FanControl-GSM

Description

FanControl-GSM – is a control system (hereinafter – system) for factory and aftermarket heaters and activation of vehicle's climate control system (table 1).

Heater and climatic system can be turned on from a phone, vehicle's factory remote control or one of the vehicle's factory buttons.

- Heater control
- Control of the ventilation system for interior heating and windshield defrosting
- Vehicle state information: factory security system alerts, central lock state, perimeter state, etc.
- Vehicle geolocation
- Temperature control: engine, interior and outside of the vehicle
- Vacation mode disables all automatic launches while you are away on vacation

Package

Advantages:

1. Complete compatibility with vehicle electronics.
2. Turning on factory installed heater.
3. Control of Webasto Thermo Top C, Evo 5, Eberspächer D5WS via special databus.
4. Vehicle geolocation (option, requires GPS/GLONASS-270 unit).
5. Activation ventillation system in default mode.
6. Usage of a aftermarket heater as a preheater.
7. Climate control setup.
8. Two temperature sensors coming with the system (have to be connected if there is no temperature information in the bus).
9. Vehicle control from mobile phone:
   - Security system alerts
   - Door, trunk and hood state
   - Engine state
   - Central lock state
   - Temperature of engine, outside and inside temperature
   - Fuel level in tank.

Table 1. List of supported vehicles

Audi	A3 (2013--), A5, A6 (2011--), A7, A8 (2010--), Q3, Q5, Q7 (2011-2015), Q7 (2016--), TT (2015--)
BMW	1 (F20), 3 (E90), 3 (F30), 5 (F10), 6 (E63), 6 (E64), 6 (F13), 7 (F01), 7 (F02), X1 (E84), X3 (F25), X4 (F26), X5 (E70), X5 (F15), X6 (E71), X6 (F16), X1 (F48), 7 (G11, G12), 5 (G30)
Land Rover	Discovery 4, Evoque (2011--), Freelander 2 (2013--), Range Rover Sport (2014--), Range Rover Vogue (2013), Range Rover Vogue (2014--), Discovery Sport (2015)
Lexus	CT 200h (2011-2013), ES 250 (2013--), GS 350 (2012--), GX 460 (2010--), IS 250 (2005-2012), IS 250 (2013--), LS 460 (2006--), LX 570 (2007--), NX 200 (2014--), NX 300h (2014--), RX 270 (2010--), RX 350 (2009--), RX 450h (2009--)
Mini	Cooper (2014--), Countryman (F60) 2017--
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--)
Seat	Altea (2004--), Leon (2006--)
Skoda	Octavia 2, Octavia 3, Superb (2009--)
Toyota	Auris (2007--), Avensis (2009--), Camry (2006-2011), Camry (2012--), Corolla (2014--), Corolla (2006-2013), Highlander (2011-2013), Highlander (2014--), Hilux (2006-2009), Land Cruiser 200 (2007--), Land Cruiser Prado (2003-2009, 2010--), RAV 4 (2006-2012), RAV 4 (2013--), Sequoia (2007--), Venza (2013-),Verso (2012--), Yaris (2009--)
Volkswagen	Amarok, Caddy (2004--), Golf 5, Golf 7, Golf Plus, Crafter, Jetta (2006--), Multivan T5 (2003-2009), Multivan T5 (2010--), Passat B6, Passat B7, Passat CC, Tiguan, Touaran, Touareg (2003-2010), Touareg (2011--), Multivan T6 (2015)
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

Mobile phone

The system can be controlled via a phone.
FanControl and can be controlled via the smartphone application FanControl (it can be downloaded from Apple Appstore or Google Play) or voice menu, and via SMS commands.

To start using the system - just call it and follow simple instructions.
After system installation:

1. Set owners phone number as "User 1".
2. Change default PIN code.

Default PIN code — "1111".

Connection

Outputs are described in table 2. Connector enumeration can be seen in figure 2.

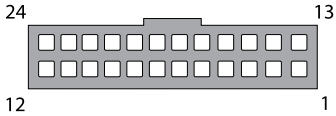


Figure 2. Connector enumeration, harness view point

Table 2. System's outputs

№	Color	Type	Note	mA
1	Brown	CAN 1	Data bus CAN 1-L	–
2	Brown/Red	CAN 1	Data bus CAN 1-H	–
3	Brown	CAN 2	Data bus CAN 2-L	–
4	Brown/Yellow	CAN 2	Data bus CAN 2-H	–
5	Brown	CAN 3	Data bus CAN 3-L	–
6	Brown/Green	CAN 3	Data bus CAN 3-H	–
7	Black/White	–	Optional sensor №2	–
8	Black/White	–	Optional sensor №1	–
9	Gray/Blue	LIN 2	Data bus	–
10	Blue/Yellow	Databus	**Connects to the heater's side.** Special data bus to control heater*	–
11	Yellow/Red	Out (+)	Positive signal while heater is running	150
12	Black	Power	Ground	–
13	Yellow/Black	TP-BUS	Digital bus to connect GPS/GLONASS-270	–
14	–	–	-	–
15	Blue	In (-)	External control (Trigger negative control)	–
16-17	–	–	-	–
18	Pink/Black	In (+)	External control (Status positive control)	–
19	Black	Ground	Optional sensor №2	–
20	Black	Ground	Optional sensor №1	–
21	Gray/Green	LIN 1	Data bus	–
22	Blue/Red	Data bus	**Connects from the vehicle's side.** Special data bus to control heater*	–
23	Green/Black	Out (-)	Negative signal while heater is running	150
24	Red	Power	+12 V	–

* Webasto Thermo Top C, Evo5, Eberspächer D5WS.

Power has to be connect to a nonswitched +12V circuit.

CAN-bus connections:

1. *Parallel connection.* Used to control factory installed heater. CAN1 is used in all vehilces for this connection.
2. *Serial connection.* Used to control factory installed heater, and to launch climate system with aftermarket heater.

- Serial connection requires CAN1 to be connected from vehicle's side, and CAN2 or CAN3 (dependes on the model of the vehicle) from the climate control's side
- Connection manuals are avaliable at www.tecel.ru/en/ and www.canbus-alarm.com.

Installation and setting up optional temperature sensors

System receives and uses engine temperature, outside and interior temperature. This data is used to launch a heater by temperature, for correct operation as a preheater and to inform users via mobile app and voice menu.

System receives data:

1. Via CAN-bus — **only with turned on ignition.**
2. From the heater, **connected via digital bus, only when heater is running.**
3. From the optional sensor - independent of ignition and heater.

We recommend to check:

1. If the temperature is avaliable via CAN-bus in a specific vehicle (check www.tecel.ru/en/).
2. If the owner is planning to use preheater mode. For this mode outside temperature data is required, system can receive in via CAN-bus or via optional sensor.
3. If the the owner is planning to use automatic heater deactivation by temperature and/or activation of climatic system by temperature. This mode requires engine temperature while ignition is turned off. System receives this data via digital bus connected to a heater or via optional sensor.
4. If the owner wishes to receive any temperature independently from the engine and heater state.

You have to install optional sensors minding owner's wishes and data avaliable in the vehicle

Setup

With micro-USB-connector (see figure 3) system can be connected to a PC. You may update system firmware, set vehicle model, activate preheater mode, set operational time, etc with TECProg software (check www.tecel.ru/en/).

Also system can be programmed with programming button (PB). PB — one of the vehicle buttons or built-in button (figure 3). Which button is used in a specific vehicle — see www.tecel.ru\en\.

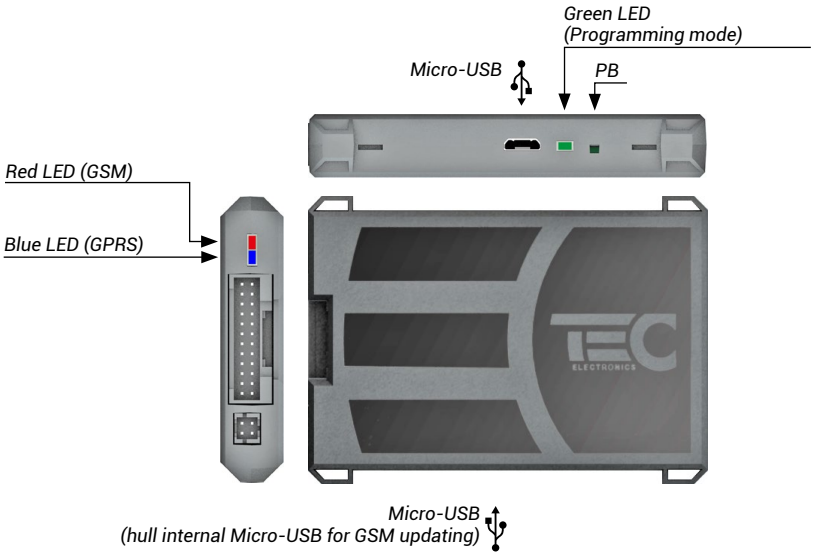


Figure 3. FanControl-GSM

Red and blue LED indication can be found in table 3.

Table 3. GSM LED and GPRS LED indication

	Red LED (GSM)	Blue LED (GPRS)
ON	GSM-network found	GPRS connected
Constantly flashes	Looking for GSM-network	Connecting to GPRS
Short flashes	GSM in sleep mode	–
	GSM in sleep mode GPRS - connected	

Vehicle identification

All vehicles supported by system are divided into groups and subgroups. Each vehicle has it's own group-subgroup number (see www.tecel.ru\en\). Identification - is setting required group and subgroup.

Identification can be easily done via TECprog, or via programming button .

Identification via PB:

CAN-bus should not be connected before identification.

1. Connect the system to power, wait for LED flashes.
2. Press PB 4 times. If everything was done correctly, green LED will flash 4 times (will show group\subgroup if it was set) and will stay lit.
3. Enter group number. Press PB corresponding number of times. After a short pause (1,5 s) green LED will show entered number.
4. Enter subgroup number. Press PB corresponding number of times. After a short pause (1,5 s) green LED will indicate entered number.
5. After a short pause (around 4 s) green LED will show entered number (group and subgroup) sequentially one after another.

If group is a two digit number — enter first digit, wait for indication, eter second digit — wait for indication.

Check if group and subgroup were entered correctly (vehicle's model) by LED signals (group — pause, subgroup — pause):

- If everything is correct — press PB once. Green LED will flash 4 times
- If you've made a mistake — press PB 2 times. Green LED will stay lit for 15 s, you may enter new group/subgroup. if, within 15 s there was no interaction with the system, it will leave programming mode.

System control

You may control the system by means shown in figure 4.

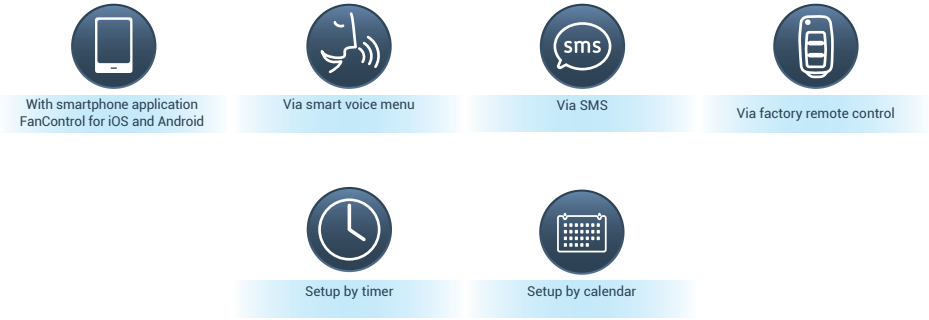
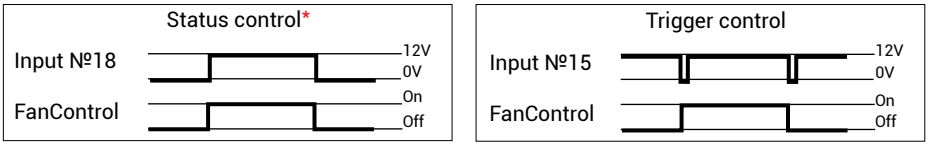


Figure 4. Means to control the system

System control:

1. *Via mobile phone.* You may access all features via mobile phone: for example turn off anf turn on the heater, check state and location of the vehicle, adjust system settings. You may control it with intellectual voice menu or smartphone application, and via SMS (see table 4).
2. *Via one of the vehicle's buttons.* Turn on/off by long (at least 2 seconds) push on a designated button (see www.tecel.ru/en/).
3. *Via remote control.* Turn on the heater by pressing 🔒 3 times. Turn off by pressing 🔓 3 times. pause between button presses should be ~3 s.
4. *Via extenal inputs and additional devices.* See figure 5 for control algorithms.



*To re-enable the system via input № 18- the «satus signal» on the input has to disappear and then appear again.

Figure 5. Control algorithms via inputs

SMS control

Send an SMS containing command in following format:

Access code*Command code#Parameter

"Access code" — System access code.
"Command code" — Same command code as in voice menu.
"Parameter" — Is used in specific cases for certain commands.

Table 4. List of SMS-commands

List of SMS commands	Code	Parameter
Commands to control launches		
Turn on heater/Extend heater runtime	832	–
Turn off heater	833	–
Turn on /extend runtime of ventillation system	837	–
Turn off ventillation system	838	–
Requests		
Receive account balance	842	–
Receive vehicle's location	843	–
"Vacation mode" (turn on/turn off)		
All launches, notifications, and task manager	852	On/Off
All launches	853	On/Off
All notifications	855	On/Off
All tasks	857	On/Off

Table 5. 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
Ventillation system operation time	12	4	1 — off; 2 — 10 min; 3 — 20 min; 4 — 30 min
Preheater mode	14	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
Climat sytem control algorithm	16	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
Optional temperature sensor №1**	18	1	1 — engine temperature; 2 — outside temperature; 3 — interior temperature
Optional temperature sensor №2**	20	3	1 — engine temperature; 2 — outside temperature; 3 — interior temperature
Climate control setup*	22	1	1 — enabled; 2 — disabled

Menu	Menu code	Factory default	Note
Climatic system settings***	26	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
Delay before Climatic system starting	28	2	1 – 5 min; 2 – 10 min; 3 – 15 min; 4 — 20 min; 5 — 25 min; 6 — 30 min
Temperature of engine for limatic system starting***	30	2	1 — 30°C; 2 — 40°C; 3 — 50°C; 4 — 60°C; 5 — 70°C; 6 — 80°C
Output settings № 11	36	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 № 23	38		

*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.
***Engine temperature for climate system activation.

Programming sequence

1. Choose required option in table 5. 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 were saved succesfully or 1 time if there was an error during save.

Factory settings reset

You may reset system settings to factory defaults.

To do so:
1. Disconnect system from power and CAN-bus.
2. Press and hold PB.
3. While holding PB, supply power to the system (CAN-bus should be disconnected). Wait for LED flashes.
4. Turn off the power, release PB

Table 6. Technical data

Characteristic	Value
Power, V	9 ... 15
Maximum current draw in operation mode, mA	500
Maximum current draw in rest mode, mA	10
Temperature, °C	–40 ... +85
Maximum relative humidity, %	95

Table 7. Package

Name	Amount, pcs.
Main unit	1
Wire harness	1
Temperature sensor	2
Enclosure TEC-0500	1
Manual	1
Package	1

Voice menu structure

Online data unit	
•	Information about heater state
•	Information about temperature state
•	Information about fuel level and battery state

Main menu	
1	Help
2, 3, 4, 5, 6	Quick access commands
7	System information
8	Control commands
9	System setup

Quick access commands	
Vehicle with heater and without GPS/GLONASS-270 and ventillation system support	
2	Turn on/Turn off the heater
5	Request account balance
Vehicle with heater and GPS/GLONASS-270, without ventillation system support	
2	Turn on/Turn off the heater
4	Request vehicle coordinates
5	Request account balance
Vehicle with heater and ventillation system support, without GPS/GLONASS-270	
2	Turn on/Turn off the heater
3	Turn on/Turn off the ventillation system
5	Request account balance
Vehicle with heater, ventillation system support and GPS/GLONASS-270	
2	Turn on/Turn off the heater
3	Turn on/Turn off the ventillation system
4	Request vehicle coordinates
5	Request account balance

7			System information
7	2		**Information about vehicle state**
7	4		**Event log**
7	4	2	Filter by launch events
7	4	4	Filter by fuel top-ups and service mode
7	4	5	Filter by GSM signal quality changes
7	4	6	Filter by attemps to pick up access code
7	4	7	Filter by system errors

7			System information
7	4	8	Filter by speeding events
7	4	9	All events
7	5		**List of turned off functions**
7	6		**Task manager contents**

8			Control commands
8	1		**Help**
8	3		**Launches**
8	3	1	Help
8	3	2	Turn on or extend heater run time
8	3	3	Turn off the heater
8	3	7	Turn on or extend ventillation system run time
8	3	8	Turn off the ventillation system
8	4		**Requests**
8	4	2	Account balance
8	4	3	Request vehicle's location
8	4	4	Request SMS with access code
8	5		**Turn on/Turn off vacation mode**
8	5	2	Turn on/Turn off all launches, notifications and task manager
8	5	3	Turn on/Turn off all launches
8	5	5	Turn on/Turn off all notifications
8	5	6	Turn off notifications for some users
8	5	7	Stop or resume task manager
8	5	8	Stope some tasks from executing

9					System setup
9	2				**Task manager**
9	2	2			Add task
9	2	2	2		**TASK:** Launch the heater
9	2	2	2	2	Once by the calendar
9	2	2	2	3	Weekly by the calendar
9	2	2	2	4	Once by the timer
9	2	2	5		**TASK:** Account balance (by the calendar)
9	2	2	6		**TASK:** Launch the ventillation system
9	2	2	6	2	Once by the calendar

9					System setup
9		2	6	3	Weekly by calendar
9	2	2	6	4	Once by timer
9	2	3			Delete task
9	2	4			COntents of the task manager
9	3				**Set up automatic launches and additional channels**
9	3	2			Set up heater parameters
9	3	2	1		Help
9	3	2	2		Conditions to stop the heater
9	3	2	3		Heater runtime
9	3	2	5		Save current climate system parameters
9	3	4			Set up ventillation system parameters
9	3	4	1		Help
9	3	4	2		Ventillation system runtime
9	3	4	3		Save current climate system parameters
9	5				**Online data unit setup**
9	5	2			Add message to the unit
9	5	3			Remove message to the unit
9	5	4			List to the unit's contents
9	6				**Set up quick access commands**
9	6	2			Set new command
9	6	2	3		Launches
9	6	2	3	2	Turn on\Turn off the heater
9	6	2	3	7	Turn on\Turn off the ventillation system
9	6	2	5		Requests
9	6	2	5	2	Account balance
9	6	2	5	3	Vehicle's coordinates
9	6	3			Remove command from the button
9	6	4			Listen to quick access commands
9	7				**Setup users and access premissions**
9	7	1			Help
9	7	2			Set up phone number of the first user
9	7	3			Set up phone number of the second user
9	7	4			Set up phone number of the third user
9	7	5			Set access code
9	7	6			Security

9					System setup
9	7	6	2		Permissions of the first user
9	7	6	3		Permissions of the second user
9	7	6	4		Permissions of the third user
9	7	6	5		Guest access =
9	7	6	6		Settings access permissions
9	8				**Notification rules**
9	8	1			User 1
9	8	2			User 2
9	8	3			User 3

Below is an example for "User 1"

9	8	1	1		Help
9	8	1	2		Listen to list of notifications
9	8	1	4		Setup notifications
9	8	1	5		Turn on all temporarily disabled notifications
9	8	1	6		Turn on\turn off confirmation of all notifications with the STAR button
9	8	1	7		Reach out mode setup
9	9				**Additional parameters setup**
9	9	2			Date and time
9	9	2	2		Date
9	9	2	3		Time
9	9	3			Cellular network parameters
9	9	3	2		USSD code to request account balance
9	9	3	4		Rule to forward SMS messages coming to system
9	9	3	5		SMS message center number
9	9	3	6		Enable\disable automatic balance request
9	9	3	8		Internet access settings
9	9	3	9		Roaming settings
9	9	3	9	4	Voice notifications from service and telemetry systems
9	9	3	9	5	SMS notifications from service and telemetry systems
9	9	3	9	6	Internet access in roaming
9	9	6			Clear all logs
9	9	7			SMS with vehicle's location settings
9	9	9			Fuel tank volume settings