Autoplugin Key-F2

Version 5.11

User Manual

Rev. A

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Glossary

CAN - Control Area Network (digital network for data transfer in vehicles)
DIS - Driver Information System of the instrument cluster
BHM or Boost Heat Mode - operational mode of the heater, when it operates together with the engine to help the engine and the interior warm up more quickly

Description

The **Autoplugin Key-F2** module is intended for remote control of fuel-fired heater (parking heater, fuel operated heater, pre-heater below), factory installed on **Ford Focus 2** (2004-2011), **Ford C-Max** (2003-2010) or **Ford Kuga** (2008-2012), by original Ford vehicle key. The device is plugged into OBD-II connector on the vehicle's dashboard and controls the heater via CAN-bus.

Module Possibilities

- Immediate start of the heater by original 3-button Ford vehicle key, with possibility to stop the heater remotely
- Indication of heater start and of autonomous operation of the heater by the turn signals in the rear-view mirrors.
- Pushbutton for one-touch heater start/stop, boost mode control and settings change
- Main battery protection from discharging inspecting the voltage level and time of autonomous work of the heater
- Heater errors clearing (unblocking)

Package Content

1. Autoplugin Key-F2 cartridge
2. This manual

Preparation for Work

Focus II (2004-2007), C-Max (2003-2006):

Turn on the ignition and select in driver information system (DIS) menu:
Your settings => Aux.heater programming =>Instant control => Auto

Focus II (2008-2011), C-Max (2007-2010), Kuga:

Start the engine and select in DIS menu:
Set => Menu => Settings => Auxiliary Heating => On => Off =>On (again)

Connection

The Autoplugin Key does not need professional installation. Just find OBD-II service connector at the dashboard to connect the module. The connector is placed in the deepening of the dashboard, driver's left knee above. Take Autoplugin Key to your hand with LED, oriented to your face, and then gently push it to OBD-II connector until it fixes. Wait until module's LED goes off.

If you need to unplug Autoplugin Key (ex. to connect diagnostic equipment to the vehicle's electronic system), it is recommended to make this operation with the ignition turned on. This protects from occasional heater start if pushbutton pressed during inserting the module.

Basic Functions

1. To start the heater by the original Ford key press "Lock" button 3 times on the key. Time intervals between presses must not exceed 20 seconds. The unlocking of the vehicle or time interval excess will restart the counter of "Lock" button presses. Watch to the turn signals to be sure that Autoplugin has received a command from the key. Every button press on the key will be confirmed by the turn signals (if the car has been locked before).

   Also if your car is equipped by keyless entry system, you can use a button on the door handle as "Lock" button to start the heater outside the vehicle (passive key must be presented).

   You can see series of double flashes by the turn signals in the rear-view mirrors, when the heater will start to operate.

2. The Autoplugin Key is adjusted by default only to switch the heater on by remote control. If you also plan to switch off the heater remotely, change the setting 5.1. As both the commands use the same combination of "Lock" presses, you should know a condition of the heater before a command send. Therefore we recommend you to activate the settings 6.4 – 6.6 to see the heater condition indicated by turn signals flashing in the rear-view mirrors. The possibility to stop the heater may be useful in the case of cancelation of the trip, including ones programmed by DIS.

3. The pushbutton has several functions. Current function is defined by the heater condition, the ignition condition and the engine condition (see **Table 1**)

When the ignition is turned off, the pushbutton is used for immediate start or stop of the heater. Button press changes a heater condition to another one: switches off the operated heater or switches on the idle heater.

When the ignition is turned on, pushbutton press keeps the current condition of the heater after the engine start. So, if the heater has operated before the engine start, it may continue to operate after the engine start (in boost heat mode).

If the heater has been idle before the engine start, pushbutton press will inform the module doesn't let the heater operate in the boost heat mode together with the engine. These functions are called quick enabling and disabling of boost heat mode respectively. Being activated these functions act for the current ignition cycle only. Turning the ignition off cancels these functions.

Table 1

Button function	Ignition status	Engine status	Heater status	Description (how to use)
Heater immediate start	Off	Not running	Off	One-touch heater start
Heater immediate stop	Off	Not running	On	One-touch heater stop
One-time boost disable	On	Not running	Off	Quick disabling of boost heat mode for short trips
One-time boost enable	On	Not running	On	Quick enabling of boost heat mode in the case of boost heat mode disabling by module's settings or in the case of one-time disabling previously
	On	Running	Off	
Boost extension	On	Running	On	This function lets the heater continue operating after the engine has been switched off. It is useful in case of short stops in a trip.

When the engine runs, the pushbutton may be used to enable the boost heat mode (if the boost heat mode was disabled early) or to activate the function called Boost Extension (if the heater operates in the boost heat mode). Usually the heater is turned off right after the engine stops. If you want stop the engine with the heater keep working, you may use this button function. Boost extension once being activated acts while doesn't the user stop the heater manually or the heater stops automatically when the coolant achieves enough temperature.

Warning! The parking heater must not be operated at filling stations, near sources of combustible vapours or dust or in enclosed spaces

Fuel fired heater needs about 3 minutes to go to normal operation after the startup. If your trip is planned to be shorter, it is highly recommended to use a button function called “one-time boost disable”. This preserves the heater from premature clogging. Turn on the ignition, press the button, then start the engine. Now the heater will not operate with the engine while don’t you turn the ignition off or use “one-time boost enable” function.

Additional Functions

By default Autoplugin Key is adjusted to execute basic functions, such as a start of the heater by the Ford key and the built-in button, a stop of the heater by the button and a control of the boost heat mode by the button. To turn on additional functions (a possibility to stop the heater by Ford Key, battery monitoring, indication by the turn signals in the rear-view mirrors, extended control of boost heat mode, etc.) you may enter the module into programming mode and activate the corresponding setting.

The built-in button of Autoplugin Key and the brake pedal are used to enter programming mode and to change the settings. It is necessary to stop the engine and the heater before. Turn the ignition on, press and hold the brake pedal. Then press the button and hold it until module’s LED is flashing (about 5 seconds). Release the button when LED will illuminate continually. Both turn signal repeaters in DIS will flash twice as a confirmation of entering programming mode. Release the brake pedal now.

Each setting in the **Table 2** corresponds to the 3-digit code. You need to enter appropriate code to activate a setting. To enter a digit of a code, press the button so much times, as corresponds to a digit. Each button press will be confirmed by a turn signal repeater of DIS: the left turn to the first and the third digits of code, the right turn to the second digit of code.

To confirm a digit entering, press and release the brake pedal (DIS will flash one time by the both repeaters simultaneously). After the third digit will be entered, module will check the code for validity and confirm it by repeaters: flash twice by the both repeaters simultaneously in the case of valid code, flash twice by the both repeaters alternately in the case of invalid code.

If you made a mistake with the number of button presses when you enter the code, press and release the brake pedal until the module indicate an error by repeaters. Enter the code again in that case. Also you may enter other codes without exit of

programming mode.

Release a brake pedal and turn the ignition off to exit of programming mode. Wait until the LED goes off. New settings will be saved in the module's memory and will be stored there regardless of whether the module is connected or not.

Attention: If you start the engine without exit of programming mode, new settings will not be saved in memory.

To reset the module to factory settings, enter the code 7.1.1. Both repeaters will flash three times to confirm command execution, and then the module will exit of programming mode and restart.

To clear all the errors in the heater's memory and thus unblock the heater, enter the code 8.1.1. Both repeaters will flash five times to confirm command execution. If unblocking of the heater is impossible, the repeaters will flash five times alternatively.

Pay attention: when you apply unblocking function for the first time, Autoplugin Key will save VIN code of the car in memory. In the future unblock function will work only for this car.

* Factory setting
Recommended settings marked in Italics

Settings table (2)

1. Boost Heat Mode Control	**1.1.** Additional engine heating in boost heat mode	**1.1.1** *Enabled by module **1.1.2** Disabled by module permanently **1.1.3** Disabled all the time, except in the case of the heater has been operated before engine start
	1.2. Additional engine heating disable by coolant temperature (in Celsius degrees)	**1.2.1** *Not applied **1.2.2** Higher than 0 degrees **1.2.3** Higher than +10 degrees **1.2.4** Higher than +20 degrees **1.2.5** Higher than +30 degrees **1.2.6** Higher than +40 degrees ***1.2.7*** *Higher than +50 degrees* **1.2.8** Higher than +60 degrees **1.2.9** Higher than +65 degrees **1.2.10** Higher than +70 degrees
2. Heater Timing	**2.1.** Limitation of heater operation time in pre-heat	**2.1.1** Not adjusted **2.1.2** 40 minutes

	mode	**2.1.3** 50 minutes **2.1.4** 60 minutes **2.1.5** **70 minutes* **2.1.6** 80 minutes **2.1.7** 90 minutes **2.1.8** 100 minutes **2.1.9** 120 minutes
3. Heater Operation Mode	**3.1.** Heater operation mode for remote start	**3.1.1** Immediate start, automatic stop in 30 minutes **3.1.2** * Immediate start, automatic stop in 30 – 70 minutes (when engine coolant will completely warmed) **3.1.3** Higher than -12˚C - mode 3.1.2, below -12˚C – delayed start with startup in 2 minutes[1] and automatic stop in 70 minutes
4. Battery Monitoring	**4.1.** Minimal voltage to let the heater start in pre-heat mode	**4.1.1** * Not adjusted **4.1.2** 11.4 V **4.1.3** 11.6 V **4.1.4** 11.8 V **4.1.5** *12.0 V* **4.1.6** 12.1 V **4.1.7** 12.2 V **4.1.8** 12.3 V **4.1.9** 12.4 V
	4.2. Minimal voltage to keep operating the heater for pre-heat mode [2]	**4.2.1** * Not adjusted **4.2.2** 10.6 V **4.2.3** 10.8 V **4.2.4** 11.0 V **4.2.5** 11.2 V **4.2.6** *11.4 V* **4.2.7** 11.5 V **4.2.8** 11.6 V **4.2.9** 11.7 V
5. Heater Control by Remote	**5.1.** "Lock" button function for the heater remote control	**5.1.1** *****Heater start only **5.1.2** Start of idle heater, stop of operated heater
	5.2. "Lock" button presses count to activate the Autoplugin module	**5.2.1** Heater control by Ford key is disabled **5.2.2** Two presses **5.2.3** *******Three presses* **5.2.4** Four presses **5.2.5** Five presses **5.2.6** Six presses

6. Heater startup and operation mode indication by the direction indicators in the rear-view mirrors and in the DIS	**6.1.** Indication of successful startup of the heater from remote control	**6.1.1** Off **6.1.2** *Series of double flashes
	6.2. Indication of unsuccessful startup of the heater from remote control	**6.2.1** Off **6.2.2** *Series of single flashes
	6.3. Indication of the heater, started by remote control	**6.3.1** *Off **6.3.2** On
	6.4. Indication of the heater, started by DIS (direct or program start)	**6.4.1** *Off **6.4.2** On
	6.5. Indication of the heater, started by the button	**6.5.1** *Off **6.5.2** On
	6.6. Flashing frequency for indication of heater autonomous operation	**6.6.1** One flash within 3 sec **6.6.2** One flash within 5 sec **6.6.3** ** One flash within 10 sec* **6.6.4** One flash within 15 sec
	6.7. Button press confirmation[3]	**6.7.1** *Off **6.7.2** One-time flash
7. Settings reset		**7.1.1** Apply factory settings
8. Heater errors reset		**8.1.1** Clear all errors in heater's memory, resulting heater unblocking

[1] – Not recommended for vehicles released after 2008 year because the heater startup is not guaranteed in 2 minutes. Using mode 3.1.3 you can save battery energy at low temperatures, because in delayed start mode the heater switches on the cabin ventilation not immediately after start, as in other modes, and after heating the coolant up to +30˚C.

[2] – Module turns off the heater automatically if battery voltage becomes lower than set

[3] – Setting is not recommended for use in cars with direction indicators in the rear-view mirrors.

Troubleshooting

If a run-time error occurs at start of the heater, Autoplugin Key will inform you by LED blinking about the error code. The number of flashes corresponds to the error code. See table 3 for the codes description and possible solutions.

Table 3

Error Code	Error Description	Possible Reasons of Error Appearance	Solutions
1	Start command cannot be executed	The heater is not adjusted in DIS menu (or has been reset to unadjusted condition after battery discharging or disconnection)	See chapter **Preparation for Work** to adjust the heater
2	No answer from the heater followed the start command	The engine is hot (no need to pre-heat)	Let the engine cool down below +75 degrees
		The heater hasn't finished previous cycle of operation yet (you can hear the noise from the air blower fan)	The heater starts after previous cycle of operation is fully completed
		Fuel level in the tank is close to empty ("Fuel Low" warning indicator is lighting in DIS)	Refuel the car
		The heater is blocked after 5 unsuccessful starts	Try to start the heater from DIS menu. If it not started to burn, check for fuel and coolant quality (especially at extreme cold temperatures) and possible heater's exhaust system clogging by snow. Then unblock the heater by Autoplugin command 8.1.1.
3	Battery level is low	The module has determined that battery voltage at the heater startup or during the heater operation is below the specified settings 4.1 и 4.2	Charge vehicle's battery with special charger (or start engine to charge) or cancel 4.1/4.2 module's settings

4	Time limit exceeded	Time limit for autonomous operation of the heater is achieved (with active setting 2.1)	Run the engine or cancel 2.1 module's setting
5	Unsuccessful start	The heater is switched off at startup	Make a diagnostics of the heater if the error occurs again
6	Operation cycle is too short	The heater switched off spontaneously with operating time of less than 20 minutes	Make a diagnostics of the heater if the error occurs again
7	CAN-bus error	No contact between Autoplugin Key and OBD-II service connector	Try to unplug Autoplugin Key from OBD-II service connector and plug it again (see chapter **Connection**)
8	Settings error	Settings have been incorrectly stored in Autoplugin memory	Reset the settings (7.1.1), readjust Autoplugin
9	Heater no connection	The heater is unplugged from CAN-bus or out of order	Make a diagnostics of the heater