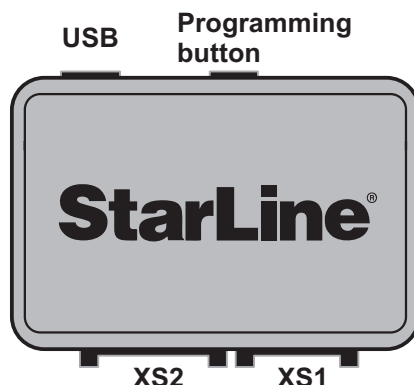


StarLine Sigma 15

*Installation guide
(StarLine Sigma 15 &
StarLine Sigma 15 v2 models)*

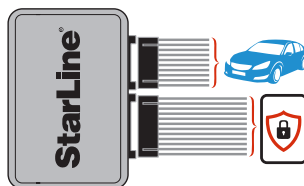
Brief overview

StarLine Sigma 15 & StarLine Sigma 15 v2 CAN/LIN modules (following simply Sigma 15) are designed for installation in vehicles along with electronic units of other manufacturers.

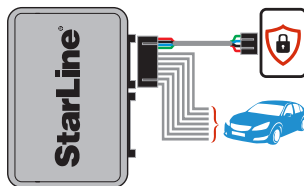


Sigma 15 receives command signals to its inputs and transfers them to the vehicle for Central Lock control, OEM alarm system mode change, "Comfort" function realization. Plus, it's able to inform alongside equipment about data available through CAN lines such as: door or trunk or hood opening, brake pedal pressure, ignition key position, etc. Sigma 15 can block the engine (iCAN technology), bypass keyless immobilizer (iKey technology) or even start the engine.

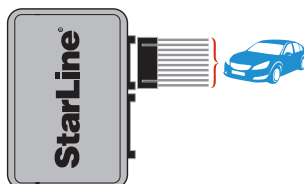
The full list of supported functions for each car model is available on the website can.starline.ru. In common case the outline of connection is as follows (for example [Davinci PHI-1380RS](#) remote-start & security system equipped with Sigma 15):



It's possible to use [SigmaBUS](#) digital interface for data exchange. It takes fewer connections ([StartFone](#) unit installation for example)::



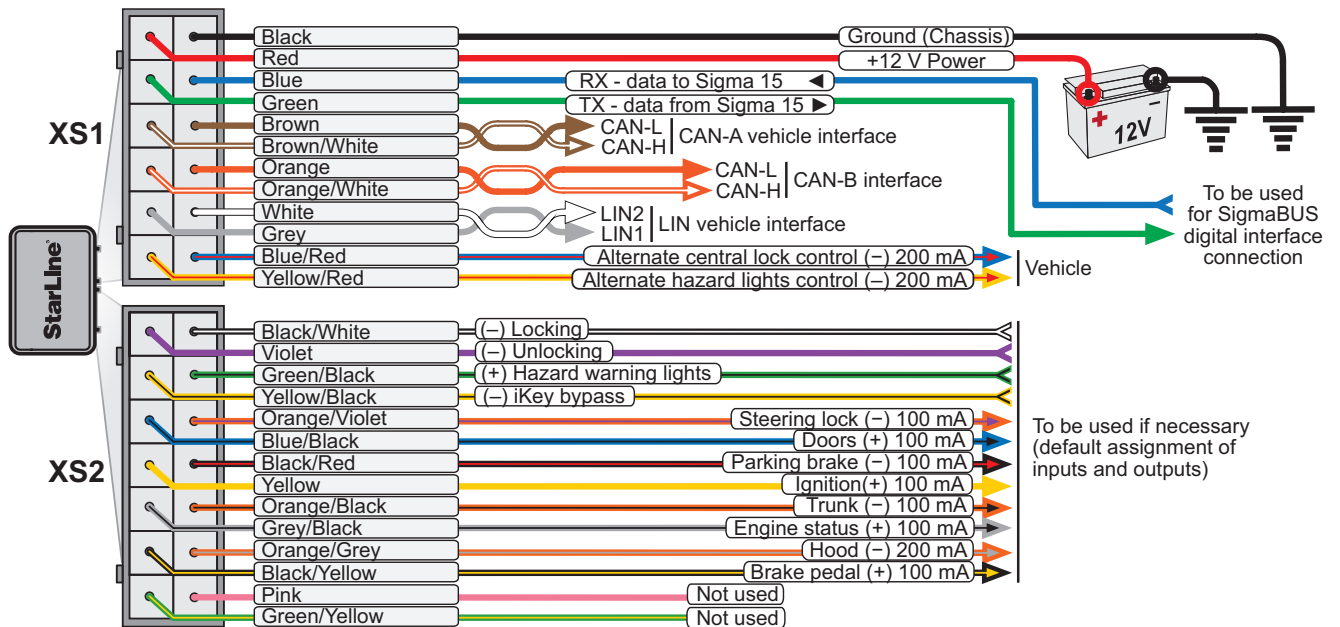
Finally Sigma 15 can be installed as a separate stand-alone Remote Starter in some cases. One can start the vehicle by OEM remote Lock-Lock-Lock command (refer for the sample PTS Toyota & Lexus [Installation guide](#)):



Principle wiring diagram

CAN and/or LIN lines must be connected in addition to power supply wires. One can see the number of used lines for each car model as well as their connections on can.starline.ru.

The algorithms of other inputs and outputs are specified "by default". They can be changed and connected in depending on a solved problem (please refer to their description below). You must decide what wires and how you want to use and then make proper connections. Available functions are listed on the website can.starline.ru too.



Programming

You need PC with USB-port and Internet connection for programming of **Sigma 15**:

1. Load "StarLine Master" program from help.starline.ru website install and run it.



2. Connect **Sigma 15** to your PC. StarLine Master will recognize its hardware version.



3. Go to can.starline.ru and find the reference to the proper hardware (**StarLine Sigma 15** or **StarLine Sigma 15 v2**) in "Outside modules" section. Download firmware for your vehicle.



4. Switch to StarLine Master and Update **Sigma 15** firmware.



5. Press "Device settings" than chose your car model precisely.



6. If you want to change I/O settings as well as Additional functions make it. Press "Save to device".



Important! Some firmware versions allow you to change **Sigma 15** settings via the Programming button. We strongly recommend you not to do it as it's easy to make an error.

Inputs algorithms

There are 4 programmable (variable) inputs: one is positive (Green/Black), three others are negative (Violet, Black/White, Yellow/Black). All of them are located on the second 14-pin connector (XS2). Use correct signals for the control in accordance with inputs polarity ("plus" or "minus").

Each of inputs can be programmed as follows (as soon as **Sigma 15** receives the signal via one of inputs it passed the command through CAN or LIN lines if it is available for this car model):

1. **Hazard lights control** – **Sigma 15** activates the flashes of all direction-indicator lamps.
2. **Locking** – control signal receipt leads to the locking of doors.
3. **Locking + Comfort** – the same as above plus windows closing.
4. **Unlocking** – control signal causes doors unlocking.
5. **Comfort function** – windows closing.
6. **Trunk release** – to unlock or open the trunk. In some cases the second command can be used for trunk closing.
7. **iCAN blocking** – can disallow the engine start and/or it's work by iCAN technology:
 - sent control signal before ignition switch-on to block the engine start;
 - activate control signal to stop the running engine.In both cases after cancelling of blocking on must turn off ignition and switch it on again to start the engine.
8. **Activate preheater** – to switch on OEM engine preheater controlled via CAN line.
9. **iKey bypass** – to activate OEM immobilizer bypass for engine remote start. **Sigma 15** can start some vehicle engines by itself:
 - for standard immobilizer bypass send control signal in 1 second before ignition activation, keep it during the period of engine runtime and switch it off after ignition deactivation. In case of failure remote start disconnect control signal and send it again in 1 second prior to ignition;
 - for full engine-start by **Sigma15** one can use two kinds of control signals: continuous voltage and pulse. Continuous voltage (duration more than 3 seconds) must be applied for the whole period of warm-up (engine runtime). Pulse signal (from 0.5 to 2 seconds) can start the vehicle engine for the time specified by Additional function "Remote start engine runtime, min." or till the second pulse (from 0.5 to 2 seconds).
10. **Keyless blocking** – to protect against OEM smart key keyless commands retranslation. Control signal blocks the work of keyless entry system until it is off.
11. **Remote start disabling** – to turn off iKEY immobilizer bypass algorithm or remote start of engine by **Sigma 15**. Moreover the engine will be shut down if it had been started by **Sigma 15** module.
12. **Simulate driver's door opening** – to simulate the short opening of the door by sending faked signal through CAN line.

Outputs algorithms

10 programmable (variable) outputs are located on both connectors: 12-pin (XS1) and 14-pin (XS2).

2 outputs with alternating polarity of XS1 (Blue/Red and Yellow/Red) are used by default as:

1. **Alternate central lock control** – to be used for direct wire control of the central locking system. It can be used when corresponding signals are not present in CAN or LIN lines. Polarity of this output is defined by the firmware.
2. **Alternate hazard lights control** – to be used for direct wire control of all direction-indicator lamps. It can be used when corresponding signals are not present in CAN or LIN lines. Polarity is defined by the firmware.

The following algorithms can be set for each of XS1 outputs:

3. **Starter control** – can be used when **Sigma 15** can start the engine but the wired starter control is needed (for example some Toyota и Lexus models). It will be activated when starter switch-on is needed and deactivated after engine start (or 5 seconds after an unsuccessful start attempt). It is possible to change its polarity.
4. **Immobilizer LED switch-off** – this output is active as soon as Sigma 15 receives iKEY bypass signal (or Lock-Lock-Lock command from OEM remote) and stays active until ignition is off. It is possible to change its polarity.

Remaining 8 outputs are on the second 14-pin connector (XS2). 4 of them are positive (Blue/Black, Yellow, Grey/Black, Black/Yellow), other 4 are negative (Orange/Violet, Black/Red, Orange/Black, Orange/Red).

All of them are used usually for status data transfer from the vehicle CAN and LIN lines. Each of the outputs can use any algorithm of the following list (if corresponding data are available for the car model):

1. **Brake pedal** – brake pedal is pressed.
2. **Parking brake** – parking brake (or handbrake) is active.
3. **Engine run status** – the presence of TAXO pulses when ignition is on.
4. **Ignition** – ignition is on.
5. **Doors** – one or more vehicle doors are opened.
6. **Trunk** – trunk is opened.
7. **Hood** – hood is opened.
8. **Accessories** – accessories power line is active.
9. **Reverse** – transmission gear lever is in the reverse (R) position.
10. **Steering lock** – special algorithm for steering wheel unlocking during remote start (for Toyota and Lexus). Violet/Orange wire can be used for it only.
11. **Driver's door** – driver's door opened.
12. **Passenger's doors** – one or more passenger's doors are opened.
13. **Parking** – A/T selector lever is in the parking (P) position.
14. **Alarm of security system** – OEM security system is in alarm/panic mode.
15. **Security system status** – OEM security system armed.
16. **Remote start control confirmation** – special algorithm consisting of several steps. It works when the engine can be started by **Sigma 15**:
 - short 1-second pulse as soon as **Sigma 15** receives RS command;
 - secondary long status signal after the successful engine start for the period of engine runtime. It will be over in 1 second after ignition switching off (or in 5 seconds after engine shut down on the condition that ignition stays on).
17. **Immobilizer LED switch-off** – this output is active as soon as Sigma 15 receives iKEY bypass signal (or Lock-Lock-Lock command from OEM remote) and stays active until ignition is off.
18. **Remote start status** – to cut off required wires (like ignition, engine blocking, etc.) for the whole duration of remote started engine runtime:
 - it will be activated 1 second prior to remote start attempt;
 - it stops 2 seconds after ignition switch off.
19. **Disabled** – to switch off the output.

Additional functions

Please note that these functions are available if there are corresponding commands in CAN or LIN protocols:

1. **Sequent doors unlocking** – simulate OEM remote with driver's door priority. The first signal opens the driver's door, the second passenger's ones (this function can be applied to "Unlocking" input).
2. **OEM security system control** – arming and disarming of OEM security system through **Sigma 15** inputs ("Locking" and "Unlocking").
3. **Slave comfort** – automatic windows closing and side-mirrors folding by the first pressure of OEM remote button for arming.
4. **Engine start by OEM remote** – to start (and sometimes to shutdown) the engine by Lock-Lock-Lock command from OEM remote. It works when **Sigma 15** can start the engine.
5. **Driver's door open shutdown** – automatic engine shutdown on driver's door opening. It works when **Sigma 15** can start the engine.
6. **RS prohibition on opened perimeter** – to disable remote start (or even immobilizer bypass) when door or hood or trunk opened.
7. **Remote start lights confirmation** – to confirm by 3 flashes of hazard lights that **Sigma 15** started the engine successfully.
8. **Remote started engine runtime, min** – engine runtime (warm-up period) when **Sigma 15** starts it by Lock-Lock-Lock command from OEM remote or pulse through "iKey bypass" input.
9. **Starter switch-on delay, sec** – delay between ignition switch-on and "Starter control" output activation (for diesel glow plugs heating).

"iKey bypass" standard learning algorithm

Attention! This algorithm of learning of **Sigma 15** is applicable for majority of car models but has several exceptions. Please check its validity for your car by visiting can.starline.ru.

Prior to the beginning be sure to connect interfaces (CAN, LIN, RX/TX, etc.) in accordance with the data published on can.starline.ru ("Connection points") for specified vehicle.

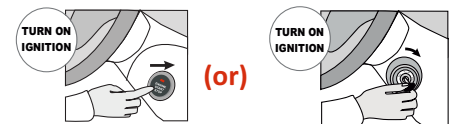
1

Make sure that ignition is off. Switch on power supply. Press programming button fourteen (14x) times.



2

Switch on ignition within next 5 seconds.



3

Sigma 15 will enter data processing mode. It can proceed up to 5 minutes and accompanied by short buzzer chirps each 3 seconds. 2 fast signals will confirm the end of learning procedure.



StarLine Sigma 15

Attention! In case of false result you can hear 4 sounds. In this case please check the firmware selection accuracy, vehicle model (number) and digital interfaces (CAN, LIN, RX/TX, etc.) connections.



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CAN.STARLINE.RU
CONNECTIONS, FUNCTIONS, FIRMWARE

