canDO Valve Controller – Technical User Guide

Firmware 1.x

---

1 Introduction

1.1 Overview

The **canDO Valve Controller** is an inline electronic module that connects between the factory exhaust-valve actuator(s) and the vehicle harness on late-model BMWs. It allows the driver to:

- **Force the valves fully open** for maximum exhaust sound.
- **Return to OEM control** at any time.
- **Automate behaviour** through canDO+ Triggers and Actions.

1.2 Key Features

- Single-piece inline module – **no cutting or splicing**.
- **Fail-safe bypass** – exhaust valves instantly revert to OEM control if signal to the exhaust valves is lost.
- Secure **wireless connection** and **OTA firmware updates** via the mobile app.
- Continuous self-diagnostics with push notifications if signal disruption is detected.
- **One-year limited hardware warranty**.

1.3 System Requirements & Compatibility

Item	Requirement
Vehicle	BMW F- or G-series models with OEM exhaust-flap actuators
Supply voltage	9 – 16 V DC
Mobile OS	iOS 12 or later / Android 11 or later
Mobile app	**canDO Valve Controller** v1.0 or later

---

2 Getting Started – App Installation

2.1 Scan the QR Code on the Module

1. Scan the QR code printed on the module's top label.
2. The landing page displays a **6-digit pairing code** and icons linking to the Apple App Store or Google Play Store.

2.2 Install the Mobile App

1. Tap the store icon and install **"canDO Valve Controller"**.
2. Launch the app once installation completes.

   Important: Complete the physical installation in §3 before pairing.

---

3 Physical Installation & Pairing

Safety Note: Work only on a cooled exhaust system. If you are unfamiliar with vehicle electronics, consult a qualified technician.

3.1 Required Tools

No special tools are required (a trim-panel tool can help remove trunk liners).

3.2 Installation Procedure

1. In the vehicle **trunk**, locate the unused grommet openings leading to the rear under-floor area.
2. Remove a grommet, feed both module connectors through it, and reseat the grommet around the cable.
3. Beneath the car, unplug the factory 3-pin connector from each exhaust-valve actuator.
4. Insert the module inline between the actuator and vehicle harness.
5. Inside the trunk, mount the module **near the battery** and tidy the harness.

3.3 Pairing the Module

1. Start the car's **ENGINE** *or* enable **Diagnostics** mode.
2. Open the app; after a few seconds, you will be prompted for the **6-digit pairing code**.
3. Enter the code. After successful pairing the app checks firmware and offers an OTA update if available.

---

4 Operation & Mobile App

4.1 Main Screen Elements

- **Valve Graphic** – shows the **actual valve position** and toggles between **Open** and **OEM** when tapped.
- **Startup Preference Selector** – **Open Valves / OEM Control / Remember Last Setting**.
- **Regulatory Button** – opens compliance information pane.
- **Update Button** – indicates when a firmware update is available.

- **canDO+ Button** – grey when no canDO+ device is detected; blue when detected. Tapping opens a pane to enter the canDO+ Wi-Fi password.

4.2 Valve Modes

Mode	Description
OEM Control	Module **transparently relays** the factory valve-control signal; ECU governed.
Open Valves	Module **holds valves fully open**, overriding the ECU.

4.3 Fail-Safe Behaviour

If **signal to the exhaust valves is lost**, the module immediately reverts to **OEM Control** and the app displays a red notification banner.

4.4 OTA Firmware Updates

1. Tap **Update** when prompted.
2. Keep Ignition ON / Diagnostics active until the progress bar completes.
3. The module reboots automatically after a successful update.

5 Integration with canDO+

When a canDO+ device is detected wirelessly, the following **Actions** become available in the **Associations Panel under Exhaust**:

- **Open Valves**
- **OEM Valves**
- **Toggle Valves**

6 Technical Specifications

Parameter	Value
Supply Voltage	9 – 16 V DC
Continuous Current Draw	100 mA (max)
Operating Temperature	–40 ... +85 °C
Ingress Protection	IP66
Physical Dimensions (L × W × H)	65 × 65 × 41 mm

7 Warranty, Support & Liability

The canDO Valve Controller is covered by a **one-year limited hardware warranty** against defects in materials and workmanship under normal, intended use.

Our sole obligation under this warranty is, at our election, to **repair**, **replace**, or **refund** the purchase price of any product found to be defective.

Limitation of Liability — canDO Inc. is **not responsible for any damage to your vehicle, its electronic systems, or other property**, nor for any loss of use, downtime, or any incidental, indirect, special, or consequential damages arising from the installation or use of this product, whether in contract, tort, or otherwise. Installation and operation of the canDO Valve Controller are undertaken **at the owner's risk**.

To obtain warranty service, contact **support@cando.plus** with a description of the issue and the device serial number.

---

8 Legal Disclaimer Legal Disclaimer

- Installation may affect OEM vehicle warranty; consult your dealer.
- Exhaust-valve control devices may be restricted on public roads in certain jurisdictions. Ensure compliance with local regulations.
- Intended primarily for track or off-road use where permitted.

---

9 Known Issues (App version 1)

1. **Android Pairing Prompt Repeats** — During initial pairing, the pairing-code dialog may appear more than once before the process completes.
2. **Post-Update Error Dialog on Android** — Immediately after a successful OTA firmware update, the app may display an "Unexpected Error" message. The firmware has already been applied correctly; dismiss the dialog.
3. **Initial pairing issue** — during the first pairing, the app may receive data before pairing is complete, showing the state of the valves. Until pairing is completed, it is not possible to control the valves, however.