User's Guide
SLOU538–June 2020

DRV8428P EVM GUI User's Guide

This document is provided with the DRV8428P evaluation module (EVM) as a supplement to DRV8428P Stepper Motor Driver datasheet. This user's guide details on how to use the DRV8428P EVM GUI application.

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Trademarks

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1 Overview

The DRV8428P EVM is a platform to support prototyping and evaluation for the DRV8428P, a medium-voltage dual H-bridge driver for brushed DC and stepper driving applications.

The EVM uses an MSP430™ microcontroller and a USB interface chip to manage communication from the GUI software application installed on a PC computer with Windows®. The GUI sends serial commands to the MSP430 to control the device signals, monitor faults, read and write SPI registers, and drive a stepper motor by issuing the step commands at the desired rate. This document describes the software and tools used to evaluate DRV8428P device for stepper motor driving on the DRV8428P EVM.

2 Hardware and Software Setup

The hardware (HW) and software (SW) tools that follow are required for the evaluation of DRV8428P:

- DRV8428P EVM
- Stepper motor
- Voltage supply from 4.2 to 33 V

This document only describes the installation and usage of the DRV8428P EVM GUI. For additional details on hardware connections refer to the DRV8428xEVM User's Guide .

3 GUI Application

3.1 Installation

Installation (For Desktop Version Only)

- Download the installable DRV8428_x.x.x_installer_win.zip file (The file is inside the DRV8428xEVM_software.zip file. x.x.x is the GUI revision number).
- Extract the zip.
- Double click on the installer to install the GUI Application. During first time installation, the installer prompts for installation of Cloud Agent. Please Install it. During the installation, customer company's firewall may block "download from website" option for the GUI composer runtime installation, please download GUI runtime v7.4.1 from this link: https://software-dl.ti.com/ccs/non-esd/gui_composer/runtime/gcruntime-7.4.1-windows-installer.exe and save it to your local harddrive. And then, use "Install from File" option to install the GUI composer runtime.

3.2 Getting Started with DRV8428P EVM GUI

The DRV8428P EVM GUI and DRV8428P EVM allows the user to configure various settings required for BDC motor or stepper motor driving. The DRV8428P EVM GUI lets the user adjust the motor speed, control the direction, control the step movement, configure various device settings, and monitor the device status.

Perform the following steps to begin using the GUI:

- Connect the stepper motor to the EVM.
- Plug in the micro-USB cable to the PC.
- Enable the motor power supply. For additional details on hardware connections refer to the DRV8428xEVM User's Guide

Click on DRV8428P EVM GUI shortcut either on the desktop or from the start menu to run the GUI application.

3.3 Use the DRV8428P EVM GUI

After open the DRV8428 GUI, the GUI landing page shown in Figure 1

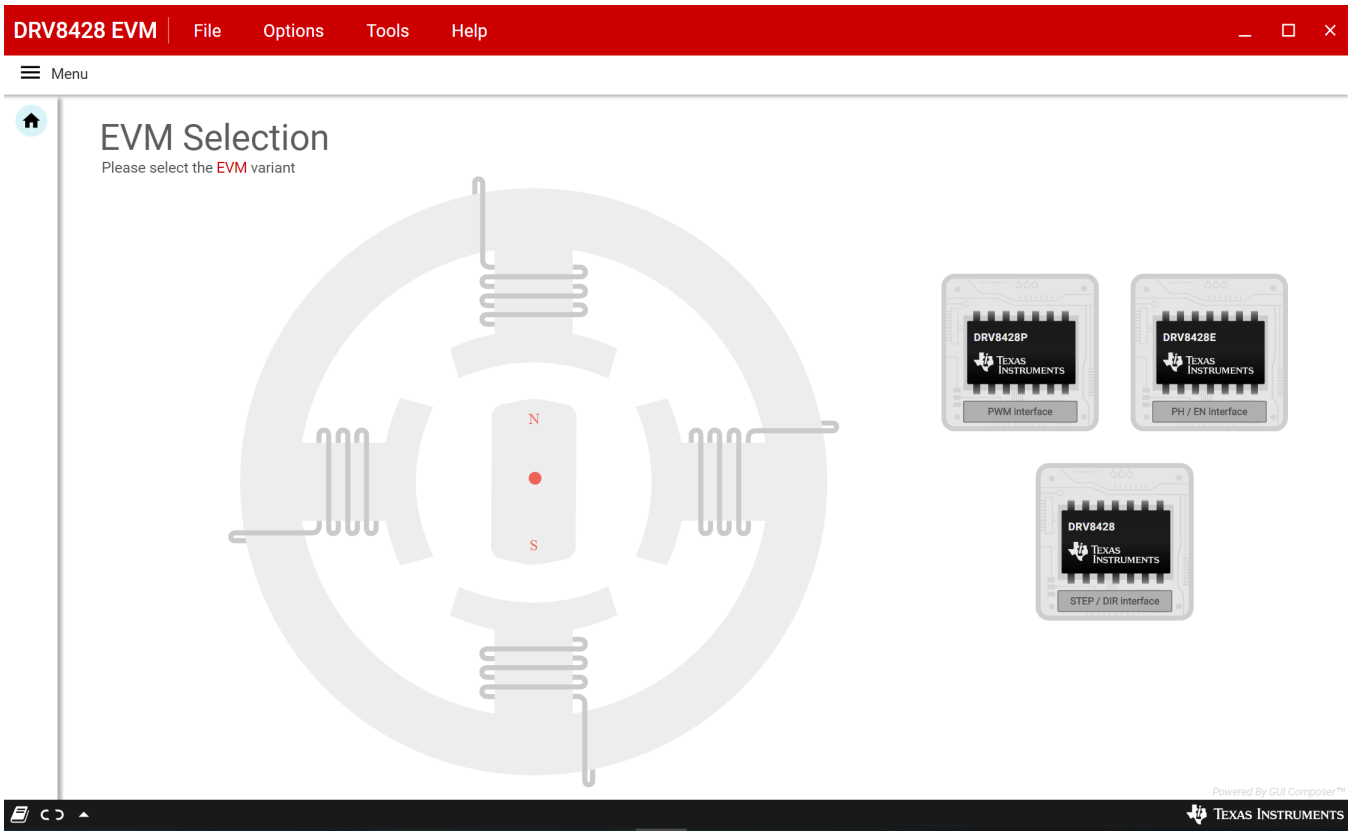

Figure 1. DRV8428 EVM GUI (Landing Page)

After click the DRV8428P device from the GUI landing page, the DRV8428P GUI home page shown in Figure 2

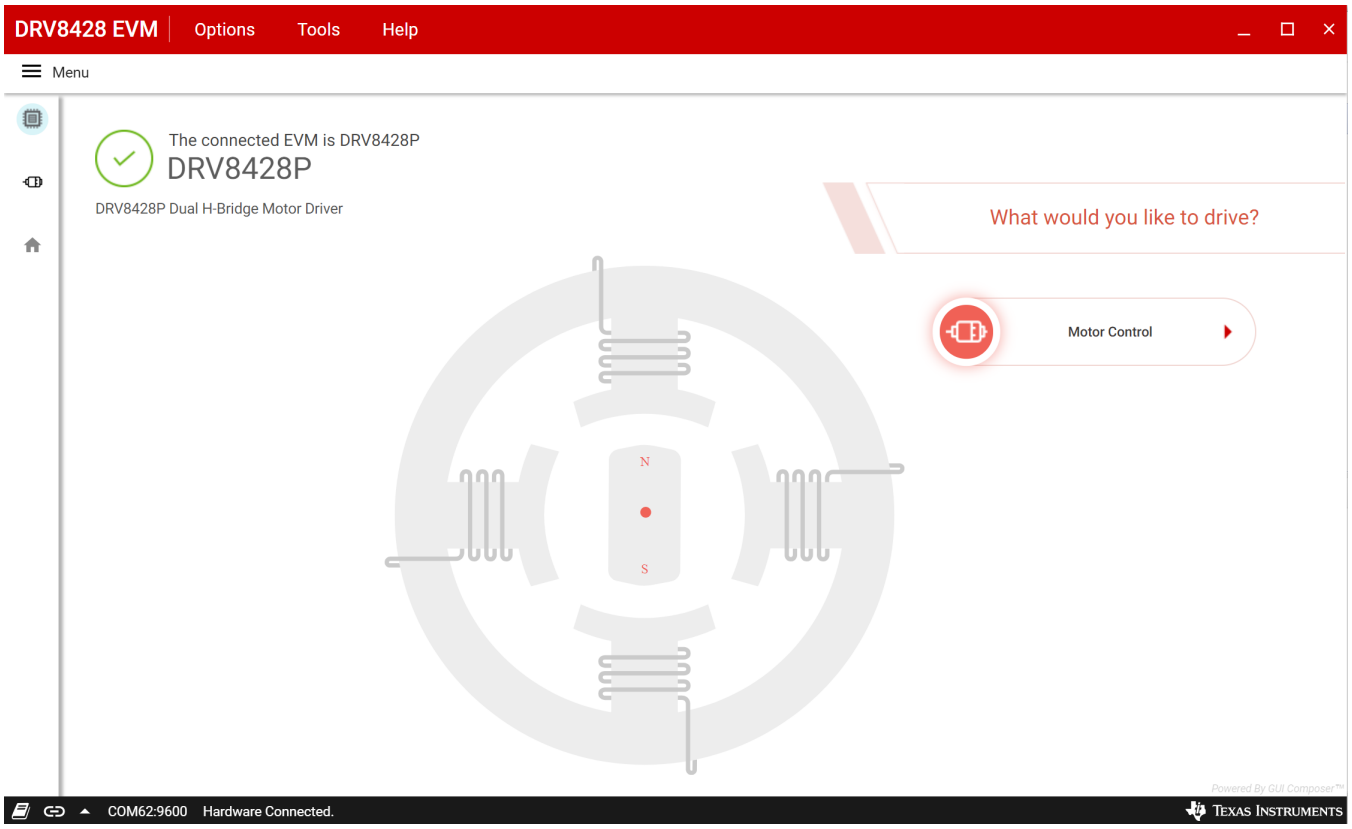

Figure 2. DRV8428P EVM GUI (Home Page)

The application will try to establish communication with the device connected. A message showing 'Connected to Cloud Agent. Connecting to target…' will be displayed in the hardware connection status pane at the bottom of the screen. If the connection is successful, 'COMxx:9600 Connected to Target' message appears as shown in Figure 3 below

Figure 3. DRV8428P EVM GUI (Device Connection Pane)

If the GUI fails to connect to the EVM, the hardware connection status pane will show the message 'Hardware Not Connected'.

If the GUI is opened without connecting the EVM, the hardware connection status pane will show 'Error: no serial ports found'.

If there are more than one DRV8428P EVM boards connected, the first matching device will be connected automatically. In order to switch to another EVM:

1. Click Options -> Serial Port. A serial port configuration popup is displayed as shown below in Figure 4.
2. Choose the appropriate port and baud rate.
3. Click OK

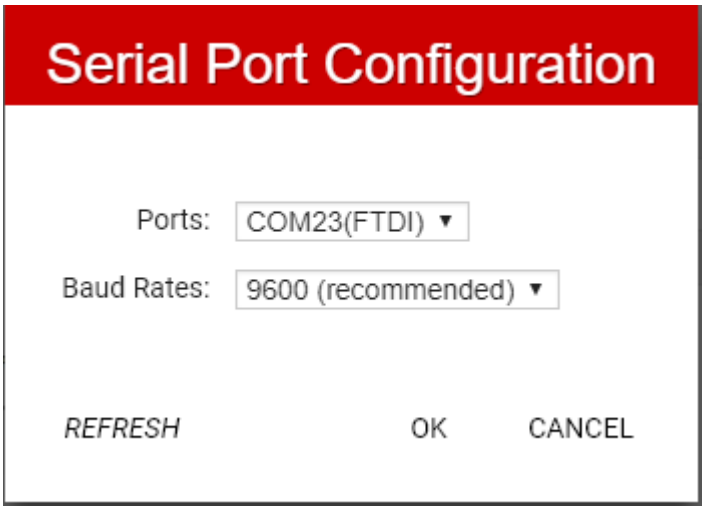

Figure 4. Serial Port Configuration

Once the correct device is connected, the home page will show a message ‘Device Connected’ with a green check mark as shown in Figure 1

Click on the ‘Stepper Motor’ button to open the motor control page.

3.3.1 Motor Control Page

This page (shown in Figure 5) includes various controls to sleep/wake the driver and control the motor by configuring various parameters such as AVREF_VALt, control mode and so forth. Hovering over the (?) icon to the right of a control displays a brief description about the control.

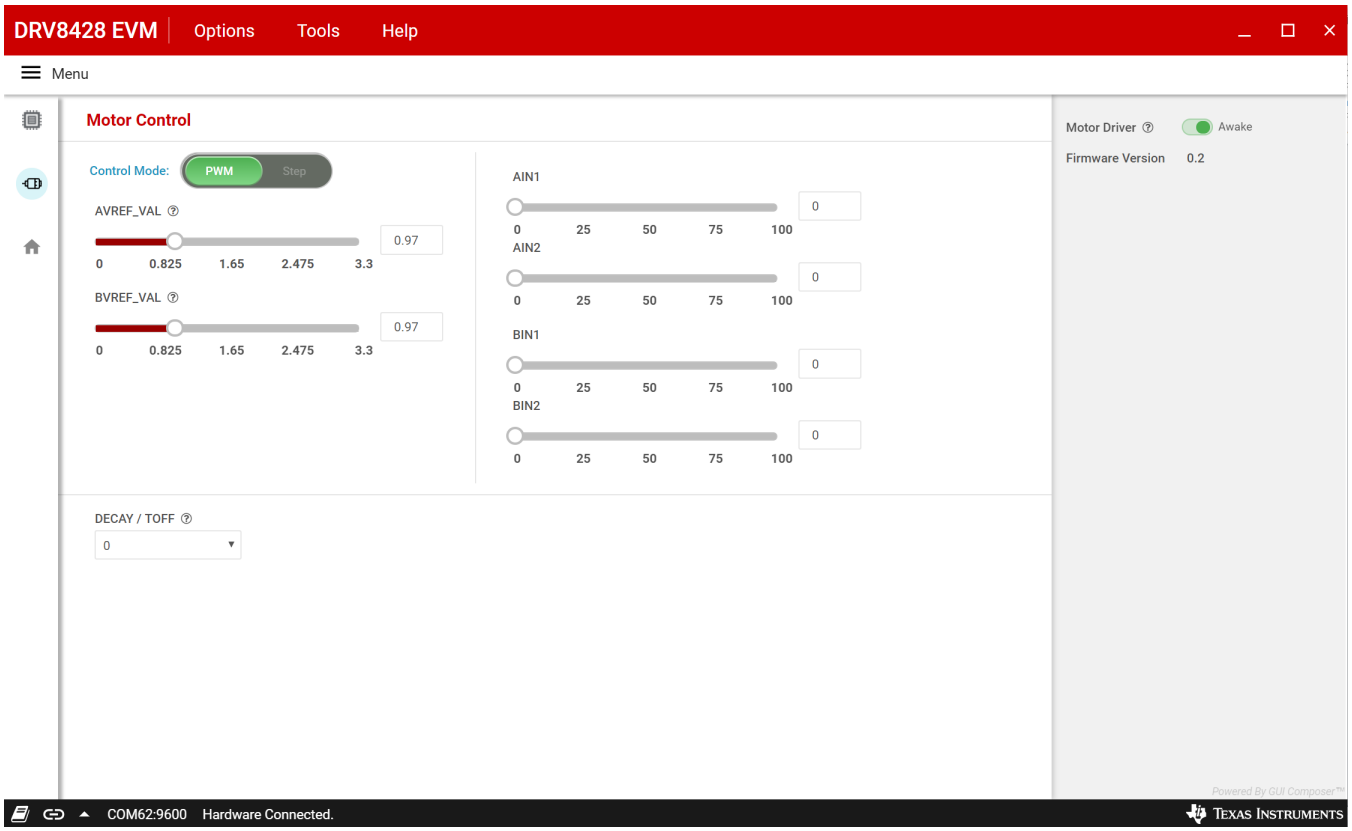

Figure 5. DRV8428P EVM GUI (Motor Control Page)

3.3.1.1 Control Modes

The GUI allows the user to control the stepper motion profile in two modes – PWM Mode and Step Mode. To toggle between the modes, use the toggle button at the top of the screen.

3.3.1.1.1 PWM Mode

By default, PWM operation mode is selected. This configuration allows the user to connect one or two brushed motors for evaluation. If transitioning to pwm mode from step mode, the following actions will take place:

1. The AINx and BINx sliders will appear.
2. The chopping current will be recalculated.

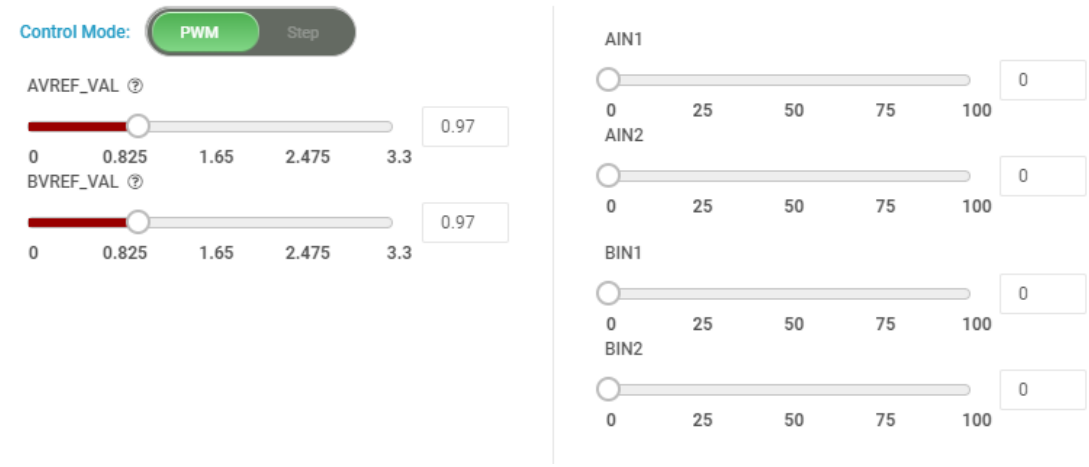

Figure 6. Controls Available for Speed Mode

3.3.1.1.2 Step Mode

The DRV8428P EVM provides the ability to operate a stepper motor in full step mode. The firmware provides the necessary timing pulses on the AINx/BINx input signals to drive the stepper at the desired speed and direction.

To use the stepper feature, set the “Control Mode” toggle to “Step”.

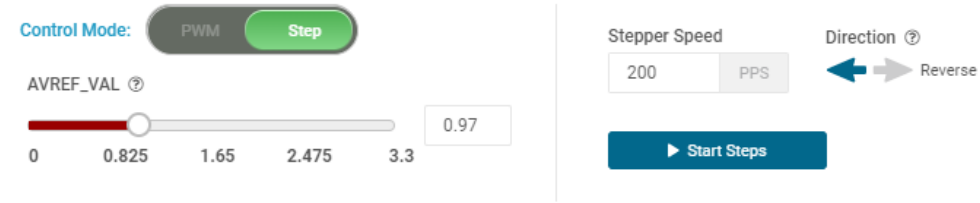

Figure 7. Controls Available for Step Mode.

Set the desired stepper step and direction, and then click “Start Steps”. The stepper speed and direction can be changed as the motor is running.

3.3.2 Decay Mode and TOFF setting

Decay refers to how the driving currents recirculate in H-bridge FETs during the off time. Using the GUI, users can configure the decay mode and TOFF for each bridge.

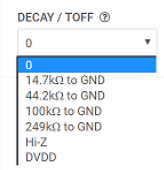

Figure 8. DRV8428P EVM Decay Mode and TOFF setting

Decay mode and appropriate TOFF values can be configured in this pulldown menu. For more information about the different decay modes, refer to the DRV8428E Motor Driver datasheet.

3.3.3 Use the Side-Bar Menu

Use the side-bar menu in the left pane to navigate to the different pages at any time. Click on the hamburger button in the top-left corner of the GUI to expand the side-bar menu. The following pages that are displayed in the side-bar menu:

- Home (landing page)
- Motor control (motor control page)
- Motor driver (DRV8428EEVM GUI home page)

3.3.4 Menu Bar Options

The following menus are available in the menu bar displayed at the top of the GUI as shown in Figure 9.

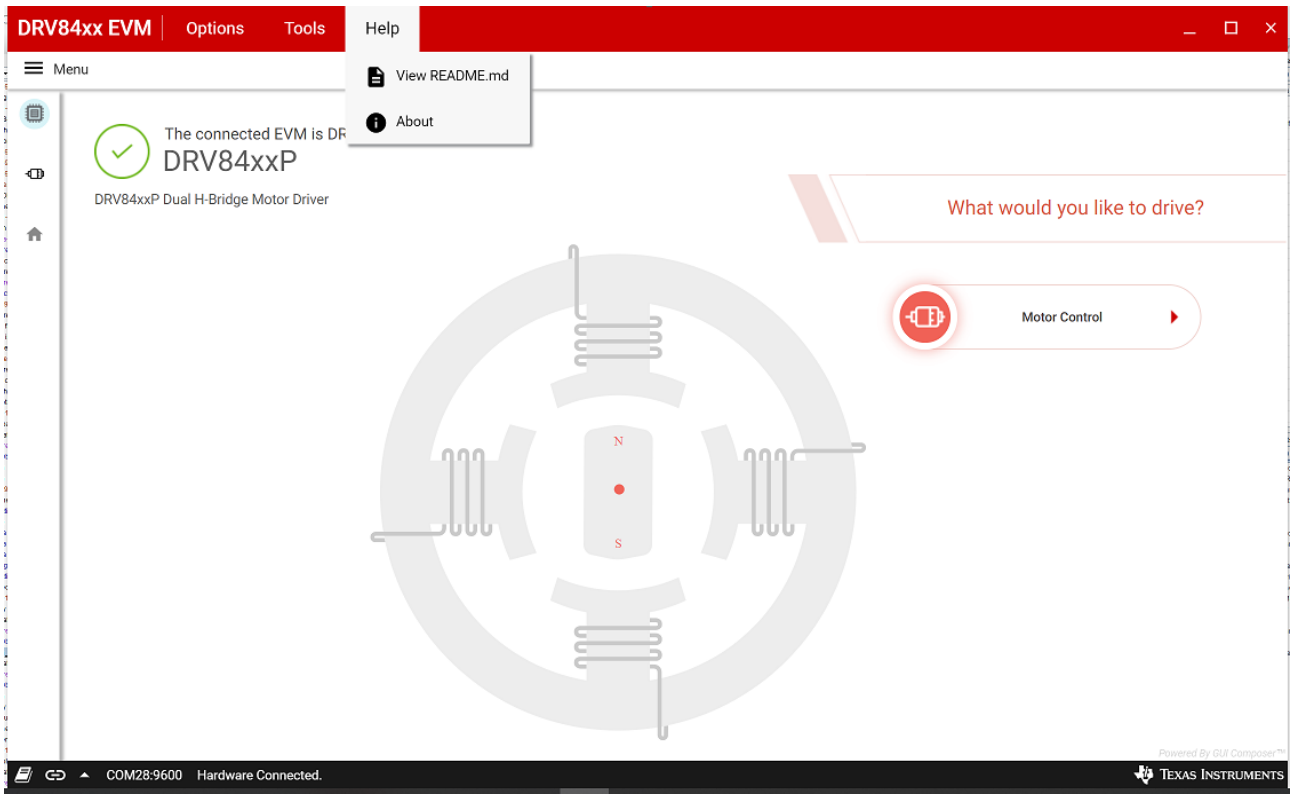

Figure 9. DRV8428P EVM GUI (Menu Bar – Help Option)

3.3.4.1 File Menu

The user can load the firmware (.out) file onto the onboard MSP430 by clicking file menu and selecting an appropriate motor driver device to match the EVM variant. For the firmware load to work, MSP430 FET needs to be plugged into the J2 connector on the EVM board.

3.3.4.2 Options Menu

This menu provides the option to configure the serial port communication settings.

3.3.4.3 Tools Menu

The "log pane" option in this menu is to open a log pane at the bottom of the GUI which shows the GUI actions.

3.3.4.4 Help Menu

The Help Menu contains options to view Readme File and About Section. The About Section displays the installed software information, including the application version.

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- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

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