

# TechGear Pro Laptop – Linux Installation & Troubleshooting (Replacing Windows)

**Problem:** You want to install Linux on your TechGear Pro Laptop, replacing the pre-installed Windows operating system, and need guidance on setup, driver installation, and common post-installation issues.

**Overview:** Installing Linux on a laptop designed for Windows can sometimes present challenges, particularly with proprietary hardware like Wi-Fi cards, Bluetooth, and dedicated GPUs (NVIDIA/AMD). This guide will walk you through the process using Fedora Linux, a popular distribution known for its cutting-edge software and good hardware support.

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## Part 1: Pre-Installation Preparations

### Step 1: Back Up Your Important Data

- **CRITICAL:** Installing Linux will erase your entire hard drive if you choose to replace Windows. Back up all your essential files, documents, photos, and videos to an external hard drive, USB stick, or cloud storage.

### Step 2: Create a Windows Recovery Drive (Optional but Recommended)

- If you ever need to revert to Windows (e.g., for warranty, resale, or specific software needs), having a Windows recovery drive can save you a lot of trouble.
- **Windows 10/11:** Search for "Create a recovery drive" in the Start Menu and follow the on-screen instructions. You'll need a USB drive (at least 16GB, but check Microsoft's recommendation for your Windows version).

### Step 3: Download Fedora Linux

- Visit the official Fedora Workstation download page:  
[getfedora.org/workstation/download/](https://getfedora.org/workstation/download/)
- Download the latest Fedora Workstation ISO file.

### Step 4: Create a Bootable USB Drive

- You'll need a USB drive (at least 8GB) and a tool to write the ISO to it.
- **On Windows:**
  1. **Recommended:** Balena Etcher ([www.balena.io/etcher/](https://www.balena.io/etcher/)) – It's cross-platform and very user-friendly.
  2. **Alternative:** Rufus ([rufus.ie/](https://rufus.ie/)) – Also popular for creating bootable drives.
- **Instructions (using Balena Etcher):**

1. Download and install Balena Etcher.
2. Open Etcher, click "Flash from file" and select your downloaded Fedora ISO.
3. Click "Select target" and choose your USB drive (DOUBLE-CHECK you select the correct drive, as this will erase its contents).
4. Click "Flash!" and wait for the process to complete.

### Step 5: Access BIOS/UEFI Settings & Disable Secure Boot / Fast Boot

- **Reboot your TechGear Pro Laptop.** As it starts up, repeatedly press the designated key to enter BIOS/UEFI settings. Common keys include: **F2**, **F10**, **F12**, **Del**, or **Esc**. (Check your laptop's manual if unsure).
  - **Disable "Secure Boot":** Look for "Secure Boot" in the Boot, Security, or Authentication sections. Disable it. Linux has improved Secure Boot support, but disabling it simplifies installation and driver loading.
  - **Disable "Fast Boot" / "Fast Startup":** This Windows feature can interfere with Linux and prevent proper shutdown or hardware detection. Disable it.
  - **Change SATA Mode (If Applicable):** Some laptops use Intel RST (Rapid Storage Technology) or RAID mode by default. Linux installers often require the SATA mode to be set to **AHCI**. Look for this setting in the Storage or Main sections of your BIOS/UEFI and change it if necessary.
  - **Set Boot Order:** Ensure your USB drive is prioritized in the "Boot Order" or "Boot Priority" list.
  - **Save Changes and Exit:** Save your BIOS/UEFI settings and reboot.
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## Part 2: Fedora Linux Installation

### Step 1: Boot from USB

- With the bootable USB inserted, your laptop should now boot from it. You might see a menu with options like "Start Fedora-Workstation-Live..." or "Test this media & start Fedora-Workstation-Live...". Choose the first option to boot into the Live environment.

### Step 2: Try Fedora (Optional but Recommended)

- Once Fedora loads, you'll see a desktop with two options: "Try Fedora" and "Install Fedora."
- Click "Try Fedora" to test your hardware:
  - **Wi-Fi:** Can you connect to your Wi-Fi network?
  - **Bluetooth:** Does Bluetooth appear to work? Can you connect a device?
  - **Sound:** Does audio play through speakers/headphones?
  - **Touchpad/Keyboard:** Do they respond correctly?
  - **Display:** Is the resolution correct?
  - This step helps identify potential issues before committing to installation.

### Step 3: Install Fedora

1. From the **"Try Fedora"** desktop, click the **"Install Fedora"** icon.
  2. **Language & Keyboard Layout:** Select your preferred language and keyboard.
  3. **Installation Destination:** This is the most crucial step.
    - Select your laptop's internal hard drive.
    - Choose **"Full disk summary and selection"** or **"Automatic partitioning."** Since you're replacing Windows, selecting the entire disk and allowing Fedora to **"Automatically configure partitioning"** is usually the easiest. This will erase everything on the drive.
    - **WARNING:** Double-check that you have selected the correct drive if you have multiple internal drives or external drives connected.
  4. **Network & Hostname:** Connect to your Wi-Fi if you haven't already. Set a hostname for your laptop.
  5. **Time & Date:** Verify your timezone.
  6. **User Creation:** Create your user account (username, password). Remember this password; it's essential for system administration.
  7. **Begin Installation:** Click **"Begin Installation"** and wait for the process to complete.
  8. **Reboot:** Once finished, click **"Finish Installation"** and remove the USB drive when prompted, then reboot.
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## Part 3: Post-Installation Setup & Drivers

### Step 1: System Updates

After the first boot into your new Fedora system, open the **"Software"** application (or a terminal) and apply all available updates. This ensures you have the latest kernel and software, which often includes updated drivers.

```
Bash
sudo dnf update -y
sudo reboot
```

### Step 2: Install Graphics Drivers (NVIDIA/AMD)

- **NVIDIA (Dedicated Graphics):** Follow the previous **"Troubleshooting Nvidia Drivers on Fedora Linux"** guide you have. The RPM Fusion method is strongly recommended for TechGear Pro Laptops with NVIDIA GPUs.
- **AMD (Dedicated or Integrated Radeon RX/Vega):** Fedora typically has excellent out-of-the-box support for AMD graphics via the open-source Mesa drivers, which are included with system updates. No extra steps are usually needed.

- **Intel (Integrated UHD):** Similarly, Intel integrated graphics usually work perfectly with the included open-source drivers.

### Step 3: Check Wi-Fi & Bluetooth Drivers

- Most modern Wi-Fi and Bluetooth chipsets are supported by the Linux kernel. If Wi-Fi or Bluetooth are not working after updates, you might have a less common chipset (e.g., some Realtek or Broadcom models).
- **Identify your wireless chipset:** Open a terminal and run `lspci -k | grep -EA3 'Network|Wireless|Bluetooth'` or `lsusb`.
- **Search for Drivers:** Use your chipset model (e.g., "Realtek RTL8821CE Linux driver Fedora") to find specific instructions online. RPM Fusion often provides drivers for common problematic wireless cards.

### Step 4: Power Management and Fan Control

- Laptops often require additional configuration for optimal power efficiency and fan management on Linux, as the defaults might not match Windows' aggressive power profiles.

#### Install **tlp** (Power Management):

```
Bash
sudo dnf install tlp tlp-rdw
sudo systemctl enable tlp.service
sudo systemctl start tlp.service
```

- **tlp** is a popular tool for optimizing battery life.
- **Fan Control:**
  - For general fan control: `sudo dnf install lm_sensors` then run `sudo sensors-detect` (answer YES to prompts) and `sensors` to check temperatures.
  - More advanced fan control (like `fancontrol` or `thinkfan` mentioned in search results) might require per-laptop tuning and are more complex. Check relevant Linux forums (e.g., r/linux, r/fedora, Arch Wiki) for advice on similar laptop models.

### Step 5: Install Essential Software

- Use the "Software" application or `dnf` in the terminal to install applications you need:
  - **Web Browsers:** Firefox (pre-installed), Chrome/Chromium (`sudo dnf install chromium`)
  - **Office Suite:** LibreOffice (pre-installed)

**Media Codecs:** Required for playing many video/audio formats.

```
Bash
sudo dnf groupupdate multimedia --setop="install_weak_deps=False"
--exclude=PackageKit-gstreamer-plugin
sudo dnf groupupdate sound-and-video
```

**Flatpak/Flathub:** Enable Flathub for access to a wider range of applications, including proprietary ones.

```
Bash
flatpak remote-add --if-not-exists flathub
https://flathub.org/repo/flathub.flatpakrepo
```

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## Part 4: Common Troubleshooting for Linux on Laptops

- **No Wi-Fi/Bluetooth after Installation:**
  - **Confirm Chipset:** Use `lspci` or `lsusb` to identify your specific wireless adapter.
  - **Check Kernel Support:** Newer hardware sometimes needs a very recent kernel. Ensure your system is fully updated.
  - **Firmware:** Some chipsets require non-free firmware, which might be provided by RPM Fusion or a specific `dnf` package. Search for "[Your Chipset Model] Linux firmware Fedora".
  - **Secure Boot:** Re-verify Secure Boot is disabled in BIOS/UEFI.
- **Screen Tearing/Poor Graphics Performance:**
  - **NVIDIA:** Re-check Nvidia driver installation as per the dedicated guide. Ensure you're using the proprietary drivers, not Nouveau.
  - **Wayland vs. X11:** If you have an NVIDIA GPU, try switching to "GNOME on Xorg" from your login screen if you encounter issues on Wayland.
  - **Integrated Graphics:** Ensure integrated graphics drivers are up to date via `sudo dnf update`.
- **No Sound or Microphone Not Working:**
  - **Check Mixer:** Open your system's sound settings and ensure the correct output/input device is selected and not muted.
  - **Install `pavucontrol`:** A more advanced sound mixer. `sudo dnf install pavucontrol`
  - **Kernel:** Very new audio hardware might require a newer kernel. Ensure your system is fully updated.
- **Laptop Overheating/Excessive Fan Noise:**

- **Power Management:** Ensure `tlp` is installed and running (`sudo systemctl status tlp.service`).
- **Dedicated GPU Management:** For NVIDIA, `nvidia-settings` can sometimes offer power profiles. For AMD, `corectrl` (from RPM Fusion) can provide similar functionality.
- **thermald:** This service can help with thermal management. `sudo dnf install thermald && sudo systemctl enable thermald --now`.
- **BIOS/UEFI Settings:** Some laptops have fan control options in the BIOS that can impact Linux behavior.
- **Suspend/Resume Issues:**
  - Common on some laptops. Ensure your kernel is up-to-date.
  - Search online for "[Your Laptop Model] suspend Linux" or "[Your Laptop Model] S3 sleep Linux".
- **Battery Draining Quickly:**
  - Ensure `tlp` is installed and active.
  - Reduce screen brightness.
  - Close unnecessary background applications.
  - Check `powertop` (run `sudo dnf install powertop` then `sudo powertop --auto-tune`) for power consumption details.
- **Boot Problems (After Kernel Update):**
  - Occasionally, a new kernel update can cause issues. During boot, try selecting an older kernel version from the GRUB menu. If an older kernel works, wait for the next update or report the issue to the Fedora community.

For any persistent or specific issues, the **Fedora Project Wiki**, **Fedora Forums**, and general **Linux communities** (e.g., **Ask Ubuntu**, **r/linux**) are excellent resources. Always include your TechGear Pro Laptop model, your Linux distribution and version, and specific error messages when seeking help.