports (LAN1 = 192.168.58.2 / LAN2 = 192.168.57.2) & E-Stop IP Reset Button

1. Plug the Ethernet cable into **LAN1** (for **192.168.58.2**) or **LAN2** (for **192.168.57.2**) on the Fairino control box (do not plug your PC into the circular M12 HMI / Teach Pendant port).
2. On your Windows laptop, open **Settings > Network & internet > Ethernet**, click **Edit** next to **IP assignment**, switch to **Manual**, and set a static IPv4 address on the matching subnet (e.g., **192.168.58.100 or 192.168.57.100** with subnet mask **255.255.255.0** — see Figure 2).
3. Open a web browser (Google Chrome or Microsoft Edge recommended) and navigate to **http://192.168.58.2** (or **http://192.168.57.2** if connected to **LAN2**).

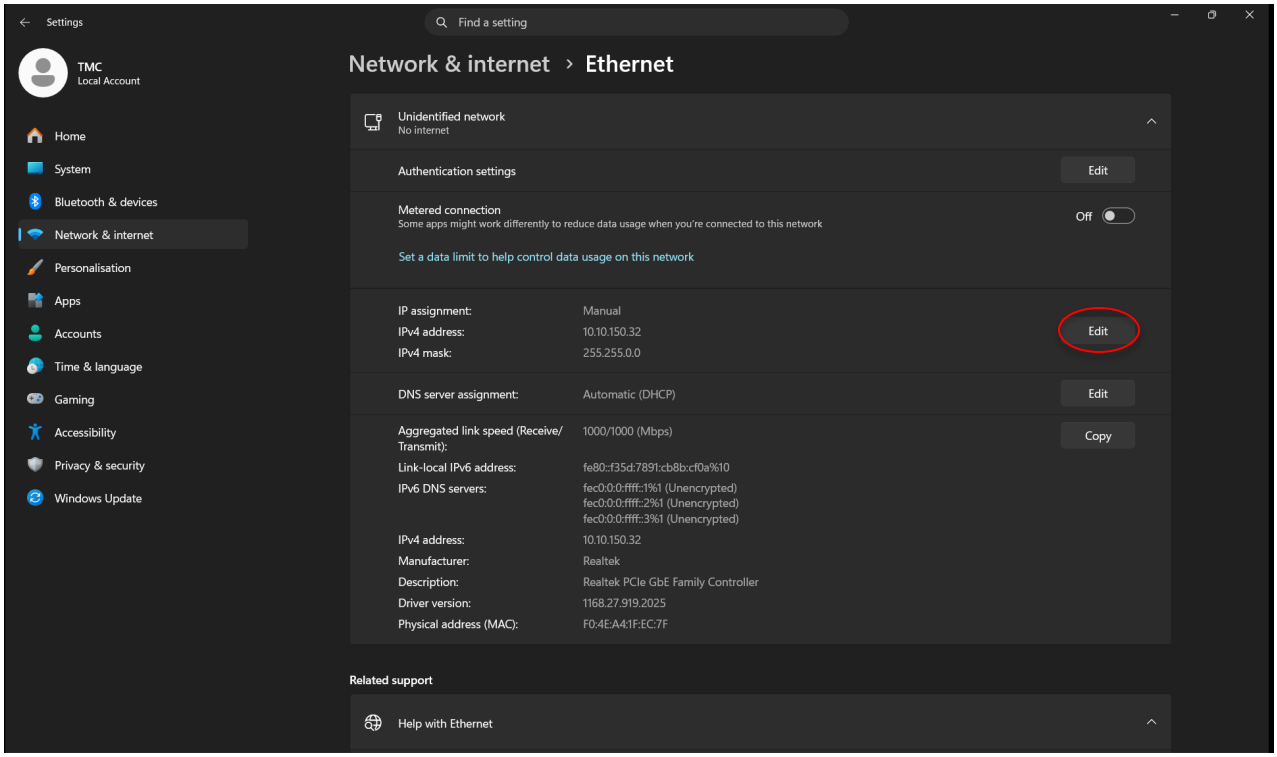
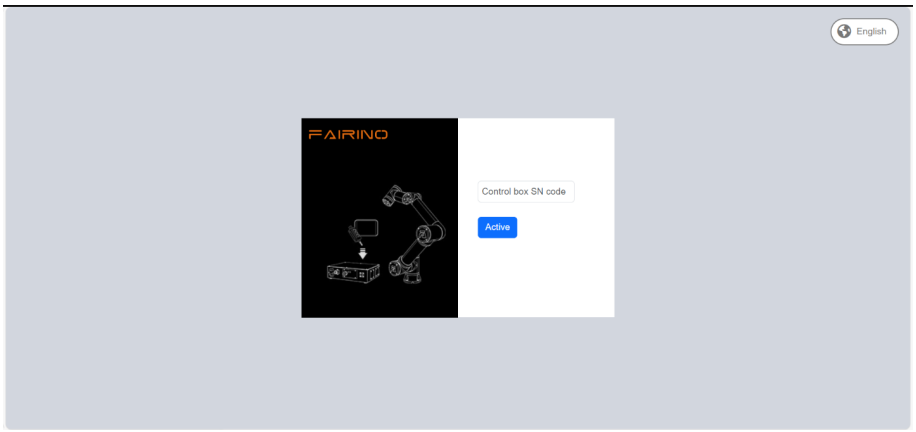


Figure 2: Configuring a Manual Static IPv4 Address on the Windows Laptop (Settings > Network & internet > Ethernet)

1.2 First Login Credentials & Robot Activation Code

1. **First-Startup Activation Code:** Upon the initial startup of a new controller (or after a system re-initialization), the Web App displays an **Activation Prompt** before allowing servo power-on:



   - Locate the Controller Serial Number printed on the nameplate label of the control box.
   - Enter this exact serial number into the activation field—making sure to keep all dashes (-) exactly as shown on the label—and click Activate / Confirm.
   - Once validated, the activation banner closes and the green **`Power / Enable`** icon in the top toolbar becomes active.

2. On the Web App **`Log In`** screen (see Figure 3), sign in using the factory default administrator credentials:
   - **`user name: admin`**

- **password: 123** (recommended: change this default password under **System > Account** once commissioning is complete).

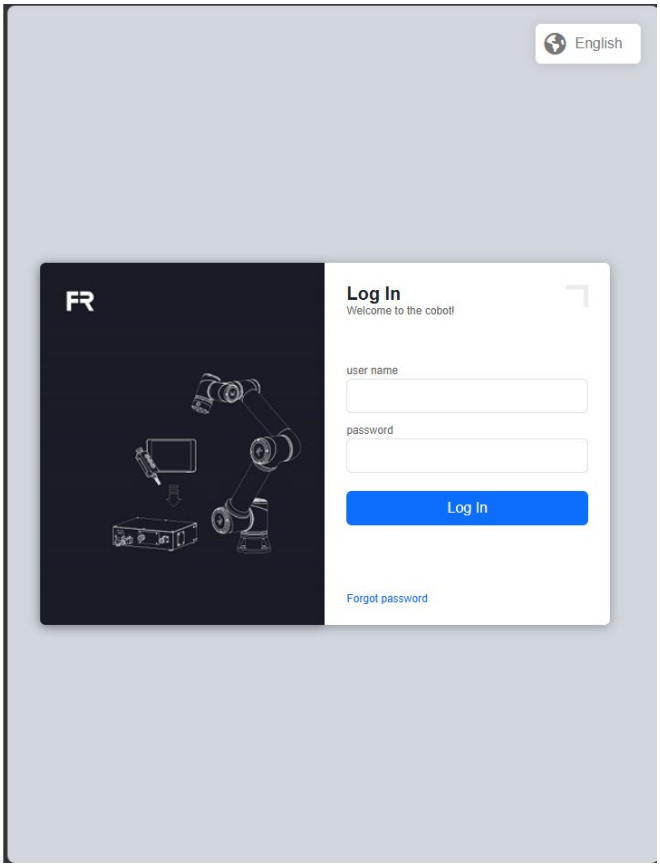


Figure 3: Fairino Web App V4.0.1 Login Screen (Default credentials: admin / 123)

1.3 Changing the WebApp IP Address (System > General > Network Settings)

1. In the left navigation sidebar of Web App V4.0.1, navigate to **System > General** and locate the **Network Settings** panel (see Figure 4).
2. Modify the **IP**, **Subnet Mask** (e.g., **255.255.255.0**), **Default Gateway**, and **DNS Server** for **Eth0** or **Eth1**. Under **Access IP**, verify which interface is bound to **WebAPP** (default **Eth1**) and **WebRecovery** (default **Eth0**).
3. Click **Set Network**. Update your laptop's IPv4 adapter address to reside on the new subnet, then reload the browser using the newly assigned IP address.

1.4 Recovering an Unknown IP Address (15-Second E-Stop IP Reset)

If a controller's IP address was previously modified and is unknown, you can reset both network interfaces back to factory defaults (192.168.58.2 on Eth1/LAN1 and 192.168.57.2 on Eth0/LAN2) directly via hardware:

1. Locate the dedicated **IP Reset button (labeled IP)** integrated on the side of the yellow Teach Pendant Emergency Stop housing (highlighted in Figure 1).
2. Press and **hold the IP button continuously for approximately 15 seconds** until the **LED indicator ring on the robot head / wrist changes color**, confirming that the network reset command has been accepted.
3. Release the button and wait a few seconds (or power-cycle the control box if needed). Reconnect your laptop on the **192.168.58.x** subnet and open **http://192.168.58.2**.

1.5 Enabling the Teach Pendant Secondary Buttons (System > General)

1. On the same **System > General** page below **Network Settings**, locate the **Teach Pendant** panel (see Figure 4).
2. Switch **Teaching pendant enable** to **ON**. Enabling this toggle activates the **secondary physical function buttons on the Teach Pendant** (mode selector, speed override keys, free-drive / drag-teach button, and auxiliary shortcut keys on the pendant housing) so operators can control the cobot directly from the pendant hardware.

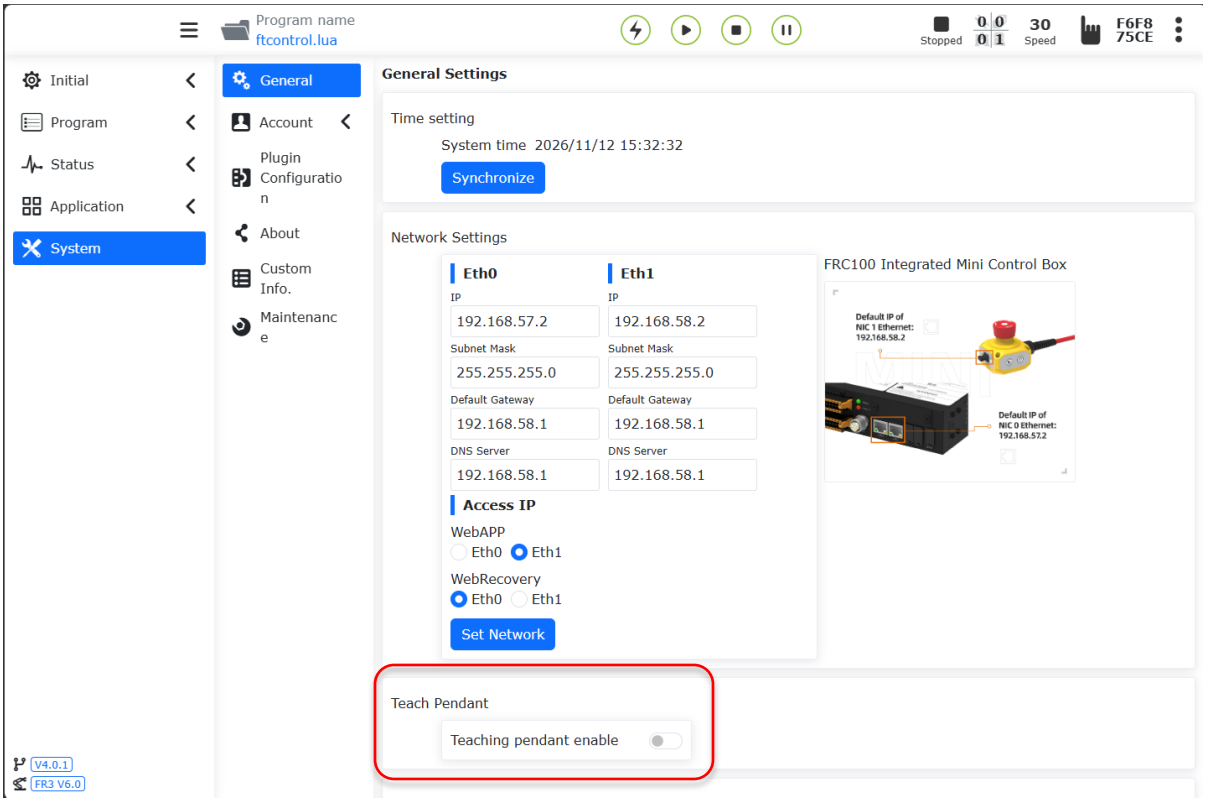


Figure 4: System > General — Time Setting, Network Settings (Eth0 / Eth1 / Set Network), and Teaching Pendant Enable

1.6 Interface Language & System Data Backup (System > General — Lower Section)

Scrolling further down on the System > General page reveals the language, fault logging, session timeout, and system backup/recovery tools (see Figure 5):

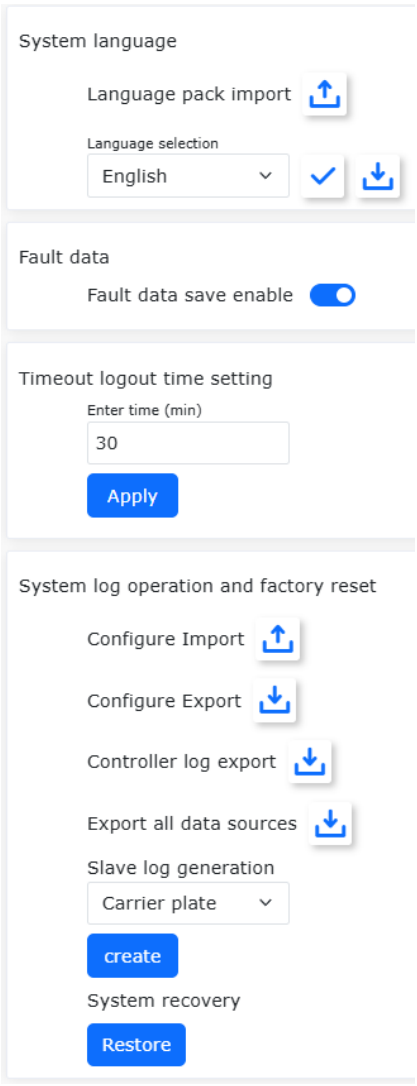


Figure 5: Lower Section of System > General (Language & Backup Controls)

- **System language:** Select the active Web App display language under **`Language selection`** (e.g., **English**) and click the blue checkmark icon to apply, or import a custom language archive via **`Language pack import`**.
- **Fault data & Timeout logout:** Keep **`Fault data save enable`** active so diagnostic snapshots are recorded automatically on error. Set **`Timeout logout time setting`** (default **`30 min`**) and click **`Apply`**.
- **Configure Export (Recommended Backup):** Click the download icon next to **`Configure Export`** to export all robot user configurations—taught **`.lua`** programs, waypoint files, TCP/Workpiece frames, Payload settings, peripheral setups (Gripper, Force Sensor, I/O), and network/system parameters—to your PC.
- **Export all data sources & Logs:** Use **`Export all data sources`** (or **`Controller log export`**) to download a complete diagnostic bundle including system logs, fault history, and configuration files for TMC Robotics support.
- **Configure Import & System recovery:** Use **`Configure Import`** to restore a saved configuration archive onto the controller, or **`System recovery > Restore`** to revert to a system recovery snapshot.

2. SOFTWARE UPDATE (WEBAPP, CONTROLLER & TEACH PENDANT)

A complete Fairino software release consists of three synchronized layers: the real-time Controller Firmware, the browser-based WebApp Interface, and the Teach Pendant / Slave Board Firmware. Following the proper update sequence prevents version mismatches and communication errors.

2.1 When to Update in Steps (Staged / Incremental Upgrades)

Before starting the update, check your current controller/WebApp version against the upgrade restriction table below to verify whether you can upgrade directly to the latest release or if you must perform an incremental (step-by-step) upgrade through mandatory intermediate versions.

Table 15.3-1 Version Upgrade Restrictions

Current Version	Maximum Upgradeable Version
< v3.6.1	v3.6.1
v3.6.1 - v3.6.4	v3.6.5
v3.6.5 - v3.6.8	v3.6.9
v3.6.9 - v3.7.4	v3.7.5
v3.7.5	v3.7.6
≥ v3.7.6	No restrictions

2.2 Step-by-Step Software Update Procedure

1. **Perform a Full Backup:** Export a complete configuration backup under **`System > General > Configure Export`** (and **`Export all data sources`**) and save it to your laptop before starting (see Section 3).
2. **Ensure Safe Idle State:** Stop all running foreground and background Lua programs, ensure the cobot arm is stationary with servos disabled, and verify that the Emergency Stop is released.
3. **Prepare & Upload `software.tar.gz`:** Navigate to **`System > Maintenance`** (or **`System > About`**) to open the **`Software upgrade`** dialog (see Figure 6). Ensure the upgrade file is named exactly **`software.tar.gz`** (if the release archive received has a different name, extract it first so **`software.tar.gz`** is visible). Select **`software.tar.gz`** and click **`Upgrade`**. Make sure to download the robot-software file from the Fairino website.
4. **Wait & Power-Cycle Controller:** Wait 2 to 5 minutes until the progress bar reaches 100% and prompts for a reboot. Turn the control box main power switch **`OFF`**, wait 15 seconds, and turn it back **`ON`**. Force-refresh your browser (**`Ctrl + Shift + R`**) to clear cached WebApp files.
5. **Update Teach Pendant & Slave Firmware (If Required):** As noted in the **`Software upgrade`** warning banner, firmware and slave device upgrades (joint servo boards, carrier plate, or Teach Pendant HMI) may be required after a software upgrade. If the Teach Pendant does not synchronize automatically upon boot, trigger the Teach Pendant / slave firmware upgrade from the WebApp maintenance menu or via a FAT32 USB drive on the Teach Pendant port.

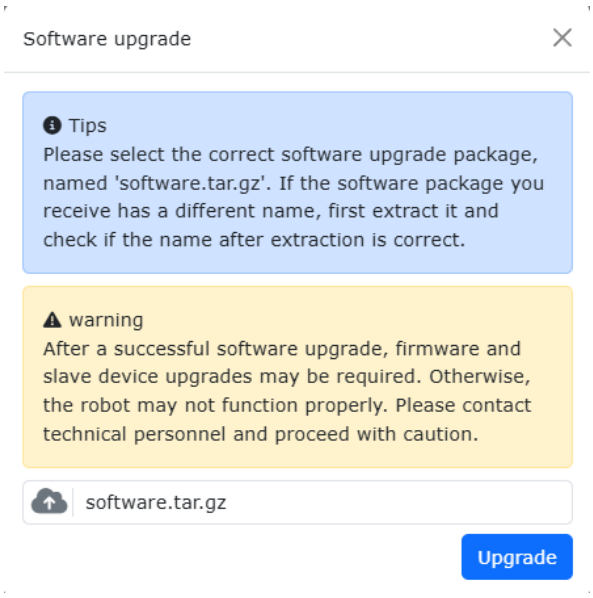


Figure 6: Web App V4.0.1 Software Upgrade Dialog (Requires package named software.tar.gz)

> **CRITICAL WARNING — DO NOT POWER OFF DURING FLASH:** Never switch off the control box, unplug the Teach Pendant, or disconnect Ethernet while a firmware write is in progress. Interrupting the flash process can corrupt the controller bootloader and require factory recovery.

2.3 Post-Update Verification Checklist (Mandatory)

After every software update—especially across major versions—always verify the following parameters before running programs at production speed:

- **1. Tool Coordinates (`Initial > Base > TCP`):** Verify that all custom TCP offsets (`X, Y, Z, RX, RY, RZ`), `Tool Type`, and `Installation position` (`end`) are intact.
- **2. Tool Payload & Center of Gravity (`Initial > Base > Payload`):** Confirm mounted end-effector mass (kg), Center of Gravity coordinates (`CoG`), and active load selection. Incorrect payload values after an update will cause immediate false collision stops.
- **3. Base Mounting & Workpiece Frames (`Initial > Base > Mounting / World TCP`):** Confirm robot mounting tilt angles (floor, wall, or ceiling) and user reference frames.
- **4. Peripherals & End-Effectors (`Initial > Peripheral`):** Verify Gripper (e.g., `JODELL / ERG` on `Port 2 at the end`) and Force/Torque sensor activation status, and run `Zero correction` if equipped.
- **5. Low-Speed Dry Run (10%–20% Speed):** Verify firmware versions in the bottom-left corner, then execute existing programs at **10%–20% speed override** to confirm trajectories before resuming normal speed.

3. BACKUP AND RESTORE

Regular system backups protect against accidental parameter overwrites, simplify recovery after firmware upgrades, and allow rapid deployment across identical cobot cells.

3.1 Creating a Full System Backup

1. Ensure no `.lua` or background program is currently executing.

2. Navigate to **System > General** and scroll down to the **System log operation and factory reset** panel (shown in Figure 5).
3. Click the download icon next to **Configure Export** to download the complete configuration backup archive (all programs, TCPs, Payload, peripherals, I/O, and system settings). Optionally click **Export all data sources** as well if you want an archive that also embeds full controller diagnostic logs.
4. Save the downloaded archive to your engineering PC and rename it clearly with date, robot model, serial number, and software version (e.g., **2026-11-12_FR3_SN12345_V4.0.1.tar.gz**).

3.2 Restoring a Backup (Same Controller vs. Another Controller)

A. Restoring onto the Same Controller (Post-Update or Recovery):

1. Verify that the controller is running the same software version (or compatible minor release) as the backup archive.
2. Go to **System > General**, click the upload icon next to **Configure Import** (see Figure 5), and select the saved backup archive from your PC.
3. Reboot the control box when prompted and verify **TCP**, **Payload**, and peripheral activation.

B. Restoring onto Another Controller (Cell Cloning or Hardware Replacement):

- **Identical Robot Model & Firmware Required:** Only transfer backups between identical robot models (e.g., **FR3 -> FR3**) running matching WebApp/Controller versions.
- **Prevent IP Address Collisions:** Because **Configure Export** includes network settings, if both controllers are connected to the same plant network, immediately change the cloned controller's IP address in **System > General > Network Settings** right after importing.
- **Re-Verify Taught Waypoints at 10% Speed:** Small mechanical mounting tolerances between two physical arms or worktables can shift Cartesian/joint waypoints by a few millimeters. Always step through taught points at **10% speed** and touch up critical pick/place positions if needed.

3.3 Summary: What Is Included vs. Not Included in a Full Backup

INCLUDED IN FULL BACKUP	NOT INCLUDED IN FULL BACKUP
• **User Programs & Points:** All taught .lua scripts, graphical instruction trees, background programs, and saved waypoint files. • **Coordinate Systems:** Tool Center Points (TCP), World TCP frames, Workpiece TCP frames, and Base Mounting orientation. • **Payload & Dynamics:** Mounted tool mass (kg), Center of Gravity (CoG X/Y/Z), load presets, and Home point coordinates. • **Peripheral & I/O Setup:** Gripper, Force/Torque sensor, Welding, Modbus/PROFINET mappings, and Digital/Analog I/O labels. • **Safety & Motion Limits:** Collision detection sensitivity levels, Cartesian/joint speed limits, and software joint range limits. • **System & Network Config:** Eth0/Eth1 IP/Subnet/Gateway parameters, UI language, session timeout, and Teach Pendant enable state.	• **Controller & TP Firmware:** Core Linux/RTOS system binaries (software.tar.gz), WebApp UI packages, and slave board firmware. • **Activation License Key:** Hardware-bound Robot Activation Code / license file (tied to the specific controller Serial Number). • **Factory Joint Calibration:** Factory encoder zero-point offsets, motor commutation tables, and joint friction calibration data. • **Live Sensor Zero-Bias:** Real-time Force/Torque sensor zero drift (must be re-calibrated via Zero Correction after boot). • **External Device EEPROM:** Parameters stored inside external hardware (e.g., RS485 station ID or baud rate inside a Jodell gripper). • **Transient Runtime Logs:** Temporary diagnostic core dumps and volatile runtime variables.