

**DOT CAN**  
**USER MANUAL**



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## DEVICE CAPABILITIES

### CAN standards support

- ✓ J1939 (FMS)
- ✓ J1979 (OBDII)
- ✓ J1708
- ✓ J1587

### Connection interfaces

- ✓ RS232
- ✓ RS485
- ✓ USB

### Communication protocols:

- ✓ text (in CANlog format)
- ✓ Binary (DOT format CAN)
- ✓ two independent CAN lines
- ✓ K-Line (optional)
- ✓ configuration and diagnostics via USB
- ✓ Discrete inputs
- ✓ Discrete outputs

## DOT CAN EXPANSION MODULE

DOT CAN - designed for reading data from the CAN bus of a car or other technical device with subsequent transmission of processing results via RS232, RS485 or USB interfaces, thereby significantly expanding the functionality of a monitoring device that does not have access to the vehicle CAN bus.

The DOT CAN module is a programmable and customizable device. The internal program of the module contains subprograms for working with various models of cars and special equipment. A complete list of supported vehicles and their corresponding subprogram numbers can be found on the manufacturer's website.

You can configure the module to work with the required subprogram via USB, RS232, RS485 interfaces.

### Features

**Connection to most vehicle buses: J1939 (FMS), J1979 (OBDII), J1708, K-Line**

**Intuitive interface**

**Convenient setup and diagnostics via USB**

**Data output in CANlog protocol format**

**Connection to monitoring devices via RS232 or RS485**

**The discrete output can be used as a speed sensor or to simulate a frequency-output fuel level sensor, among other applications.**

### Application

**The DOT CAN module can be used in satellite vehicle monitoring systems, providing a link between the tracker and the vehicle CAN bus.**

## 1. TECHNICAL SPECIFICATIONS

| PARAMETER                                              | VALUE                  |
|--------------------------------------------------------|------------------------|
| Overall dimensions, mm (excluding antenna and harness) | 75 x 50 x 22.5         |
| Supply voltage, V                                      | 9 ... 40               |
| Overvoltage protection threshold, V                    | 55                     |
| Protection against power supply reverse polarity       | Yes                    |
| Transient voltage protection, V                        | 600                    |
| Maximum current consumption, mA                        | 60                     |
| Operating temperature                                  | -40°C to + 80°C        |
| Number of CAN interfaces                               | 2 channels             |
| K-Line interface                                       | optional               |
| RS232 interface                                        | CANlog/DOTCAN protocol |
| RS485 interface                                        | DOTCAN protocol        |
| USB interface                                          | 1                      |
| Number of discrete inputs                              | 1                      |
| Number of analog inputs                                | 1                      |
| Number of discrete outputs                             | 2                      |

### Connection to CAN bus

A list of supported vehicles is available at [http://edvado.com/docs/dot\\_can\\_ext\\_list.pdf](http://edvado.com/docs/dot_can_ext_list.pdf). Connection to the vehicle CAN bus is carried out according to established diagrams, which can be obtained upon request by email [support@edvado.com](mailto:support@edvado.com). If the connection is correct and configured for the appropriate subprogram of the module, after turning on the ignition, the green LED indicator on the module lights up.

### Device indication

The module has an LED indicator that lights up when the ignition is on and the connection is correct.

## 2. CONNECTOR PINOUT

Figure 1 shows the location and functions of the main connector pins.

| Pin No. | Designation | Application              |
|---------|-------------|--------------------------|
| 1       | RS485-A     | RS485 interface          |
| 2       | RS485-B     | RS485 interface          |
| 3       | CAN1-H      | CAN 1 interface          |
| 4       | CAN1-L      | CAN 1 interface          |
| 5       | CAN1-H      | CAN 2 interface          |
| 6       | CAN1-L      | CAN 2 interface          |
| 7       | TX 1        | RS232 interface 1        |
| 8       | RX 1        | RS232 interface 1        |
| 9       | TX 2        | RS232 interface 2        |
| 10      | RX 2        | RS232 interface 2        |
| 11      | IN0         | Positive analog input    |
| 12      | IN1         | universal input/output   |
| 13      | IN2         | universal input/output   |
| 14      | IN3         | universal input/output   |
| 15      | PWR         | Power input 9 .. 40 V    |
| 16      | GND         | Supply negative (ground) |

Table 2. Pin functions.

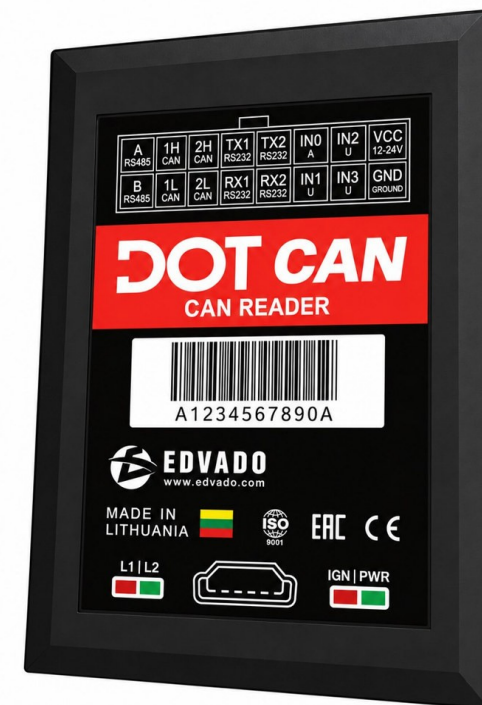


Figure 1. View of the device in the housing.

### 3.DEVICE SETUP

**Note: When using a DOT brand navigation device, setting up the DOT CAN expansion module is not required. You just need to connect the expansion module to the device via one of the interfaces (RS232 or RS485), then make the appropriate settings for the navigation device and apply power:**

| CONFIGURABLE SETTINGS               | DOT 2-3            | DOT 4          | DOT 5                 | DOT I1         | DOT I2         | DOT I3                         |
|-------------------------------------|--------------------|----------------|-----------------------|----------------|----------------|--------------------------------|
| <b>FOR CONNECTION METHOD: RS232</b> |                    |                |                       |                |                |                                |
| <i>RS232 operating mode</i>         | <i>CAN-LOG ext</i> | <i>CAN EXT</i> | <i>CAN EXT</i>        | -              | -              | <i>CAN LOG (RS232 version)</i> |
| <b>FOR CONNECTION METHOD: RS485</b> |                    |                |                       |                |                |                                |
| <i>RS485 operating mode</i>         | -                  | <i>LLS 485</i> | <i>CAN EXT/LLS485</i> | <i>LLS 485</i> | <i>LLS 485</i> | <i>LLS 485 (RS485 version)</i> |

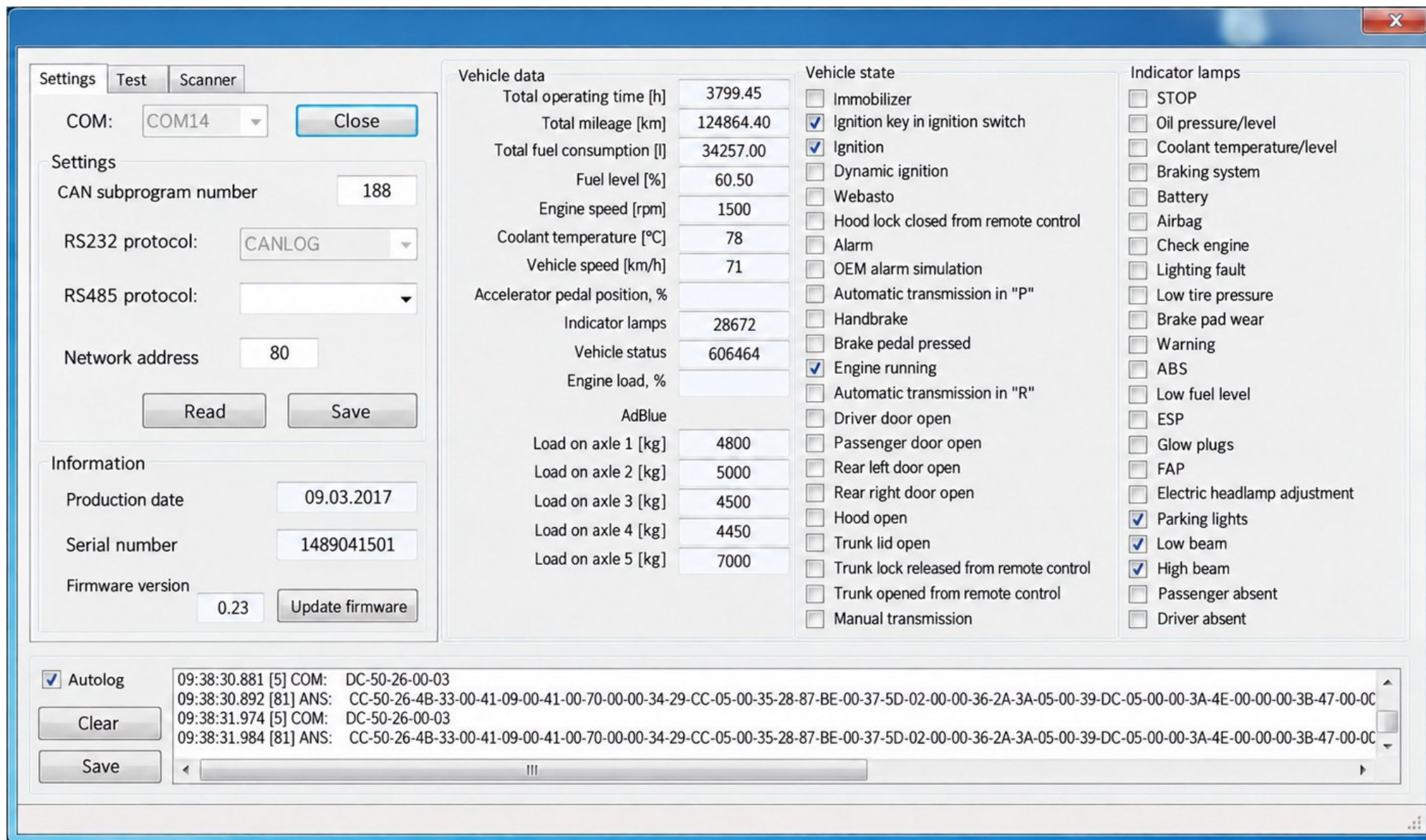
**IN THE “CAN PROGRAM:” FIELD, ENTER THE SUBPROGRAM NUMBER CORRESPONDING TO YOUR VEHICLE.**

A list of supported vehicles and their corresponding subprogram numbers is located at  
[http://edvado.com/docs/dot\\_can\\_ext\\_list.pdf](http://edvado.com/docs/dot_can_ext_list.pdf)

**On the “PACKET STRUCTURE” tab, select the CAN bus parameters to be transmitted to the monitoring server.**

When using third-party navigation devices, configuration is required. To configure and diagnose the module via a USB interface, there is a special DOT CAN application running under Windows OS. The latest version of the application, firmware, as well as the USB driver required to connect the module to a personal computer can be downloaded from the manufacturer’s file server: [http://8888.edvado.com/DOT\\_CAN\\_EXT/](http://8888.edvado.com/DOT_CAN_EXT/)

The application is an executable “exe” file, does not require installation, the main application window is shown in Fig. 2.



The screenshot shows the main window of the Configuration application. It has a blue title bar and a standard Windows-style interface. The window is divided into several sections:

- Settings (Left Panel):** Contains tabs for Settings, Test, and Scanner. Under Settings, there are fields for COM (COM14), CAN subprogram number (188), RS232 protocol (CANLOG), RS485 protocol, Network address (80), Production date (09.03.2017), Serial number (1489041501), and Firmware version (0.23). There are buttons for Read, Save, and Update firmware.
- Vehicle data (Middle Panel):** A table showing various vehicle parameters and their values.
 

| Parameter                     | Value     |
|-------------------------------|-----------|
| Total operating time [h]      | 3799.45   |
| Total mileage [km]            | 124864.40 |
| Total fuel consumption [l]    | 34257.00  |
| Fuel level [%]                | 60.50     |
| Engine speed [rpm]            | 1500      |
| Coolant temperature [°C]      | 78        |
| Vehicle speed [km/h]          | 71        |
| Accelerator pedal position, % |           |
| Indicator lamps               | 28672     |
| Vehicle status                | 606464    |
| Engine load, %                |           |
| AdBlue                        |           |
| Load on axle 1 [kg]           | 4800      |
| Load on axle 2 [kg]           | 5000      |
| Load on axle 3 [kg]           | 4500      |
| Load on axle 4 [kg]           | 4450      |
| Load on axle 5 [kg]           | 7000      |
- Vehicle state (Right Panel):** A list of checkboxes representing the current state of various vehicle components.
  - Immobilizer: ☐
  - Ignition key in ignition switch: ☒
  - Ignition: ☒
  - Dynamic ignition: ☐
  - Webasto: ☐
  - Hood lock closed from remote control: ☐
  - Alarm: ☐
  - OEM alarm simulation: ☐
  - Automatic transmission in "P": ☐
  - Handbrake: ☐
  - Brake pedal pressed: ☐
  - Engine running: ☒
  - Automatic transmission in "R": ☐
  - Driver door open: ☐
  - Passenger door open: ☐
  - Rear left door open: ☐
  - Rear right door open: ☐
  - Hood open: ☐
  - Trunk lid open: ☐
  - Trunk lock released from remote control: ☐
  - Trunk opened from remote control: ☐
  - Manual transmission: ☐
- Indicator lamps (Far Right Panel):** A list of checkboxes representing the status of various indicator lamps.
  - STOP: ☐
  - Oil pressure/level: ☐
  - Coolant temperature/level: ☐
  - Braking system: ☐
  - Battery: ☐
  - Airbag: ☐
  - Check engine: ☐
  - Lighting fault: ☐
  - Low tire pressure: ☐
  - Brake pad wear: ☐
  - Warning: ☐
  - ABS: ☐
  - Low fuel level: ☐
  - ESP: ☐
  - Glow plugs: ☐
  - FAP: ☐
  - Electric headlamp adjustment: ☐
  - Parking lights: ☒
  - Low beam: ☒
  - High beam: ☒
  - Passenger absent: ☐
  - Driver absent: ☐
- Autolog (Bottom Panel):** A section for logging data. It includes a checkbox for Autolog (checked), a Clear button, and a Save button. Below these are several lines of log data showing timestamps, event types, and IDs.

Figure 2. Configuration application.

To start working with the module, after connecting the device to the PC, you need to open the COM port. To do this, click the “Open” button in the upper left part of the application window. It is not necessary to select the COM port number for connection; in the “Auto” mode, all COM ports available in the system will be polled. If the connection is successful, the application will automatically request information about the current settings from the module and display them in the appropriate text fields, and polling of CAN data from the module will begin every second. CAN data is displayed on the right side of the application window. Requests to the module and its responses are displayed in the lower part of the application window in hex format, byte by byte.

**Note: For the DOT CAN module configuration and diagnostics application to work correctly, driver installation is required. To do this, download the USB driver from the file server and run the executable file from the archive that corresponds to your operating system (or “manually” install the driver through the “device manager”). Before starting the application, make sure that the USB driver is installed correctly and that when you connect the DOT CAN module to the PC, a new device appears in the Device Manager in the “Ports (COM and LPT)” section (the port number does not matter).**

Changing any settings in the module is done after clicking on the “Save” button in the “Settings” section. Accordingly, you can read the current module settings by clicking the “Read” button.

To change the CAN module subprogram number, use the corresponding field in which you need to enter the required subprogram number. If the CAN module successfully received and executed the command to change the subprogram number, a message will appear stating that the CAN module has restarted, and for further operation it will be necessary to reopen the COM port.

**Note: Change the subprogram number only when the module is disconnected from the CAN bus or the ignition of the vehicle (or other monitored equipment) is switched off.**

The DOT CAN module has two main interfaces for connecting to telematics equipment:

RS232 — uses the CANlog text protocol, automatically transmitting CAN data once per second.

Note: CAN data is transmitted automatically once per second.

RS485 — supports both the CANlog text protocol and the DOTCAN binary protocol.

Note: The DOTCAN protocol specification for RS485 is available on request from [support@edvado.com](mailto:support@edvado.com).

In the “RS485 protocol” drop-down list, you can select one of the operating modes of the RS485 interface described above.

The DOTCAN communication protocol is addressable, both when working via the RS485 interface and when working via USB.

The default network address is “80”.

**Note: In the application, the module's network address is displayed and specified in decimal notation. Valid values are from 1 to 254. Address 255 is a broadcast address, the module processes all commands received with address 255. It is not recommended to change this value unless necessary. To work with DOT terminals via the RS485 interface - the default address is “80”**

You can change the network address of the module by setting its value in the corresponding field.

#### **4.FIRMWARE UPDATE**

When adding vehicles to the list of vehicles supported for reading CAN data or expanding the list of parameters read from them, module firmware updates will be released. You can always download the latest firmware version from the file server of Edvado Electronics LLC at [http://8888.edvado.com/DOT\\_CAN\\_EXT/](http://8888.edvado.com/DOT_CAN_EXT/)

The DOT CAN module can be updated using the configuration application.

After establishing communication with the module, click “Update firmware” to enter bootloader mode. The COM connection closes, and the system should detect a removable drive. Copy the firmware file to the root directory of that drive. The module then restarts automatically.

**Note: On the first versions of the firmware, it will not be possible to update the internal firmware of the CAN module in Windows 8-10. We recommend using a PC running Windows 7 for these purposes.**

#### **5. TEST SUBPROGRAM NUMBER: 188**

The DOT CAN expansion module includes test CAN subprogram 188, intended solely to check the connection between DOT CAN and the navigation device. This subprogram does not access the physical CAN1/CAN2 bus inputs or read data from the vehicle CAN bus. It only sends predefined test data to the navigation device.