# TOYOTA GR86 ZN8 / SUBARU BRZ ZD8 CHASSIS

## GEN2 FORMULA LINE RACING STEERING WHEEL SYSTEM

## INFORMATION PACKET

SYSTEM ARCHITECTURE / PROGRAMMING / FUNCTION LIBRARY / FITMENT

FORMULA LINE WITH STANDARD OLED DID + REVLEDS

**DOCUMENT SCOPE**

This packet documents the Toyota GR86 / Subaru BRZ Chassis Formula Line platform, vehicle integration, MadtraceLAB profile structure, and 32-command function library. Actual behavior depends on model year, market, factory steering-wheel, audio and infotainment equipment, transmission, cruise and driver-assistance equipment, drive-mode configuration, coding, installed options, and software configuration.

# OVERVIEW


PRODUCT LINE POSITIONING + COMPARISON — pg. 3–5

EXECUTIVE SUMMARY — pg. 6

MECHANICAL CONSTRUCTION — pg. 7

VEHICLE INTEGRATION: CAN + LIN — pg. 8

MADTRACELAB 2.0 — pg. 9

MULTI-PROFILE SETTINGS + QUICK SWITCH — pg. 10

CONTROL INPUT ARCHITECTURE — pg. 11

REVLED SHIFT LIGHT + ILLUMINATION — pg. 12

OLED DRIVER INFORMATION DISPLAY (STANDARD) — pg. 13

MAGNETIC PADDLE SHIFTERS — pg. 14

STEERING WHEEL FUNCTIONS: CORE + MEDIA — pg. 15

STEERING WHEEL FUNCTIONS: MENU + CRUISE / ASSIST — pg. 16

CAR CONTROL FUNCTIONS — pg. 17

GENERAL VEHICLE FUNCTIONS — pg. 18

VEHICLE FITMENT + INCLUDED EQUIPMENT — pg. 19

CONFIGURATION WORKFLOW + SAFETY SUMMARY — pg. 20–21

# WHERE THE FORMULA LINE FITS

## PRODUCT LINE POSITIONING

•Clubsport Line is the streamlined GEN2 entry platform, retaining programmable factory steering-wheel functions, RGB lighting, MadtraceLAB, and multi-profile storage.
•PODIUM Line adds RevLED, center-console commands, advanced race controls, rear profile quick switching, and optional multi-paddle configurations while preserving round-wheel adapter flexibility.
•Formula Line combines the high-level GEN2 electronics with a purpose-designed 290 mm Formula wheel. RevLED, the OLED Driver Information Display, and two programmable magnetic paddles are integrated as standard equipment.
•GEN1 is the legacy fixed-layout platform and does not include MadtraceLAB programming, RGB customization, RevLED, or multi-profile operation.

| LINE | PRIMARY POSITION | KEY DIFFERENCE |
|---|---|---|
| **Clubsport** | GEN2 entry platform | Core factory functions and programmable controls; no RevLED or advanced race controls. |
| **PODIUM** | Expanded GEN2 platform | RevLED, center-console and race controls, profile switching, and optional paddle expansion. |
| **FORMULA** | Dedicated 290 mm Formula wheel | RevLED, OLED DID, and two programmable magnetic paddles are standard. |
| **GEN1** | Legacy platform | Fixed layout; no MadtraceLAB, RGB customization, multi-profile operation, or RevLED. |

### FORMULA LINE TAKEAWAY

FORMULA combines Podium-level electronic control with a dedicated 290 mm Formula wheel, standard OLED DID, RevLEDs, and integrated magnetic paddles.

# PRODUCT LINE COMPARISON: CORE PLATFORM

| FEATURE | CLUBSPORT | PODIUM | FORMULA | GEN1 |
|---|---|---|---|---|
| **Factory steering-wheel functions** | Standard | Standard | Standard | Standard |
| **Completely plug and play** | Standard | Standard | Standard | Standard |
| **Programmable button layout** | Standard | Standard | Standard | Fixed layout |
| **RGB customizable button colors** | Standard | Standard | Standard | Not equipped |
| **MadtraceLAB** | Standard | Standard | Standard | Not equipped |
| **OLED Driver Information Display (DID)** | Optional | Optional | Standard | Not equipped |
| **Two programmable magnetic paddles** | Optional for AT | Optional for AT | Standard | Optional for AT |

**HOW TO READ THE TABLE**

Standard = included in the line architecture. Optional items depend on vehicle, transmission, and ordered configuration. AT = automatic transmission.

# PRODUCT LINE COMPARISON: RACE CONTROLS + ADAPTERS

| FEATURE | CLUBSPORT | PODIUM | FORMULA | GEN1 |
|---|---|---|---|---|
| **Two programmable magnetic paddles** | Not equipped | Optional | Standard | Not equipped |
| **RevLED CAN bus shift lights** | Not equipped | Standard | Standard | Not equipped |
| **Center-console functions** | Not equipped | Standard | Standard | Not equipped |
| **Advanced race controls** | Not equipped | Standard | Standard | Not equipped |
| **Multi-profile settings** | Standard | Standard | Standard | Not equipped |
| **Rear button profile quick switch** | Not equipped | Standard | Standard | Not equipped |
| **6×70 mm MOMO original horn-cap adapter** | Optional | Optional | Not equipped | Optional |
| **6×74 mm NARDI-type steering-wheel adapter** | Optional | Optional | Not equipped | Optional |

**WHY FORMULA STANDS APART**

FORMULA matches PODIUM's advanced control capability in a purpose-built Formula wheel, with the OLED DID, RevLEDs, and magnetic paddles included as standard equipment.

# EXECUTIVE SUMMARY

•The JQ Werks Madtrace GEN2 FORMULA Line is a purpose-designed 290 mm racing steering wheel system inspired by GT3 and GT4 endurance-racing ergonomics.
•For supported Toyota GR86 and Subaru BRZ applications, the control hub integrates compatible CAN bus and LIN bus communication so factory steering-wheel, media, cruise, driver-assistance, drive-mode, lighting, and wiper functions can be operated from the wheel.
•A dedicated harness, CAN integration module, adapter hub, and quick-release base with integrated chassis PCB create a plug-and-play, vehicle-specific installation without wire splicing.
•Front-facing buttons, joystick-style rotary controls, dedicated rotary controls, and two programmable magnetic paddles can be assigned through MadtraceLAB across a 32-command Toyota GR86 / Subaru BRZ library: 23 Steering Wheel, 4 Car Control, and 5 General functions.
•Three complete profiles can be stored in the hub, each with an independent button map and lighting configuration, and recalled through an assigned profile quick-switch input.
•The OLED DID, RevLED shift lights, 290 mm Formula wheel, and two programmable magnetic paddle inputs are integrated; MOMO and NARDI adapters are not offered.
•The system removes the factory steering wheel and airbag and is intended exclusively for off-road, track, racing, and competition use.

**FUNCTION AVAILABILITY**

Slides 15–18 document the complete 32-command Toyota GR86 / Subaru BRZ function library. Availability depends on model year, market, factory steering-wheel, audio and infotainment equipment, transmission, cruise and driver-assistance configuration, drive modes, coding, software configuration, and the selected vehicle profile.

# MECHANICAL CONSTRUCTION

## FORMULA LINE HARDWARE

•The purpose-designed 290 mm Formula wheel housing is precision machined from 6061-T6 billet aluminum for accurate geometry, consistent alignment, and a premium finished surface.
•Smooth, high-grip rubber is applied to the handgrip areas to support secure control and endurance-racing ergonomics.
•Black and red anodized finishes define the Formula Line visual treatment and coordinate with the matching adapter hub and quick-release assembly.
•The quick release is manufactured from 7075-T6 billet aluminum for strength, durability, and a precise mechanical fit.
•Front-facing buttons, joystick-style and dedicated rotary controls, RevLED shift lights, the OLED DID, and two programmable paddle inputs keep critical functions within reach.
•The integrated design eliminates the need for a separate round steering-wheel rim, horn-cap adapter, or NARDI/MOMO steering-wheel adapter.

**CONFIGURATION SHOWN**

Official Formula configuration shown with integrated OLED DID, RevLED shift lights, and two programmable magnetic paddle inputs.

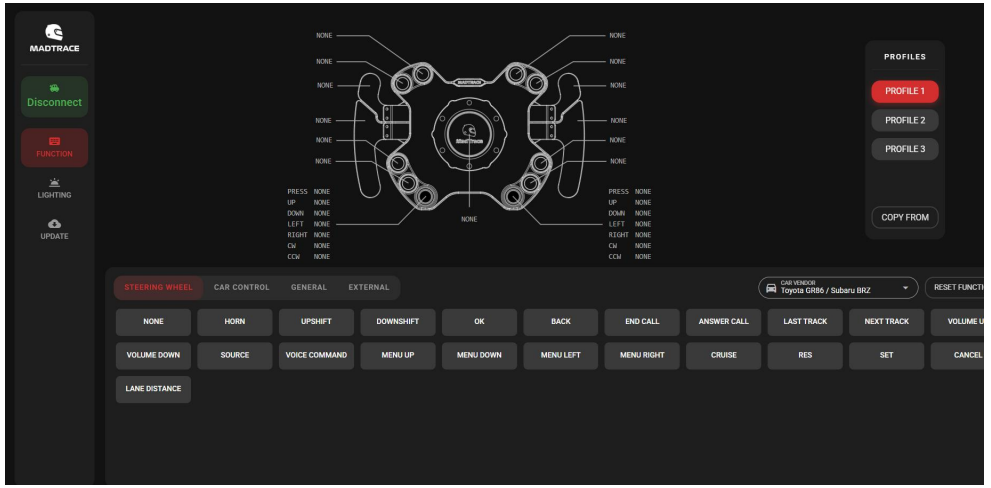
# VEHICLE INTEGRATION: CAN + LIN

•Toyota GR86 / Subaru BRZ steering-wheel, media, cruise, driver-assistance, drive-mode, lighting, and wiper commands are distributed across the vehicle's electronic networks. The FORMULA Line interfaces with supported data through vehicle-specific CAN + LIN integration hardware.
•CAN communication supports compatible factory data and commands, including RevLED RPM input, steering-wheel controls, cruise, Track Mode, SPORT, ESP, SNOW, lane distance, and the vehicle functions exposed by the selected Toyota GR86 / Subaru BRZ profile.
•LIN communication supports compatible factory steering-wheel electronics where required by the configured application.
•A dedicated Toyota GR86 / Subaru BRZ harness and CAN integration module connect the system without cutting or splicing factory wiring.
•The supplied library includes 32 commands. Transmission, media, menu, cruise, lane-distance, Track Mode, SPORT, ESP, and SNOW commands require the corresponding vehicle equipment, market configuration, coding, and software profile.
•See pages 14–18 for the Formula paddle architecture and complete Toyota GR86 / Subaru BRZ function tables.

# MADTRACELAB 2.0

MadtraceLAB is the configuration and update platform for the GEN2 Formula control hub.
The Function workspace displays the steering wheel graphic, available input locations, selected vehicle vendor, function categories, and active profile.
A user can select an input and assign a supported command from the Steering Wheel, Car Control, General, or available External category.
Lighting settings control button illumination and RevLED behavior for visibility, recognition, and driver preference.
The Update section manages compatible software and feature updates through the hub's discreet USB-C service connection.
“Copy From” can transfer an existing layout into another profile before profile-specific changes are made.

## MADTRACELAB FUNCTION WORKSPACE




### PROFILE SETUP

For the Toyota GR86 / Subaru BRZ vendor profile, confirm the exact model year, market, transmission, steering-wheel, audio and infotainment equipment, cruise and driver-assistance equipment, drive-mode controls, coding, installed options, and software profile before mapping or copying a layout.

# MULTI-PROFILE SETTINGS + QUICK SWITCH

- Up to three complete profiles can be stored directly in the Formula hub's internal memory.
- Each profile can contain independent button assignments, paddle assignments, and illumination settings.
- A race profile can prioritize Track Mode, SPORT, ESP, SNOW, signals, wiper, and frequently used menu or media controls.
- A road or media profile can group phone, audio source, track selection, volume, voice command, menu controls, and cruise.
- A third profile can support lane-distance control, a second driver, endurance use, or another verified Toyota GR86 / Subaru BRZ configuration.
- Assign a profile quick-switch input for rapid access, and use the standard OLED DID or MadtraceLAB to review and manage the active mapping.

| STORED PROFILE | SUGGESTED USE | WHAT IS RETAINED |
|---|---|---|
| **Profile 1** | Race baseline | Verified essential commands + lighting |
| **Profile 2** | Road / media | Independent functions + lighting |
| **Profile 3** | Distance / secondary driver | Independent functions + lighting |

# CONTROL INPUT ARCHITECTURE

## FRONT-FACING CONTROLS

- Front-facing push buttons provide direct access to frequently used mapped functions.
- Two joystick-style rotary controls expand the input count with Press, Up, Down, Left, Right, Clockwise, and Counterclockwise actions when enabled.
- Dedicated rotary controls can support Clockwise and Counterclockwise assignments where enabled.
- Two magnetic paddle inputs are integrated and can be assigned to supported upshift / downshift, signals, flash, wiper, mode, menu, media, or other verified commands.
- A profile-selection input can switch among the three saved maps and their independent lighting configurations.
- Shift, cruise, lane-distance, menu, media, ESP, and drive-mode assignments must match the actual Toyota GR86 / Subaru BRZ factory equipment, transmission, market configuration, coding, software configuration, and selected profile.

| INPUT GROUP | AVAILABLE ACTIONS | TYPICAL GR86 / BRZ ASSIGNMENT |
|---|---|---|
| **Front buttons** | Push inputs | Horn, media, cruise, voice, menu, or mode |
| **Left joystick** | Press / U / D / L / R / CW / CCW | Menu navigation or driver preference |
| **Right joystick** | Press / U / D / L / R / CW / CCW | Menu navigation, cruise, or lane distance |
| **Dedicated rotary controls** | CW / CCW | Media or driver preference |
| **Magnetic paddles** | 2 programmable inputs | Shift, signals, flash, wiper, menu, or mode |
| **Profile selection** | Assigned quick-switch input | Profile 1 / 2 / 3 |

**HUMAN-FACTORS NOTE**

Place functions where they can be identified and operated without the driver looking away from the track. Keep critical commands consistent across profiles.

# REVLED SHIFT LIGHT + ILLUMINATION

RevLED CAN bus shift lights are standard equipment on the FORMULA Line control hub.

In MadtraceLAB 2.0, the user can set the RPM threshold at which the shift-light sequence begins and the redline alert flashes.

Engine-speed data is received through the vehicle communication system so the sequence can respond to the supported RPM signal.

The LEDs progress through the configured sequence, and all lights flash at the programmed redline condition.

Button illumination colors can be customized so groups of controls are easier to recognize during a driving session.

Different profiles may use different lighting schemes, providing visual confirmation of the active button map.

The standard OLED DID provides direct adjustment of display brightness, RGB button colors and mapping functions of the hub, while complete programming remains available through MadtraceLAB.

Review redline and illumination settings whenever the hub is moved to another compatible vehicle or the engine calibration changes.

> **CONFIGURATION RESPONSIBILITY**
>
> Shift lights are a driver aid, not a substitute for the vehicle's engine-protection strategy. Match the visual redline to the verified engine setup.

# OLED DRIVER INFORMATION DISPLAY

Every FORMULA Line racing steering wheel includes an OLED Driver Information Display positioned directly beneath the RevLED shift lights.
Through the integrated CAN bus connection, the DID can display supported real-time telemetry such as vehicle speed.
The display provides direct access to button-layout mapping and profile selection without reconnecting the hub to a computer.
Display brightness and RGB button illumination can be adjusted from the DID interface.
Available telemetry channels depend on the selected vehicle and software configuration.
Test the vehicle after any on-wheel mapping change, even when the DID confirms that the assignment was saved.

## DID CAPABILITIES

| CAPABILITY | STATUS |
|---|---|
| **Real-time speed** | Supported telemetry |
| **Button mapping** | Direct control |
| **Profile switching** | Direct control |
| **Display brightness** | Adjustable |
| **RGB button colors** | Adjustable |
| **Computer connection** | Not required for DID changes |

### STANDARD EQUIPMENT

The OLED DID is integrated into every Formula Line wheel and is included as standard equipment.

# MAGNETIC PADDLE SHIFTERS

- The FORMULA Line includes two motorsport-grade magnetic paddles made from 6061-T6 billet aluminum.
- Both paddle inputs are integrated into the purpose-built wheel architecture and included as standard equipment.
- Each paddle is programmable, allowing either input to control any supported function in the selected Toyota GR86 / Subaru BRZ profile.
- A common GR86 / BRZ layout can use the paddles for supported upshift / downshift, turn signals, flash, wiper, mode changes, menu navigation, media, or other verified commands.
- Assignments can be adapted for road, track, endurance, or secondary-driver profiles without changing hardware.
- Paddle assignments can be stored independently in each of the three profiles.
- Verify every assignment with the vehicle stationary before track use.

**MAPPING SAFETY**

Program only functions that can be safely operated from a paddle. Avoid assignments that could cause an unintended vehicle-state change during steering input.

# STEERING WHEEL FUNCTIONS: CORE + MEDIA

| MADTRACELAB FUNCTION | COMMAND PURPOSE | CONFIGURATION NOTE |
|---|---|---|
| **NONE** | Leaves the selected input unassigned. | Use for unused or reserve inputs. |
| **HORN** | Activates the supported horn command. | Verify stationary before use. |
| **UPSHIFT** | Requests the supported transmission upshift. | Supported automatic transmission required. |
| **DOWNSHIFT** | Requests the supported transmission downshift. | Supported automatic transmission required. |
| **OK** | Confirms the supported selection. | Factory interface dependent. |
| **BACK** | Returns to the previous supported menu. | Factory interface dependent. |
| **END CALL** | Ends the supported phone call. | Factory infotainment dependent. |
| **ANSWER CALL** | Answers the supported incoming call. | Factory infotainment dependent. |
| **LAST TRACK** | Selects the previous supported audio track. | Factory audio dependent. |
| **NEXT TRACK** | Selects the next supported audio track. | Factory audio dependent. |
| **VOLUME UP** | Raises supported factory audio volume. | Factory audio dependent. |
| **VOLUME DOWN** | Lowers supported factory audio volume. | Factory audio dependent. |

**VERIFICATION**

Transmission, phone, and audio commands require the corresponding factory equipment and selected Toyota GR86 / Subaru BRZ profile. Test every assignment with the vehicle stationary.

# STEERING WHEEL FUNCTIONS: MENU + CRUISE / ASSIST

| MADTRACELAB FUNCTION | COMMAND PURPOSE |
|---|---|
| **SOURCE** | Cycles the supported factory audio source. |
| **VOICE COMMAND** | Activates the supported voice-command input. |
| **MENU UP** | Moves upward through the supported menu. |
| **MENU DOWN** | Moves downward through the supported menu. |
| **MENU LEFT** | Moves left through the supported menu. |
| **MENU RIGHT** | Moves right through the supported menu. |
| **CRUISE** | Activates the supported cruise-control command. |
| **RES** | Resumes the supported stored cruise setting. |
| **SET** | Sets the supported cruise-control target. |
| **CANCEL** | Cancels the active supported cruise command. |
| **LANE DISTANCE** | Adjusts the supported following-distance command. |

**REGIONAL + EQUIPMENT DEPENDENCY**

Audio-source, menu, voice-command, cruise, and lane-distance commands require the corresponding Toyota GR86 / Subaru BRZ factory equipment, market support, coding, software configuration, and selected profile.

# CAR CONTROL FUNCTIONS

| MADTRACELAB FUNCTION | COMMAND PURPOSE |
| --- | --- |
| **TRACK MODE** | Activates the supported Track Mode command. |
| **SPORT** | Activates the supported sport-mode command. |
| **ESP** | Activates the supported stability-control command. |
| **SNOW** | Activates the supported snow-mode command. |

**CONTROL PLACEMENT**

Track Mode, SPORT, ESP, and SNOW commands require the corresponding Toyota GR86 / Subaru BRZ factory equipment, transmission, market configuration, coding, software configuration, and selected profile.

# GENERAL VEHICLE FUNCTIONS

| MADTRACELAB FUNCTION | COMMAND PURPOSE |
|---|---|
| **NONE** | Leaves the selected input unassigned. |
| **FLASH** | Activates the supported high-beam flash command. |
| **LEFT TURN SIGNAL** | Activates the supported left turn signal. |
| **RIGHT TURN SIGNAL** | Activates the supported right turn signal. |
| **SINGLE WIPE** | Requests one supported windshield-wiper cycle. |

- Turn-signal, high-beam, and windshield commands are configuration dependent and must be verified on the actual car.
- Do not assume the same input map behaves identically across model years, markets, equipment packages, coding, or software revisions.

# VEHICLE FITMENT + INCLUDED EQUIPMENT

## APPLICABLE TOYOTA / SUBARU MODELS

| CHASSIS VERSION | MODEL | MODEL YEARS |
|---|---|---|
| **ZN8 / ZD8** | TOYOTA GR86 / SUBARU BRZ | 2022–PRESENT |

## EACH FORMULA LINE HUB KIT INCLUDES

1x FORMULA Line control hub unit
1x Quick-release base with integrated chassis PCB
1x CAN bus integration module
1x Vehicle harness kit
1x Resistor
1x Adapter hub (Boss Kit)
1x Adapter hub locking wrench
1x Trim-removal tool
1x Hardware kit
1x Allen key
1x Button-sticker set
1x JQ Werks / Madtrace sticker set
1x USB cable

**FORMULA STANDARD EQUIPMENT**

The OLED DID, RevLED shift lights, 290 mm Formula wheel, and two programmable magnetic paddle inputs are integrated; MOMO and NARDI adapters are not offered.

# CONFIGURATION WORKFLOW

1. Confirm the exact Toyota GR86 or Subaru BRZ model year, market, transmission, steering-wheel, audio and infotainment equipment, cruise and driver-assistance equipment, drive-mode controls, coding, installed options, and software configuration.
2. Install the vehicle-specific adapter hub, harness, CAN integration module, and quick-release base according to the applicable guide. Do not splice factory wiring.
3. Connect the control hub through USB-C and confirm compatible MadtraceLAB software and system updates.
4. Select the Toyota GR86 / Subaru BRZ profile and map only commands supported by the actual model year, transmission, factory equipment, market, coding, and software configuration.
5. Create Profile 1 as the verified baseline. Copy that layout to Profiles 2 and 3 before condition- or driver-specific changes.
6. With the vehicle stationary, test every button, joystick direction, rotary action, both paddles, profile selection, RevLED sequence, OLED DID command, and mapped shift, phone, media, menu, cruise, lane-distance, ESP, drive-mode, lighting, or wiper function.
7. Repeat verification after any software update, vehicle change, transmission change, coding change, equipment change, calibration update, hardware change, or profile revision, then record the final map.

**IMPORTANT**

This is a high-level configuration workflow, not an installation manual. Follow application-specific instructions and use a qualified professional where required.

# SAFETY, USE RESTRICTIONS + SUMMARY

## IMPORTANT SAFETY INFORMATION

The JQ Werks Madtrace Racing Steering Wheel System is designed only for off-road, track, racing, and competition purposes. It is not intended for street use.
Installation removes the factory steering wheel and airbag. A solid racing steering wheel can increase the risk of bodily injury in a collision.
Do not use the system with the factory three-point seat belt. JQ Werks requires a six-point racing harness with a racing roll bar for off-road use.
Do not install the system on a vehicle subject to state safety inspection.
Laws and required safety equipment vary by country, state, and region. Consult qualified legal and motorsport-safety professionals.
Professional installation, complete stationary function testing, and driver familiarization are recommended before track use.

***CONTROL WITH PURPOSE.***

JQ WERKS x MADTRACE

**SUMMARY**

For supported Toyota GR86 and Subaru BRZ applications, the GEN2 FORMULA Line combines a purpose-designed 290 mm Formula wheel, CAN + LIN vehicle integration, 32 configurable commands, three stored profiles, RevLEDs, OLED telemetry, and two programmable magnetic paddles in one removable driver-control platform.