

CANTEC-F2 v5
Technical Manual
(TEC-6050-6)

Unit Description

CANTEC-F2 v5 is a universal adapter, hereinafter referred to as the unit, designed for connecting additional security, multimedia and service systems to vehicles' CAN bus.

The unit has ten programmable outputs, two of which have changeable polarity. Each of the outputs can be assigned with any of 24 functions (see Programmable Outputs Functions table). Four programmable inputs are designed for controlling vehicle devices via the unit. Each of the inputs can be assigned with one of 8 functions (see Programmable Inputs Functions table).

Unit interfacing with the vehicle (model selection) is carried out automatically. Upon connecting to the CAN bus and the power source and carrying out a set of simple actions (for the majority of vehicles it is turning the ignition on and off and vehicle locking / unlocking via the original remote control), the unit identifies the vehicle automatically.

For more information on connecting the unit to the vehicle along with the list of all the vehicles compatible with the unit along with its functional features information, please see Help installation files on www.canbus-alarm.com

Unit inputs / outputs

Unit contacts functionality is described in Unit Port Contacts Functionality table. For contacts enumeration please see Fig. 1 Inputs / outputs configuration is carried out via programming (see Unit Hardware Functions Programming).

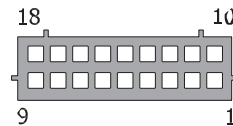


Fig. 1 Port contacts enumeration from the wiring viewpoint

Table 1. Unit Port Contacts Functionality

No.	Wire color	Functionality	Factory default settings	Current, mA
1	Blue / red	Programmable output (+ / -) with changeable polarity*	Alternate hazard lights control	200
2	Blue / yellow	Programmable input (+ / -) with changeable polarity*	Alternate central locking control	200
3	Black	Power (Ground)	-	-**
4	White / black	Programmable output (+)	Engine on	50
5	Green / yellow	Programmable output (-)	Parking brake	50
6	Pink / green	Programmable output (+)	Brake	50
7	Yellow / red	Programmable output (+)	Ignition	50
8	Green	Programmable input (-)	Central locking closing + Comfort	1.5
9	Blue	Programmable input (-)	Central locking opening	1.5
10	Brown / red	CAN-H vehicle data bus	-	-
11	Brown	CAN-L vehicle data bus	-	-
12	Red	+12 V power	-	750 (4)***
13	Gray / black	Programmable output (-)	Security	50
14	Gray / blue	Programmable output (-)	All doors	50
15	Gray / green	Programmable output (-)	Trunk	50
16	Gray / yellow	Programmable output (-)	Hood	50
17	Orange / white	Programmable input (+)	Turn lights activation	1.5
18	Orange / green	Programmable input (-)	Trunk opening	1.5

* - Outputs with changeable polarity. Outputs' operation with load higher than the indicated is not guaranteed and may damage them.

** - consumed current on output No. 3 depends on the load connected to the negative outputs.

*** - typical current rate is indicated for operation and standby modes. It may change depending on positive outputs' load.

Outputs No. 4-7, 13-16 are designed as per open collectro schemes. Making contact between outputs No. 4, 6, 7 with the ground and outputs No. 5, 13-16 with +12V is not allowed.

Contact No_1 Programmable with changeable polarity.

Factory settings: Alternate hazard lights control. This contact is designed for hazard lights control in vehicles where CAN bus control is not available. For information on vehicle-specific connection please see Help installation files. When using this output for alternate hazard lights control the polarity is set automatically when interfacing the unit with the vehicle. When assigning any of 24 functions to this output (see Programmable Outputs Function

table) it is necessary to set the required polarity (see Unit Settings section).

Contact No_2 Programmable with changeable polarity

Factory settings: Alternate central locking control. This contact is used for central locking control in vehicles where CAN bus control is not available. For information on connection to a particular vehicle please see Help installation file. When using this output for alternate central locking control the polarity is set automatically when interfacing the unit with the vehicle. When assigning any of 24 functions to this output (see Programmable Outputs Function table) it is necessary to set the required polarity (see Unit Settings section).

Contact No_3 Ground

This contact is connected to the vehicle's body in one of the areas determined by the manufacturer for connecting the ground of original equipment.

Contacts No_4, 6, 7 – programmable positive outputs.

Contacts No_5, 13-16 – programmable negative outputs.

Contacts No_8, 9, 18 – programmable negative inputs.

Contacts No_10, 11 – CAN-H, CAN-L.

These contacts are connected to vehicle CAN bus (see Integrator).

Contact No_12. Unit power

This contact is connected via 1 A fuse to one of the vehicle wires with +12 V unswitched voltage.

Contact No_17 – programmable positive input.

Unit Setup

Programming Button (PB) and LED indicator (LED) located in the unit's body are used for setting the unit. (see Fig.2)

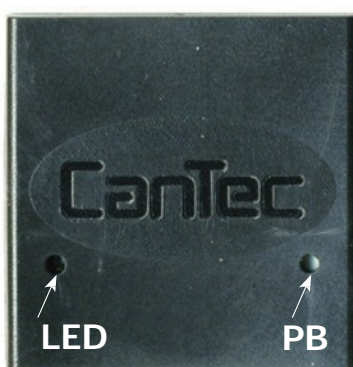


Fig. 2

Unit interfacing with the vehicle

Two interfacing options are available:

Automatic interfacing

Upon carrying out connection to CAN-bus, power supplying and carrying out a set of simple actions (see Help installation file for a particular vehicle) a required group and subgroup will be defined automatically. You just need to check correctness of a group and a subgroup defining by checking light indicators (group number – pause, subgroup – pause). Interfacing procedure for every particular vehicle is described in Help installation file. (visit www.canbus-alarm.com)

If the unit identifies only the vehicle group, it will stop emitting short light signals and will periodically emit series of lights signals, where the number of signals corresponds with vehicle group.

If the unit identifies both vehicle group and subgroup, it will emit triple series of light signals, where the number of long signals corresponds with the group number, while the number of short signals corresponds with the subgroup number

Forced interfacing

Please use only in exceptional cases.

Programming is carried out via Programming button. Prior to interfacing, the vehicle group must not be identified and the CAN bus must not be connected. Programming will stop if the Programming button is not pressed within 60 seconds.

Programming sequence:

1. Connect the power source to the unit and wait for short light signals.
2. Press and release the Programming button 10 times (begin this action not later than 10 seconds upon connecting the power source to the unit). If all the actions are carried out correctly, the unit will inform on this with three light signals.
3. Enter option No. 1 – vehicle model by pressing the Programming button 1 time. The unit will inform on option selection with repeated single light signals.
4. Enter vehicle group number by pressing the Programming button for the corresponding number of times (see a Help installation file). The unit will periodically emit series of light signals, where the number of signals corresponds with the group number.
5. Wait for 2 seconds.
6. Enter the vehicle subgroup number by pressing the Programming button for the corresponding number of times (see a Help installation file). Check if the vehicle model has been chosen correctly with light signals (group number – pause, subgroup number – pause):

- If the vehicle model is chosen correctly, press the Programming button once. Light signals will stop and the vehicle model will be programmed.
- If the vehicle model has been chosen incorrectly, press the Programming button twice. Repeat the programming beginning from p. 4.

Unit hardware functions programming

Programming is carried out as per Unit Hardware Functions Programming table

Table 2. Unit Hardware Functions Programming

No.	Option description	Setting range / default	Note
1	Vehicle model	- / -	See Unit interfacing with the vehicle section
2	Original car alarm control	-/enabled	LED is on – factory car alarm control is on LED is off – factory car alarm control is off
3	Sequential door opening	-/disabled	LED is on – the function is on LED is off – the function is off
4	Automatic windows closing (comfort feature)	-/enabled	LED is on – the function is on LED is off – the function is off
5	Timer channel function operation length (comfort)	1-6 / 3	One unit is 10 seconds
6	Central locking alternative control algorithm via the output no 2	1-3/-	1 – impulse negative control 2 – impulse positive control 3 – impulse negative control (when central locking status is not available)
7	Hazard lights alternative control algorithm via the output no 1	1-5 / -	1 – impulse negative control 2 – status negative control 3 – impulse positive control 4 – status positive control 5 – lamps control (negative)
8	Parking distant control (PDC) system algorithm	1-3/1	1 – “Activation on rear gear” 2 – “Activation on speed” 3 – “Activation on rear gear with priority of switching off”
9	PDC control button	-/-	Any OEM (factory) vehicle’s button which is “visible” in CAN-bus can be used. Also any (negative or positive) button connected to the corresponding output of the unit.

Annotations to the Table

- Option No. 1. Vehicle model. Allows forced vehicle group and subgroup assignment.
- Option No. 2. Original (OEM) car alarm system control. If the original alarm system control is on, the unit locks and unlocks the vehicle with the same commands that activate (deactivate) the original alarm system (via original remote control, door lock etc.). If the original alarm system control is off, the unit locks (unlocks) the vehicle with commands that don’t activate (deactivate) the original alarm system. (E.g. central lock locking/unlocking via vehicle interior button).
- Option No. 3. Sequential door opening. Allows activating/deactivating the sequential doors opening.
- Option No. 4. Automatic windows closing (Comfort feature). Allows activating or deactivating the automatic activation of comfort feature when locking the central lock. If the function is on, then in 2 seconds upon central lock locking the unit will close the windows.
- Option No. 5. Timer channel (comfort) feature operation length. Allows setting the time during which the Timer channel (comfort) function will be active. Time is set in 10-second intervals.
- Option No. 6. Central locking alternative control algorithm via the output no.2. When necessary, this option allows setting the output no.2 polarity and its running according to a particular algorithm. The algorithm is set automatically when interfacing with the vehicle.
- Option No. 7 Hazard lights alternate control algorithm via the output no.1. If necessary, this option allows setting the necessary control algorithm. In the majority of cases the algorithm is set automatically when interfacing with the vehicle.
- Options No. 8 Parking distant control (PDC) system algorithm:
 - “Activation on rear gear”. Front and rear parking sensors are activated upon shifting a gearbox to R or with the control button and deactivated upon the speed reaches 15 km/h or with the PDC control button.
 - “Activation on speed”. Front parking sensors turns are active if the vehicle’s speed is less than 15 km/h. Rear parking sensors turns are active if the vehicle moves back and its speed is less than 15 km/h. If necessary all sensors can be deactivated with the control button until the next ignition turning on or activation with the PDC control button.
 - “Activation on rear gear with priority of switching off”. This algorithm is the similar to “Activation on rear gear” algorithm but if the parking sensors have been deactivated with the control button they will not be activated with shifting a gearbox to R position until the next ignition turning on or activation with the PDC control button.
- Options No. 9 PDC control button. Allows to assign the PDC control button (see the clause 5.4. of Programming sequence section).

Table 3. The unit’s inputs & outputs configuration

No.	Option description	Setting range / default	Note
1	Output (+/-) no. 1	1-24 / Hazard lights alternate control	“Hazard lights alternate control” is used for the vehicles where hazard lights control via CAN-bus is not possible.
2	Output no. 1 polarity	- / Negative polarity	LED is off – negative LED is on – positive
3	Output (+/-) no. 2	1-24 / Central locking alternate control	“Central locking alternate control” is used for the vehicles where central locking control via CAN-bus is not possible

No.	Option description	Setting range / default	Note
4	Output no. 2 polarity	-/ Negative polarity	LED is off – negative LED is on – positive
5	Output (+) no. 4	1-24/13	
6	Output (-) no. 5	1-24/22	
7	Output (+) no. 6	1-24/21	
8	Output (+) no. 7	1-24/11	
9	Output (-) no. 13	1-24/1	
10	Output (-) no. 14	1-24/8	
11	Output (-) no. 15	1-24/8	
12	Output (-) no. 16	1-24/8	
13	Input (-) no. 8	1-10/1	
14	Input (-) no. 9	1-10/2	
15	Input (+) no. 17	1-10/4	
16	Input (-) no. 18	1-10/3	

Annotations to the Table

Options No.-No. 1, 3, 5-12 are suitable for creating a special configuration of the unit by assigning any of 24 functions to a particular output. (see Table 3. Programmable Outputs Functions)

Options No.-No. 13-16 are suitable for creating a special configuration of the unit by assigning any of 9 functions to a particular output. (see Table 3. Programmable Outputs Functions)

Options No.-No. 2, 4 allows to set a required polarity to the unit's outputs no.1 and no. 2.

The polarity can be set up only if for these outputs have been assigned for one of 24 functions (see Table 3. Programmable Outputs Functions)

Table 4. Programmable Outputs Functions

No.	Function	Function description
1	Security	Constant level signal is formed for the time while the unit is in Security mode
2	Arming impulse	0.8 sec long impulse is formed when the unit is armed.
3	Disarming impulse	0,8 sec long impulse is formed when the unit is disarmed
4	Trunk opening via original remote control impulse	0,8 sec long impulse is formed when the unit detects the trunk opening command from the original remote control
5	Original alarm system panic	Constant level signal is formed for the time while the original alarm system (if one is installed) is in Alert mode.
6	Siren panic	30 sec long constant level signal is formed if one of the zones is triggered in Security mode: trunk, doors, hood opening. This function can be used in vehicles that are not equipped with original alarm system. The signal stops when the vehicle leaves Security mode.
7	Panic on horn from external input	Impulse signal is formed for the time while there is an input signal on the external digital input with Horn control function
8	Doors, hood and trunk	Constant level signal is formed if any of the preprogrammed doors, hood or trunk is open
9	Sensors ignoring	Constant level signal is formed in Security mode with the trunk open if it is opened with original remote control. Also the signal is formed for the time while Comfort feature is active. This function is designed for organizing sensors' deactivation in order to evade false alarms.
10	Original buttons	Constant level signal is formed if a preprogrammed vehicle button is pressed.
11	Ignition	Constant level signal is formed with the ignition on (including engine start).
12	ACC	Constant level signal is formed with vehicle ACC on (first key position, may be congruent with ignition in some vehicles). This function is deactivated only when the key is removed from the ignition lock. Can be used for correct organization of accessory multimedia system power supply.
13	Engine on	Constant level signal is formed with the engine on
14	Engine rpm	Impulse signal is formed with impulse sequence frequency proportionate to vehicle crank rotation frequency. 1 imp/sec corresponds with crank rotation frequency of 20 rpm. Signal is designed for determining estimated, but not the exact rpm rate.
15	Transmission condition	Constant level signal is formed if the transmission is set into the preprogrammed position (P, R, N, D). For robotized transmission the following positions can be programmed: R, N, D). For mechanical transmission only R position is available.
16	Vehicle moving	Constant level signal is formed if the vehicle speed has exceeded a certain threshold rate (this rate varies from vehicle to vehicle but is within 5 – 10 kmph rate).
17	Front parking sensors activation	Constant level signal is formed if the engine is on, the transmission is in D or R position (for mechanical transmission only R position is available), and the vehicle speed is below 15 kmph.


No.	Function	Function description
18	Rear parking sensors activation	Constant level signal is formed if the engine is on, the transmission is in R position and the vehicle speed is below 15 kmph.
19	Parking distance control Led indicator	It is used for indicating the PDC system condition. <ul style="list-style-type: none"> • If parking sensors work according to "Activation on rear gear" or "Activation on rear gear with priority of switching off" algorithm, LED indicator is ON when the sensors are active • If parking sensors works according to "Activation on speed" or "Activation on rear gear with priority of switching off" algorithm, LED indicator is OFF when the sensors are not active
20	Movement speed	Impulse signal is formed with impulse sequence frequency proportionate with vehicle movement speed. 1 imp/sec corresponds with 1 kmph speed. This signal is designed for determining estimated but not the exact speed rate.
21	Brake	Constant level signal is formed when the brake pedal is pressed.
22	Handbrake	Constant level signal is formed when the car is put on handbrake.
23	External lights	Constant level signal is formed when the external lights are activated.
24	Comfort timer channel	Constant level signal is formed during a certain time period (from 10 to 60 seconds) upon arming the vehicle. The time is set in 10 sec intervals.

Table 5. Programmable Inputs Functions

No.	Function	Function description
1	Central lock locking + Comfort	Sending an impulse to this input allows locking the central lock. When the signal lasts for more than 2 seconds, windows start closing. Windows' closing stops when the signal stops.
2	Central lock unlocking	Sending an impulse to this input allows opening the central lock.
3	Trunk opening	Sending an impulse to this input allows opening the trunk lid.
4	Turn lights activation	Sending an impulse to this input allows blinking with turn lights. For some vehicles, due to their constructive particularities, uneven lamp blinking may be observed while the impulses are fed evenly.
5	Horn control	Sending a signal to this input allows activating the programmable outputs function No. 7 – Panic on horn from external input. Stopping the input feed stops this function.
6	Engine start	Engine starts via CAN bus
7	Central lock is locked (status)	This function is used in exceptional cases when central lock status is not available in CAN bus (see Help installation files)
8	Central lock is unlocked (status)	This function is used in exceptional cases when central lock status is not available in CAN bus (see Help installation files)
9	PDC control button	This function is used for providing control of PDC (parking distance control) with an extra button (this function is required when there is no "visible" in CAN-bus buttons in the vehicle).
10	Drivers door open signal simulation	Sending an impulse to this input does an imitation of signal via CAN-bus informing that the driver's door is open.

Programming sequence

1. Turn the ignition on.
2. In order to enter "Menu 1" press the Programming button 10 times. If everything is performed correctly, the unit will emit three light signals. In order to enter "Menu 2" press the Programming button 12 times. If everything is performed correctly, the unit will emit four light signals.
3. Select the required option according to the tables no. 2 or no.3. by pressing and releasing the Programming button for the number of times corresponding with the option number. The unit will inform on option number with series of light signals.
4. Move to option settings by pressing and holding the brake pedal. The unit will inform on option condition with LED. With the brake pedal pressed, there is no countdown until programming mode is deactivated.

 In case if the vehicle's CAN bus does not contain data on brake pedal position (see Integrator), unit's Trunk opening input is used. Please send signal to this input instead of pressing the brake pedal when in programming mode.

5. Change the option's setting by pressing and releasing the Programming button for the number of times required for moving from current setting's number to the number of the required setting (e.g., in order to change the function No. 1 (Security) to function No. 8 (Doors, hood and trunk), please press and release the Programming button 7 times). The unit will inform on the new option's setting with series of light signals. Please consider the fact that when navigating the option's setting, the last setting is followed by the first one. Release the brake pedal. The unit will change light indication from option setting back to option number. Now you can proceed with programming the next option or leave the programming mode.
- 5.1. Function No. 8 Doors, hood and trunk programming algorithm. You can set any combination of doors, hood and trunk, upon opening of which the unit will form the signal on the programmable output. For the purposes of this algorithm's description, the doors, hood and trunk are referred to as the doors. With the brake pedal pressed go to option No. 8 settings. The unit will inform on the option's condition twice with series of 8 light signals, upon which it will start emitting short light signals. Open only the doors that need to be indicated on this output, and leave the rest closed (the doors can be open in advance). Press the brake pedal again. The unit will inform on option's condition with series of 8 light signals and the doors will be assigned to this output. If you don't press the brake pedal and leave current option's programming, the unit will save its previous condition. Release the brake pedal and the unit will start indicated the option's number.

- 5.2. Function No. 10 Original buttons programming algorithm. With the brake pedal pressed move to option No. 10 setting. The unit will inform on the option's condition twice with series of 10 light signals, upon which it will emit short light signals. Without releasing the brake pedal, press the required button (for the vehicle specific list of buttons, please see the Help installation file). If the unit has identified the button, it will stop emitting short light signals and will emit option setting number with series of 10 light signals. If you release the brake pedal prior to setting the button, the unit will exit the option and will save its previous condition and will start indicating the option number.
- 5.3. Function No. 15 Transmission condition programming algorithm. With the brake pedal pressed go to option No. 15 settings. The unit will inform on option setting twice with series of 15 light signals, upon which it will emit short light signals. Without releasing the brake pedal, set the transmission into the required position: P, N, D or R (transmission handle can be set in the required position in advance); R, N, D positions for robotized transmission; only R position for mechanical transmission. Release and press the brake pedal again. The unit will stop emitting short light signals and will indicate option setting number with series of 15 light signals. Release the brake pedal, and the unit will start emitting the option's number. If you don't press the brake pedal and leave current option's programming, the unit will save its previous condition.
- 5.4. PDC control button assigning algorithm. With the brake pedal pressed go to option No. 9, "Menu 1". The unit will emit short light signals. Press and hold pressed the brake pedal the button that you have chosen for the particular time (see below) (if the unit detects the button then the light indication will be off while the button is pressed):
- Control with short press: keep the button pressed less than 2 sec;
 - Control with long press (2.5 sec): keep the button pressed within 3-5 sec.
 - Control by status – keep the button pressed longer than 5 sec.
- Release the button: the unit will emit light signal once and turn the light indication off.
- Release the brake pedal, and the unit will start emitting the option's number.
6. In order to move to next option's programming press and release the Programming button for the number of times required to navigate from current option's number to the required option's number (e.g., in order to navigate from option No. 2 Original alarm system control to option No. 8 (+) Output No. 4, the Programming button needs to be pressed six times). Please consider that when navigating the options, last option is followed by the first one.

Leaving the programming mode.

The unit will leave programming mode and will save all the settings in the permanent memory when the ignition is turned off or within 60 seconds upon the last action if the brake pedal is not pressed.

Resetting to factory default settings

The unit has the procedure of resetting all the programmable settings back the factory default means. When this procedure is performed, all the vehicle model settings are erased, and all the other programming options' settings are reverted to factory default.

In order to revert the unit back to factory default settings, please do the following:

- Detach the unit from power source and CAN bus.
- Press and hold the Programming button.
- With the Programming button pressed down, supply power to the unit (CAN bus must remain disconnected). The unit will emit short light signals.
- Detach the power source and release the Programming button.