ES75iT
GPRS class 12
EDGE class 12
GSM modem

USER MANUAL

Contents

1. Safety Requirements

Restrictions for the usage of the device in the vicinity of other electronic devices:

- turn off the modem ES75iT in hospitals or in the vicinity of medical equipment (e.g. cardiostimulators, hearing aids). It can cause interference for medical equipment;
- turn off the modem ES75iT in aircrafts. Take measures against accidental activation;
- turn off the modem ES75iT in the vicinity of gas-filling stations, chemical enterprises, blasting work places. It can cause interference to technical devices;
- at a short range the modem ES75iT may cause harmful interference to TV and radio receivers.
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Prevent the modem ES75iT from dust and moisture.

Improper use deprives you of all warranty claims.

2. General Information

2.1. Purpose of the Device

The modem ES75iT is a structurally accomplished GSM modem designed for reception and transmission of data, text messages and telecopies. It is excellently adjusted both for mobile Internet Access and for industrial applications — telemetry, wireless data collection from sensors, remote surveillance, monitoring and signaling.

The modem operation is based on the GSM module of the company Cinterion. The control is performed by means of standard AT-commands. The modem is equipped with light-emitting diodes (LEDs) enabling to monitor the status of connection.

2.2. Configuration

Complete set of the modem ES75iT:

- modem ES75iT,
- label,
- factory box.

2.3. Parameters

The GSM module MC75 is used as a base component. Its basic parameters:

- frequency ranges: GSM 850/900/1800/1900 mHz;
- power output:
  - 2W (class 4 for EGSM850),
  - 2W (class 4 for EGSM900),
  - 1W (class 1 for GSM1800),
  - 1W (class 1 for GSM1900);
- EDGE class 12;
- GPRS class 12;
- MC class B;
- CSD up to 14.4 kbps;
- USSD;
- SMS: MT, MO, CB, Text and PDU modes;
- fax group 3: class 1.

Electric power supply:

- power supply voltage from 9 to 25 V;
- absorbed current not more than:
  - with power supply voltage +12 V – 200mA;
  - with power supply voltage +24 V – 100mA.

Physical parameters:

- size not more than 70x74x33 mm;

- weight not more than 100 g.;
- operating-temperature range from -20°C to +65°C.

Interfaces:

- DB9 RS-232,
- USB-B USB 2.0,
- antenna connector FME,
- RJ11 power supply.

2.4. Exterior Appearance

The modem ES75iT is a compact device. The exterior appearance is represented on Fig. 2.4.1 and Fig.2.4.2.

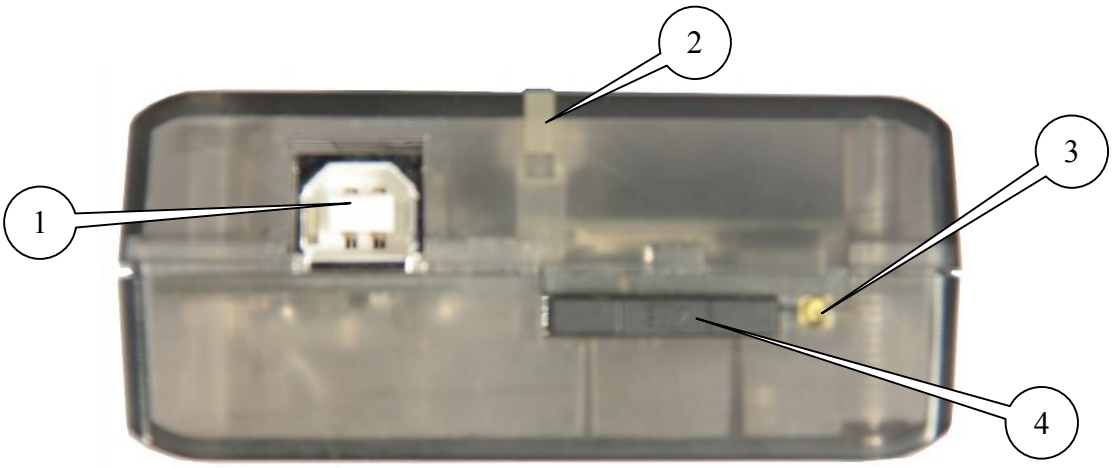

Fig.2.4.1 Front view

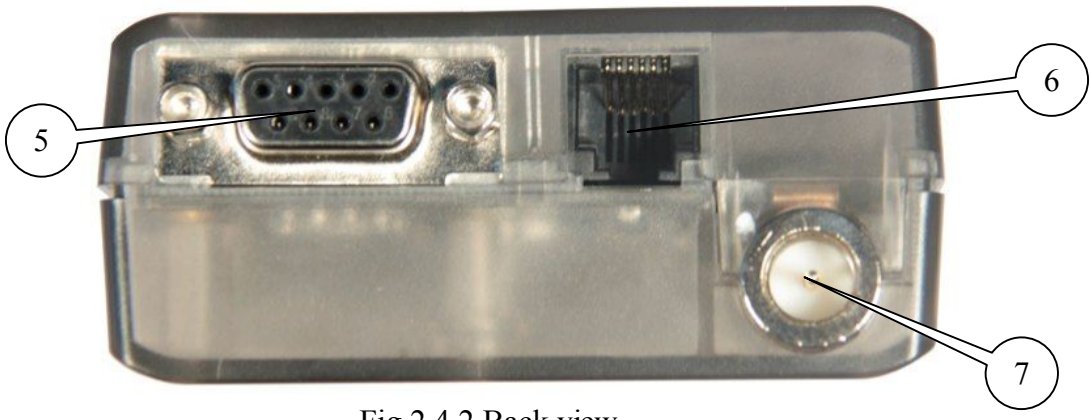

Fig.2.4.2 Back view

On the figures the digits signify the following:

1. USB connector type B for connection of the data cable,
2. Network and emergency LED indicator,
3. SIM card tray extractor,
4. SIM card tray,
5. Connector DB9 (RS232) for connection of the data cable,
6. Connector RJ11 for power supply connection,
7. FME connector for connection of the GSM antenna.

2.5. Interfaces

2.5.1. Connector DB9 for Data Cable Connection

The connector is used for connection to the control device, exchange protocol RS232.

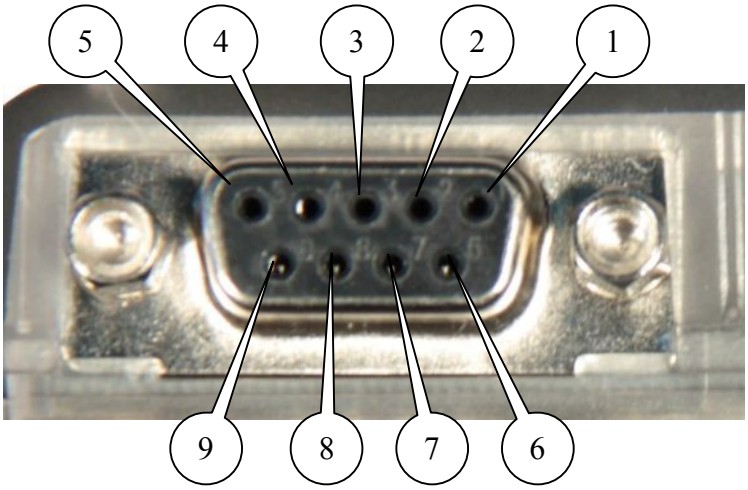

Table 2.5.1 Purpose of the connector pins.

Contact	Signal	Direction	Purpose
1	DCD	Modem-PC	Availability of carrier wave
2	RXD	Modem-PC	Data reception
3	TXD	PC-Modem	Data transmission
4	DTR	PC-Modem	Availability of data receiver
5	GND	general	System housing
6	DSR	Modem-PC	Readiness of data
7	RTS	PC-Modem	Request for transmission
8	CTS	Modem-PC	Availability of transmission
9	RI	Modem-PC	Call signal

2.5.2. Connector RJ11 for Electric Power Supply Connection

The connector is used for connection of electric power supply.

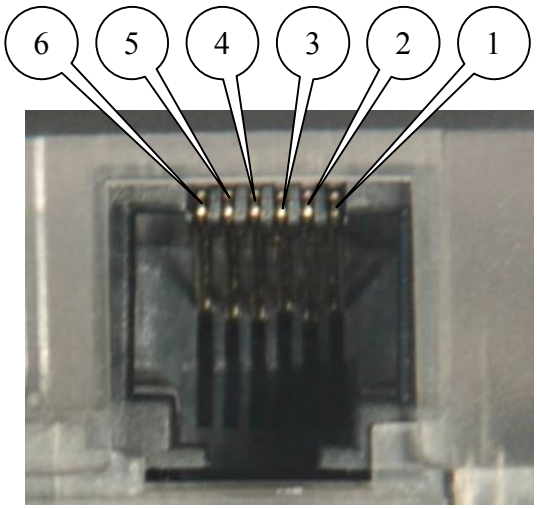

Table 2.5.2 Purpose of power supply connector pins.

Contact	Signal	Purpose
1	GND	System housing
2	not used	
3	not used	
4	not used	
5	not used	
6	+ 12V	Positive pole of DC supply voltage.

2.5.3. USB Connector Type B for Data Cable Connection

The connector is used for connection to the control device. The USB port has priority over the COM port (COM port becomes inactive).

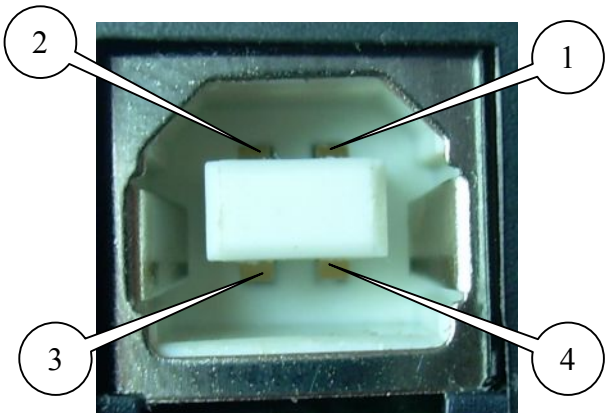

Table 2.5.3 Purpose of the USB connector pins.

Contact	Signal	Purpose
1	V BUS	+5 V (is used as port to determine the USB connection)
2	D−	Data connection
3	D+	Data connection
4	GND	System casing

2.6. Modem Status Indication

Two LEDs are used to indicate the operation mode or any emergency situation.

Table 2.6.1 Operation mode indication (green LED)

Indication mode	Conventional displaying of indication	Operation mode
Turned off	●	Modem is turned off or there is an emergency situation
600 ms on / 600 ms off	○○○○○●●●●●	Modem is not registered in the network
75 ms on / 3 s off	○●●●●●●●●●	Modem is registered in the network
75 ms on / 75 ms off / 75 ms on / 3 s off	○●○●●●●●●●●	GPRS/EDGE connection is installed
500 ms on / 50 ms off	○○○○○●	Data transmission is underway
250 ms on / 10 s off	○○○●●●●●●●●●	Modem is in the power standby mode, alarm clock mode.
250 ms on / 250 ms off	○○○●●●	Programming mode, menu mode

Table 2.6.2 Emergency situation indication (red LED)

Indication mode	Conventional displaying of indication	Emergency description
Turned on continuously	○	Input voltage invalid
0.5 s on / 0.5 c off	○○○○○●●●●●	Power supply of the module invalid
0.25 s on / 0.25 c off / 0.25 s on / 1 s off	○○○●●●○○○●●●●●●	GSM module not started
0.25 s on / 0.25 s off / 0.25 s on / 0.25 s off / 0.25 s on / 1 s off	○○○●●●○○○●●●○○○●●●●●●	COM port unavailable

For description of emergencies see section 4 (page 14)

3. Connection and Setting Up

3.1. Connection

The application field of the modem can be divided into two nominal parts: personal computer connection for Internet access and industrial use.

In both cases the connection order is the same.

Before feeding the power supply you need to install the SIM card in the modem (the SIM card must be enabled). To do this, you need:

- to extract the SIM tray by pressing the SIM tray extract button (Fig. 2.4.1);
- to install the SIM card into the SIM tray;
- to insert the SIM tray into the modem.

No strong physical efforts must be applied while installing the SIM card.

Connect the GSM antenna to the antenna connector (Fig. 2.4.2) as well as the commutating cable (RS232 or USB). Thereupon you need to feed power supply to the modem through the connector RJ11 (Fig. 2.4.1).

Note: GSM antenna, commutating cables and electrical power unit are not included in the complete set configuration.

After the power supply feeding, registration occurs automatically, which is signaled by the green indicator frequent flashing. After the registration is completed, the modem jumps to the operating mode, the green indicator flashes less frequently (Table 2.6.1).

3.2. EDGE/GPRS Setting-Up

Connection and setting up of the modem for access to the Internet from the personal computer should be performed as that of a standard modem. In case of any difficulties, read the guidelines on the manufacturer's website (www.radiofid.ru), the support section.

For industrial applications the modem control is performed by means of the standard AT commands.

3.3. Restarting and Power Off

The modem can be restarted in the following ways:

- by eight jumpings of the DTR COM port line into passive state (DTR < -2V), duration of pulses and the pauses between the pulses must lie within the range 100-500 ms;
- restarting after a specified time period (WD interval, turned off on default), the setting-up is carried out in the menu mode;
- by temporary power-off.

The modem can be powered off using the following ways:

- by the program method, using AT commands (escape to the power standby mode);
- directly by power-off.

After the power-off made by means of AT commands, the modem escapes to the power standby mode (minimum power consumption). Escaping from the power standby mode is performed upon the DTR COM port line or while turning-on of the GSM module by the alarm clock.

4. 3.4. Menu Mode

The menu mode is designed to change the modem parameters and browse the statistics. In the menu mode the power supply of the GSM module is turned off, after escaping from the mode, automatic start occurs. You can jump to the menu mode from the operating mode. Before starting, connect the modem to the computer through the DB9 interface (rate is 115200 bit/sec, 8-N-1), start the Hyper Terminal or a similar program to communicate with the modem. After extraction of the SIM tray (by pressing the SIM tray extract button), the modem will jump to the menu mode. Herewith the main menu is to be represented:

Menu_mode:
Variant XX
<P1> View statistics
<P2> WD interval = XXX hh (или “OFF”)
<PR> Clear statistic,
where **Variant XX** is the weaving version.

The characters <…> signify the control commands. Input of the command gets underway after pressing “Enter”. In case of incorrect input, “ERROR” is indicated. There is no difference between the entered uppercase and lowercase characters.

After input of the command “P1” you jump to the statistics browsing menu:
Power modem XX…X
Bad Power modem XX…X
Power module XX…X
Bad power module XX…X
Start module XX…X
Bad start module XX…X
Comport to fail XX…X
Deadlock of module XX…X
Reset module XX…X

When the modem is used, the following situations are automatically saved:
Power modem – number of modem connexions,
Bad power modem – number of power supply deviations of the modem from the allowed value,
Power module – number of power supply feedings to the GSM module,
Bad power module - number of power supply deviations of the GST module from the allowed value,
Start module – number of successful GSM module starts,
Bad start module – number of situations where the GSM module did not start,
Comport to fail – number of situations where the COM port was unavailable (CTS signal),
Deadlock of module – number of the GSM module deadlocks,
Reset module – number of restartings.
After the statistics output, you will jump to the main menu.

After the input of the command “P2” you will jump to the WD menu:
WD interval, hh (hh=00 -> WD=OFF, max=255)

<Q> Quit
WD interval =

In order to change the restarting interval, enter the number from 0 to 255 (input is after pressing «Enter»). The restarting interval is specified in hours. If you need to disable this function, enter 0. You should consider that after expiration of the specified time interval the modem will be restarted unconditionally. In case of incorrect input, the modem will indicate “ERROR” and represent the WD menu again. If the restarting interval is entered successfully, or the “Q” command is given, you will jump to the main menu.

After the input of the “PR” command you will jump to the statistics clearing menu:
Clear statistic?
<Yes> Yes
<Q> Quit

The collected statistics is cleared by the command “YES”. In case of incorrect input, the modem will indicate “ERROR” and represent the statistics clearing menu again. In case of successful entering or input of the command <Q>, you will jump to the main menu.

After the input of the “M” command – the main menu will be loaded again.
You will escape from the menu mode after installation of the SIM tray.

5. Emergency Situations

To simplify the use of the modem, tracking of emergencies is provided.

6. 4.1. Emergency 1 (input voltage invalid)

Emergency 1 occurs in case of deviation of the input power supply voltage from the allowed value. In such case the modem stops the operation: disconnects the power supply of the GSM module. It signals with the red LED about the emergency situation (turned on continuously). Escaping from the emergency situation is possible only after restoring of the input voltage.

7. 4.2. Emergency 2 (power supply of the module invalid)

Emergency 2 arises in case of deviation of the power supply voltage of the GSM module from the allowed value. In such case the modem stops its operation: disconnects the power supply of the GSM module. It signals with the red LED about the emergency situation (0.5 s on / 0.5 s off). Escaping from the emergency situation is possible only after restoring of the power supply voltage of the module within 10 seconds from the time when the emergency situation occurred. If the power supply voltage of the module stays incorrect within 10 seconds (with correct input voltage), the modem jumps to the standby mode – the module power supply is disconnected, the emergency indication persists. Escaping from the standby mode is possible only after full disconnection of power supply.

In case of any repeated emergency after restarting of the modem, the modem is to be repaired.

8. 4.3. Emergency 3 (GSM module not started)

Emergency 3 occurs in case where the GSM module is not started. Red LED signaling about the emergency situation: 0.25 s on / 0.25 s off / 0.25 s on / 1 s off. Escaping from the emergency situation is possible only after successful start of the GSM module. In case of 10 consecutive failed attempts to start the module (15 seconds), the modem jumps to the standby mode – the module power supply is disconnected, the emergency indication persists. Escaping from the standby mode is possible only with full disconnection of the power supply.

In case of any repeated emergency after restarting of the modem, the modem is to be repaired.

4.4. Emergency 4 (COM port unavailable)

Emergency 4 arises if case of unavailability of the GSM module COM port. Red LED signaling about the emergency situation 0.25 s on / 0.25 s off / 0.25 s on / 0.25 s off / 0.25 s on / 1 s off. Escaping from the emergency situation is possible upon the availability of the GSM module COM port. In case of 10 consecutive failed attempts (20 seconds), the modem jumps to the standby mode – the module power supply is disconnected, the emergency indication persists.

In case of any repeated emergency after restarting of the modem, the modem is to be repaired.