

# USER GUIDE

## GSM modem

### iRZ MC52PU





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## 1. Introduction

### 1.1. Document description

This manual is intended for experienced PC users. It describes the device and the operation of the GSM modem iRZ MC52PU.

### 1.2. Service data

Document version		Issue date	
2.2		08.30.2013	
Prepared by	V.N. Golovin	Approved by	P.A. Kosolapov

### 1.3. Safety rules

Restrictions on the use of the device near other electronic devices:

- Turn the modem off in hospitals or when located near medical equipment such as pacemakers, hearing aids and so on. Interference for medical equipment may occur;
- Turn the terminal off when on an airplane. Take measures to avoid accidental turning on;
- Turn the modem off in the vicinity of gas stations, chemical plants, and places where demolition work is conducted. Interference for technical devices may occur;
- At a close range, the modem may produce interference for television sets and radio transmitters.

Maintenance requirements:

- Protect the modem against external hazards (high temperatures, caustic chemicals, dust, water and so on);
- Keep the modem safe from blows, falls, and strong vibrations;
- Do not attempt to take apart or modify the modem on your own. Such actions will void your warranty.

**Note:** Make sure you follow the operation manual for this device. Improper use of the device will disqualify your warranty.



## 2. General Information

### 2.1. Purpose

iRZ MC52PU modem is an industrial GSM modem for receiving and transmitting data, text messages and faxes. It is perfectly suited both for providing mobile access to the Internet and for industrial applications including telemetry, wireless data collection from sensors, remote monitoring, control, and signaling.

The modem is controlled by standard AT-commands. The device is equipped with LED to monitor connection status.

### 2.2. Set

The set of the iRZ MC52PU GSM modem includes:

- iRZ MC52PU modem;
- Factory package.

### 2.3. Features

Key features:

- Frequency bands: GSM 900/1800MHz;
- Output power:
  - 2W (class 4 for EGSM 900);
  - 1W (class 1 for GSM1800).
- GPRS class 10;
- TCP/IP stack accessed via AT-commands;
- MS class B;
- CSD up to 14.4kbps;
- USSD;
- SMS;
- Voice transmission;
- Fax group 3, class 1.

Power:

- Power supply from 9 to 30V;
- Consumption current not exceeding:
  - with the supply voltage of +12V — 200mA;
  - with the supply voltage of +24V — 100mA;
- Power supply through the USB connector +5V, consumption current not exceeding 0.5A.



Physical characteristics:

- Dimensions not exceeding 69x75x26mm;
- Weight not exceeding 100g;
- Operating temperatures from -40°C to +65°C;
- Storage temperatures from -50°C to +85°C.

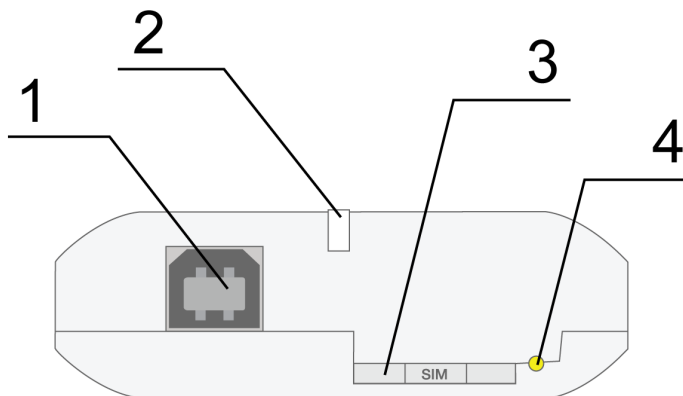
Interfaces:

- TJ6-6P6C connector for powering the modem;
- USB type B connector for connecting the USB interface and power;
- DB9 connector (female) for connecting the RS232 interface;
- FME Jack (male) for connecting the GSM antenna.

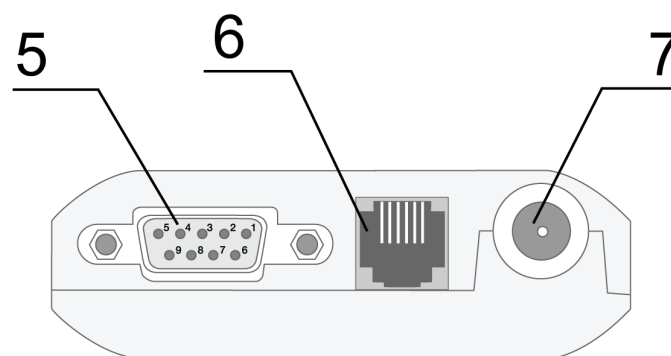


## 2.4. Appearance

MC52PU modem is a compact device in a plastic case. Its appearance is displayed on Fig.2.4.1 and Fig.2.4.2.



**Fig. 2.4.1. Front view**



**Fig. 2.4.2. Back view**

The numbers on Fig. 2.4.1 and Fig. 2.4.2 stand for:

1. USB type B connector for connecting the USB interface;
2. Network LED;
3. SIM card holder;
4. SIM card holder ejector button;
5. DB9 connector (female) for connecting the RS232 interface;
6. T-jack connector for powering the modem;
7. FME Jack (male) for connecting the GSM antenna.



## 2.5. Interfaces

### 2.5.1. DB9 Connector (RS232)

Use the connector to communicate with a controlling device, RS232 interface.

Factory settings: speed – 57600 bit/s, data bits – 8, parity – none, stop bit – 1. The AT-commands are used to control the modem operation (see the module description).

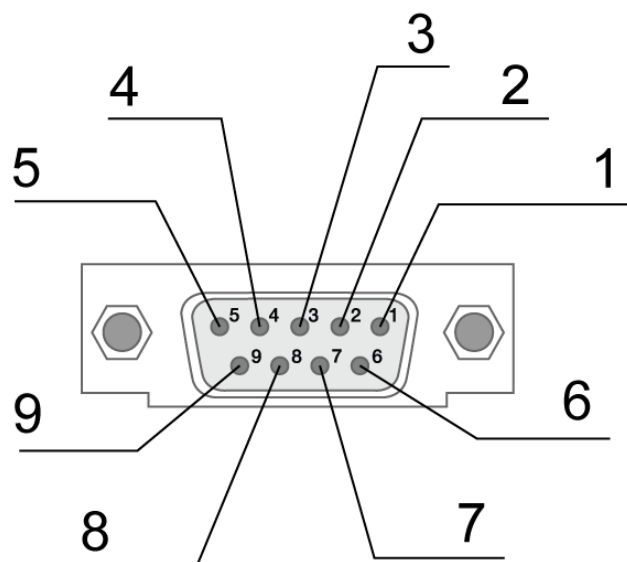
There are several specific features of this modem:

- Autobauding is not supported
- No DTR, DSR, DCD, RING circuits. Management of this circuits by using AT-commands is prohibited.

Using AT-commands you see ERROR message

- No fax or CSD calls. Using of AT-commands is prohibited, ERROR message is show
- If multiplex mode is activated for USB interface, AT-commands is not supported

Please see the external look of the connector on Figure 2.5.1:



**Fig. 2.5.1.** DB9 connector

**Attention:** RS232 standard (COM-port) does not support a "hot" connection.

To avoid damaging the COM-port of the modem connect and disconnect the device at least 5 seconds after the power of the connecting devices has been turned off.





**Table 2.5.1:** Using DB9 connector pins

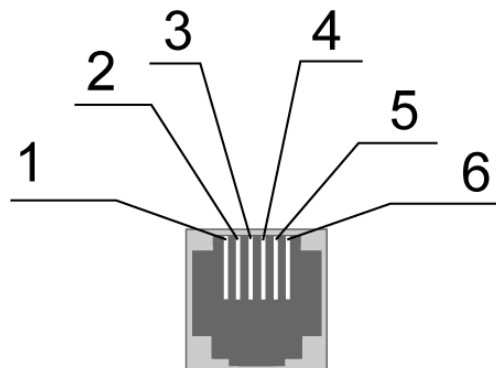
Pin	Signal	Direction	Purpose
1	Not used		Shortened to the body of the system
2	RXD	Modem-PC	Received Data
3	TXD	PC-Modem	Transmitted Data
4	DTR	PC-Modem	Start and rest the modem (see chapter 3.3)
5	GND	General	Common Ground
6	Not used		Shortened to the body of the system
7	RTS	PC-Modem	Request to Send
8	CTS	Modem-PC	Clear to Send
9	Not used		Shortened to the body of the system

The purpose of pins is consistent with the serial interface to ITU-T V.24 Interchange Circuits DCE.

The length of the cable is not to exceed 1.8 m. It is recommended to set data transfer speed that does not exceed 115,200 bit/s.

### 2.5.2. Power connector

The connector is used to power the device.



**Fig. 2.5.2.** Power connector

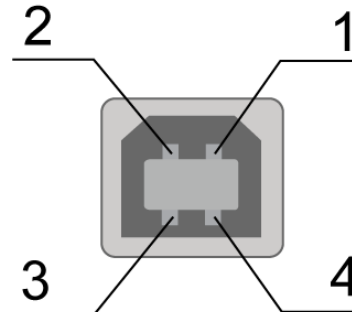
**Table 2.5.2:** Using connector power pins

Pin	Signal	Purpose
1	+ 12V	The positive pole of DC supply voltage. Fused circuit and overvoltage protection (when input voltage of over 30V is applied) and reverse polarity
2	Not used	
3	Not used	
4	Not used	
5	Not used	
6	GND	Ground



### 2.5.3. USB type B connector

Connector USB (type B) is used for connection to controlling the device, USB interface. USB also used for powering the modem, see chapter 3.



**Fig. 2.5.3.** USB connector type B

**Table 2.5.3:** Using USB type B connector pins

Pin	Signal	Purpose
1	V BUS	+5 V (can be used to power the modem, see details in Chapter 3)
2	D-	Data transmission
3	D+	Data transmission
4	GND	Ground

### 2.6. Modem status LED

LED is used to indicate the connection status. This function may be disabled by the following AT-command: AT^SSYNC (AT^SSYNC=1 — on; AT^SSYNC=0 — off). By default, AT^SSYNC=1 (on).

**Table 2.6.1:** Connection status LED

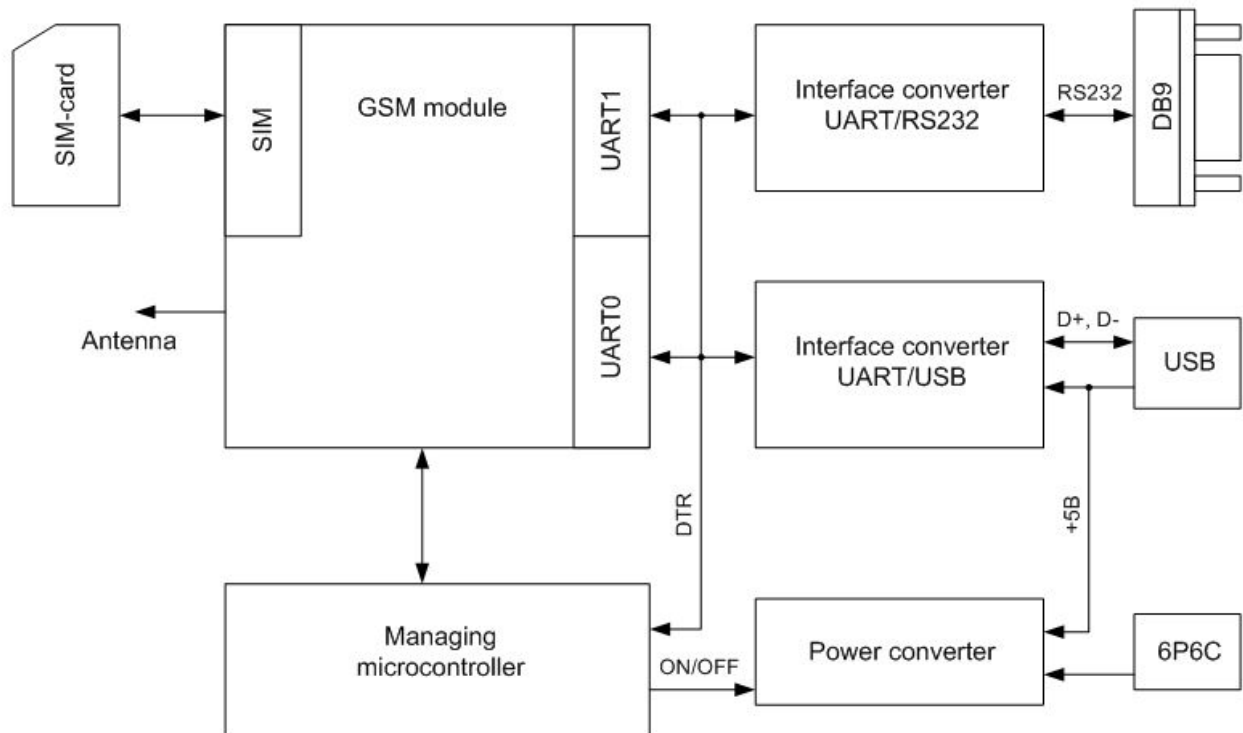
LED mode	Conditional indication display	Operation mode
Turned off	○	Modem is turned off or indication is shut down, power saving mode, ALARM mode
600ms on / 600ms off	●●●●●○●●●●●○	Modem is not logged to the network
75ms on / 3s off	●○●●●●●○●...○	Modem is logged to the network
75ms on / 75ms off / 75ms on / 3s off	●○●○●●●●○●...○	GPRS connection is activated
500ms on / 50ms off	●●●●●○	Data transfer in progress (GPRS)
250ms on / 10s off	●●●●●●●●...○	Sleep mode
Permanently turned on	●	Voice call, CSD



### 3. Connecting and configuring

#### 3.1. Functional diagram of the modem

The functional diagram of the modem is displayed on Fig. 3.1.1:



**Fig. 3.1.1.** Functional diagram of the modem

#### 3.2. Connecting

The modem is controlled by standard AT-commands. You can download the description of the AT-commands at [www.irz.net](http://www.irz.net).

Before connecting the device, install the SIM card into the modem. In order to do that:

- Eject the SIM holder by pressing the SIM card holder ejector button (Fig.2.4.1);
- Place the SIM card into the SIM card holder;
- Insert the SIM card holder with the SIM card into the modem.

Be careful when installing the SIM card. Connect the GSM antenna to the antenna connector.

Modem has two interfaces for connecting to the controlling device: RS232 and USB. Device can be controlled simultaneously using both interfaces.

In order to use the USB simply connect the USB cable. The modem will be powered using the USB cable.

**Note:** GSM antenna, the commuting cables and the power supply are not included in the set.



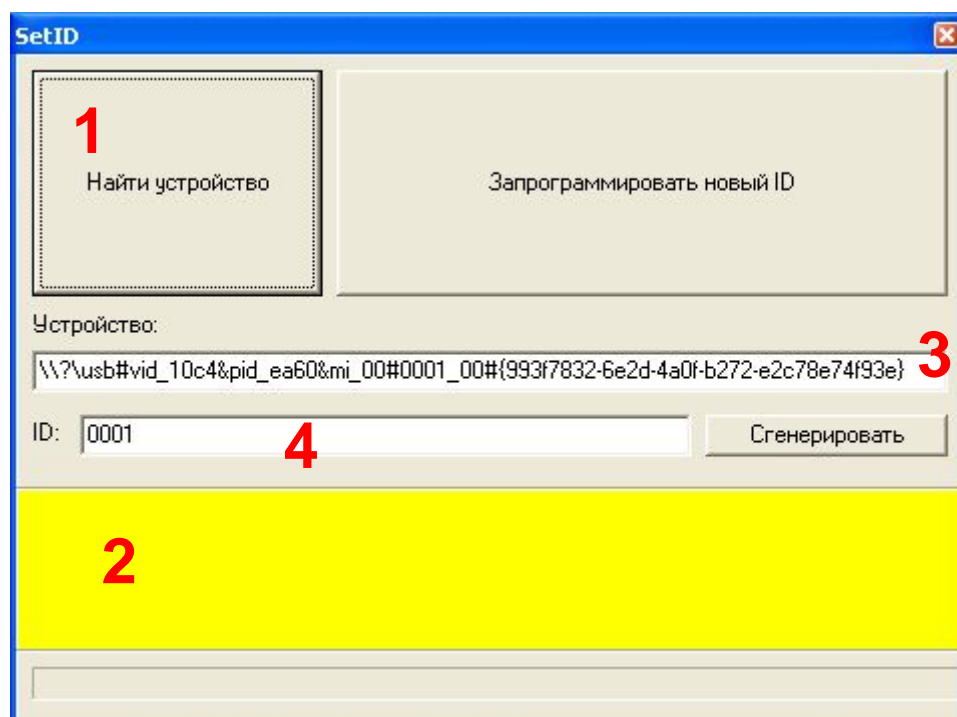
After the device is powered on, it is being automatically registered, which is indicated by the green LED blinking rapidly. If PIN code is disabled from SIM card the modem automatically will be registered to the network. Once the registration is completed, the modem goes into the operation mode and the green LED begins to blink less rapidly (see Table 2.6.1)

### 3.3. Control, rebooting, and turn off

The modem is controlled by standard AT-commands. When the modem is connected using the USB interface, a driver is needed (it can be downloaded from [www.irz.net](http://www.irz.net), "Support" section). After the driver is installed a virtual COM port should appear. Use the modem as any standard modem. When selecting a modem it is recommended to choose a standard 33600bps modem.

For additional information and support visit [www.irz.net](http://www.irz.net).

By default, all modems have same serial numbers ID. If you connect several modems via USB to a PC, your modem's serial ID numbers must be different. You can change the ID by using the SetID application (available at [www.irz.net](http://www.irz.net)).



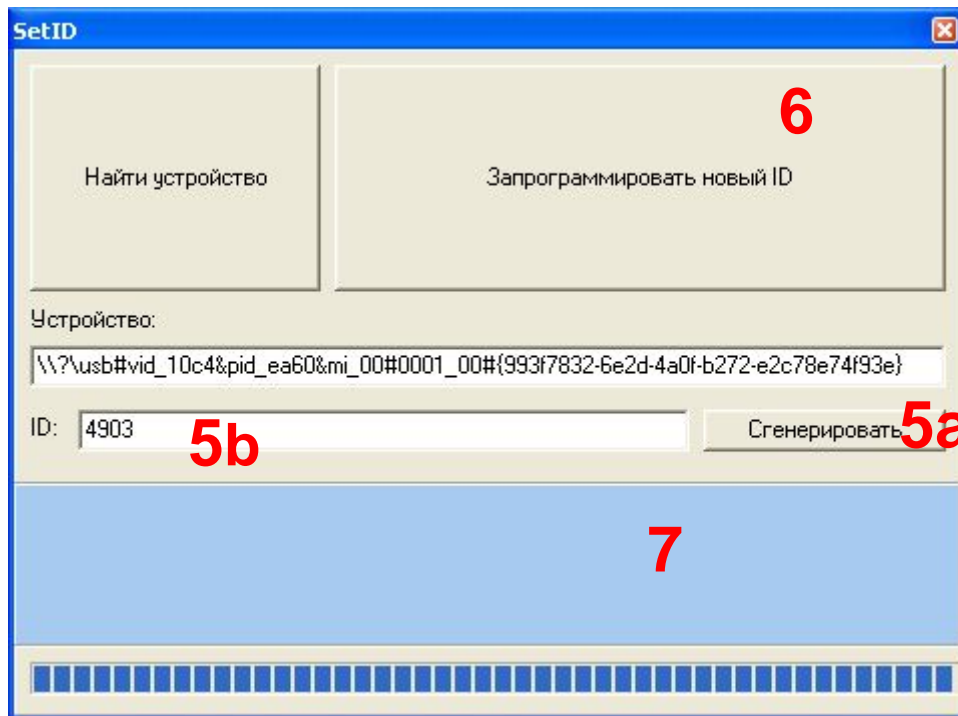
**Fig. 3.2.** SetID program's window

Procedure:

1. Connect one of the modems to the PC;



2. Run **SetID** application ("SetID.exe" file), main application window will open (see Fig. 3.2). Click on "Найти устройство" (1) button. The bottom margin of the main window will be turned to yellow (2), in strings "Устройство" (3) and "ID" (4) ID's numbers will be displayed (see Fig. 3.2);



**Fig. 3.3.** Generate ID

3. Click on "Сгенерировать" (5a) button, or input any four-digit number to a "ID" string (5b) (see Fig. 3.3);
4. Нажать на кнопку "Запрограммировать новый ID" (6). Программа изменит серийный номер ID, нижнее поле главного окна станет голубым (7) (see Fig. 3.3). После этого операционная система обнаружит новое устройство и придётся снова установить драйвера.

Repeat this operation for every modem.

The modem can be rebooted using one of the following ways:

- Eight transitions of the DTR COM-port line into a passive state ( $DTR < -2V$ ), the duration of the impulses and pauses between the impulses should remain within the range of 100-500ms;
- By using AT-command "AT+CFUN=1,1"
- Temporary power shutdown.

The modem can be shut down using one of the following ways:

- By using AT-command "AT^SMSO"  
After using "AT^SMSO", you can use alarm clock function (ALARM mode) to turn on modem.
- Power shutdown.



When shutting down using AT-commands the modem goes into a sleeping mode (minimal energy consumption). Emergence from the sleeping mode occurs along the line of the DTR COM-port transition from a passive to an active state.

Controlling the modem using the DTR line is done using the USB interface. After the driver is installed a virtual COM port should appear.

Switch-over of modem into power saving mode by using AT-command "AT+CFUN". Controlling the alarm mode by using AT-command "AT+CALA". For more detail see AT-commands description for the GSM module.



## 4. Support

New document versions and software are available using:

St. Petersburg	
The company's website:	<a href="http://www.radiofid.ru">www.radiofid.ru</a>
Phone number in St. Petersburg:	+7 (812) 318 18 19
E-mail:	<a href="mailto:support@radiofid.ru">support@radiofid.ru</a>
Moscow	
The company's website:	<a href="http://www.digitalangel.ru">www.digitalangel.ru</a>
Phone number in Moscow:	+7 (495) 974 74 22
E-mail:	<a href="mailto:info@digitalangel.ru">info@digitalangel.ru</a>

Our support team is ready to assist you with any questions you might have when installing, configuring or solving issues with our equipment.