StartDefender

User Manual

Racing Tech LLC

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v0.2

Summary

Introduction

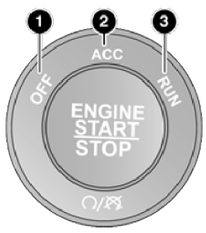
This operation manual assumes that the **StartDefender** has been correctly installed in the engine bay.

If you have not already installed it, please follow our video tutorial for installation or, if you prefer, have your mechanic install the **StartDefender**.

The **StartDefender** system comprises two devices that work together to provide a complete and responsive user experience.

The first device, referred to as ***Main***, is installed in the engine bay of the car and performs essential functions such as input readout, locking, and unlocking operations. The second device, referred to as the ***USB LED***, serves as a companion to the core device, acting as an audio-visual status indicator.

This guide assumes that the car is in **ACC** (Accessory) or **RUN** (Run) mode. In **OFF** mode, the ***Main*** device will be in sleep mode and not respond to any commands.



1. **OFF**, Off
2. **ACC**, Accessory
3. **RUN**, Run

⚠ WARNING

The StartDefender box includes a *Code Sheet* containing a VERY IMPORTANT and UNIQUE CODE. If the sheet is missing, please contact Customer Service.

Control Interface

1 Device connection

The control interface is available via a **Wi-Fi connection** provided by the ***Main*** device. To access the interface, put the car in **ACC** (Accessory) mode and connect a **smartphone** or **computer** to the **Wi-Fi network** detailed on the *Code Sheet*.

The device comes with a unique **12-character** password. Make sure to disable any applications that could interfere with communication, such as **VPN apps**. For power-saving reasons, the **Wi-Fi connection** is available only in **ACC** (Accessory) and **RUN** (Run) mode.

Once connected to the network:

1. **QR Procedure:**

   Scan the QR code below to be directed to the home page.

2. **Manual Procedure:**

   (a) Open a web browser.

   (b) Navigate to `http://startdefender.local`.

   (c) After step (b), the home screen should appear.

⚠ WARNING

Be sure to connect to HTTP and not HTTPS

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2 Home page

Once you are successfully connected to **StartDefender**, the Home Interface displays various options as illustrated below:

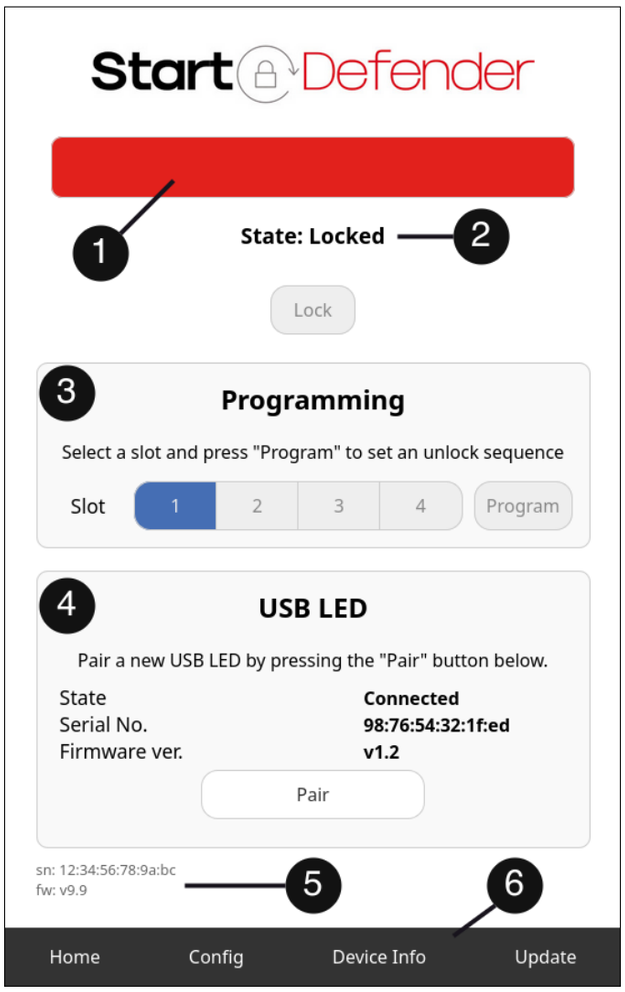


Figure 2: Home Interface screenshot

1. **Status Bar**
2. **System State**
3. **Sequence Programming Section**
4. ***USB LED* Connection Management**
5. **Hardware and Firmware Information**
6. **Navigation Bar**

The Home Interface provides a global overview of the system, allowing the user to view the system status, program a new sequence, or manage the ***USB LED*** device. Below are the individual functions explained:

1. **Status Bar**: Displays one of four states that follow the color-coding defined in Section 6.
2. **System State**: The system can have multiple states:
   - **Locked**: The vehicle is locked and engine start is inhibited.

- **Wrong**: The inserted code is incorrect; inputs are ignored.
- **Unlocking**: **StartDefender** is in the process of unlocking the vehicle; simply wait.
- **Unlocked**: The vehicle is unlocked and engine start is permitted.
- **Programming**: The ***Main*** module is in programming mode, allowing you to change the code (see section 5).
- **Fault**: (Fault state description.)

3. **Sequence Programming Section**: You can set up to four codes.
4. ***USB LED* Connection Management**: View the ***USB LED*** state, serial number, firmware version, or pair/unpair the ***USB LED*** device.
5. **Hardware and Firmware Information**: View the serial number and firmware version of the ***Main*** module.
6. **Navigation Bar**: Navigate between screens—**Home** (Home Interface), **Config** (Configuration Interface; see section 3), **Device Info** (current and historical data, such as temperature or crank history), and **Update** (see section 9)).

3 Configuration page

The configuration screen allows the user to customize the behavior of **StartDefender**.

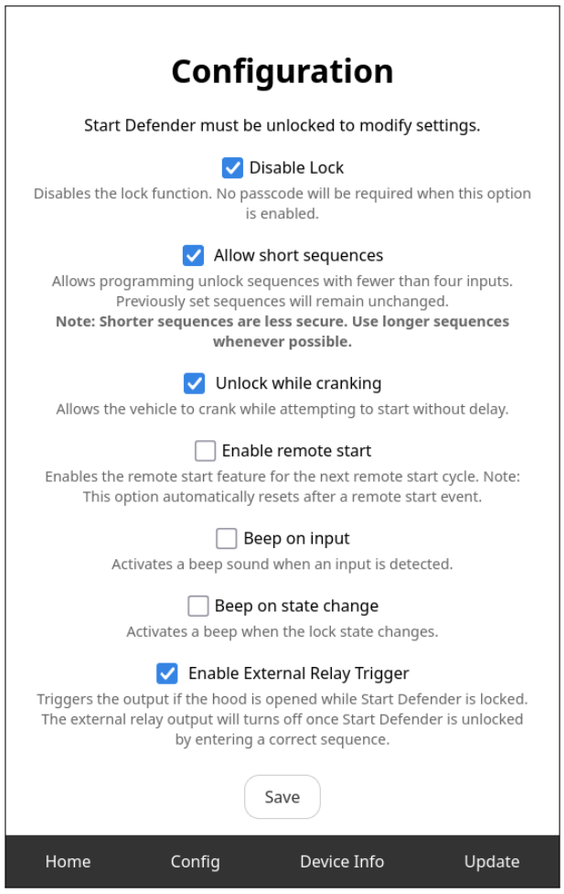


Figure 3: Configuration Page

The available features are listed below:

- **Disable Lock**: Disables **StartDefender**. The system will remain unlocked as long as this option is enabled.
- **Unlock While Cranking**: Allows **StartDefender** to unlock when the car is attempting to start. For example, if this option is disabled and **StartDefender** begins unlocking while the engine is cranking, it will unlock immediately to allow engine start; otherwise, it will wait until cranking ceases.
- **Enable Remote Start**: Activates the remote start feature. This feature must be reactivated after each remote start event.
- **Beep on Input**: Emits a beep with every button press.
- **Beep on State Change**: Emits a beep whenever the **StartDefender** state changes (e.g., from locked to unlocked).
- **Enable External Relay Trigger**: Activates the external relay trigger when the hood is opened while **StartDefender** is locked.

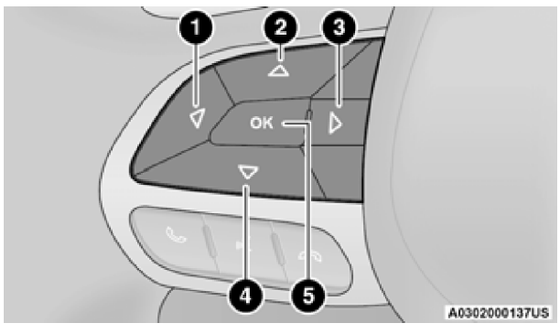
Usage

4 Unlocking StartDefender

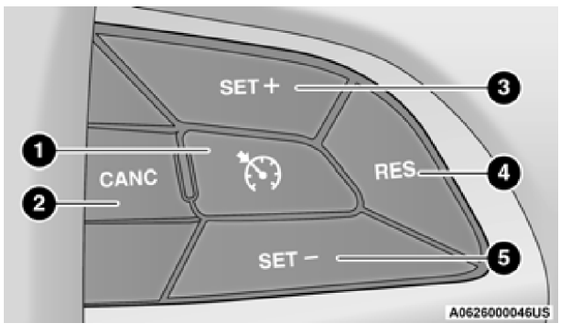
To unlock the **StartDefender** device, enter the correct sequence followed by the submit button.

4.1 Available buttons

All available buttons are located on both sides of the steering wheel.



(a) Left-side Buttons



(b) Right-side Buttons

The button is used to submit the unlock sequence and cannot be used as part of the sequence. The default sequence is unique for each **StartDefender** and can be found on the *Code Sheet*.

4.2 Unlocking procedure

To unlock the vehicle, ensure the car is in either **ACC** (Accessory) or **RUN** (Run) mode:

1. Put the car in **ACC** (Accessory) or **RUN** (Run) mode.
2. Enter the unlocking sequence.
3. Submit the sequence by pressing .

If the sequence is correct, the ***USB LED*** indicator will turn green, indicating that the vehicle is unlocked and the engine can be started normally. If the sequence is incorrect, the indicator will remain purple for a few seconds.

⚠ WARNING

Button presses during this period are ignored. Once the indicator light returns to red, you may attempt another sequence. Note that repeated incorrect attempts will increase the waiting time up to a maximum of 2 minutes.

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5 Programming a new sequence

After unlocking **StartDefender** (see Section 4), you can program a new sequence. As shown on the home screen, up to four sequence slots are available. Follow these steps:

1. Unlock **StartDefender**.
2. Connect via WiFi to **StartDefender** and navigate to the home page.
3. Select a slot and press the `Program` button.
4. Enter a sequence of up to 7 buttons, followed by .
5. Repeat the same sequence, ending with .
6. If programming is successful, **StartDefender** will lock. Otherwise, repeat from step 3 and ensure both sequences match.
7. Verify the newly programmed sequence by attempting to unlock **StartDefender**.

6 *USB LED* indicator codes

Table 1 shows the light patterns displayed by the ***USB LED*** indicator and their explanations.

Light Pattern	Explanation
	The ***USB LED*** is disconnected from the ***Main*** device.
	The ***USB LED*** is disconnected from the ***Main*** and is sleeping.
	The vehicle is locked; engine start is **inhibited**.
	The inserted code is incorrect; inputs are ignored.
	The system is waiting for the starter command to turn off.
	The vehicle is unlocked; engine start is **permitted**.
	The ***Main*** device is in programming mode.
	The ***USB LED*** is scanning for available ***Main*** devices.
	The ***USB LED*** is attempting to connect to a ***Main*** device.
	The ***USB LED*** is in OTA programming mode.
	The ***USB LED*** is performing an OTA update.

Table 1: ***USB LED*** Light Indicators

Additional light states may occur at specific moments. For example, when entering a code, the indicator light will briefly turn blue to acknowledge a button press.

External Relay Control

7 Specifications

StartDefender supports an optional external alarm output. In particular, the alarm's **12V output** can be used to trigger a relay **(high side)** to drive a larger siren. However, **if you choose to drive the siren directly, it must have a maximum rating of 1A**.

⚠ WARNING

Installing an external device that does not meet the specified requirements may cause StartDefender to fail and will not be covered under warranty. It is strongly suggested to consult an expert for the installation of the device.

Below is the wiring pinout for the two installation options (position numbers are indicated on the connector body):

Figure 5: Connector Mating

Position	Note
1	12V Relay Command
2	GND

Table 2: Connector Pinout

8 Functioning

The **External Relay Control** option **can be activated** or **deactivated in the configuration menu** (see Section 3). The External Relay Control will activate if the front bonnet is opened while **StartDefender** is locked. In this case, if the bonnet is not closed within 5 seconds, the alarm will be triggered. **To deactivate the alarm, enter the correct sequence as you would for a normal StartDefender unlock procedure.**

Maintenance

9 Over-the-air firmware updates

Visit https://www.racing-tech.net/startdefender to download the latest software updates for the Main Unit and ***USB LED***. Save the update file to the device you use to connect to StartDefender. These updates typically include bug fixes and performance improvements.

Main
Open StartDefender, navigate to the **Update** section, select the `startdefender.tar.enc` update file, then click **Update Firmware**. The process will begin and display progress bar until completion.

USB LED
To put the ***USB LED*** in OTA update mode, unplug it, then, while holding down the push button, plug it in a USB port. The LED should be blinking blue. Now, connect to the ***USB LED*** WiFi network defined in the **Code Sheet** that was supplied with the device. Then navigate to http://startdefender.local, upload the downloaded `sd_usb.tar.enc` update file and press **Update Firmware**.

10 Main to *USB LED* pairing

The Main and ***USB LED*** devices come pre-paired out-of-the-box. This procedure is intended for use if the units lose their pairing. To pair the ***Main*** and the ***USB LED*** devices, place both devices in pairing mode.
On the ***Main*** device, enable pairing mode via the web interface home page by pressing the `Pair` button in the ***USB LED*** management section.
On the ***USB LED*** device, press and hold the push-button for 5 seconds until the indicator light blinks white, indicating that it is in pairing mode.
If **both** devices are correctly configured and **within WiFi range** to each other, the pairing process should **complete within one second**.

FAQ and Troubleshooting

▶ *I lost my password.*
Contact Racing Tech LLC Customer Service.

▶ *I lost all my unlock codes.*
Contact Racing Tech LLC Customer Service.

▶ *The car is not unlocking.*
Check the installation for any damage, especially verify the position of the ring terminal for the ground connection to the chassis.

▶ *I lost my USB LED unit.*
Contact Racing Tech LLC Customer Service if you need a replacement.

▶ *The external relay is not working.*
Check whether the alarm is enabled in the main menu; if it is, inspect the siren wiring harness and pinout.