



GPS TRACKER
DOT L-SERIES
USER MANUAL

Contents

GENERAL INFORMATION.....	3
Technical specifications.....	4
Main connector pinout and device label.....	5
Connection recommendations.....	6
Status indicators.....	7
Configuration via SMS.....	8
Discrete input/output modes.....	12
Bluetooth (BLE) sensors.....	13
Bluetooth (BLE) sensors – server integration.....	14
SMS AND TCP COMMANDS.....	15
MONITORING SYSTEM INTEGRATION.....	17
WARRANTY	19
PACKAGE CONTENTS.....	20

GENERAL INFORMATION

The DOT L SERIES navigation controller (hereinafter referred to as the “tracker”) is a compact and functional device designed for remote monitoring of moving objects and collecting data from equipment installed on them.

Series features:

modification	L1	L2
Key differences	Standard version, Battery up to 380 mAh	More compact than L1, Battery up to 110 mAh

Data transmission to the server is carried out via a 2G GSM channel.

The tracker can transmit data simultaneously to 2 servers. Supported data transfer protocols to the server:

- **INTERNAL** – a proprietary open protocol available for integration
Identification on the server occurs using the IMEI of the modem.
Supported in monitoring systems Wialon, Locavist and others.
- **USER_AG** is a specialized protocol (not for general use).
- **EGTS_ID**. Identification on the server occurs by ID (SN) of the modem.
- **EGTS_IMEI**. Identification on the server occurs using the IMEI of the modem.

Tracker features:

- Built-in cellular, navigation and Bluetooth antennas
- 1 SIM card in nano-SIM or SIM-chip format
- Transferring data to the server via GSM channel (2G/GPRS)
- Bluetooth 4.0 LE for connecting wireless sensors (fuel level sensors, temperature sensors, wireless relays, etc.)
- Motion (acceleration) sensor - accelerometer
- 1 positive-triggered discrete input for ignition monitoring or another sensor
- 1 universal input/output with inductive transient protection (for a frequency fuel level sensor, button, immobilization relay, etc.). Maximum switching current in output mode: 500 mA.
- Backup battery (capacity 380 mA) with charge control (for L1)
- Input power protection up to 60V
- Compact enclosure: L1 – 85×41×13 mm; L2 – 61×42×13 mm (even more compact without the battery).

Technical specifications

The main technical characteristics of the tracker are presented in Table 1.

Table 1

Parameter	Value		Note
	L1	L2	
Device dimensions, mm	85x41x13	61x42x13	
Weight, g	40		Excluding wires and battery
Supply voltage, V	8 — 40		Excluding transient voltage spikes
Reverse polarity protection	Yes		
Operating temperature range, °C	-40 ... +80		Excluding battery
Positive-triggered discrete input	A1		Threshold > 7 V – logic 1
Negative-triggered discrete input	U0		Protected against inductive transients *Combined with discrete output
Discrete output	U0		Open collector, Switching current up to 500 mA. *Combined with discrete input
Motion sensor	Yes		Built-in
Non-volatile memory, packets			Not less than 12000
Micro-USB interface	Yes		Diagnostics, software and settings updates
BlueTooth 4.0	SIM868E		Wireless sensors, diagnostics, configuration. Built-in antenna
GSM module (2G)	SIM868E		GSM 850 / 900 / 1800 / 1900 MHz Built-in antenna
Navigation module	SIM868E		GPS GLONASS Built-in antenna
Number of SIM card slots	1*		Without using a SIM chip
Number of SIM chip slots	1*		Without using a SIM card
Backup battery, mA	380	110	Li-Pol
Built-in battery protection	Yes		Protection against overcharge, full discharge, forced charging shutdown
Data transfer protocol			Open (available upon request)
Enclosure protection rating			IP53

Main connector pinout and device label

Figure 1 and Table 2 provide information on the pinout of the main connector. The appearance of the device is shown in Figure 2.

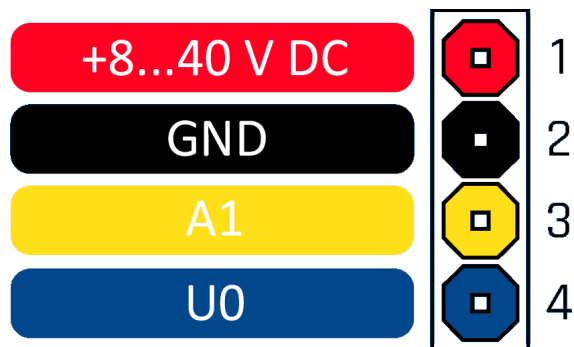


Figure 1

Table 2

No		Purpose	Application/connection
1	12-24V	Input power	Connection to the vehicle's on-board network
2	GND	Power supply negative	Ground connection
3	A1	Positive-triggered discrete input (PIN1)	Positive-triggered discrete sensors
4	U0	Universal input/output (PIN0)	Negative-triggered discrete sensors



Figure 2. Device label

Connection recommendations

Recommended sequence of actions when connecting a device:

1. Install SIM card
2. Connect the internal battery of the device (if available)
3. Close the case
4. Connect power to the device (red and black wires of the main harness)

ATTENTION! The positive wire of the constant power supply is connected last and always through a 1-2 A fuse, which is placed as close as possible to the point of connection to the on-board network of the object

The remaining wires of the harness are connected according to the required functionality.

For best signal reception from satellites, the tracker should be placed so that the navigation antenna faces upward. Positioning the device at any other angle is also acceptable. When installing, the tracker body on the side of the navigation antenna must not be obscured by metal objects or coatings.

If driving behavior monitoring is used, orient the tracker with the main connector side facing the direction of travel.

ATTENTION! The tracker should not be placed near very hot parts of the car. Ambient temperatures above +80°C may affect the stability of the device.

There are 3 tools for diagnosing, configuring and updating device software:

- WEB configurator – remote configuration and software update
- PC program – connection is made via USB. Diagnostics of the operation of the device and connected devices, changing settings
- SMS commands

ATTENTION! For the convenience of the first setup (when receiving the tracker from the factory), just go to your personal account on the WEB configurator and assign the necessary settings, then the tracker will take them on its own, no additional commands are required. This option only works during the first setup.
Link to quick start video

Status indicators



Combined power indicator.

- Green – external power is connected.
- Green and red at the same time (looks like yellow) – external power is connected, the internal battery is charging.



GSM/GPS modem status indicator. The indication is a series of short and long LED flashes.

Long flashes – GSM modem operating mode:

- There are no long flashes – the GSM modem is disabled.
- 1 long flash – search and registration in the cellular network.
- 2 long flashes – the device is registered on the network, connecting to the server.
- 3 long flashes – connection to the server is established.
- 4 long flashes – accumulated data is being unloaded from the storage

Short flashes – navigation modem operating mode:

- There are no short flashes – the navigation modem is disabled.
- 1 short flash – the modem is turned on, searching for satellites.
- 2 short flashes – satellites have been found, the signal level is acceptable (from 5 to 8 satellites in the visibility zone).
- 3 short flashes – satellites found, excellent signal level (more than 8 satellites in visibility range).

Frequent and constant blinking indicates that the unit is working with the WEB configurator - the software or settings are being updated.

Within 1–3 minutes after power is applied, the GSM | NAV LED should start repeating 3 long flashes and 3 short flashes. This indicates normal operation.

If this does not happen, you need to check the correct installation of the device and the specified settings, or contact the support@edvado.com support service

Configuration via SMS

The structure of the message with the command to change settings is as follows:

<access_password>*SETP*<parameter_list>

By default, the <access_password> field has the value 123456

Field <parameter_list> contains the number and value of one or more parameters to be changed.

Each element from the list of changeable parameters has the following structure:

#<parameter_number> = <value>

<parameter_number> - numerical index of the parameter.

<value> - new parameter value, can be simple or compound.

A composite value is a sequence of simple values separated only by a comma contiguously without spaces:

<value_1,value_2,value_N>.

List elements are transmitted without delimiters: the end of one element is indicated by the beginning of the next (# sign).

When sending messages via SMS, it is necessary that the length of the message does not exceed 160 characters, and the message contains letters only of the Latin alphabet.

If the SMS command was accepted, an SMS with the current device settings will be sent in response.

The device automatically synchronizes settings with the WEB configurator, so the WEB configurator always contains the actual current settings of the device.

Table 3 – List of Setting Parameters for the SETP Command

Parameter number	Description
#1	Monitoring server settings 1
#2	SIM card 1 mobile operator APN parameters
#3	Device access password
#5	Track recording parameters
#15	Operating mode in roaming
#26	Monitoring server settings 2

An example of changing several parameters in one message:

123456*SETP*#1=hw.Locavistpro.com,20248#5=400,18,20,150

*If you have any difficulties forming the “SETP” command, you can use the response to the “GETP” command as a hint. Example: 123456*GETP*

Below is the setting of the main parameters. For additional information on configuration commands, please contact support support@edvado.com

Monitoring server parameters 1 - Parameter number: 1

Command format: #1=<server_address>,<server_port>

Arguments:

<server_address> - a string up to 32 characters long. Contains the DNS name or IP address of the server.

<server_port> - a number from 1 to 65535. It is not a required parameter: if there is no need to change the port, the parameter can be omitted.

Examples:

123456*SETP*#1=95.163.12.22,20248 – set the IP address, server port

123456*SETP*#1=hw.Locavistpro.com,20248 – set the DNS name and server port

123456*SETP*#1=hw.Locavistpro.com – change only the server address, leave the server port unchanged

SIM card cellular operator APN parameters - Parameter number: 2

Command format: #2=<APN>,<username>,<password>

Arguments:

<APN> - a string up to 32 characters long. Contains the access point name

<username> - a string up to 32 characters long. Contains the username of the access point

<password> - a string up to 32 characters long. Contains the access point password

Examples:

123456*SETP*#2=internet,gdata,gdata – set the APN parameters of the Megafon operator

123456*SETP*#2=,, – clear APN parameters

Device access password - Parameter number: 3

Command format: #3=<new_access_password>

Arguments:

<new_access_password> - a string 6 digits long. Contains the new password to access the device. An empty line means that the device will be accessed without a password.

Examples:

123456*SETP*#3=135711 – set access password 135711

Track recording parameters – Parameter number: 5

Command format:

#5=<distance_home>,<angle_home>,<speed_home>,<interval_home>

Home – settings for home network mode

Examples:

123456*SETP*#5=400,18,20,150 – set all parameters for track recording

123456*SETP*#5=,,35,300 – change only the speed and interval, leave the distance and angle unchanged

123456*SETP*#5=,15 – change only the angle, leave other parameters unchanged

Operating mode in international roaming – Parameter number: 15

Command format: #15=<SIM_card_mode>,<SIM_chip_mode>

Arguments:

<SIM_card_mode> - operating mode in international roaming

<SIM_chip_mode> - operating mode in international roaming:

0 – data transmission while roaming is disabled; all stored data will be uploaded on return to the home network;

1 – data transfer while roaming is allowed.

Examples:

123456*SETP*#15=0,0 – disable data transfer when the device is in international roaming.

Monitoring server parameters 2 - Parameter number: 26

Command format: #26=<server_address>,<server_port>

Arguments:

<server_address> - a string up to 32 characters long. Contains the DNS name or IP address of the server.

<server_port> - a number from 1 to 65535. It is not a required parameter: if there is no need to change the server port, the parameter can be omitted.

Examples:

123456*SETP*#26=95.163.12.22,20248 – set the IP address, server port

123456*SETP*#26=hw.Locavistpro.com,20248 – set the DNS name and server port

Discrete input/output modes

Each input/output has several operating modes. List of available operating modes:

Table 4 - Input/output modes

Negative-triggered input/output (U0)	
0. Not used	
1. Switch on and off by command - manual control of the output using SMS and TCP commands (page 15)	
4. Discrete (on/off) – shows the state of the circuit	
6. Pulse with reset - counts pulses from the moment the previous packet was generated	
7. Frequency – connection of a frequency fuel level sensor	
21. Pulse with accumulation - counts pulses with subsequent transmission in each packet	
22. Safety monitoring (speed) – overspeed detection (see the supplementary instructions)	
23. Safe immobilization – output activation only below 5 km/h	
Positive-triggered input (A1)	
0. Not used	
4. Discrete (on/off) – shows the state of the circuit	
15. Ignition – shows the ignition state v_in if the virtual threshold is 0 (also used for motion detector)	

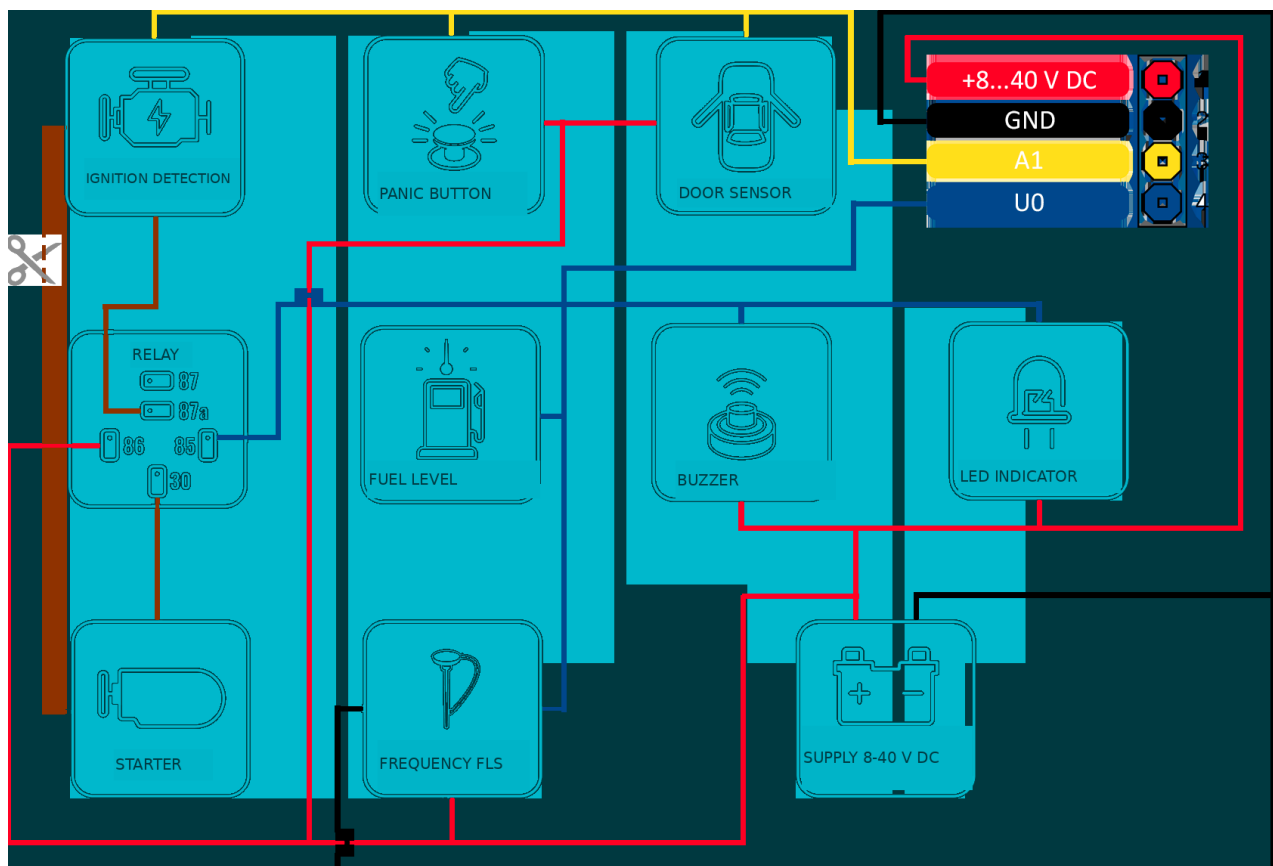


Figure 3. Basic connection diagram

Bluetooth (BLE) sensors

The tracker supports external wireless sensors (see Table 5 for the list of supported sensors).

Table 5 – List of supported sensors

No	Manufacturer	Sensor	Parameters
1	DOT	BLE-LLS	Fuel level, temperature, battery voltage
2		BLE-TERMO	Reed switch status (circuit monitoring), Temperature, battery voltage
3		BLE-RELAY	Circuit state, relay visibility state
4	DuoTec	DTA-BLE-TERMO	Reed switch status (circuit monitoring), temperature, battery voltage
5		TL-BLE	Temperature, battery voltage
6		TD-BLE	Fuel level, temperature, battery voltage
7	Escort	TH-BLE	Humidity, temperature, battery voltage
8		DU-BLE	Tilt angle, event, battery voltage
9	Teltonika	Teltonika Eye Sensor	Magnetic sensor status, temperature, battery voltage
10	Mielta	Mielta Fantom BLE	Fuel level, temperature, battery voltage
11	Italon BLE	Italon BLE (ESCORT protocol)	Fuel level, temperature, battery voltage

The list of supported wireless sensors is always growing. You can always view up-to-date information by clicking on the link.

To connect, you need to enter the MAC address in one of the cells for wireless sensors and select the Bluetooth module operating mode “only BLE sensors” or “mobile application + BLE sensors”

Addresses 1 and 2 – you can register any sensors, including relays.

Addresses 3 and 4 – can only work with wireless relays.

Address 5 – tag monitoring only

Figure 4. Bluetooth settings

The cell number coincides with the network address under which data will be transmitted to the server.

Bluetooth (BLE) sensors – server integration

On the Locavist server in the DOT A/L-series (20248) protocol, the state of the temperature sensor or FLS can be monitored using the following parameters:

- TEMP_X – temperature with a resolution of 0.1 °C.

This parameter is transmitted only for temperature sensors when “Transmit temperature with 0.1 °C resolution” is enabled.

- lls_X_val – relative level value for the FLS or circuit monitoring status for the temperature sensor
- lls_X_temp – sensor temperature
- lls_X_bat – battery voltage

Where X is the sensor number (cell number)

Example - the temperature sensor is registered in cell 1 (MAC address 1).

TEMP_1=22.1 – temperature with a resolution of 0.1 °C.

LLS_1_VAL=0 – STATE OF THE CIRCUIT MONITORING SENSOR

(1 – circuit open, 0 – circuit closed)

lls_1_temp=22 – temperature with a resolution of 1 °C.

lls_1_bat=3.6 – battery voltage (V)

Example – the fuel level sensor (FLS) is registered in cell 1 (MAC address 1).

lls_1_val=1500 – relative fuel level

lls_1_temp=19 – temperature with a resolution of 1 °C.

lls_1_bat=3.6 – battery voltage (V)

SMS AND TCP COMMANDS

Table 6 – SMS and TCP text commands:

Binary TCP commands	SMS format or text TCP command	Action
0101	<access_password>*SERV*1.1	send the packet to the monitoring server
0102	<access_password>*SERV*1.2	Receive an SMS with the firmware version, IMEI, external supply voltage and backup battery voltage
0104	<access_password>*SERV*1.4	forced software update
0105	<access_password>*SERV*1.5	update software via WEB configurator
0106	<access_password>*SERV*1.6	clearing device memory
0107	<access_password>*SERV*1.7	device restart
0108	<access_password>*SERV*1.8	update settings via WEB configurator
0109	<access_password>*SERV*1.9	Upload settings to the WEB Configurator (synchronize)
08000X	<access_password>*SERV*8.0.X	Switch output U0 to state X: 1 - enable 0 - turn off
18000XYY	<access_password>*SERV*24.0.X.Y Y	Activate output U0 for a time: X - minutes YY – seconds
	<access_password>*SERV*1.128.X	Re-uploading data from memory to the monitoring server 0 – to the first server 1 – to the second server
	<access_password>*GETP	Get the current tracker configuration
	<access_password>*SMSI	Receive an SMS with the firmware version, IMEI, external supply voltage and backup battery voltage
	<access_password>*MSK	Receive an SMS with coordinates and a link to the map

All the above commands can be sent either via SMS or as TCP text commands.

Examples of binary commands in the Wialon system (custom_msg):

Object properties - _L1_ ×

General Access Icon Advanced Sensors Custom fields Groups **Commands**

Driving quality Properties Trip detector Fuel consumption Maintenance

+ Create

Command name	Phone number	Channel	Parameters	Queue	
Restart device Send custom message (custom_msg)	-	TCP	0107	-	
Update firmware via WEB Send custom message (custom_msg)	-	TCP	0105	-	
Update settings via WEB Send custom message (custom_msg)	-	TCP	0108	-	
Deactivate output U0 Send custom message (custom_msg)	-	TCP	080000	-	
Activate output U0 Send custom message (custom_msg)	-	TCP	080001	-	
Clear memory Send custom message (custom_msg)	-	TCP	0106	-	

Restore properties Export to file Cancel OK

Figure 5

Examples of text commands in the Wialon system (driver_msg):

Object properties - _L1_ ×

General Access Icon Advanced Sensors Custom fields Groups **Commands**

Driving quality Properties Trip detector Fuel consumption Maintenance

+ Create

Command name	Phone number	Channel	Parameters	Queue	
Update firmware via WEB configurator Send driver message (driver_msg)	-	TCP	123456*SERV*1.5	-	
Update settings via WEB configurator Send driver message (driver_msg)	-	TCP	123456*SERV*1.8	-	
Restart device Send driver message (driver_msg)	-	TCP	123456*SERV*1.7	-	

Figure 6.

MONITORING SYSTEM INTEGRATION

Devices are supported by a number of monitoring systems, including Wialon, Locavist, and other popular platforms. To integrate your device with the Locavist monitoring system, follow these steps:

- Manufacturer - Edvado
- Equipment Type – Select “DOT A/L-series (20248)”.
- Unique ID – enter the IMEI of the device indicated on its sticker.

The detailed steps for adding a device may vary between monitoring platforms.

New object

General | Advanced | Counters | Trip detector | Custom fields | Sensors | Commands | Retranslator

Name: * ?

Object type: * ?

Identifier: * ?

Manufacturer: * ?

Device type: * ?

IP address: IP

Owner: * ?

Figure 7.

Table 7 - parameters in the Wialon system

Locavist parameter DOT A/L-series (20248)	Description	Comments
bU	External supply voltage, V	
RBU	Internal battery voltage, V	
gsm	GSM signal strength	Range 1 to 31 (99 – no GSM network)
gsm_st	Operating status GSM modem	0 - disabled 1 - enabled 2 - AT Ok 3 - GPRS activation 4 - GPRS Ok
nav_st	Operating status GPS Glonass module	0 - disabled 1 - enabled 2 - on, NMEA OK, satellite search 3 - 3D fix (excellent reception quality)
hdop	Horizontal dilution of precision	
sim1_st	SIM card status	0 - no SIM card 1 - registration in the home network 2 - network search 3 - registration rejected 4 - reserve 5 - roaming registration 6 - PIN error 7 - reserve
s0_st	Service server connection status (WEB Configurator)	0 - not used 1 - connection establishment 2 - connection established 3 - reserve
s1_st	Monitoring server connection status	0 - not used 1 - connection establishment 2 - connection established 3 - reserve
mw	Motion sensor status (accelerometer)	0 – stationary 1 - movement 2 - error 3 - self-test error
bt	Bluetooth module operation status	0 - disabled 1 - enabled 2 - error
lls_X_val	FLS fuel level or temperature sensor control circuit status	Wireless and wired sensors
lls_X_temp	Temperature from sensor	Wireless and wired sensors Transmitted in degrees
lls_X_bat	Sensor battery voltage	Wireless sensors Transmitted in volts
freq_X	Frequency value	Frequency FLS (input - frequency)
info_messages	Service value	Packet formation code (see protocol for description)
v_in	Ignition state (by input A1) / virtual ignition (by voltage threshold)	
in_X	Input/output inX (UX)	Displays input/output value

WARRANTY

To maintain the specified tracker performance, replace the rechargeable battery every 2 years.

WARRANTY REPAIR OR REPLACEMENT DOES NOT APPLY IN THE FOLLOWING CASES:

- Failure to follow the product operating instructions;
- Mechanical damage (external or internal);
- Faults caused by foreign objects, insects or liquids entering the device;
- Chemical, electrochemical, electrostatic or extreme thermal damage;
- Repairs or maintenance during the warranty period performed by persons not authorized by the manufacturer;
- Equipment faults resulting from external influences on the device or the electrical circuit to which it is connected;
- Faults caused by third parties or other unforeseen circumstances outside the equipment manufacturer's obligations.

PACKAGE CONTENTS

The tracker is supplied with the items listed in Table 8.

Table 8 – Package contents

№	Item	Qty	Note
1	GPS tracker	1	monitoring device
2	Main harness	1	
3	Rechargeable battery	*	optional
4	Product data sheet	*	On request

All the latest technical information and software can always be found on the corresponding page of the manufacturer's website:

<https://edvado.com/>

Note: The manufacturer reserves the right to change the supplied items without reducing the product's performance or functionality.
