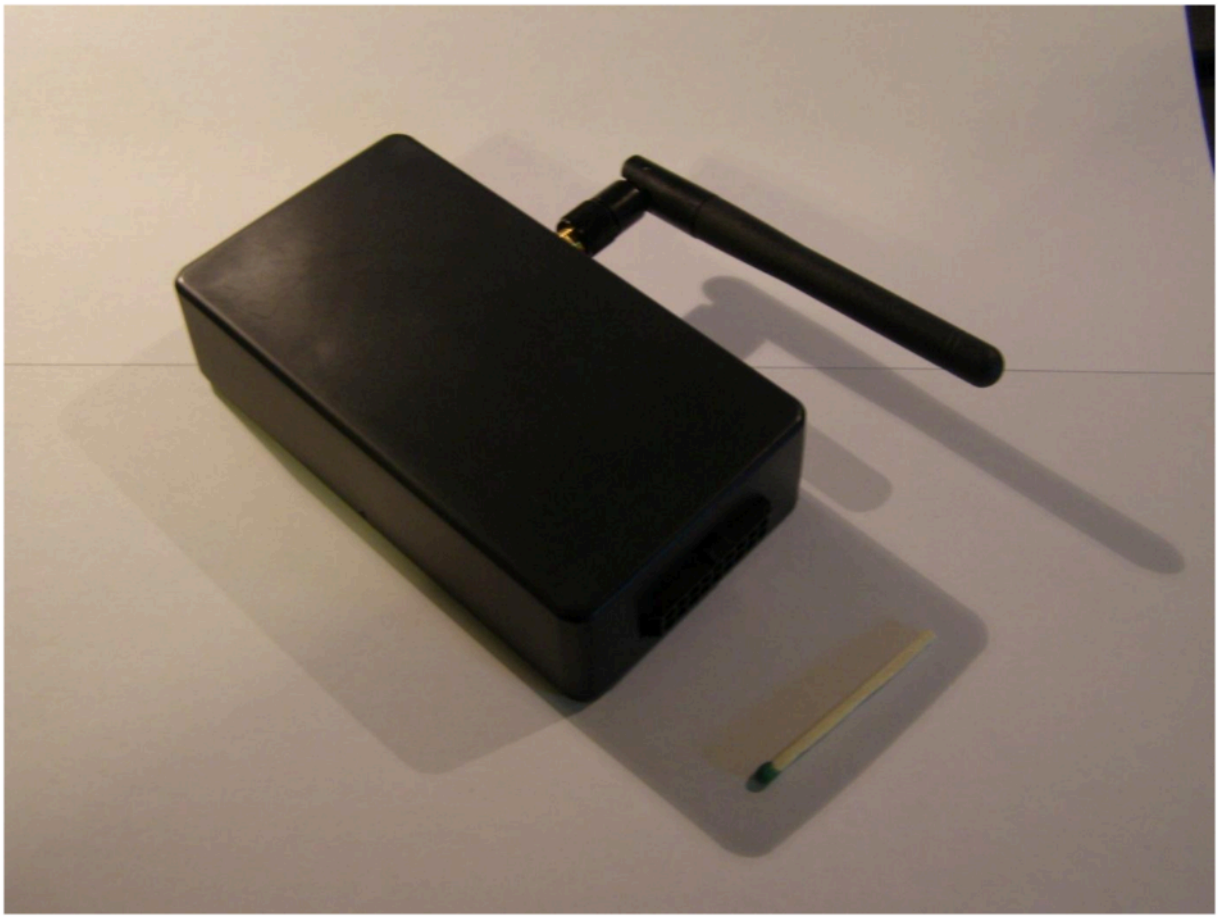
Installation Manual for GPS Tracker Type: mL900-8p

(version 1.02)

Tracker: mL900-8p



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1. General Information

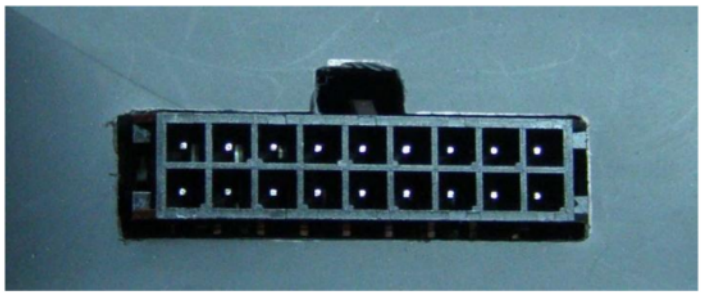
The mL900-8p GPS tracker is a device designed for monitoring machines and mechanical equipment operating in open areas. It is used wherever information about the device's location, speed, and other technical parameters is required.

2. Construction and Operating Principle

The mL900-8p tracker is built using a GSM transmission module and a GPS receiver. The antenna receiving the GPS satellite signal is built into the device, while the GSM transmission antenna is screwed onto the outside of the housing. The tracker operates as follows:

1. Collects information about geographical location from the GPS satellite system
2. Collects data from digital and analogue inputs
3. Collects data from other sensors (if connected)
4. Processes the collected data
5. Transmits the collected data via the GSM mobile network to the server
6. Allows control of digital outputs via SMS commands

The tracker is equipped with an 18-pin socket used for control and data collection



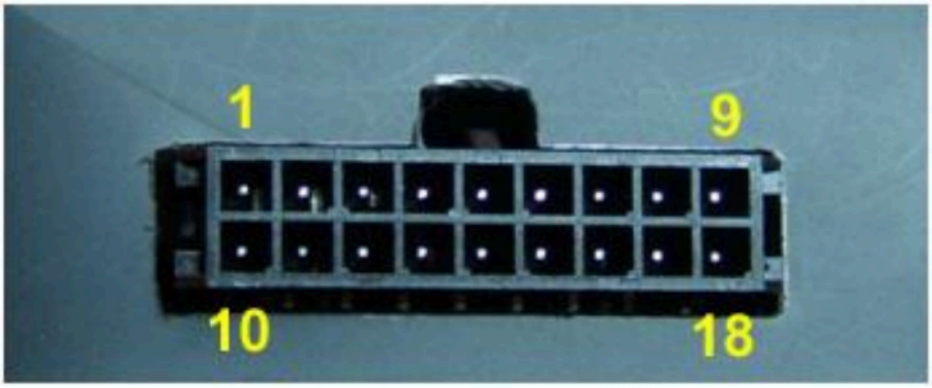
Gniazdo mL900-8p

3. Tracker Functions

The GPS tracker has the following functions:

2. Receives geographical coordinates from the GPS satellite system
3. Receives data from 8 digital inputs
4. Receives data from 2 analogue inputs
5. Receives data from a temperature sensor if connected
6. Has 3 digital outputs of the OC (open collector) type

4. Pinout of the Tracker



Oznaczenie styków na obudowie lokalizatora

Number	Function Description of the Pin
1	12V Power Supply =
2	Ground
3	Digital Output 1, open collector type. Maximum supply voltage 24V. Maximum current 250mA.
4	Digital Output 2, open collector type. Maximum supply voltage 24V. Maximum current 250mA.
5	Digital Output 3, open collector type. Maximum supply voltage 24V. Maximum current 250mA.
6	Ground
7	DS1820 Temperature Sensor Data
8	DS1820 Temperature Sensor Power Supply + 3v3=
9	Analogue Input 2 – used to connect 12V or 24V power supply for monitoring purposes
10	Analogue Input 1 – used to connect a fuel level probe or fuel tank float.
11	Digital Input 8. Connecting 12V or 24V sets the logic state to '1'. Connecting to ground or leaving open sets it to logic '0'.
12	Digital Input 7. Connecting 12V or 24V sets the logic state to '1'. Connecting to ground or leaving open sets it to logic '0'.
13	Digital Input 6. Connecting 12V or 24V sets the logic state to '1'. Connecting to ground or leaving open sets it to logic '0'.
14	Digital Input 5. Connecting 12V or 24V sets the logic state to '1'. Connecting to ground or leaving open sets it to logic '0'.
15	Digital Input 4. Connecting 12V or 24V sets the logic state to '1'. Connecting to ground or leaving open sets it to logic '0'.
16	Digital Input 3. Connecting 12V or 24V sets the logic state to '1'. Connecting to ground or leaving open sets it to logic '0'.
17	Digital Input 2. Connecting 12V or 24V sets the logic state to '1'. Connecting to ground or leaving

	open sets it to logic '0'.
18	Digital Input 1. Connecting 12V or 24V sets the logic state to '1'. Connecting to ground or leaving open sets it to logic '0'.

7. Installation of the GPS Tracker in the Machine

To correctly install the mL900-8p tracker in the machine, the following steps should be performed:

1. Unpack the tracker from its transport packaging
2. Screw the supplied GSM antenna onto the protruding threaded pin on the tracker housing. This should be done gently to avoid damaging the antenna or socket. Do not use excessive force. Do not use any tools for this operation.
3. In the machine, locate a place in the wiring where a constant 12V supply is present. This means the wires are powered from the vehicle's electrical system even when the machine is immobilised.
4. Connect the power supply, inputs and outputs, and sensors.
5. The location where the tracker itself is installed is very important. As it contains an antenna under the housing for receiving signals from GPS satellites, it must be installed in a place not covered from above by metal parts of the machine.
6. Connect the tracker to the correctly connected cable harness using the 18-pin socket.
7. Immediately after connection, the tracker will start operating.
8. If the connection has been made correctly, a red indicator light will illuminate on the underside of the housing.
9. From this moment, the device is ready for operation.

6. Meaning of Indicator Lights

There are two indicator lights on the underside of the housing. These are, in order, red and green.

A. The red light indicates correct power supply connection to the tracker.
B. The green light indicates the status of the GSM communication module.

Possible indicator states.

POWER – Red Light	Steady illumination	Tracker correctly connected to power supply
POWER – Red Light	Not illuminated	No power supply or reversed polarity of power wires
GSM – Green Light	Not illuminated	Modem failure – contact service
GSM – Green Light	Flashes a single pulse every 800 milliseconds	GSM modem is synchronising with the mobile network.
GSM – Green Light	Flashes a single pulse every 3 seconds	GSM modem operating correctly

During normal tracker operation, the indicators appear as follows:

A. The red power light is steadily illuminated
B. The green GSM light flashes every 3 seconds

In this state, the tracker is able to determine its geographical position and transmit it to the server www.monitoring-gps.net .

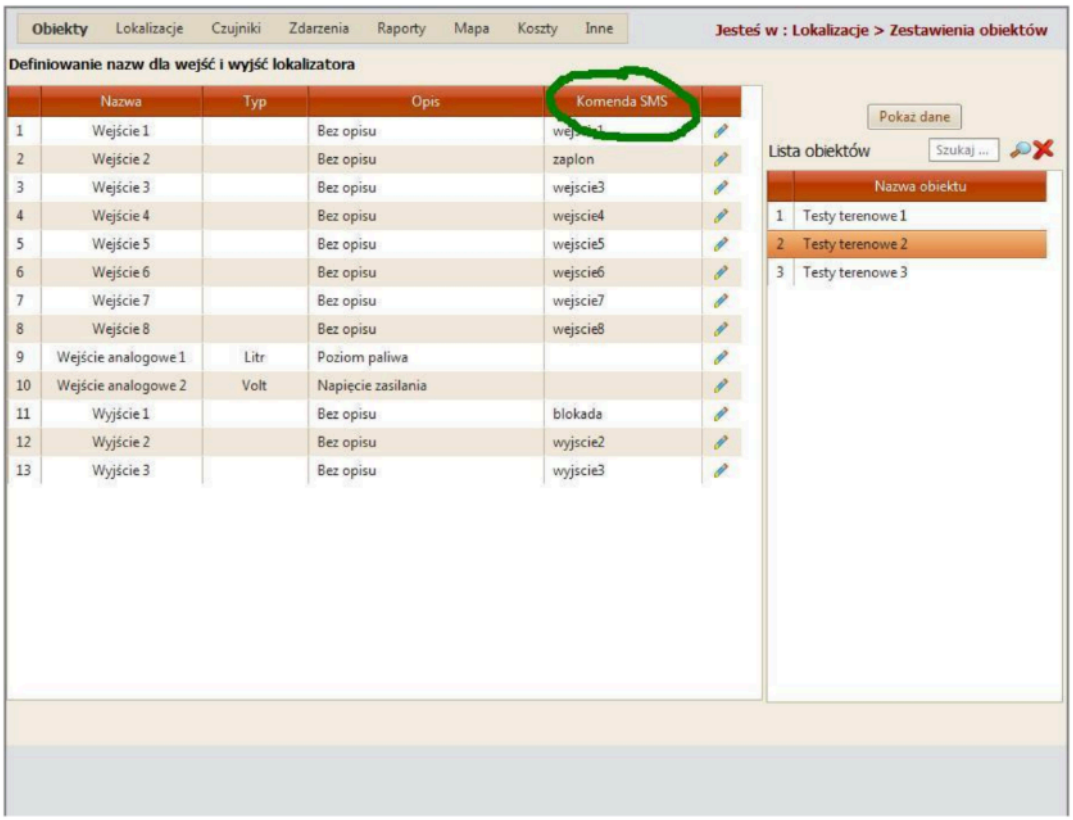
7. SMS Commands

The tracker has 3 outputs of the 'open collector' type. These can be controlled via SMS commands. Below is a list of SMS commands used to control the outputs.

To connect a relay to the 'open collector' circuit, connect one relay coil terminal to the positive power supply and the other to the appropriate output (pin 3, 4, or 5).

The internal electronic circuit controls the current from the ground side. When activated, it closes this circuit to ground, allowing current to flow through the relay coil circuit.

The table below shows the SMS commands. The names of digital inputs and outputs shown below as 'InputX' or 'OutputX' can be defined in the monitoring system. To do this, go to Sensors > Define Input and Output Names and make the appropriate change in the 'SMS Command' column. The changes will be retrieved by the tracker within 20 minutes, i.e. at the next settings download from the server.



SMS Command	Circuit State	Remarks
OutputX ON	The control transistor collector circuit is activated. This allows current to flow through this circuit to ground.	Command sent via SMS to the SIM card number of the tracker. X – number of the controlled circuit. For example: 'Output2 on' closes output circuit number 2. In response, an SMS will be sent with the content 'Output2 > 1 – OK'
OutputX	The control transistor collector circuit is blocked.	Command sent via SMS to the SIM card number of

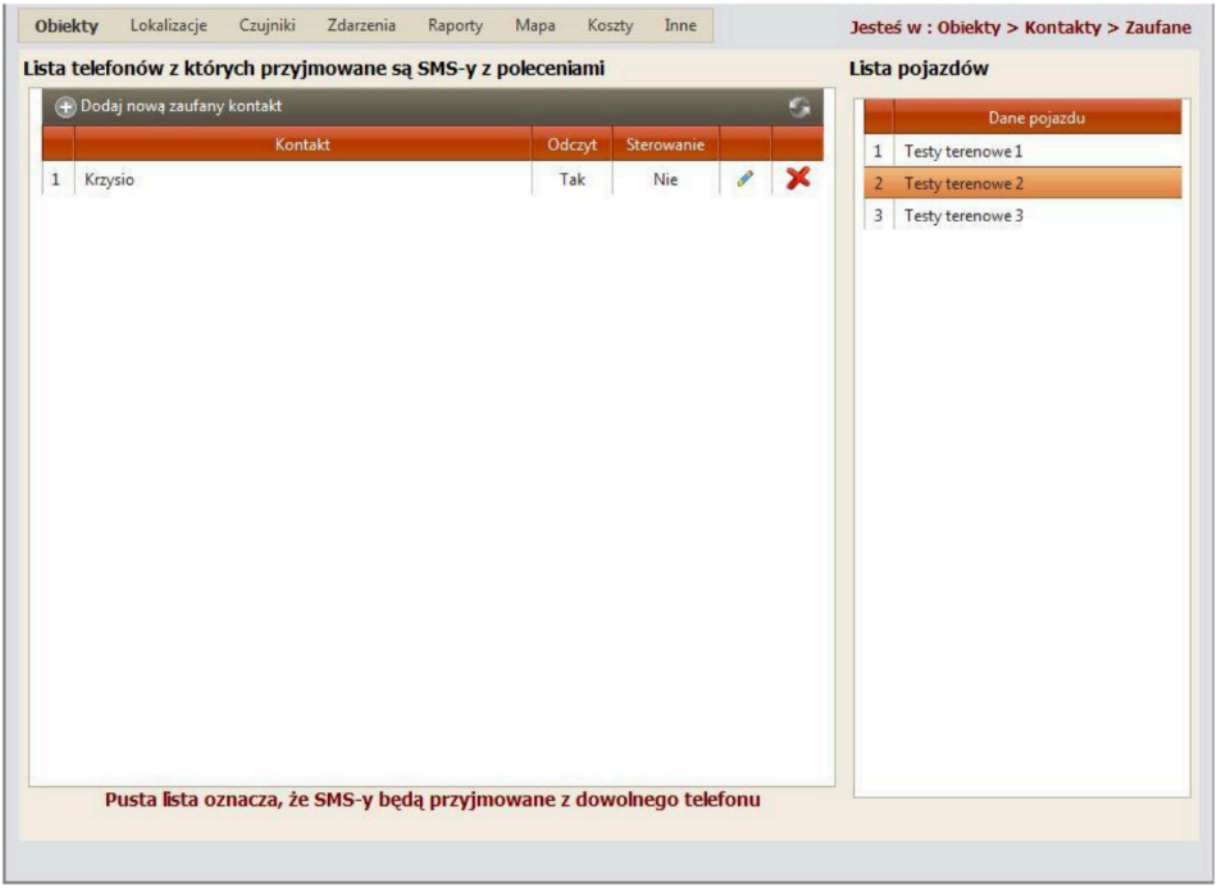
OF	This blocks current flow in the circuit.	the tracker. X – number of the controlled circuit. For example: 'Output2 of' opens output circuit number 2. In response, an SMS will be sent with the content 'Output2 > 3 – OK'
OutputX ONOF	The state of the control circuit changes for 3 seconds, then returns to the previous state	Command sent via SMS to the SIM card number of the tracker. X – number of the controlled circuit. For example: 'Output2 onof' switches output circuit number 2 for 3 seconds. In response, an SMS will be sent with the content 'Output2 > 3 – OK'
States	Query about the states of digital inputs and outputs	In response, an SMS is sent with the content: 'Inputs=10101010 Outputs=101' where zeros and ones indicate the current states of the system's inputs and outputs.
OutputX	Query about the state of a digital output	In response, an SMS is sent with the content: 'OutputX=1' or 'OutputX=0'
InputX	Query about the state of a digital input	In response, an SMS is sent with the content: 'InputX=1' or 'InputX=0'

The SIM card number used in the tracker will be provided by email by the supplier. It should be protected from unauthorised access.

Lack of response to a sent command does not mean it has not been executed. Responses are sent via the GPRS network and whether they are received depends on whether the GPS tracker is connected to this network.

SMS commands are accepted by default from any phone number. If it is necessary to restrict this, it should be configured in the system. Go to Menu > Objects > Contacts > Trusted SMS Contacts and select the contacts from which the tracker will accept SMS messages. The changes will be downloaded by the tracker within 20 minutes, i.e., during the next settings update from the server.

Below is a screenshot showing the configuration of a single contact as trusted for the selected tracker.



Note: The manufacturer accepts no responsibility for any consequences resulting from the use of the circuit cut-off function in any machine. The purchaser installs such a circuit at their own exclusive risk.

9. Technical specification of the mL900-8p tracker

GPS module

Chipset	MediaTek
Internal antenna	25x25 mm
Current consumption (standby)	5 mA
Current consumption (in motion)	40 mA
Frequency	L1
Number of channels	51
Positioning accuracy	2.5 m
Cold start	36 seconds
Hot start	1 second
Processor	ARM7TDMI

Operating temperature	-40°C to +85°C

GSM modem

Operating bands	GSM/GPRS 900/1800/1900 MHz
Current consumption	2W
GPRS	Class 10
PPP stack	Built-in
CSD	14.4 kbps
GPRS speed	85.6 Kbps
SMS	Supported
Operating temperature	-40°C to +85°C

Main board

Processor	Atmega64L
Power supply	12 V DC
Power indication	Red LED
GSM modem indication	Green LED

Tracker

Current consumption	120 mA
GSM antenna	External
Dimensions	110x60x25 mm
Weight	150 g
Operating temperature	-40°C to +75°C
Enclosure	PVC – IP20 Class

Inputs and outputs

Digital inputs	Input x 8
Temperature sensor data	Input
Analogue inputs	Input x 2
OC outputs	Output x 3