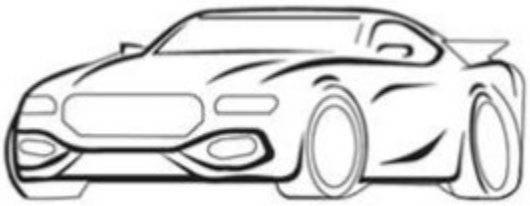
INSTALLATION GUIDE

DIRECTED®



933.HYUNDAI8
v3.03.200.13

2016 Hyundai Sonata (Smart Key)

Accessories (sold separately):

THHYN4 (optional)

Functions compatible with the 2016 Hyundai Sonata (Smart Key)

***Telematics features:** The telematics features listed below (with an asterisk) ONLY apply when using SmartStart Pro.

- * Odometer
- 3x LOCK START (Start control using OEM Remote)
- 3x LOCK STOP (Stop control using OEM Remote)
- Accessory Activation
- Arm Factory Security
- Brake Status (foot brake)
- Control of aftermarket alarm with OEM remote
- Disarm Factory Security
- Door Lock Control
- Door Unlock
- Driver Priority Unlock
- E-Brake Status
- Entry Monitoring ALL Door Pins
- Entry Monitoring Hood Pin
- Entry Monitoring Trunk/Hatch Pin
- Factory Alarm Trigger Monitoring
- Fuel level/EV battery level
- Ignition Activation
- Ignition Status
- Immobilizer Bypass-Data No Key Req'd
- Parking Lights Control
- RAP Shut Down (Retained ACC Power)
- Remote Start Takeover
- SmartStart
- Start (Crank) Activation
- Tach / RPM Output
- Trunk / Hatch Release

This product is intended for installation by a professional installer only! Attempts to install this product by a person other than a trained professional may result in severe damage to a vehicle's electrical system and components.

Contents

Introduction . . . 3
Pre-installation and application warnings . . . 4
Installation . . . 5
Wiring diagram with T-Harness (THHYN4) . . . 5
Wiring diagram . . . 6
Locating components in the vehicle . . . 7
Optional starter disable connection CORE 199+ . . . 8
Vehicle connections . . . 9
Module programming . . . 12
For Security-Only and Convenience-Only programming, see next sections. . . . 12
Module programming for convenience only (skip transponder) . . . 13
Module programming for security-only installations . . . 14
Pairing remotes . . . 15
Connecting the module . . . 15
8556T Temperature Sensor . . . 15
8504D Combo Sensor . . . 15
RF Systems . . . 15
When used in conjunction with SmartStart . . . 16
D2D port configuration . . . 16
Manual transmission . . . 17
LED diagnostics and troubleshooting . . . 18
Soft reset . . . 20
Hard reset . . . 20
Tach learning procedure (not needed with Virtual Tach) . . . 21
Initializing Virtual Tach (not needed with hardwired or data tach applications) . . . 21
Limited lifetime consumer warranty . . . 22
Quick Reference Guide (customer copy) . . . 23

Introduction

This guide provides information on the installation of the **DS3/DS3+** and **DS4/DS4+** modules as a digital solution. Using these modules in a digital configuration requires the module to be flashed with vehicle-specific firmware. Refer to our website (www.directechs.com) and click on the DIRECTLINK text in the header for additional information.

DS3/DS3+ and **DS4/DS4+** modules provide an all-in-one solution for most modern vehicles, and include remote start, keyless entry, security, and immobilizer bypass capabilities. T-harnesses may also be used in many applications for easy installation.

The following methods are available to configure modules:

- Web: www.directechs.com (**DS3/DS3+** and **DS4/DS4+**)
- Desktop application: Directlink DT (**DS3/DS3+** and **DS4/DS4+**)
- Mobile device: Directlink App (**DS4/DS4+** only)

When flashing via Directlink DT (desktop app) or via the Web, an XKloader2 will be required.



To configure via Web or DirectLink DT (desktop app):

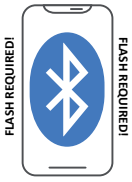
1. Disconnect the main module from any (+) 12V power source.
2. Connect the module to your computer using the XKLoader2.
3. Follow the steps in the pop-up window that will be displayed when the module is detected.

Notes:

- Flashing via web is only possible using Internet Explorer on Windows 8, 8.1, and 10.
- This method is not compatible with any other browser (Edge, Chrome, Firefox, etc.).
- When using Windows 11 or newer, Directlink DT is mandatory.



The **DS4/DS4+** module is designed to be configured using the DirectLink application through mobile devices. To download the DirectLink mobile application, visit the Google Play or Apple store. They can also be configured via Web and DirectLink DT. The **DS4/DS4+** features are built in Bluetooth® 4.0, allowing you to configure and control your system. The **DS3/DS3+** module is not equipped with Bluetooth®, therefore is not compatible with the DirectLink app for mobile devices.



To configure via DirectLink mobile app (Android/iOS):

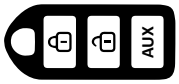
1. Follow and complete the wiring diagram(s) related to your installation through the app.
2. When installation is complete, select **Configure DS4/DS4+**.
3. Follow the on-screen instructions.

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Pre-installation and application warnings



This section highlights important information for this specific firmware and will assist in pricing accordingly, as well as bringing awareness to any operational or vehicle limitations.

Compatibilities and Requirements					
T-Harness compatible 	Yes ☒ – THHYN4		**Keys required for programming** 1	**Keys required for operation** 0	
Vehicle Takeover	Yes ☒ – Refer to the **Quick Reference Guide** section for more details.				

Firmware notes

- **Input/output configurations:** Firmware Version 3.0 and higher uses different input/output configurations and are not compatible with the wiring instructions of previous versions. Updating an older version to version 3.0 or higher will require wiring modifications. **Note:** Damage to the vehicle may occur if the appropriate wiring modifications are not done.
- **T-Harness (THHYN4) notes:**
  - All T-Harness wires not listed in the diagram are not required for the installation. Loose wires such as Siren Output and Hood Input may need to be pulled from the tapped section of the T-Harness. Refer to the "Wiring diagram with T-Harness" for more information on connections and installation instructions.
  - The optional Plug & Play THHYN4 T-Harness is sold separately.
- **Fuses:** It is important to check that the fuses are positioned correctly in the module. Proper fuse positioning is displayed on each wiring diagram.
- Unless specified otherwise, all connectors are displayed from the wire side, with the exception of the OBDII diagnostic connector.
- Refer to the "Vehicle connections" following the installation diagram.

Footnotes 1 2 3

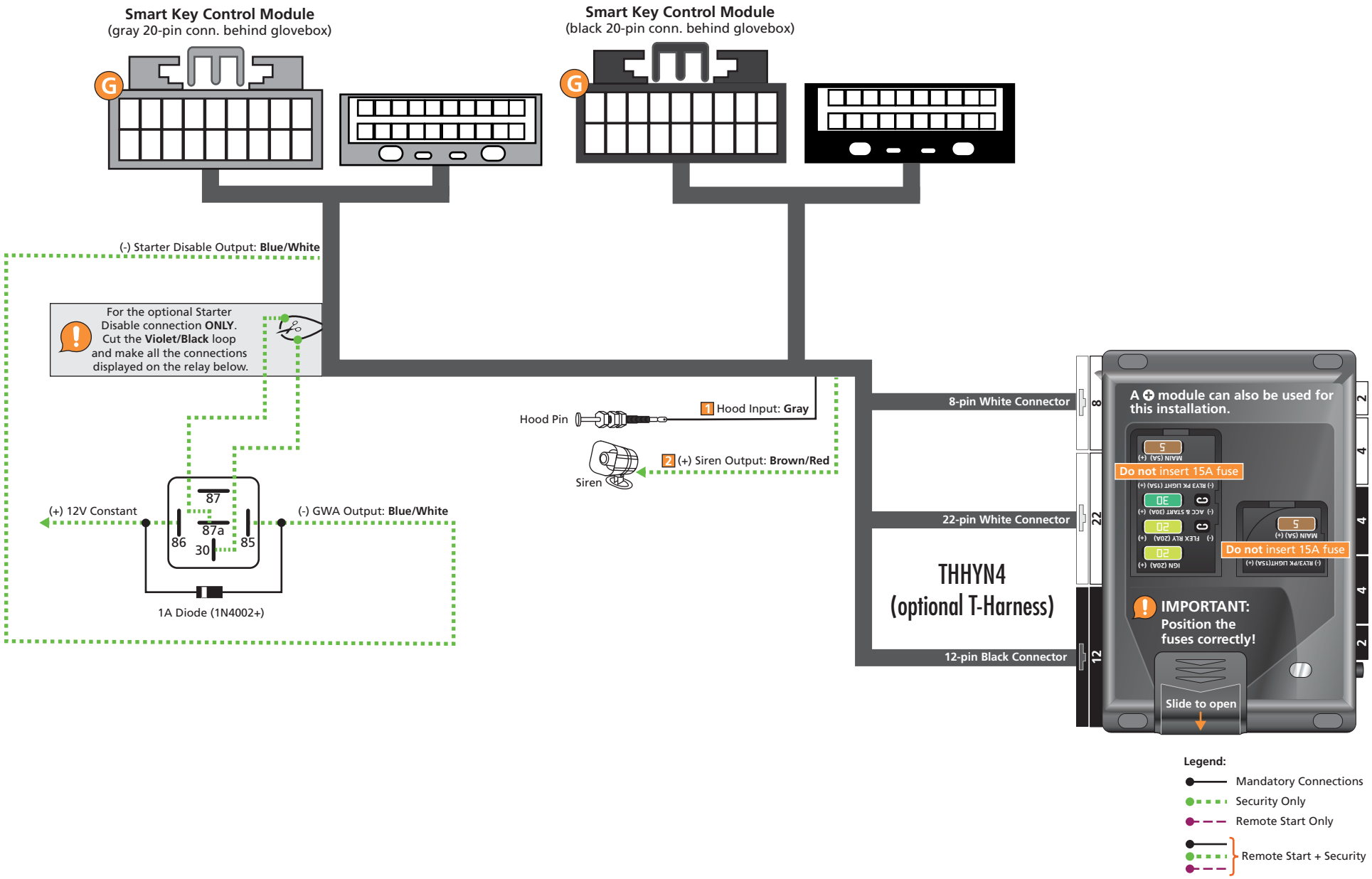
[1] **Hood pin:** The installation of an aftermarket hood pin is only required on vehicles that are not equipped with a factory hood pin, or if not supported in data.

[2] **Siren:** Only required when enabling the security features during module flashing.

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Wiring diagram with T-Harness (THHYN4)

Refer to "Pre-installation and application warnings" for important information, such as the description of each special note referenced in the diagram (1 2 3).

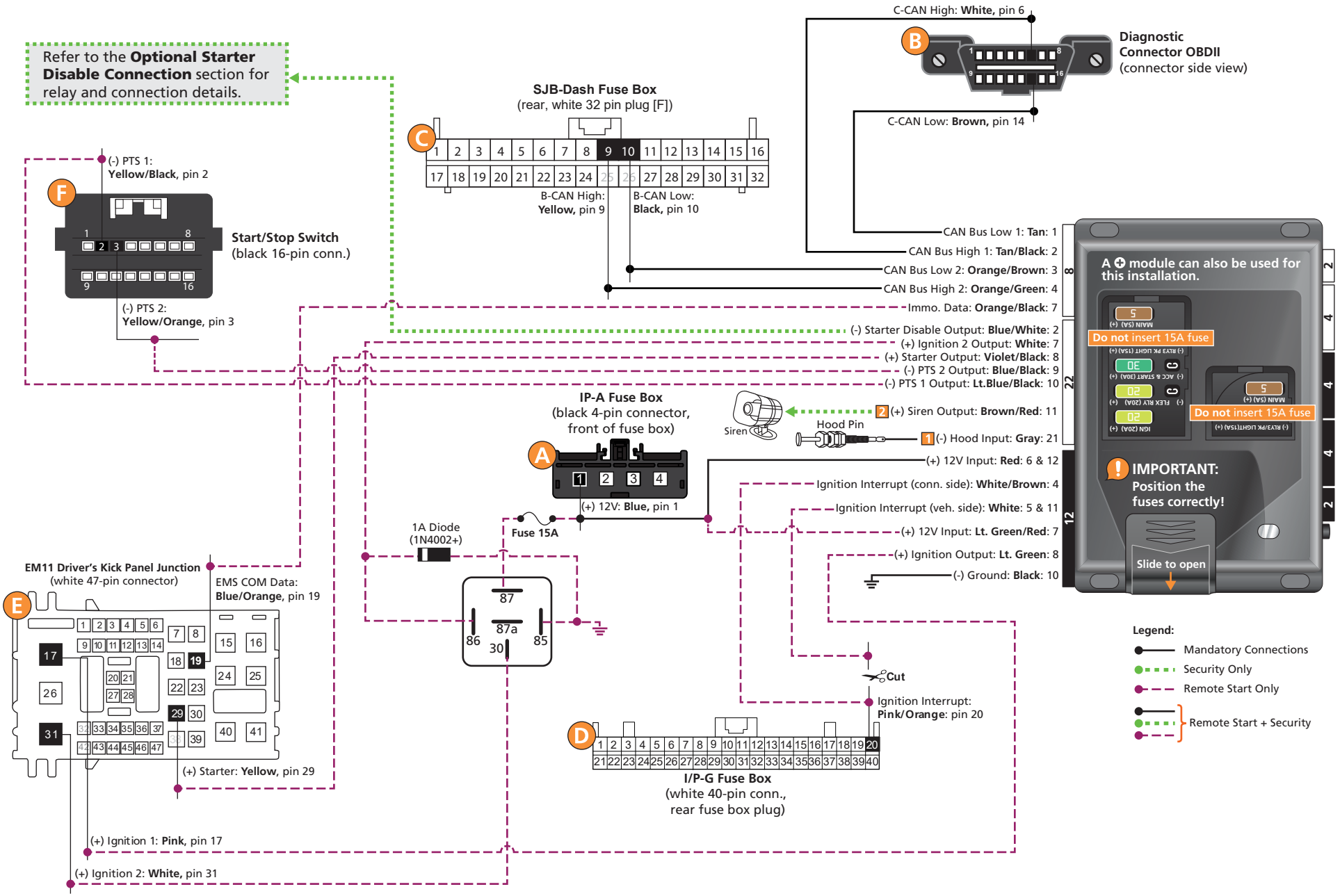


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Wiring diagram

Refer to "Pre-installation and application warnings" for important information, such as the description of each special note referenced in the diagram (1 2 3).



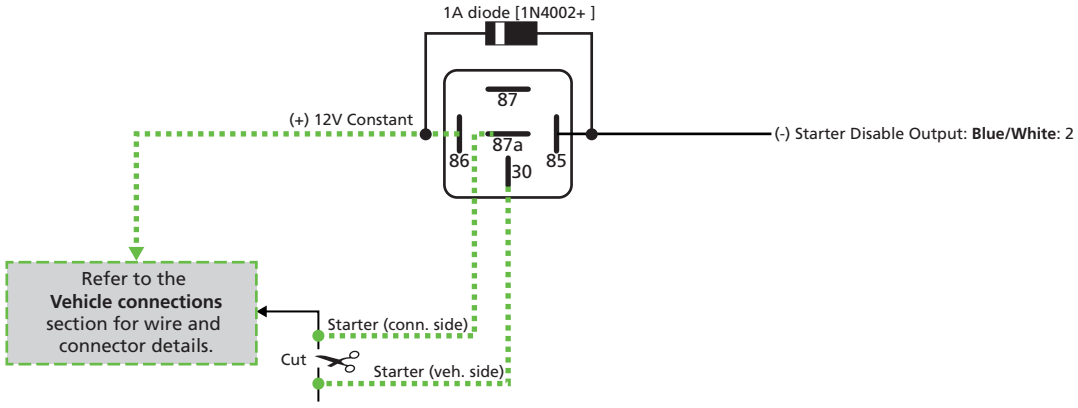
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Locating components in the vehicle



Optional starter disable connection

When using an external relay, use a 1N4002 diode or larger.





Important: When flashing your module for **Security Only** or **Remote Start & Security**, the output used for Starter Disable must be set to **Starter Kill** or **AG Starter Kill** (if Anti-Grind is desired).

Note: On CORE versions prior to 198 and in certain vehicle applications, a different method of performing Starter Disable may be required. See Tech Bulletin **TB130** on Directechs.com for more information.

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Optional starter disable connection CORE 199+

- Certain hybrid or electric vehicles may not support the Starter Disable feature. Please see the Vehicle Connections section of this guide to verify if your vehicle is compatible.
- For CORE 198 and earlier, or if the below configuration do not work for your specific vehicle, refer to **Tech Tip TB130**.

1

Choose Starter Disable Option:

When flashing the module for **Security Only** or **Remote Start & Security**, there are two configuration options:

- **Option A: Normally Closed (N.C.)**
  The starter functions normally unless the security system is armed and an ignition is sensed.
- **Option B: Normally Open (N.O.)**
  The starter is disabled by default and only enabled when the system is disarmed and ignition is sensed.

After selecting the desired option, refer to the corresponding wiring diagram below.

2

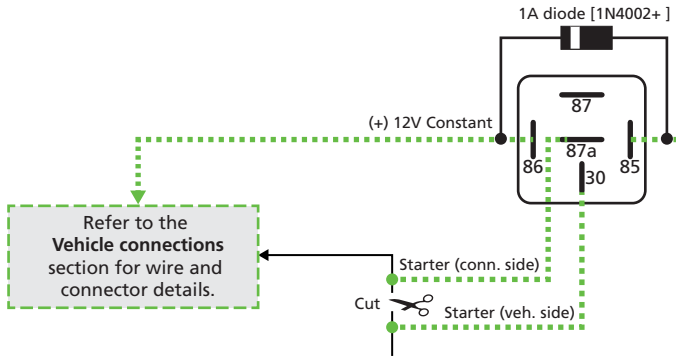
Configure desired Starter Disable Output:

The **Starter Disable Output** should be configured as one of the following:

- **Option A:** (N.C.) **Starter Kill** or (N.C.) **AG Starter Kill** (if Anti-Grind is desired);
- **Option B:** (N.O.) **Starter Kill** or (N.O.) **AG Starter Kill** (if Anti-Grind is desired).

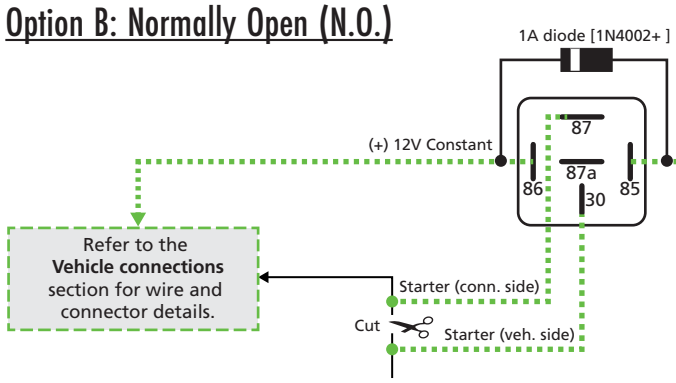
It is recommended to configure the suggested output shown in the wiring diagram; however any available negative (-) output can also be configured.

Option A: Normally Closed (N.C.) (Recommended)



OR Use the configured negative (-) output

Option B: Normally Open (N.O.)





Legend:

- Mandatory Connections
- Security Only

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Vehicle connections

The connection information listed below is specific to the 2016 Hyundai Sonata (Smart Key). Refer to "Pre-installation and application warnings" for a list of important notes.

Data harness, 8-pin white connector (H1)

Module			Connects To			
Conn./Pin	**Color**	**Description**	**Wire Location**	**(+/-)**	**Wire Color**	**Connection**
H1/1	Tan	(Data) HS CAN 1 Low	OBD-data link connector, black 16 pin plug, pin 14	data	brown (C-CAN)	Mandatory
H1/2	Tan/Black	(Data) HS CAN 1 High	OBD-data link connector, black 16 pin plug, pin 6	data	white (C-CAN)	Mandatory
H1/3	Orange/Brown	(Data) HS CAN 2 Low	SJB-dash fuse box, rear, white 32 pin plug (F), pin 10	data	black (B-CAN)	Mandatory
H1/4	Orange/Green	(Data) HS CAN 2 High	SJB-dash fuse box, rear, white 32 pin plug (F), pin 9	data	yellow (B-CAN)	Mandatory
H1/5	Lt. Green	No Connection	No Connection			
H1/6	Violet/Brown	No Connection	No Connection			
H1/7	Orange/Black	(Data) Immo. Data	driver kick, white 47 pin plug (EM11), pin 19	data	blue/orange (EMS COM)	Remote Start Only
H1/8	Yellow/Black	No Connection	No Connection			

Analog input/output harness, 22-pin white connector (H2)

Module			Connects To			
Conn./Pin	**Color**	**Description**	**Wire Location**	**(+/-)**	**Wire Color**	**Connection**
H2/1	Lt. Green/Black	(-) Factory Alarm Arm Output	No Connection			
H2/2	*Blue/White*	*(-) Starter Disable Output*	*Starter:* *driver kick, white 47 pin plug (EM11), pin 29* *(+) 12V Input:* *SJB-dash fuse box, black 4 pin plug (A), pin 1* *Must use a relay.* *Must use a 1N4002 diode or larger.* *Refer to the Optional Starter disable connection section for relay and connection details.*	+ +	*yellow* *blue (40A)*	*Security Only*
H2/3	Dk. Green/Black	(-) Lock Output	No Connection			
H2/4	Red/White	(-) Trunk Release Output	No Connection			
H2/5	*Brown/Black*	*(-) Horn Output*	*driver kick, white 47 pin plug (EM11), pin 35*	-	*yellow/orange*	*Optional*
H2/6	Brown/White	(-) AUX 1 Output	No Connection			
H2/7	White	(+) Ignition 2 Output	Must use a relay. When using an external relay, use a 1N4002 diode o 15A fuse to 12V. driver kick, white 47 pin plug (EM11), pin 31	+	white	Remote Start Only
H2/8	Violet/Black	(+) Starter Output	driver kick, white 47 pin plug (EM11), pin 29	+	yellow	Remote Start Only
H2/9	Dk. Blue/Black	(-) PTS 2 Output	start stop button switch, black 16 pin plug, pin 3	-	yellow/orange	Remote Start Only
H2/10	Lt. Blue/Black	(-) PTS 1 Output	start stop button switch, black 16 pin plug, pin 2	-	yellow/black	Remote Start Only
H2/11	*Brown/Red*	*(+) Siren Output* [2]				*Security Only*
H2/12	Pink	(+) Ignition Sense Input	No Connection			
H2/13	Violet	(+) Door Trigger Input	No Connection			

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Module			Connects To			
Conn./Pin	Color	Description	Wire Location	(+/-)	Wire Color	Connection
H2/14	Brown	(+) Brake Input	No Connection			
H2/15	White/Blue	(-) Activation Input	No Connection			
H2/16	Red/Blue	(-) Instant Trigger	No Connection			
H2/17	Black/White	(-) E-Brake Input	No Connection			
H2/18	Orange/Black	(+) Valet Switch Input	No Connection			
H2/19	Blue	(-) Trunk Trigger Input	No Connection			
H2/20	Green	(-) Door Trigger Input	No Connection			
H2/21	*Gray*	*(-) Hood Switch Input* [1]				*No Connection*
H2/22	Violet/White	(AC) Tach Input	No Connection			

Main harness, 12-pin black connector (H3)

Module			Connects To			
Conn./Pin	Color	Description	Wire Location	(+/-)	Wire Color	Connection
H3/1	Blue/White	Relay N.C. - No Connection	No Connection			
H3/2	Blue/Red	Relay N.O. - (+) 12 Volt Input	No Connection			
H3/3	Blue	Relay COM - No Connection	No Connection			
H3/4	White/Brown	Relay N.C. - Ignition Interrupt (conn. side)	SJB-dash fuse box, rear, white 40 pin plug (G), pin 20 DO NOT insert the blue 15A fuse.	cut	pink/orange	Remote Start Only
H3/5	White	Relay COM - Ignition Interrupt (vehicle side)	SJB-dash fuse box, rear, white 40 pin plug (G), pin 20 DO NOT insert the blue 15A fuse.	cut	pink/orange	Remote Start Only
H3/6	Red	(+) 12 Volt Input	SJB-dash fuse box, black 4 pin plug (A), pin 1	+	blue (40A)	Mandatory
H3/7	Lt. Green/Red	Relay N.O. - (+) 12V Input	SJB-dash fuse box, black 4 pin plug (A), pin 1	+	blue (40A)	Remote Start Only
H3/8	Lt. Green	Relay COM - (+) Ignition Output	driver kick, white 47 pin plug (EM11), pin 17	+	pink	Remote Start Only
H3/9	Lt. Green/White	Relay N.C. - No Connection	No Connection			
H3/10	Black	(-) Ground			(chassis ground)	Mandatory
H3/11	White	Relay COM - Ignition Interrupt (vehicle side)	SJB-dash fuse box, rear, white 40 pin plug (G), pin 20 DO NOT insert the blue 15A fuse.	cut	pink/orange	Remote Start Only
H3/12	Red	(+) 12 Volt Input	SJB-dash fuse box, black 4 pin plug (A), pin 1	+	blue (40A)	Mandatory

Relay harness, 10-pin white connector (H4)

Module			Connects To			
Conn./Pin	Color	Description	Wire Location	(+/-)	Wire Color	Connection
H4/1	N/A	No Connection	No Connection			
H4/2	Red/Black	(+) 12 Volt Input	No Connection			
H4/3	Pink/Black	Flex Relay (pin 87a)	No Connection			
H4/4	Pink/White	(+) Ignition 2 Output	No Connection			
H4/5	Red	(+) 12 Volt Input	No Connection			

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Module			Connects To			
Conn./Pin	Color	Description	Wire Location	(+/-)	Wire Color	Connection
H4/6	Green	Starter Input (vehicle side)	No Connection			
H4/7	Violet	(+) Starter Output (conn. side)	No Connection			
H4/8	Orange	(+) Accessory Output	No Connection			
H4/9	Red/White	(+) 12 Volt Input	No Connection			
H4/10	Pink	(+) Ignition Input/Output	No Connection			

RF Port harness, 2-pin white connector (H5)

Module		
Conn./Pin	Color	Description
H5/1	N/A	RF Loop
H5/2	N/A	RF Loop

D2D harness, 4-pin white (1) and black (2) connectors (H6)

Module		
Conn./Pin	Color	Description
H6/1	Blue	(Data) TX
H6/2	Black	(-) Ground
H6/3	Green	(Data) RX
H6/4	Red	(+) 12 Volt

Temperature sensor harness, 2-pin black connector (H7)

Module			Connects To			
Conn./Pin	Color	Description	Wire Location	(+/-)	Wire Color	Connection
H7/1	*Black*	*Temperature Sensor*				*No Connection*
H7/2	*Black*	*Temperature Sensor*				*No Connection*

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Module programming

⚠ Refer to "LED diagnostics and troubleshooting" for more information and for troubleshooting purposes.

For *Security-Only* and *Convenience-Only* programming, see next sections.

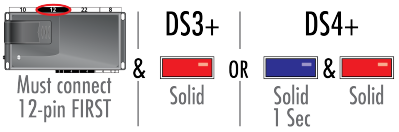
1 Ensure vehicle is in a safe location, and cannot move forward during programming. For vehicles equipped with a manual transmission, make sure the gearshift lever is in the neutral position.



2 **DS3+:** Connect the 12-pin main power harness to the DS3+ module FIRST.
Wait until the LED turns ON solid red before proceeding to the next step.

DS4+: Connect the 12-pin main power harness to the DS4+ module FIRST.
The LED will turn ON solid Blue for 1 second to confirm Bluetooth communication.

Wait until the LED turns ON solid red before proceeding to the next step.



3 Connect the remaining harnesses to the module.



4 Make sure the key is inside the vehicle.



5 **Important!** Do not press the brake pedal.

Press the Push-to-Start (PTS) button twice (2x) to turn the ignition on.



6 The LED flashes orange, then the LED turns on green for 3 seconds and shuts off.



7 Press the PTS button one time (1x) to turn the ignition off, when the module is successfully programmed.



8 Pair remotes (if applicable).

For information on how to pair a specific remote, please refer to its corresponding owner documentation, which can be found inside the product packaging of the complete system or on www.directechs.com.*



9 DATA/Hardwired Tach Learning: When using Data Tach, it is recommended to follow the Tach Learning procedure. However, when using a Hardwired Tach, the procedure is mandatory.

For more information, refer to the Tach Learning procedure section.



* Your aftermarket remote may differ from the model shown in the illustrations.

You have successfully completed the module programming sequence.

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Module programming for convenience features only (skip transponder)

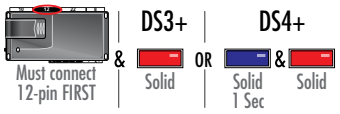
Refer to "LED diagnostics and troubleshooting" for more information and for troubleshooting purposes.

1 Ensure vehicle is in a safe location and cannot move forward during programming. For vehicles equipped with a manual transmission, make sure the gearshift is in the neutral position.



2 Connect the 12-pin main power harness to the module.

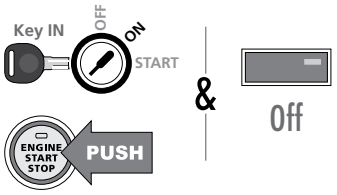
DS3+: Wait until the LED turns ON solid red then proceed to the next step.
DS4+: The LED turns ON solid blue for 1 second to confirm Bluetooth communication. Wait until the LED turns ON solid red, then proceed to the next step.



3 Connect remaining harnesses to the module then press the programming button five (5) times. The LED turns ON solid orange.



4 Turn ignition ON and wait until the LED turns OFF.



5 Turn ignition OFF.



6 Pair remotes (if applicable).

For information on how to pair a specific remote, please refer to its corresponding owner documentation, which can be found inside the product packaging of the complete system or on www.directechs.com. Your aftermarket remote may differ from the model shown in the illustrations.



You have successfully completed the module programming sequence.

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Module programming for security-only installations

Refer to "LED diagnostics and troubleshooting" for more information and for troubleshooting purposes.

1 Ensure vehicle is in a safe location and cannot move forward during programming. For vehicles equipped with a manual transmission, make sure the gearshift is in the neutral position.



2 Connect the 12-pin main power harness to the module.

DS3+: Wait until the LED turns ON solid orange then proceed to the next step.
DS4+: The LED turns ON solid blue for 1 second to confirm Bluetooth communication. Wait until the LED turns ON solid orange, then proceed to the next step.



3 Connect the remaining harnesses to the module.



4 Press twice (2) on the Push-to-Start (PTS) button to turn the ignition ON. Wait until the LED turns OFF.



5 Press the PTS button once more (1) to turn the ignition OFF.



6 Pair remotes (if applicable).

For information on how to pair a specific remote, please refer to its corresponding owner documentation, which can be found inside the product packaging of the complete system or on www.directechs.com. Your aftermarket remote may differ from the model show in the illustration.



You have successfully completed the module programming sequence.

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Pairing Remotes and Sensors

To enter pairing:

1 Turn the vehicle ignition to the ON position.



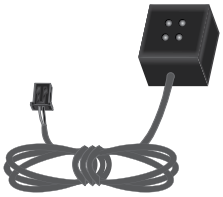
2 Within 10 seconds, on the Control Center (antenna) or the LED/Valet Pod (standalone switch), press and release once (1x), and then press and hold the programming button until the LED starts flashing, then release the button. Your antenna may differ from the model shown in the illustration.



Pairing remotes: Follow the remote-specific instructions to complete the pairing process. This information can be found in the RF kit's owner's guide, "QR2" Tech Tip, and on the DS3/DS4 Quick Reference Install guide.

Pairing sensors: Sensors should be connected to the DS3/DS4 module prior to connecting the 12-pin main power harness. When powered up, connected peripherals will pair automatically.
In the event where a sensor needs to be re-paired, repeat the steps above. Connected devices will become registered within four to six (4-6) seconds. No further action is required.

8556T Temperature Sensor



The 8556T Temperature Sensor is optional, but included with your DS3+/DS4+ module.

When used, the Temperature Sensor must be plugged into the 2-pin black connector of your module.

Note: When the system is configured as a remote starter, the temperature is reported by the 8556T Temperature Sensor. When security features are enabled, it is reported by the 8504D Combo Sensor.

8504D Combo Sensor

The 8504D Combo Sensor is optional, but included with the purchase of a DS4SU security package.



The Combo Sensor is preset for the majority of applications; however, it can be adjusted using the DirectLink application, as well as a compatible LED or LCD remote. Please refer to the instructions included with the DS4SU for more information on how to make adjustments.

Note: When the system is configured as a remote starter, the temperature is reported by the 8556T Temperature Sensor. When security features are enabled, it is reported by the 8504D Combo Sensor.
IMPORTANT: The Combo Sensor must be paired to the device before it can be used.

RF Systems

An RF System consists of one or multiple remotes, a Control Center (antenna), and an antenna cable – various combinations exist. An RF System allows the vehicle owner to control the system with enhanced range. Two-way models are available. Please follow the instructions included with the kit for appropriate installation and programming information.

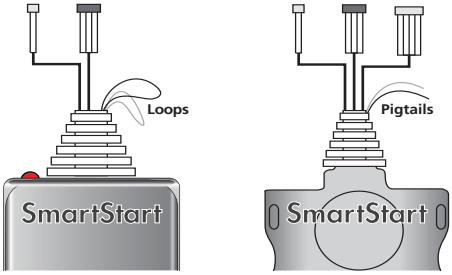
When used in conjunction with Directed SmartStart®

To enable D2D communication between the DS3+/DS4+ and the Directed SmartStart® one of the following actions must be performed before providing power to the Directed SmartStart® unit:

SmartStart with **Loops** – The brown loop must be cut.

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SmartStart with **Pigtails** – The gray wire must be connected to a ground source.



DO NOT connect the Directed SmartStart® 2-pin power harness when using the DS3+/DS4+. Power and ground will be provided by the D2D connector on the module. Refer to the Directed SmartStart® documentation for further details.

D2D port configuration

Caution! Do not connect the Control Center (antenna) or any digital sensors (8504D) to the white D2D1 port.

The white D2D1 port is reserved ONLY for SmartStart, Module flashing or 3rd Party bypass. The two black D2D2 ports are reserved for the Control Center (antenna) and digital sensors (8504D).

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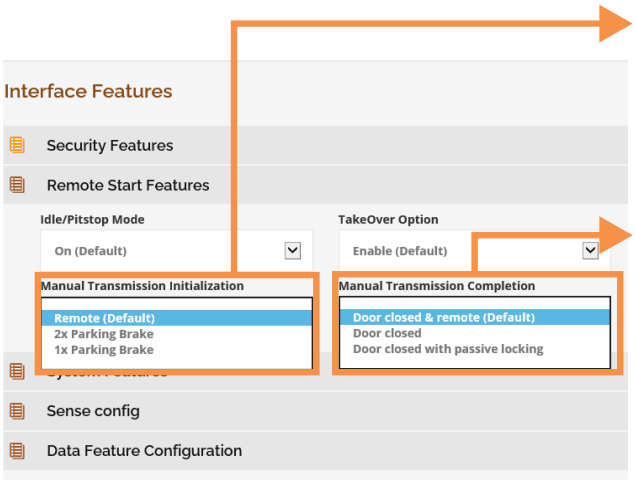
Manual Transmission

IMPORTANT! Directed does not approve nor support installations of manual transmission and remote starts on any electronic vehicles (EV), OEM Remote Start Activation firmware, vehicles with convertibles and/or removable tops, including but not limited to Jeep Wrangler, Honda S2000, Mazda Miata, and other such vehicles.

This system supports manual transmission installations; however, not all vehicles and firmware versions are compatible. If your vehicle is supported, you will be prompted to select either Automatic or Manual transmission during the module flashing process.
Refer to "Directwire" section at www.directechs.com for further information on vehicle-specific wiring connections.

When flashing the module for Manual Transmission on the Directechs website:

1. In the **Remote Start Features** section, select the desired configurations for Manual Transmission Initialization & Manual Transmission Completion.



Manual Transmission Initialization
Sets how the manual transmission sequence is initialized

Feature visible to	Installer
Remote (Default)	With foot on brake, set e-brake, remove foot brake, press ANY button on Directed remote. Ready mode is activated. Parking lights will flash 5 times confirming.
2x Parking Brake	With foot on brake, setting the parking brake ON, OFF, ON within 10 seconds then removing foot brake will initialize the manual transmission ready mode. Parking lights will flash 5 times confirming.
1x Parking Brake	With foot on brake, setting the parking brake ON then removing foot brake will initialize the manual transmission ready mode. Parking lights will flash 5 times confirming.

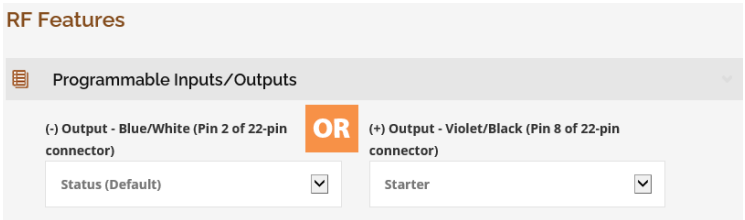
Manual Transmission Completion
Sets how the manual transmission sequence is ended.

Feature visible to	Installer
Door closed & Remote (Default)	To complete the manual ready mode sequence and shut down the remote start, turn off the ignition (engine stays running), exit the vehicle with your keys, shut all doors and press lock on the Directed remote.
Door closed with passive locking	To complete the manual ready mode sequence and shut down the remote start, turn off the ignition (engine stays running), exit the vehicle with your keys, 8 seconds after the last door is closed, the remote starter will shut down, the door will automatically lock and the system will arm at the same time.
Door closed	To complete the manual ready mode sequence and shut down the remote start, turn off the ignition (engine stays running), exit the vehicle with your keys, 8 seconds after the last door is closed, the remote starter will shut down. Doors will stay unlocked.

Note 1: For PTS vehicle specific instructions, please see the bottom of the "Vehicle Specific Install Guide" for manual transmission sequence procedures.

Note 2: The trunk input trigger is considered a "door" for manual ready mode. If trunk or any other door is opened, manual transmission ready mode will be canceled.

2. In addition, if no Clutch Output is pre-configured in the firmware, an output can be configured when flashing the module under the **Programmable Input/Output** section. Use any available positive (+) or negative (-) outputs depending on the polarity of the clutch switch listed on Directwire, set it to **Starter**.



3. Note: A Relay may be required depending on your vehicle.
See Tech Tips 10000 - Clutch Bypass for Remote Start - https://directechs.blob.core.windows.net/techtips/10000.pdf

4. Additional connections may be required if these functions are not supported by the firmware.

Connection	Description
(-) E-Brake Status Input (Black/White, pin 17)	Must be connected to a working emergency brake in the vehicle. Although most vehicles have simple (-) trigger emergency brake circuits note some vehicles do not and may require unique integration methodologies.
(-) Door Trigger Input (Green, pin 20) OR (+) Door Input (Violet, pin 13)	Must be connected to a working door trigger in the vehicle, which monitors all doors. The unit must monitor the door pins to allow the Ready Mode process to be enabled. **Note**: Some vehicles may require unique integration methodologies for this circuit. For more information, refer to www.directechs.com.
(AC) Tachometer Input (Violet/White, pin 22)	Must be connected to a working tachometer signal in the vehicle (fuel injector, ignition coil, true tach, etc.) and learned successfully to the DS4+.

See Tech Tips 10001 - https://directechs.blob.core.windows.net/techtips/10001.pdf

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LED diagnostics and troubleshooting

This section provides LED diagnostics and troubleshooting information to guide you through the various stages of your installation.

Module Programming

LED	Description	Troubleshooting
Off	Module has no power.	Make sure the D2D harness is connected and that 12 Volt is present between the red and black wires. If 12 Volt is present, the module may be defective.
Solid blue	Confirmation of Bluetooth communication. (Applicable to DS4/DS4+ ONLY.)	Normal operation.
Solid red	Waiting to begin the programming sequence.	Ensure the correct programming procedure is being followed.
Flashes green & red	Initialization failed.	Reset the module and complete the programming again. If the issue persists, please contact Technical Support.
Solid orange	Transponder functions were skipped.	(If compatible) when RXT mode is not desired or convenience features are needed, please reset the and reprogram the module.
Flashes green	All required CAN networks has been detected.	Normal operation.
Flashes orange	1 of 2 CAN networks has been detected.	Normal operation.
Flashes orange slowly	Key2GO initiated.	Please follow the steps indicated in “Module programming” to complete the Key2GO programming.
Solid green x 3 secs	Module was successfully programmed with all functions.	Normal operation.
Solid orange x 3 secs	Module was successfully programmed without transponder functions.	Normal operation.

Analog Error Codes

LED	Description	Troubleshooting
Flashes red, green & orange	DEI feature error.	A feature config file mismatch was detected. Please contact Technical Support.

Module Programming - Error codes

LED	Description	Troubleshooting
Flashes red x 1	CAN2 not detected.	Check the CAN2 Orange/Green and Orange/Brown wire connections. Wake up the data bus by turning the ignition on and try again. If your installation does not require this connection, skip this step by pressing the programming button 5 times.
Flashes red x 1	J1850 not detected.	Check the J1850 wire connection. Wake up the data bus by turning the ignition on and try again.
Flashes red x 2	CAN1 not detected.	Check the CAN1 Tan and Tan/Black wire connections. Wake up the data bus by turning the ignition on and try again. If your installation does not require this connection, skip this step by pressing the programming button 5 times.
Flashes red x 3	Bypass data not detected.	Check the bypass line connection. If more than one wire is used, make sure they are not inverted. Ensure the vehicle still operates correctly using the factory key.
Flashes red x 4	Bypass processing error.	The bypass calculation failed. Reset the module and try again. If the condition persists, please contact Technical Support.
Flashes red x 5	ISO 1 not detected.	The Yellow/Black wire did not detect the expected signal. Refer to “Installation (wiring diagrams & vehicle wiring reference charts)” to check the connections.
Flashes red x 6	ISO 2 not detected.	The Orange/Black wire did not detect the expected signal. Refer to “Installation (wiring diagrams & vehicle wiring reference charts)” to check the connections.
Flashes red x 7	MUX not detected.	The Violet/Green or Violet/Brown wire did not detect the expected voltage value. Refer to “Installation (wiring diagrams & vehicle wiring reference charts)” to check the connections.

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External Module Synchronization

LED	Description	Troubleshooting
(Flashes red, red, then orange) x 10	OBDII feature not supported.	The diagnostic data bus was not detected, therefore the SmartStart features will be limited.

Active Ground When Running (Status)

LED	Description	Troubleshooting
Flashes green	Ground When Running (Status) command received.	The module has initialized the remote start sequence.
Flashes red & orange	Ignition ON command received.	The module has received the Ignition ON command and is processing the remote start sequence.
Flashes green quickly	Start ON command received.	The module has received the Start ON command and is processing the remote start sequence.
Flashes red x 10	PTS shutdown error.	The PTS output from the module was not activated due to safety protection.
Flashes red x 21	CAN bus incorrectly detected.	Verify the CAN1 and CAN2 connections. Refer to "Installation (wiring diagrams & vehicle wiring reference charts)" to check the connections.

Commands

LED	Description	Troubleshooting
Flashes orange x 1	LOCK command received.	If the bypass module fails to flash, it did not receive the signal. Commands can come from RF or D2D.
Flashes orange x 2	UNLOCK command received.	If the bypass module fails to flash, it did not receive the signal. Commands can come from RF or D2D.
Flashes orange x 3	TRUNK command received.	If the bypass module fails to flash, it did not receive the signal. Commands can come from RF or D2D.
Flashes orange x 4	AUX1 command received.	If the bypass module fails to flash, it did not receive the signal. Commands can come from RF or D2D.
Flashes orange x 5	AUX2 command received.	If the bypass module fails to flash, it did not receive the signal. Commands can come from RF or D2D.
Flashes orange x 6	AUX3 command received.	If the bypass module fails to flash, it did not receive the signal. Commands can come from RF or D2D.

Shutdown Codes

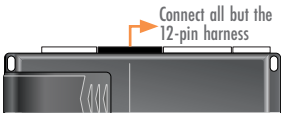
LED	Description	Troubleshooting
Flashes green x 1	Takeover successful.	Normal operation.
Flashes red x 1	Runsafe was not disabled.	No UNLOCK command was received prior to opening the door, or the 45 second timer expired in takeover mode.
Flashes red x 2	Brake was not detected.	The brakes were not detected, which prevents the system from shutting down the vehicle.
Flashes red x 3	Smart key was not detected.	The smart key was not detected, which prevents the system from shutting down the vehicle.
Flashes red x 4	Speed was detected.	The vehicle was detected as moving, which prevents the system from shutting it down.

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Soft reset

A module reset will only erase the steps perfomed in “Module Programming”. The firmware and settings flashed to the module will not be affected.

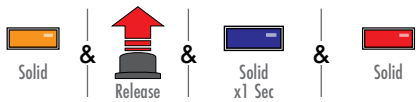
1 If required for your installation, connect all the harnesses to the module, EXCEPT the 12-pin main power harness. Press and hold the programming button, then connect the 12-pin harness to the module.



2 **DS3+**: Wait 3 seconds until the LED turns ON solid orange then release the programming button.
The LED turns ON solid red.



DS4+: Wait 3 seconds until the LED turns ON solid orange then release the programming button.
The LED turns ON blue for 1 second then solid red.

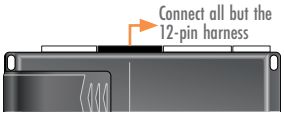


Hard reset

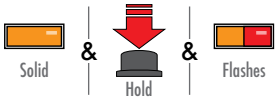
Warning Against Executing a Hard Reset!

A hard reset will revert the flashed firmware back to its default factory settings. Depending on the installation, some settings may need to be reconfigured. Connect your module to a computer and use the web configuration tool to edit its programmable features.

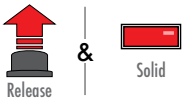
1 If required for your installation, connect all the harnesses to the module, EXCEPT the 12-pin main power harness. Press and hold the programming button, then connect the 12-pin harness to the module.



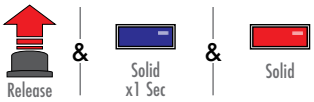
2 After 3 seconds the LED turns ON solid orange. Keep holding the programming button until the LED flashes red, then orange slowly.



3 **DS3/DS3+**: Release the programming button. The LED turns solid red.



DS4/DS4+: Release the programming button. The LED turns ON blue for 1 second then solid red.



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Tach learning procedure (not needed with Virtual Tach)

Data Tach: The procedure is not required as the tach comes preprogrammed. However, it is strongly recommended to learn the exact value of the vehicle for the most consistent and reliable starting and functionality.

Hardwired Tach: The procedure is required.

Before starting the procedure: In the *Data Sense* settings menu, if using Data Tach, ensure the *Sense Tach Status* option is set to **On** or **Enabled**. If using Hardwired Tach, ensure the option is set to **Off** or **Disabled**.

To perform the Tach Learning procedure:

1. Start the vehicle using the key.
2. Within 5 seconds, press and hold the Control Center (antenna) or Valet Pod button until the LED turns on Solid. OR Within 5 seconds press and hold the IPB (integrated programming button) on the main module, until the LED turns ON solid green.
3. Release the button. Tachometer value is now stored in memory.

If the LED does not turn ON solid, find an alternate tach source.

Note: When the tachometer is programmed, the main module automatically enters the Tachometer engine checking mode.

Initializing Virtual Tach (not needed with hardwired or data tach applications)

To program Virtual Tach:

1. After the install is complete, remote start the engine. The programming operation may require 3 cranks of the starter before the engine starts and runs. Do not turn off the remote start if this happens, it is a normal programming operation.
2. Once the engine begins running, let it run for at least 30 seconds.
3. Using the remote, send the Remote Start command to turn remote start off.

Virtual Tach is programmed. To reset Virtual Tach, a hard or soft module reset must be done.

Note:

- After successfully learning Virtual Tach, a small minority of vehicle starters may over crank or under crank during remote start. Use the VirtualTach Fine tune feature in the configuration wizard to adjust the starter output time in 50ms increments to compensate for such an occurrence.
- Virtual Tach can disengage the starter motor during remote starting; however, it does not address over-rev. If the customer requests the over-rev protection capability, the tach wire or data tach must be used.
- Virtual Tach cannot be used in Manual Transmission Mode. It is also not recommended for diesel vehicles.
- To reset Virtual Tach, a hard or soft module reset must be done.

Hybrid Vehicles

For some Hybrid vehicles without Data Tach, it may be necessary to change the Engine Checking Mode option to the OFF setting and adjust the Cranking Time setting to 2.0 or 4.0 seconds.

CAUTION: When configuring the Engine Checking Mode option to the OFF setting, there is no way to monitor or confirm if the vehicles engine is actually running. Therefore, there is no Over-Rev protection. If the vehicle attempts to remote start, but is unsuccessful, the remote start will keep the ignition on for the entire runtime period.

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Sending commands to your vehicle

Whether you want to remote start the engine, lock/unlock the doors or pop the trunk, there are 3 possible ways you can send commands to your vehicle, using the:

- Factory remote.
- Aftermarket remote.
- Directed SmartStart application via your smartphone.

If applicable, you can also start the engine remotely by pressing the Lock button 3 times quickly on your factory remote.

Vehicle takeover with Get In and Go

1	Close the vehicle doors, hood and trunk, then press the Remote Start button on the transmitter to start the vehicle.*	
2	Press the Unlock button on the factory or aftermarket remote.*	
	Complete the following steps within 45 seconds or the vehicle will shut down.	
3	Enter the vehicle, while making sure the factory remote is inside with you.	
4	Depress the brake pedal, put the car in gear and drive off.	

* Icon and remote appearance may differ depending on the model purchased.

Get In and Go

Get In and Go is designed to provide users with easy takeover when entering their Push-to-Start (PTS) equipped vehicle, once it has been remote started.

Typically, users would have to remote start their vehicle, then get inside and press the PTS button to perform a takeover. There is therefore a physical action required to drive away. With Get In and Go, you simply remote start the vehicle, unlock the doors, get in and go... All that's left to do is put the gear in drive and drive off.

Pit stop/idle mode

The vehicle pit stop/idle mode feature is **not** available in this firmware.

List of available commands

Note that the information below is for many Viper, Clifford, Python, Avital, Automate, Autostart and AstroStart models. Icons and commands may differ depending on the model and options purchased. Refer to your authorized installation center for more specific information.

Button(s)	Actions
	Press & hold for 1 second to lock.
	Press & hold for 1 second to unlock.
*	Press & hold for 1 second to remote start.
AUX *	Press & hold for 5 seconds to activate the trunk release (optional).

* Icon and remote appearance may differ depending on the model purchased.

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SmartStart Bluetooth compatiblity (applicable to DS4/DS4+ ONLY)

This system is equipped with a Bluetooth version of SmartStart offering up to 200' of range. The simple graphical interface gives you control over the following features of your installed remote start system or security with remote start system:

Lock/Arm

- Unlock/Disarm
- Remote Car Starter
- Trunk Release
- Panic
- AUX Channels

You can also control multiple vehicles – great for families – and assign more than one user to control a vehicle. It's easy with SmartStart! But, this is only the beginning! SmartStart is loaded with additional features including GPS tracking, SmartSchedule, vehicle status, roadside assistance, parked car finder and more.

The application enables a "Cloud-Connected Car" like never before, providing 2-way interaction with your vehicle. Connectivity is managed through the Directed Cloud Services (DCS) network linking car, app, end user, and the Internet.

For more information, visit www.mysmartstart.com.

Notes

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