FanControl-U2

Technical manual

Contents

1. Description of the module

Module **FanControl-U2** is designed for operation in the following vehicles:

- Audi A3 (2013--), A6 (2011--), A7, A8 (2010--), Q5, Q7 (2011--), Q3, A5, Q7 (2015), TT (2015)
- BMW 1 (F20), 3 (F30), 5 (F10), 6 (F13), 7 (F01, F02), X3 (F25), X1 (E84), 3 (E90), X5 (E70), X5 (F15), X6 (E71), 6 (E63, E64), X4 (F26), X6 (F16), X1 (F48); 7 (G11, G12); 5 (G30)
- Mini Cooper (2014--), Countryman (F60) 2017--
- Land Rover Range Rover Vogue (2013), Range Rover Vogue (2014--), Range Rover Sport (2014--), Discovery 4, Discovery Sport (2015), Evoque (2011--), Freelander 2 (2013--)
- Mercedes-Benz 463 (2013--), 447, 222, 221, 218, 216, 212, 207, 205, 204, 176, 166, 156, 211, 219, 164 (ML, GL), 251, 463, 203, 169, 639 (2003-2010), 639 (2010-2014), 906, 292 (GLE), 217, 253 (GLC)
- Porsche Cayenne (2011--), Macan, Panamera (2009)
- Skoda Octavia 3; Skoda Octavia 2, Superb (2009--)
- Volkswagen Touareg (2011--), Touareg (2006-2010), Amarok, Multivan T5 (2003-2009), Multivan T5 (2010--), Passat B6, Passat B7, Passat CC, Golf 5, Golf Plus, Jetta (2006--), Caddy (2004--), Touaran, Tiguan, Golf 7, Crafter, Multivan T6 (2015)
- Seat Altea (2004--), Leon (2006--)
- Volvo XC 60 (2008-2010), XC 60 (2011--), XC 70 (2012--), XC 90 (2005-2014)
- Infinity QX 30 2016; QX 30 2017; QX 30 2018

You can find connection manuals at www.tecel.ru/en/ or www.canbus-alarm.com.

The module allows implementing the following functions:

1. Activation of vehicle's climatic system.
2. Activation of vehicle's factory heater.
3. Activation of heater and the climatic system for engine and interior warm-up using vehicle's factory button or factory remote control.
4. Control of Webasto Thermo Top C, Evo 5, Eberspächer D5WS heaters via digital bus.
5. Support of heat-assistance mode.

Figure 1. Package

2. Connection and configuration of the module

Module pins designation is described in the Table 1 “Module connector pins designation", and connector pins enumeration — in Figure 2.

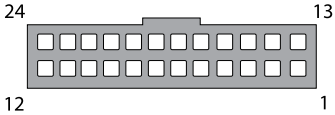


Figure 2. Connector pins enumeration. View from the harness side

Table 1. Module connector pins designation

Pin	Wire color	Type	Designation	Current mA
1	Black	Power	Ground	–
2	Yellow/black Yellow	TP-Bus	Digital bus for CheckControl	–
3	Grey/green	LIN 1	Serial data bus	–
4	Grey/blue	LIN 2	Serial data bus	–
5	Blue/yellow	Digital bus	Special bus for controlling Webasto Thermo Top C, Evo5, Eberspacher D5WS heaters Can be used for control of aftermarket heaters and, in specific cases, for factory heaters.	–
6-7	–	–	–	–
8	Orange/green		LED (+)	–
9	Blue	Input (-)	External input for module control (trigger negative control)	–
10	Green			–
11	Pink/black	Input (+)	External input for module control (status positive control)	–
12	Orange/white			–
13	Red	Power	+12 V	–
14	Yellow/red	Output (+)	There is a positive signal during FanControl operation	150 mA
15	Green/black	Output (-)	There is a negative signal during FanControl operation	150 mA
16	Brown/red	CAN 1	Vehicle CAN-H data bus	–
17	Brown	CAN 1	Vehicle CAN-L data bus	–
18	Brown/yellow	CAN 2	Vehicle CAN-H data bus	–
19	Brown	CAN 2	Vehicle CAN-L data bus	–
20	Brown/green	CAN 3	Vehicle CAN-H data bus	–
21	Brown	CAN 3	Vehicle CAN-L data bus	–
22-24	–	–	–	–

The Module shall be powered from one of vehicle's wires with +12 V unswitched voltage.

Before installation

- Carefully read this technical description
- Check whether the module is compatible with the designated vehicle and make sure that the required functions are supported by the module.

Module programming

The module has a micro-USB port for programming. This port allows you to program the module without additional devices and also quickly update the software, set a required vehicle model, activate a heat-assistance mode, set module operation time, etc. For programming it is necessary to download TECPROG software from www.tecel.ru/en/ (or www.canbus-alarm.com) website.

The programming can also be implemented either by a programming button – one of the factory vehicle's buttons (for information on which button is used for a particular vehicle please visit www.tecel.ru/en/ website), or by the built-in button (Figure 3).

Figure 3. FanControl-U2 module

Operation mode indication

Indication is performed by means of the LED indicator. There are the following LED operation modes:

Table 2. LED indication

LED	Reason
Constantly on	Module is switched on
Off	The module is switched off
x2	Low voltage shut-down
x4 at startup	Heater error
Constant flashes	Group-sugroup was not set
Constant group-subgroup identification	CAN was not identified
Indication when connected via W-BUS/Eberspächer protocol:	
x1 pause **x1**	Switched off due to absence of communication or according to the standard algorithm.
x1 pause **x2**	Low voltage shut-down of the heater (registered by the heater)
x1 pause **x3**	Flame failure (only for Webasto)
x1 pause **x4**	Uknown error

Vehicle Identification

Identification is performed via TECPROG software or manually by using the built-in button.

Description of manual identification using of the built-in button:

CAN bus should not be connected prior to implementation of the identification procedure.

1. Power up the module. Wait for LED to star blinking.
2. Press the built-in button 4 times. The LED will flash 4 times (or will indicate programmed group-subgroup) and will stay lit.
3. Enter a group number by the built-in button. After a short pause (1.5 second) the LED shall indicate the entered number.
4. If group number consists of 2 digits – enter first digit, wait for indication, then enter second digit and wait for indication
5. Enter a subgroup number. After a short pause (1.5 second) the LED shall indicate the entered number. After a pause (about 4 seconds) the LED shall indicate the entered number (group and subgroup) as a sequence of digits.
6. If a group and subgroup are entered correctly, press the built-in button one time, or two times, if there was an error.
7. If the input data is correct (such model exists) the LED will blink 4 times and the unit will reboot.
8. If the input data is wrong, the LED will light up for 15 seconds, expecting new group-subgroup. If within 15 seconds there was no data entry – module will leave programming mode.

Connection to CAN bus

Connection types

There are two types of module connection to CAN bus:

- Parallel connection. It is used to control factory heaters. CAN 1 pair is used for parallel connection in all vehicles.
- Connection by cutting into CAN-bus. It is used to control factory heaters and the climatic system.

In case of series connection CAN 1 pair is connected from the vehicle's side, and from the side of a climatic system, CAN 2 or CAN 3 depending on vehicle model.

For description of FanControl-U2 module connection in specific vehicles and operational-features with respect to different vehicles please visit www.tecel.ru/en/ website.

Module control

The module can be controlled:

- By the factory vehicle button (for information on which button is used for a particular vehicle – see www.tecel.ru/en/ or www.canbus-alarm.com website)
- By the factory remote control
- By additionally installed devices through external input (GSM module, auxiliary car alarm etc.).

Module control by the factory vehicle button

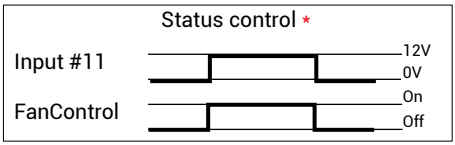
Module activation/deactivation is performed by a long (not less than 2 seconds) pressing of a certain factory button.

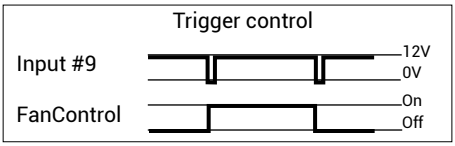
Module control by the vehicle factory remote control

Activation of the module is performed by triple pressing on the locking button not less than 15 seconds after the vehicle alarm is armed.

Deactivation of the module is performed by triple pressing on the unlocking button.
Pause between pressing on the button should be ~ 3 seconds.

Switch the module on/off with the external input





* To restart the module via input #11 it is necessary to switch off the “status” signal and then activate it again.

Programming sequence

1. Choose required option in table 3. Then press PB amount of times corresponding to menu code. LED will inform you about it's state.
2. Change option state. To do so press PB required amount of times, required to change the option value to the chosen one. Mind that the first value, goes after last value.

System will leave programming mode and save all changes after turning off the ignition or after 15 seconds after last button press. LED will flash 4 times if settings are saved succesfully or 1 time if there is an error during save.

Table 3. System setup

Menu	Menu code	Factory default	Note
Protocol W-BUS/Eberspächer	6	1	Set automatically. Choose by hand if required. 1 – Automatic identification; 2 – Webasto; 3 – Eberspächer; 4 – Protocol control is forbidden; 5 – Factory Webasto heater alternative protocol for VAG; 6 – Factory Webasto heater for RR Evoque (2011-2013); 7 – Factory Eberspächer for RR Evoque (2011-2013)/Sport (2014-2015); 8 – Factory Eberspächer for Toyota; 9 – Factory Eberspächer for RR Sport (2016)
The vehicle battery voltage level for automaic system shut down	11	9	1 — 10,5 V; ... 9 — 11,3 V; ... 11 — 11,5 V
Heater operation time	10	3	1–10 min; 2–20 min; 3–30 min; ... 12–120 min
Preheater mode	12	2	If outside temperature is lower 5°C — an aftermarket heater will start automatically. If outside temperature increases to 12°C — heater will turn off. 1 — on; 2 — off
Climate sytem control algorithm	14	1	1 — standard; 2 — alternate algorithm №1*; 3 — alternate algorithm №2*; 4 — alternate algorithm №3*
Aftermarket heater temperature limiter*	15	1	1 — disabled; 2 — 71°C; 3 — 73°C; ... 9 — 85°C
Climate control setup*	20	1	1 — enabled; 2 — disabled
Climatic system settings	24	1	1 — Activation immediately after a heater is turned on 2 — Delayed activation after a heater is turned on 3 — Activation by temperature 4 — Activation after a delay or by temperature (depending on what comes first) 5 — Climatic system inactive

Menu	Menu code	Factory default	Note
Delay before Climatic system starting	26	2	1 – 5 min; 2 – 10 min; 3 – 15 min; 4 — 20 min; 5 — 25 min; 6 — 30 min
Engine temperature of engine for climatic system starting	28	2	1 — 30°C; 2 — 40°C; 3 — 50°C; 4 — 60°C; 5 — 70°C; 6 — 80°C;
Output settings № 14	30	1	1 — Heater operational status. A constant level of electrical signal is formed while a heater is in operation (If it is activated with FanControl); 2 — Control of recirculating pump. A constant level of electrical signal is formed while a heater is in operation and also within 2 minutes after a heater is deactivated. The signal would be formed if the heater was activated with FanControl. 3 — Ventilation status. A constant level of electrical signal is formed while ventilation is in operation (If it is activated with FanCocntrol). 4 — Reserved by the manufacturer.
Output settings № 15	32		

* Used only in special cases. Check documentation to see which vehicles require these settings (www.tecel.ru/en/).
** Sensor is installed if there is no data in the CAN-bus.

Heater operation time

It allows presetting the module operation time after its activation (from 10 up to 120 min. with 10 min. intervals). Programming is performed by the programming button (factory or built-in one). To enter the timer programming mode it is necessary to switch the ignition on press a programming button 10 times within a 10-second time-frame after ignition start up and then wait for a while. If done correctly, the module will inform about its status by series of flashes (from 1 to 12) within 15 seconds after ignition has been switched on start up, which corresponds to time interval before deactivation of the module (from 10 to 120 minutes). To change time interval, enter a desired value by pressing the programming button.

Factory settings — 3 (30 minutes). To exit the programming mode turn off ignition or wait for 30 seconds after the last pressing of the programming button.

When controlling the module by means of “status” signal through input #11 the InterTime preset timer shall be ignored. The module stays in active mode upon presence of control signal at input #11, but for not more than 120 minutes.

Pre-heater mode

In this mode an aftermarket self-contained heater operates according to algorithms of the factory pre-heater: if ambient temperature is less than 5°C, the module switches into the pre-heater mode. If ambient temperature falls below a value of 5 °C during engine operation, the module will be activated. If ambient temperature rises up to 12 °C, the heater will be switched off automatically. For activation/deactivation of pre-heater mode press the programming button 12 times (a factory or built-in one) with ignition switched on. The module shall inform about the status:

- 1 signal – pre-heater mode is off (factory settings)
- 2 signals – pre-heater mode is on.

W-BUS/Eberspächer protocol selection

In most cases, the protocol is assigned automatically when you connect the system to a heater. Manual selection of the protocol is required in exceptional cases. Programming is performed only by the built-in button (see Figure 2). In order to select a protocol switche the ignition on, press the programming button 6 times. The module shall inform about the item status by series of flashes:

- 1 signal – protocol is not set (factory settings).
- 2 signals – W-BUS.
- 3 signals – Eberspächer
- 4 signals – control is disabled.

Change item status by pressing the programming button as many times as it is required. The module exits programming mode in 15 seconds after the last button-pressing. Upon successful saving of settings, the LED would flash 4 times; 1 long flash means an error.

Set heat-up temperature limit for aftermarket heater

This option is used with some vehicles in exceptional cases. You may find recommendation to use it in the corresponding manual (check www.tecel.ru/en/ or www.canbus-alarm for latest manuals).

To change this option press programming button 15 times. Module will inform about its state with series of LED flashes:

- 1 flash – off (factory default)
- 2 flashes – 71°C
- 3 flashes – 73°C
- 4 flashes – 75°C
- 5 flashes – 77°C
- 6 flashes – 79°C
- 7 flashes – 81°C
- 8 flashes – 83°C
- 9 flashes – 85°C.

3. Restoring default settings

The following steps are required to reset to default settings:

1. Power the unit off.
2. Press the built-in button
3. Power on. While holding the button wait until the LED starts to flash.
4. Release the button and wait until the LED stops flashing.Technical data and operating conditions

Table 4. Package contents

Name	Value
Supply voltage, V	9 ... 15
Maximum current draw in operating mode, mA	200
Maximum current draw in standby mode, mA	2,5
Temperature, °C	– 40 ... + 85
Maximum relative humidity, %	95

Table 5. Package contents

Name	Number, pcs.
Central unit	1
Wire harness with connector	1
LED indicator	1
Enclosure TEC-0500	1
Technical description	1
Packaging	1

Product warranty period is 3 years from the date of purchase if installed according to the instructions. Please contact your vendor if you wish to make a warranty claim.

Seller _____ Date of purchase _____

CE

Manufactured by TEC electronics

The product is manufactured according to Technical Specification 4372-006-78025716-10.