

canDO+ Technical User Guide

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Introduction

Congratulations on your purchase of canDO+, a cutting-edge device designed to enhance your BMW's CAN bus capabilities, offering advanced configuration options and debugging tools. This guide will walk you through the installation process, configuration settings, and how to utilize the device's advanced features effectively.

Installation

Installing canDO+ on your BMW requires a careful process due to the nature of accessing the CAN port. Follow these steps:

1. Prepare your workspace: Ensure you have enough space to work around the center console of your BMW. Gather necessary tools such as screwdrivers, and ensure the vehicle is parked safely with the ignition off.
2. Disassemble the center console: Depending on your BMW model (F-series or G-series), the process may vary slightly. Generally, you will need to locate and remove the trim pieces surrounding the iDrive controller.
3. Locate the CAN port: Once the center console is partially disassembled, locate the CAN port connected to the iDrive controller. This port is where you will connect the canDO+ device.
4. Connect the Y-cable: canDO+ comes with a Y-cable to facilitate connection to the CAN port. Connect one end of the Y-cable to the CAN port and the other end to the canDO+ device.
5. Secure the canDO+ device: Place the canDO+ device in a secure location within the center console, ensuring it does not obstruct any other components or wiring.

To ensure that the canDO+ device is functioning properly, follow these steps:

- **WiFi Server**

When up for the first time, canDO+ will start its WiFi server so you may configure the device. To change this behaviour, please read the Update section.

- **Connect to the WiFi Network**

On your computer, navigate to the list of available WiFi networks.

Locate and connect to the "canDO" WiFi network.

Enter the password when prompted: "candobmw".

It is recommended that you change this password after first connecting to canDO+ from the "Update" window.

- **Access the canDO+ Interface**

Open a web browser on your computer.

Enter the following address in the browser's address bar: <http://cando.local>, or <http://10.10.10.1> if your computer doesn't use mDNS.

Encrypted and secure connections are ensured by limiting the allowed number of WiFi connections to a single one (using WPA2 security). Once you are connected, canDO+ actively refuses other connection attempts, making the network a point to point connection between canDO+ and your computer. Encrypted communication is ensured through WPA2.

- **Customize or Analyze CAN Bus**

Once connected to the canDO+ interface, you can customize settings or analyze the CAN bus data.

Explore the interface to access features such as real-time data monitoring, message logging, and interactive mode for sending custom CAN messages.

- **Verify Functionality**

Confirm that you can access the canDO+ interface and navigate its features smoothly.

Test basic functionality such as viewing live data streams or sending custom CAN messages to ensure proper operation.

Once you have verified correct operation of the canDO+ device, carefully reassemble the center console trim pieces, making sure everything is aligned correctly and securely fastened.

Configuration

The canDO+ device offers comprehensive configuration options through its intuitive web-based interface. Start by following instructions found in the Installation section to access the the canDO+ web browser interface.

Associations Window

The Associations window allows you to create customized behaviors for your BMW by associating Trigger messages with Action messages.

The screenshot shows the 'Associations Window' in the canDO+ software. The interface includes a top navigation bar with buttons for 'Associations', 'canSPY', 'Update', and 'Restart'. The main area is divided into two sections. The top section, titled 'Trigger' and 'Action', features dropdown menus for 'M1/M2' and 'M Road Mode', with an 'Associate' button. Below this is a table of existing associations:

Trigger	Action	Remove
ENGINE Start	Engine Sport Plus	🗑️
	Chassis Sport Plus	
M1/M2	M Road Mode	🗑️

The bottom section, titled 'Custom CAN Message', contains a text input field with the value '123#1122334455667788', a 'Message Name' input field, and a 'Create' button. The version number 'G8X ID8 1.3.0' is visible in the bottom right corner.

Creating an Association

Select a Trigger

Choose a Trigger message from the dropdown menu. This message will initiate the desired action when detected by the canDO+ device.

Choose one or more Actions

Select the desired Action message from the dropdown menu. This message or sequence of messages will be executed in response to the Trigger message.

Associate Trigger with Action

Click the "Associate" button to link the selected Trigger message with the chosen Action message.

Custom Actions

In addition to predefined Action messages, users can create custom CAN messages based on observations made using the canSPY window. The Custom CAN message section allows users to define specific CAN messages to be sent as part of an Action sequence.

Custom CAN messages are entered in the following format: III#BBBBBBBBBBBBBBBB, where:

III represents the device ID.

indicates the start of the data bytes.

BBBBBBBBBBBBBBBB represents up to 8 bytes of hexadecimal data.

Manage Associations and Custom Messages

Associations and custom messages can be deleted or modified at any time by the user. Use the provided options to edit or remove existing associations and custom messages as needed.

Save Changes

It's important to note that changes made in the canDO+ interface are not immediately saved to non-volatile memory. Instead, a Save icon in the upper right corner becomes active when there are pending changes that the user would like to commit.

Click the Save icon to store the changes in the device's memory. This commits the changes to Flash memory, allowing for long-term application. However, modifications can still be made later on, ensuring flexibility and ease of adjustment between car starts.

By following these steps, users can easily create associations between Trigger and Action messages, as well as define custom CAN messages, to customize behaviors in their BMW. Additionally, they have the flexibility to manage associations and custom messages as needed, ensuring that the canDO+ device adapts to their preferences over time.

Important Notice Regarding canDO+ Associations

canDO+ provides users with the capability to automate and streamline various features already present in their vehicle, such as, but not limited to, traction control, lane departure warning, brake assist, etc. While these features are inherent to the vehicle, canDO+ allows for automation and shortcuts, enhancing user convenience.

It is crucial for users to understand that when utilizing canDO+ to automate these configurations, the built-in safety warnings typically displayed by the vehicle will be suppressed.

By opting to enable these automated customizations, users acknowledge and accept the following:

- canDO+ facilitates the automation and streamlining of existing features within the vehicle, enhancing user convenience and control.
- The suppression of built-in safety warnings is a direct consequence of canDO+'s automation of these configurations, aimed at providing users with a seamless experience.
- Users assume full responsibility for the consequences of their automated customizations and acknowledge that the manufacturer, distributor, and any affiliated parties shall not be held liable for any resulting damages or issues.

It is imperative for users to exercise caution and discretion when utilizing canDO+ to automate their vehicle's configuration. If uncertain about the implications of any customization, users are strongly advised to refrain from making the modification altogether.

By proceeding with the use of canDO+, users signify their understanding and acceptance of these terms and conditions.

canSPY Window

The canSPY window is comprised of three main areas, each offering unique functionalities for monitoring and analyzing CAN bus data. Please note that Associations are disabled when using the canSPY window. To return canDO+ to “normal” behaviour, make sure to return to the Associations Window.

The screenshot displays the canSPY window interface. On the left is a vertical blue bar with the 'canDO+' logo. The main window has a top navigation bar with buttons for 'Associations', 'canSPY', 'Update', and 'Restart'. Below this are three main panels:

- canSEND:** Contains the text '123#1122334455667788'. At the bottom, there is a 'MARKER (MS)' field with '100' and a 'Send' button.
- Device Management:** Features radio buttons for 'NO FILTERING' and 'BLACKLIST' (which is selected). A 'REC' button is also present. Below, a list of CAN IDs is shown: '038, 0C4, 417, 486, 148, 40F, 3B4, 57E, 10F, 267, 7E9, 5F4, 25E, 71B, 767, 3F1, 64F, 3BD, 286, 75E, 57B, 0F9, 759, 039, 7FD'. At the bottom, there is a 'WHITELIST' section with a text input field containing 'Enter whitelisted CAN ids, comma separated'.
- canVIEW:** Shows a list of CAN messages with their IDs and data bytes. The message 'IDR#11 22 33 00 00 00 C0 C0' is highlighted in red. At the bottom, it displays 'MSG/SEC: 000/000' and 'COUNT: 5.800E+1'. A 'CLEAR MARK' button is located at the top right of this panel.

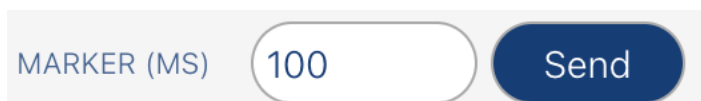
The bottom right corner of the window shows the version 'G8X ID8 1.2.0'.

canSEND

The canSEND section empowers users to inject one or more CAN messages onto the bus for testing and diagnostic purposes. Users can specify the identifier and data bytes before sending messages onto the CAN bus.

Users can send multiple messages by entering each on a separate line.

Marker Section



Positioned at the bottom of the canSEND interface, the Marker section offers a valuable tool for enhancing response tracking in the canVIEW window. Here, users can set a delay in milliseconds. Upon sending a message, a marker is immediately placed in the canVIEW window. Another marker is then automatically added after the specified delay period. This functionality aids users in pinpointing responses from the vehicle within a predetermined timeframe, facilitating easier identification of relevant messages amidst a high volume of bus traffic.

Device Management

Device Management provides options for filtering messages on the bus based on device ID, enhancing users' ability to focus on specific devices or message types during debugging sessions.

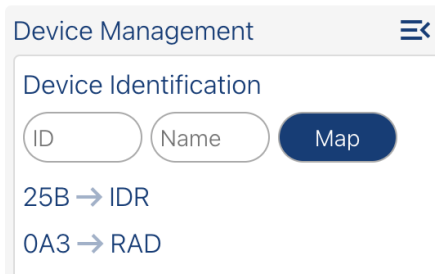
Users can toggle between "No Filtering," "Blacklist," and "Whitelist" modes using radio buttons.

With the Blacklist enabled, messages from devices included in the blacklist are filtered out in the canVIEW window, simplifying the search for relevant messages triggered by in-car events, such as button presses.

Users can modify the blacklist and whitelist by entering comma-separated device IDs, allowing for flexible customization of message filtering criteria.

The "Record" feature, represented by the "REC" icon, lets users dynamically append device IDs to the blacklist for the recording, facilitating focused analysis of specific device communications.

Device Identification



Users can access the Device Identification section, located in the upper right corner of the Device Management area. Here, users can assign three-letter identifications to specific device IDs, enhancing message readability and comprehension in the canVIEW window.

canView

The canView window provides a comprehensive view of messages on the CAN bus, allowing users to monitor and analyze data in real-time. Here's an overview of the features available in the canView window:

Filtered Message Display

Messages on the CAN bus are displayed in real-time, allowing users to observe the flow of data. Filtered messages can be displayed based on device ID filtering settings configured in the Device Management section.

ASCII View

```
000#63 61 6E 44 4F 2B  
canDO+
```

Users can toggle an ASCII view of received message bytes using the "ctrl-shift-a" hotkey. This feature allows for easier interpretation of message contents, especially when dealing with text-based data.


Message Rate Monitoring and Message Count

```
MSG/SEC: 000 / 000 COUNT: 3.000E+1
```

The canView window shows the rate of messages per second on the CAN bus, providing insights into bus activity and data transmission rates.

Users can track the total number of messages received during the session, providing an overview of bus activity over time.

The canView window includes user interface elements for added functionality:

```
canVIEW CLEAR MARK 
```

Marker

Users can add a marker to the message stream by clicking on the marker icon. This feature helps users identify specific points of interest in the data stream.

Clear

Users can clear the message window by clicking on the clear icon, allowing for a clean slate when monitoring new data.

Start/Stop

Users can toggle message capture by clicking on the toggle switch icon. This functionality provides control over when data is being captured for analysis.

By leveraging the features and UI elements available in the canView window, users can gain valuable insights into CAN bus activity and perform real-time monitoring and analysis effectively.

Update Window

The update process for the canDO+ device is handled through the Update section of the user interface.

The screenshot displays the canDO+ user interface with a dark blue header and a white main content area. On the left side, the 'canDO+' logo is oriented vertically. The top navigation bar contains four buttons: 'Associations', 'canSPY', 'Update' (which is highlighted with a blue border), and 'Restart'. Below the navigation bar, the 'Update' section is divided into two main panels. The first panel, titled 'Firmware Update', contains two input fields for 'WiFi Name' and 'WiFi Password', followed by a dark blue 'Connect' button. Below these fields is a paragraph of text: 'canDO will attempt to your WiFi network and check for new firmware online, then install it. This may take a few minutes. Please do not power off your car during the update. During the update, canDO will disconnect from your computer. Check periodically for the canDO WiFi network to become available, then connect to it.' The second panel, titled 'Update canDO's WiFi password. This will take effect on the next power up.', contains two input fields for 'WiFi Password' and 'Confirm Password', followed by a dark blue 'Update' button. Below these fields is a toggle switch for 'WiFi on startup is ENABLED*' and a 'Toggle' button. A note at the bottom of this panel reads '*ensure you have tested OPTION Long Press before disabling!'. In the bottom right corner of the interface, the version number 'GBX ID8.1.2.0' is displayed.

Prepare for Update

Start the WiFi feature of the canDO+ device as described in the "Accessing the canDO+ Interface" section.

Open a web browser on a computer connected to the same network as the canDO+ device, as explained in the "Accessing the canDO+ Interface" section.

Access the Update Section

In the web browser, navigate to the Update section of the canDO+ interface. Enter the SSID and password of a WiFi network with internet connectivity, then click Update.

Initiate Update Process

canDO+ will go online and check for available updates. If an update is found, it will be downloaded, and the upgrade process will begin automatically.

During the update, it's recommended not to turn off the vehicle to avoid interrupting the process. This may take a few minutes, during which time the device will not be available.

Monitor Network Connectivity

It's possible that the computer used for the update will connect to a different network than canDO+'s during the process. Users should monitor available WiFi networks. Note that **it can take up to 5 minutes** for the update process to complete, even after the canDO Wifi network becomes available. While canDO+ performs the update, you may get an error page such as this one, this is normal.



Your connection was interrupted

A network change was detected.

ERR_NETWORK_CHANGED

Verify Update Status

Once connected back to the canDO+ network and the web page refreshes, you should see the following message:



Updating WiFi preferences

canDO+ always starts its WiFi network on startup so you may connect to it for configuration. With WiFi on startup disabled, the network shuts down after a short grace period.

We recommend changing the canDO+ default password.

Troubleshooting

If you encounter any issues with your canDO+ device, follow these troubleshooting steps to resolve common problems.

Resetting Associations and Custom Messages

If you experience issues related to associations or custom messages, you can reset the databases to factory default through the canDO+ interface. To do this, press CTRL-SHIFT-D while accessing the relevant section of the interface. This action will reset all associations and custom messages to their default settings.

Contacting Support

If you're unable to resolve the issue using the troubleshooting steps provided, contact canDO+ support for further assistance. You can reach out to support@cando.plus for any inquiries or troubleshooting help. Provide detailed information about the issue you're experiencing, including any error messages or symptoms observed.

By following these troubleshooting steps, you can effectively address common issues with your canDO+ device and ensure smooth operation.

Technical Specifications

Dimensions: Approximately 65 x 45 x 25 mm (L x W x H)

Compatibility: BMW iD8 G-series vehicles

Power Supply: 12V DC

Supported Protocol: CAN

API-driven browser interface

Warranty & Support

The canDO+ device comes with a 6-month exchange warranty. This warranty covers defects in materials and workmanship under normal use. If you encounter any issues with your device during the warranty period, you are eligible for an exchange.

For warranty claims and inquiries, please contact our support team at support@cando.plus. Provide detailed information about the issue you're experiencing, including any error messages or symptoms observed. Our support team will assist you in processing your warranty claim and arranging for a replacement device if necessary.

Disclaimer: Use of canDO+

By using canDO+, the user acknowledges and agrees to the following terms and conditions:

Limited Warranty: The manufacturer warrants that canDO+ will function as intended for a period of six (6) months from the date of purchase. However, the user acknowledges that there is no guarantee that canDO+ is free of software defects. If the device fails to function within this warranty period due to defects in materials or workmanship, the manufacturer will, at its sole discretion, repair or replace the device.

Assumption of Risk: The user acknowledges and understands that canDO+ provides the capability to configure various functionalities within the vehicle, including but not limited to, automatically disabling safety features such as Dynamic Stability Control (DSC), enabling Sport Mode, and suppressing built-in warning messages. By using canDO+, the user assumes all risks associated with configuring the device to perform these actions, and they accept full responsibility for any consequences arising from such configurations.

Limitation of Liability: In no event shall the manufacturer, distributor, or any affiliated parties be liable for any direct, indirect, incidental, special, or consequential damages arising out of or in any way connected with the use or performance of canDO+. This includes, but is not limited to, damages for loss of profits, goodwill, use, data, or other intangible losses, even if advised of the possibility of such damages.

Indemnification: The user agrees to indemnify and hold harmless the manufacturer, distributor, and any affiliated parties from and against any and all claims, liabilities, damages, losses, costs, or expenses (including reasonable attorneys' fees) arising out of or related to the use of canDO+.

Jurisdiction: Any legal action or proceeding arising out of or related to the use of canDO+ shall be instituted exclusively in the provincial courts of Quebec, Canada. The user waives any objection to such jurisdiction and venue.

User Responsibility: The user is solely responsible for ensuring that the use of canDO+ complies with all applicable laws, regulations, and manufacturer guidelines. The user agrees to use the device responsibly and to exercise caution when making any modifications to the vehicle's settings or systems.

Modification of Terms: The manufacturer reserves the right to modify or update these terms and conditions at any time without prior notice. It is the user's responsibility to review these terms periodically for any changes.