

Manual

SKREEMULATOR



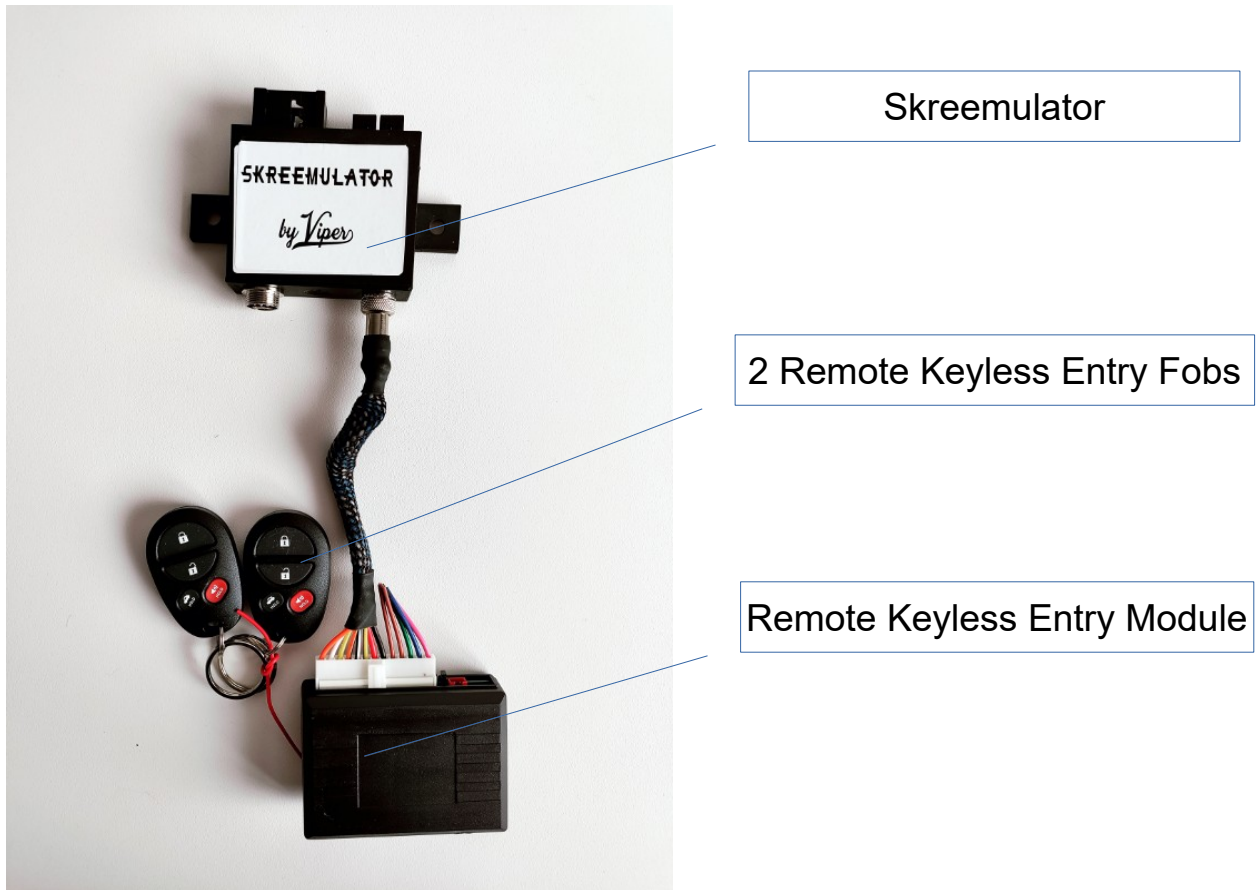
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1. Introduction

I would like to thank you for the trust you have placed in me and my product. The Skreemulator software has been tested very extensively in my own personal Crossfire for over 500 starts as well as in several beta testers and after nearly 2 years, no issues have been reported. Many thanks to the beta testers!!! Hardware version v3.0 has been tested in my Crossfire for several months and also works flawlessly.

2. Components



An optional OLED display with control switch is also available.

3. Installation

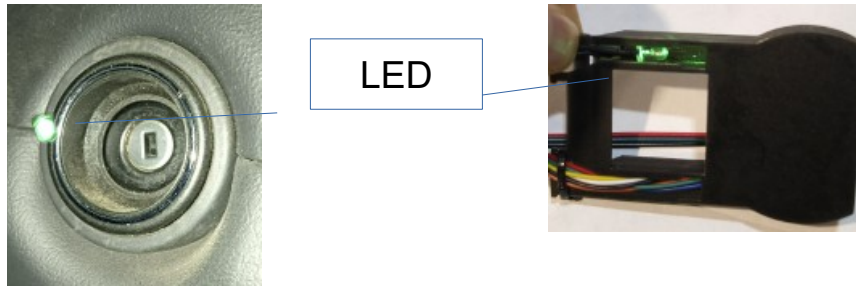
In order for the Skreemulator to function, your ECU (engine control unit) must be programmed to the Skreemulator prior to installation. This is performed when you send your ECU in and when you receive everything back, it will be ready for install.

After programming, your ECU will work with both the Skreemulator and your original SKREEM module (provided it was properly functioning when removed) and you can switch to or from the original SKREEM and the Skreemulator at any time without having to reprogram the ECU.

1. Disconnect the negative terminal of the battery. (This is very important for all model year Crossfires and is imperative for later model years that have shin airbags)
2. Remove the ECU from the compartment on the right rear of the engine bay. You will need to start with removing the black 9-pin connector, then the black and grey 24-pin connector, then the 52-pin black and grey connector, then the 40-pin black and grey connector and finish by removing the white 9-pin connector.
3. Remove the driver side interior dash paneling and instrument cluster to access the original SKREEM. Be very careful when removing the interior trim parts as they can be easily damaged due to their age. Be sure to note where all the specific fasteners belong so they can all be installed in the correct places during reassembly.
4. Remove the original SKREEM from its plastic bracket and disconnect the black 20-pin connector, then disconnect the black 2-pin connector from the antenna ring and finally disconnect the white 2-pin connector. Link to a very good video description: <https://youtu.be/X-VhH4usWUc>
5. Place the ECU, original SKREEM and all keys into static safe bags to be sent out for programming and initially testing. Please be sure to remove all key rings or key chains from your keys to prevent loss or damage. If you

cannot source static safe bags, place the ECU, SKREEM and keys in paper bags. Do NOT use plastic grocery bags!

6. Ship your parts to the address provided when you placed your order. Please ensure everything is properly packaged to prevent damage during transit. This is also a great time to make sure you have a battery maintainer on your car's battery so it is fully charged and ready to go.
7. When you receive your parts back along with the Skreemulator, please lay everything out to ensure you are not searching for anything after you start the installation.
8. Install the reprogrammed ECU, starting with the white 9-pin connector and working in reverse from removal and ending with the black 9-pin connector. Each connector only fits in a specific position so you cannot install them incorrectly but take your time and ensure they are all properly inserted and firmly seated. Be sure the cam locks on the 3 center connectors are completely opened prior to insertion and latch securely when seated.
9. Install the Skreemulator into the plastic bracket where the original SKREEM was removed and connect the white 2-pin connector to outermost socket, ensuring the connector key lines up with the socket. Then connect the 20-pin black connector. Do NOT connect the 2-pin black connector. In its place, you will find a wire with an LED already plugged into the Skreemulator. Do not remove and disconnect this or replace with the black 2-pin connector for the antenna ring which is used with the original SKREEM only. If the black 2-pin connector is connected, it will destroy both the antenna ring and the Skreemulator.
10. Connect the 5-pin connector from the remote keyless entry module to the Skreemulator, (be sure to properly index the connector and socket before inserting to avoid damage) and securely attach it to the top of the Skreemulator with double-sided adhesive tape.
11. Mount the control LED where you would like. The LED is very bright and it is recommended to insert it into the rubber surround next to the ignition lock or in the right part of the frame for those who purchased the optionally available OLED display.



12. If you purchased the optionally available OLED display, connect the 10-pin connector to the Skreemulator (again, be sure to properly index the connector and socket before inserting to avoid damage) and mount it in front of the speedometer as shown in the picture below. Please note, the trip meter is no longer visible after installation of the display.



13. If you purchased the optionally available OLED display, carefully slide the display control switch onto the cruise control stalk and secure the wiring with cable ties or other suitable method to prevent it from being snagged or damaged during use or when entering/exiting the car.



14. Reconnect everything that you may have disconnected during interior disassembly, especially the shin airbag if equipped. Do **NOT** reconnect battery with the shin airbag disconnected as it can be nearly impossible to clear the SRS warning light on these models.
15. Reconnect the previously removed negative battery cable, press the unlock button on either remote keyless entry fob, turn your key in the ignition to start your vehicle and verify a successful installation. Please note, if your car does not start after several attempts, review all of the instructions and go over all of the previously performed steps to verify something was not missed. This includes checking all connector and verifying they are correctly installed and properly seated.
16. Disconnect negative battery cable again before continuing. (Again, this is very important for all model year Crossfires and is imperative for later model years that have shin airbags)
17. Reinstall the instrument cluster, driver side interior dash paneling and shin airbag (if equipped) and attach the display to the base of the instrument cluster surround with double-sided tape. Take care when routing the display cable between the gaps in the dash panels so it is not pinched and subsequently damaged.
18. Reconnect negative battery and go enjoy driving your Crossfire knowing that the Skreemulator will keep you from ever having to deal with a SKREEM issue ever again.

4. How it works

When the ignition key is turned to position 2, the engine control unit asks for a code to unlock the immobilizer. This code is normally sent by the SKREEM after it has verified that a key with matching transponder has been inserted into the ignition lock. If this code is not sent due to an internal error of the SKREEM, the engine control unit will not receive this code and the vehicle cannot be started.

The Skreemulator no longer requires a transponder. It is designed to send this code when the Crossfire is opened with the included center four control module, or when the vehicle is unlocked with the key via the driver's door handle lock (US models only).

As an anti-theft measure, this code will expire if the Crossfire is not started within 15 minutes of unlocking. To start the Crossfire after this time has elapsed, remove the key from the ignition, press the unlock button on the remote keyless entry fob, wait for the green LED to illuminate, and then start the Crossfire. The green LED indicates that the Skreemulator is "unlocked" and will send a code to the engine control unit when it is requested.

Other than the differences in how the engine control unit receives the code to unlock the immobilizer, the Skreemulator works similarly to the original SKREEM when paired with the remote keyless entry module. Remote keyless locking and unlocking of the doors, trunk, center console (convertibles only) and fuel door are retained and everything will lock and unlock together. Please note, selective unlocking is no longer possible due to limitations with the remote keyless entry.

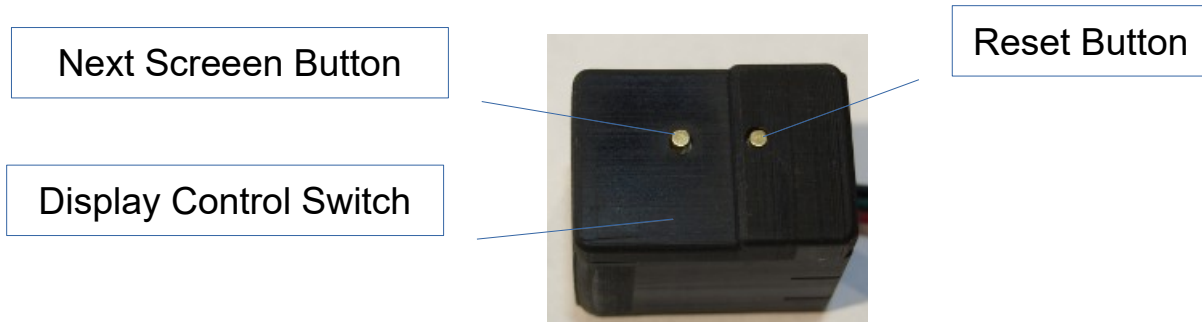
Automatic relocking has been retained. If the doors are unlocked with a remote keyless entry fob but a door is not opened in a timely manner, the vehicle will relock to prevent accidental unlocking.

Automatic locking has also been retained and the doors are locked as soon as you start driving.

With the Skreemulator, you no longer need expensive factory transponder keys, a simple mechanical key that operates the ignition is enough.

5. Display control switch

The Optional OLED display includes a display control switch which has two buttons. The outermost button is used for switching screens on the optional OLED display, with the screens advancing to the next every time the button is pressed. The second button is recessed and can only be pressed with a pointed object like a paper clip. This is a reset button and after pressing it, the Skreemulator restarts. This is normally not needed as the Skreemulator monitors itself by means of a "watchdog" and restarts automatically in case of a malfunction.

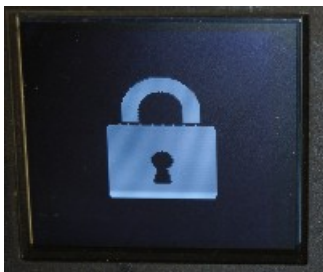


Default displays:

Open:



Close:



Code send:



Code accepted from ECU:












The additional displays show different units of measurement depending on which country code was selected by DIP switch on the Skreemulator.

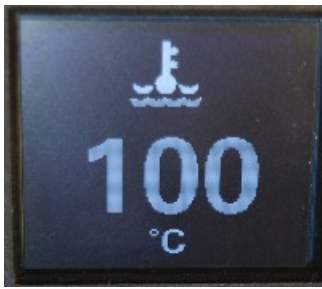
The following applies:

- no DIP switch switched = EU
- US DIP switch switched = US
- GB DIP switch switched = GB

In order for the additional functions to be displayed, the Next button on the control unit must be pressed once after each new booting of the Skreemulator.

Normally, if only the Crossfire is restarted (no booting of the Skreemulator), the last selected display is shown immediately.

EU-Version	US-Version	GB-Version
	 Boot Screen	
	 Vehicle Speed	
	 Engine RPM	



Coolant Temperature



Engine Oil Temperature






A/T Fluid Temperature



A/T Gear & Shift Program



Fuel level

	 Range (estimated)	
	 Consumption (estimated)	
	 Combination Display	

Unfortunately, not all the necessary data is transmitted via the CAN bus on early model Crossfire so some display screens may not be available for you to view.

The transmission shift program display shows "Drive" for the original transmission control unit, "Sport or Manual" for the Speedshift software and "Sport, Comfort, Agility or Manual" for the new Speedshift software with 4 driving programs depending on the selected driving program.

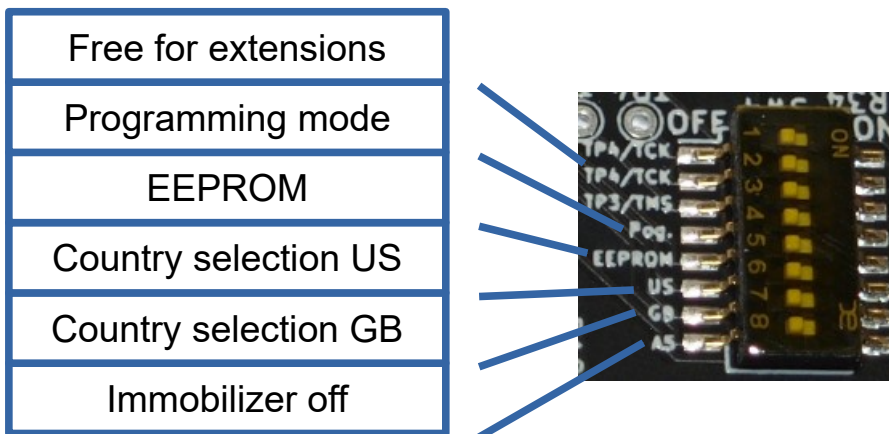
The consumption data from the ECU fluctuates greatly and is roughly calculated. As a result of this, it can be very inaccurate so these values should only be used as an approximation or guide and are not suitable for determining exactly when you will need to refuel.

6. Documentation

6.1 DIP-Switch

ATTENTION!!!

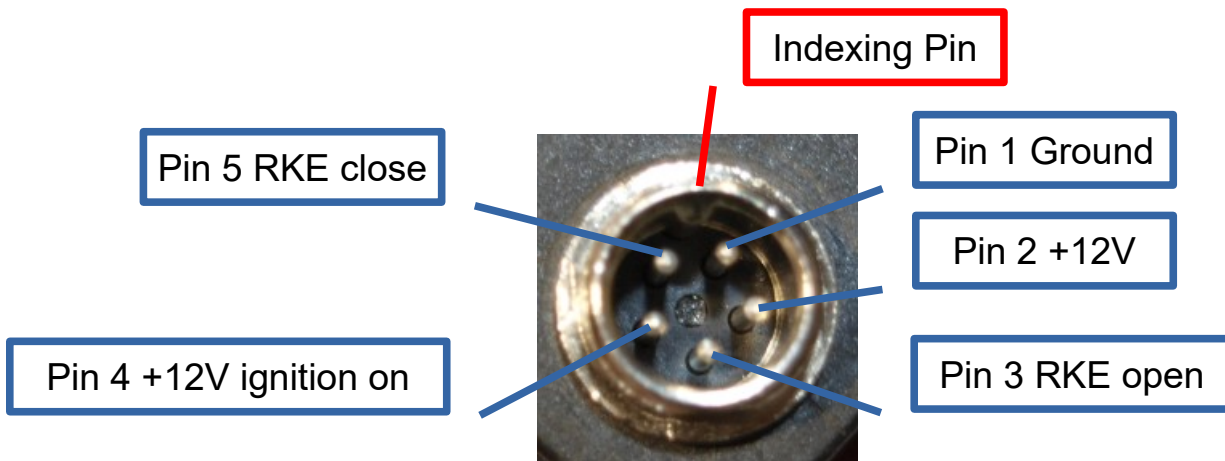
There is no reason you should need to change these switches and unless you are advised otherwise, you should leave them alone as incorrectly changing them can cause the Skreemulator to permanently stop working.



Function	Description
Programming mode (Switch 4)	OFF - Default position ON - Skreemulator will read another SKREEM module overwriting the internal EEPROM and the Skreemulator will no longer work.
EEPROM (Switch 5)	OFF - Default position ON - Skreemulator will not boot and EEPROM can be programmed
US Country	OFF - Used for GB or EU Country Selection

selection (Switch 6)	ON - Temperatures in °F / Speed in Miles/Hour
GB Country Selection (Switch 7)	OFF - Used for US or EU Country Selection ON - Temperatures in °C / Speed in Miles/Hour
EU Country Selection	Both US = OFF and GB = OFF Temperature in °C / Speed in Kilometers/Hour
Immobilizer off (Switch 8)	OFF - Default position ON - Skreemulator sends code to engine control unit when requested, even if the car is not unlocked.

6.2 5-pin socket (central locking module)



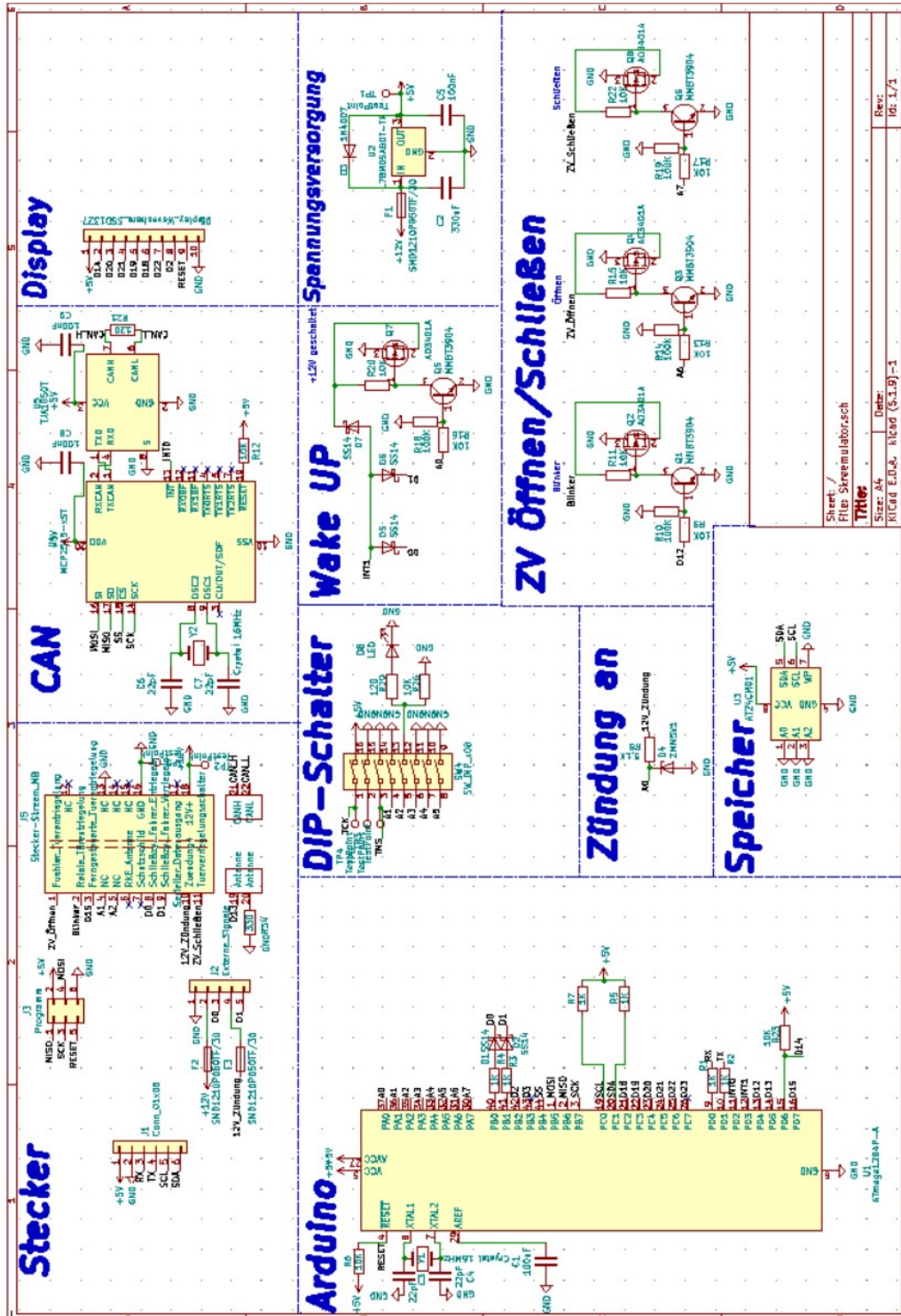
Above you can see the pinout of the 5-pin socket for the remote keyless entry module. You can install any central locking module which can switch to ground. It is also possible to connect a pushbutton to pin 1 and pin 3 which is hidden somewhere and with each press the Crossfire is opened and the Skreemulator is "unlocked".

6.3 Troubleshooting

Issue	Troubleshooting
<p>Car does not lock or unlock when the remote keyless entry fob buttons are pressed</p>	<ul style="list-style-type: none"> - Try another remote keyless entry fob - Replace batteries in the remote keyless entry fob - Listen for a clicking noise from the remote keyless entry module relay. - If you cannot hear a click, verify the vehicle battery is not discharged. If not, check the 5-pin connector for the remote keyless entry module is connected to the Skreemulator. - If you hear a clicking noise but do not see the indicators of the Crossfire and the green LED of the Skreemulator light up, disconnect the battery ground briefly to reset the Skreemulator (or press reset button if you have the optional OLED display). - If you hear a clicking noise and see the indicators of the Crossfire and the green LED of the Skreemulator light up, check the Central Locking Pump in the trunk
<p>Engine starts and then shuts off right away</p>	<ul style="list-style-type: none"> - Check that the Skreemulator is unlocked and the green LED on. - If the green LED is not on, press unlock on the remote keyless entry fob and verify that the green LED is now on and you can try to start again. - If the green LED is on, attempt to restart the engine. If the issue persists after the third starting attempt, the Skreemulator has lost synchronization with the engine control unit and you may have to attempt to restart the engine up to 30 times until it resynchronizes. - If nothing happens when turning the ignition key, disconnect the battery ground for a few minutes and then continue the procedure.
<p>The green LED remains on even though I have locked the doors.</p>	<p>This is normal. The Skreemulator is unlocked for 15 minutes after pressing the unlock button on the remote keyless entry fob. This gives you time to load or unload the vehicle or if you are sitting in the car for</p>

a few minutes and do not immediately start the vehicle.

6.4 Circuit diagram:



6.5 BOM:

Designator	Comment	Footprint
C1,C8,C9	100nF	Capacitor_SMD:C_0603_1608Metric
C2	330nF	Capacitor_Tantalum_SMD:CP_EIA-3216-18_Kemet-A
C5	100nF	Capacitor_Tantalum_SMD:CP_EIA-3216-18_Kemet-A
C3,C4,C6,C7	22pF	Capacitor_SMD:C_0603_1608Metric
D3	1N4007	Diode_SMD:D_SMA
D4	ZMM5V1	Diode_SMD:D_MinimELF
D1,D2,D5,D6,D7	SS14	Diode_SMD:D_SMA
D8	LED	LED_SMD:LED_0603_1608Metric
F1,F2,F3	SMD1210P050TF/ 30	Fuse:Fuse_1210_3225Metric
J1	Conn_01x06	Connector_PinHeader_2.54mm:PinHeader_1x06_P2.54 mm_Vertical
J2	Externe_Signale	Connector_PinHeader_2.54mm:PinHeader_1x05_P2.54 mm_Vertical
J3	Programm Stecker-	Connector_PinHeader_2.54mm:PinHeader_2x03_P2.54 mm_Vertical
J5	Skreem_MB	Stecker_MB Connector_PinSocket_2.54mm:PinSocket_1x10_P2.54 mm_Vertical
J6	Display	Package_TO_SOT_SMD:SOT-23
Q2,Q4,Q7,Q8	AO3401A	Package_TO_SOT_SMD:SOT-23
Q1,Q3,Q5,Q6	MMBT3904	Package_TO_SOT_SMD:SOT-23
R10,R14,R18,R19	100K	Resistor_SMD:R_0603_1608Metric
R6,R9,R11,R12,R13, R15,R16,R17,R20,R 22,R23,R26	10K	Resistor_SMD:R_0603_1608Metric
R1,R2,R3,R4,R5,R7	1K	Resistor_SMD:R_0603_1608Metric
R21,R29		120 Resistor_SMD:R_0603_1608Metric
R34		330 Resistor_SMD:R_0402_1005Metric
R8	5,1K	Resistor_SMD:R_0402_1005Metric
SW4	SW_DIP_x08	Button_Switch_SMD:SW_DIP_SPSTx08_Slide_Copal _CHS-08B_W7.62mm_P1.27mm
TP1,TP2,TP3,TP4,T P5,TP6	TestPoint	TestPoint:TestPoint_THTPad_D1.5mm_Drill0.7mm
U1	ATmega1284P-A	Package_QFP:TQFP-44_10x10mm_P0.8mm
U2	L78M05ABDT-TR	Package_TO_SOT_SMD:TO-252-2
U3	AT24CM01	Package_SO:SOIC-8_3.9x4.9mm_P1.27mm
U4	MCP2515-xST	Package_SO:TSSOP-20_4.4x6.5mm_P0.65mm
U5	TJA1050T	Package_SO:SOIC-8_3.9x4.9mm_P1.27mm
Y1,Y2	Crystal 16MHz	Crystal:Crystal_SMD_5032-2Pin_5.0x3.2mm