CANTEC-2XL
(CAN-bus adapter)

Description

Unit description

CANTEC-2XL– is a universal adapter(hereinafter reffered as unit), designed for connecting additional systems to vehicles' CAN bus.

Utit and additional equipment can be connected via UART through custom designed T-BUS protocol developed by TEC electronics(www.tec-electronics.ru).

To set up unit programming button is used (PB), LED, and micro-USB connecor, in the units enclosure (fugure 1).

Web-aplication Integrator (www.tec-integrator.com) contains all required information about connection to a specific vehicle, list of supported vehicles.

Connection

Units connections described in table 1. To check conector numeration check figure 2. With micro-USB connector unit can be connected to PC to set up or update firmware.
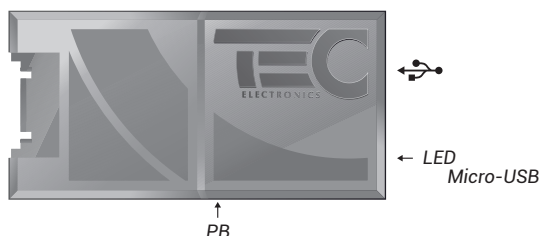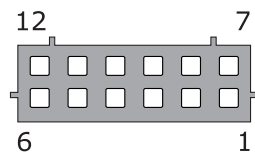

Figure 1. CANTEC-2XL

figure 2. PIN numeration in the connector, from the wire viewpoint

Table 1. Connector description

№	Color	Type	Note	current, mA
1	Block	Power	Ground	–*
2	Blue	UART-Rx	DATA(IN)	–
3	Green	UART-Tx	DATA(OUT)	–
4	Gray/Blue	Databus	Heater control	–
5	–	–	–	–
6	Blue/Yellow	Output (+/-)**	Central lock alternate control	200
7	Red	Power	+12 V	470 (7)***
8	Brown/Red	CAN 1	CAN bus CAN1-H	–
9	Brown	CAN 1	CAN bus CAN1-L	–
10	Brown/yellow	CAN 2	CAN bus CAN2-H	–
11	Brown	CAN 2	CAN bus CAN2-L	–
12	Blue/red	Output (+/-)**	Hazard lights alternate control	200

*Current depends on the load connected to negative outputs .

**Outputs with interchangable polarity. If load is more than indicated, corrrect operation is not guaranteed.

***Average consumption current in operation and standby mode, it may change depending on output load.

Outputs №6, №12 are protected from short circuits, induction, overheating and overloading.

Description of connector pinout

Pin №1. "Ground". Connects to the body of the vehicle in one of the point specially designed by the manufacturer for installation of aftermarket equipment.

Pins №2, №3. Information channel.

Pin №4. "Heater control". Special bus to control Webasto Thermo Top C, Evo5, Eberspächer D5WS. Can be used to control aftermarket heater, in some ways - factory heater.

Pin №5. Not avaliable.

Pin №6. "Central lock alternate control". Used in vehicles where CAN control is unavaliable (check. Integrator). Polarity will be detected automatically during identification.

Pin №7. "Power". Connected through 1A fuse to one of the vehicles wires with non switched +12V voltage.

Pins №8, №9. Databus CAN 1. Connects to the CAN bus of the vehicle (check Integrator).

Pins №10, №11. Databus CAN 2. Connects to CAN bus of the vehiclel is required (check Integrator).

Pin №12. "Hazard lights alternate control". Used in vehicles where CAN bus control is unavaliable. Information about connection to specific vehicle can be found in Integrator. Polarity will be detected automatically during identification.

Vehicle identification

All supported vehicles are divided to groups and subgroups. Every vehicle has it's own group and subgroup number (Integrator). Identification procedures can be found in the Integrator.

🛈 If unit was installed in other vehicle (group and subgroup was set) reset it before installing in other vehicle.

Two ways of identification are possible:

1. Automatic identification

Vehicle identification will be performed automatically after connecting unit to CAN bus of the vehicle, connecting power and perfoming simple actions (for many vehicles – turn on\turn off ignition or open\close vehicle with factory remote) required group and subgroup will be set. You just have to check LED to see if group was set correctly (Group number – pause, subgroup number – pause). If group is a 2 digit number, every group digit will be set individually. For example, group 35, subgroup 2 will be indicated as follows: 3 long signals– pause 1 second, 5 long signals – pause 2 seconds, 2 short signals– pause 4 seconds et cetera. Idntification procedure for every vehicle can be found in Integrator.

🛈 It is recommended to perform identification in auto mode (if installing unit in a new vehicle).

2. Принудительное согласование

Used in exceptional cases, this mode allows you to force set group and subgroup. Forced identification can be made via TECprog, by connecting unit to the PC. If you don't have access to a computer, identification can be made manually.

Before identification group should not be detected, and CAN bus should not be connected. Programming will be interrupted if there were no presses on programming button within 60 seconds.

Programming sequence:
1. Supply power to the unit, wait for LED signals.
2. Within 10 seconds enter "Menu 1". To do so press programming button 10 times. If everything was done correctly, LED will flash 3 times.
3. Enter option №1 "Vehicle model". To do so press brogramming button 1 time. LED will infor about chosen option by flashing 1 time.
4. Enter group number by pressing programming button corresponding number of times(check Integrator). LED will emit series of flashes corresponding to chosen group.
5. Wait for 2 seconds.Enter subgroup number, to do so press programming button corresponding number of times (check Integrator).

🛈 If group is a 2 digit number – enter first digit of the group, wait for 2 seconds, and enter second digit. LED will show series of signals corresponding to group-subgroup number.

Check group and subgroup:
- If everything was set correctly – press programming button 1 time. LED signals will be stop
- IF something went wrong – press programming button 2 times. Repeat programming starting from step №4.

Hardware features programming

Programming can be made with programming button (check table 2).

Table 2. Hardware features configuration («Menu 1»)

№	Name	Range	Factory default	Note
1	Vehicle model	–	–	Set automatically. Forced configuration is possible
2	Factory alarm control	1-2	1	1 – on. (LED is on); 2 – off. (LED is off)
3	Sequential door opening	1-2	2	
4	Automatic windows close ("Comfort")	1-2	2	
5	Central lock alternate control algorithm with pin №6	1-3	–	1 – impulse negative.; 2 – impulse positive.; 3 – impulse negative. (if there is no central lock state)
6	Hazard lights alternate control algorithm with pin №12	1-5	–	1 – impulse negative.; 2 – state negative.; 3 – impulse positive.; 4 – state positive.; 5 – lights control (negative)
7	Heater control protocol	1-3	–	1 – Webasto; 2 – Eberspächer; 3 – disabled
8	Enable/disable factory heater control via CAN	1-2	1	1 – enabled; 2 – disabled

Options №№1, 5, 6, 7. Set automaticaly. If required - manually.

Option №2. "Factory alarm control". If control is enabled, unit will close\open vehicle with commands that will turn off\turn on factory security system. If control is disabled, unit will use commands, which do not affect factory security system.

Programming sequence

1. Turn on the ignition.
2. To enter "Menu 1" press programming button 10 times, LED will flash 3 times.
3. Choose required option. To do so - press programming button corresponding number of times. LED will inform you which option was chosen by series of flashes.
4. Change option state. To do so press and hold brake pedal. LED will show option state.
5. Change option state. To do so press programming button amount of time required to go from one menu option to another. LED will show option state. Take a note that last option will be followed by the first.
6. Release brake pedal, LED will show chosen option. Now you can go another option or leave programming mode.
7. To go to a different option press programming button number of times required to go from one option to another.

Unit will leave save configuration and leave programming mode after turning off the ignition or 60 seconds after last action, if brake pedal was not pressed.

Reset to factory default settings

To reset to factory defaut settings:
1. Remove CAN bus connection and power from the unit.
2. Press and hold programming button.
3. While holding programming button, supply power to the unit (CAN bus should be disconnected). Wait for LED flashes.
4. Remove power, release programming button.

Table 3. Technical characteritics

Note	Value
Unit power	
Power should be supplied to the unit without any stabilizers or additional power sources	
Voltage, V	9 ... 15
Average current, mA (without load on additional inputs)	
Maximum, mA	100
Operation mode, mA	50
In sleep mode, mA (if I/O is in passive state)	7
UART electrical characteristics	
For RX Input	
Logical "0" (dominant state), V	0 ... 1,4
Logical "1" (recessive state), V	1,6 ... V supply
Current RX, мA (dominant state at 0 V)	1,3
For TX output	
Logical "0" (dominant state), V	
At 1 mA	0,2
At 10 mA	0,7
Max. load current (limited by built in protection), mA	50
Logical "1" (recessive state), V	5
Logical "1" is made though pull-up diode and resistor 2,4 kOhm to the 3,3 V. to raise log "1" up to required level (5 V or higher) it hast to be "pulled-up" in RX circuit of the receiver	
Electrical characteristics of digital outputs	
Outputs are open collector circuits (no pullup resistor) without short circuit protection.	
Max. current load, mA	150
Voltage at negative out at maximum load, no more than V	0,8
Voltage at positive out at maximum load, no more than V	Upower... 1,5
Electrical characteristics of digital inputs	
Logical "0" for negative inputs, V	0 ... 3
Logical "0" for positive inputs, V	0 ... 6
Logical "1" for negative inputs, V	3,5 ... Upower
Logical "1" for positive inputs, V	6,5 ... Upower
Current in negative out at Uin=0 V, mA	0,7

Table 4. Electrical and operating requirements

Note	Value
Power supply voltage, V	9 ... 15
Maximum current draw in operation mode, mA	470
Maximum current draw in idle mode, mA	7
Operating temperature, °C	-40 ... +85
Storage tempreature, °C	-40 ... +85
Maximal relative humidity, %	95

Table 5. Packaging

Name	Amount, pcs.
Central unit	1
Wire harness with connector	1
Manual	1
Packaging	1