

# Reader CP-Z-1 GSM

## User Manual

### 1. GENERAL INFORMATION

The CP-Z-1 GSM reader is designed for operation in access control systems (ACS) using GSM cellular communication standard and allows using the telephone number of an incoming call as an identifier for access control. In addition, incoming SMS messages can also be the source of the identifier. The identifier obtained in the form of a certain code sequence can be further transmitted to:

1. A controller via iButton (Dallas Touch Memory) or Wiegand protocols.
2. A personal computer (PC) via RS-485 interface.

Features of the reader:

- Telephone number identification during the call and when receiving SMS messages;
- Reader parameter adjustment using SMS messages;
- RS-485 interface allows connecting the reader to a computer and both receiving codes from the reader and configuring its parameters;
- A connector for connecting the GSM antenna allows an increased level of network signal reception by connecting a remote antenna.

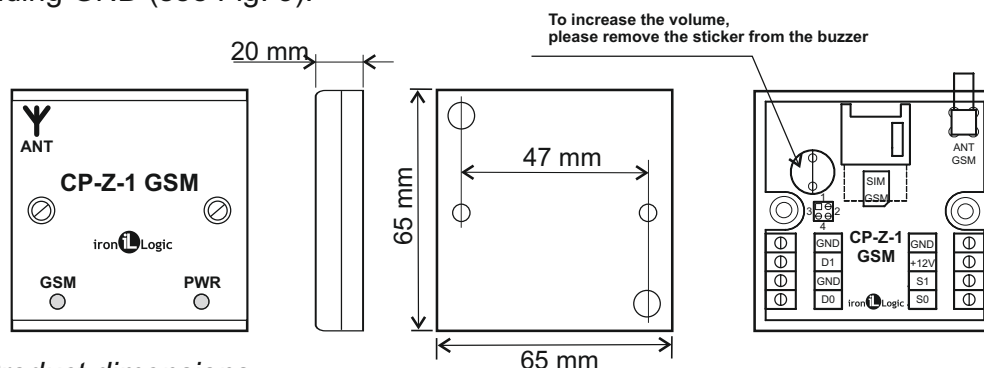
### 2. INSTALLATION AND CONNECTION

The reader should be mounted on a flat surface in a place protected from direct sunlight and precipitation.

1. Mark and drill mounting holes to fit the size of the reader holes (see Fig. 1).
2. Connect the wires according to the wiring diagram.
3. Insert a SIM card.
4. Install the reader and secure it.
5. Connect the GSM antenna.
6. Turn the power on and make sure that the power indicator "PWR" is on.

To ensure the required distance from the installed reader to the controller provided in the specifications, it is necessary to use a twisted pair cable (for example, UTP CAT5e).

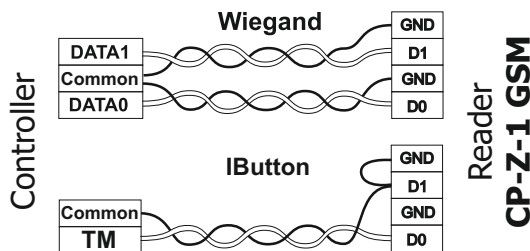
When connecting via iButton, one twisted pair is connected to the GND terminal and the other is connected to the D0 terminal (see Fig. 2). Additionally, it is necessary to connect the D1 and GND terminals with a separate wire. When connecting via Wiegand, two twisted pairs are used. The first twisted pair connects GND and D0 terminals and the second twisted pair connects GND and D1 terminals (see Fig. 2). When connected via RS-485, a twisted pair and another wire are used; the twisted pair connects D0 and D1 terminals and a separate wire connects it to the grounding GND (see Fig. 3).



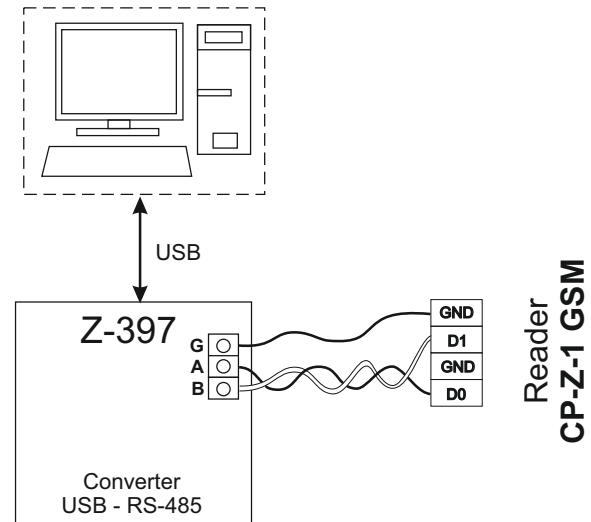
**Fig. 1** Product dimensions.

**Purpose of reader terminals:**

GND common (ground);  
 +12V power supply +12...24V;  
 D0 output DATA0;  
 D1 output DATA1;  
 S0 output No.0 (TTL +5V);  
 S1 output No.1 (TTL +5V).



**Fig.2** Connection and transmission protocol selection.



**Fig.3** Connection diagram for RS-485.

### 3. READER OPERATION

#### 3.1 Telephone number identification

To send the required code sequence to the controller, the reader can identify the telephone number in the following ways:

- By a call from any telephone number (the telephone number of the caller will be transmitted to the controller);
- By an SMS from the telephone number recorded in its own database of numbers (the controller will receive a set code: for the administrator - AAAAAAAAAAxx, for the user - BBBBBBBBBBBBBBBXx, where the xx is a serial number of the cell in the database of administrators or users);
- By an SMS from any telephone number, except for its own database of numbers (the code from the text of the SMS message will be transmitted to the controller).

For the identification by a call: Call the number corresponding to the reader's SIM card. The reader will determine the telephone number of the caller and if such identification is allowed (see Clause 3.2) the reader will convert this number into the required format and transmit it to the controller, as well as switch the status of the terminals S0 and/or S1 if the switching parameters are set and the caller's telephone number is in the reader's database of numbers, then the reader will reject the incoming call and give 1 short light signal and a sound signal.

For identification by SMS for a telephone number from its own database of numbers:

- Create a main administrator of the telephone number database and additional administrators, if necessary (see Clause 3.2);
- Add a user with the specified telephone number and assign him/her a PIN code (see Clause 3.2);

- 3) Send an SMS to the number corresponding to the SIM card of the reader from the user's number containing the text of his/her PIN code assigned during registration.

The reader will determine the telephone number of the sender of the SMS message and if such identification is allowed, the reader will find this number in the database of numbers, convert the code corresponding to the number into the desired format and transmit it to the controller and also switch the state of terminals S0 and/or S1 if the switching parameters are set, then the reader will give 1 short light signal and a sound signal.

For identification by text from an SMS received from any telephone number, except for its own database: send an SMS to the number corresponding to the SIM-card of the reader containing the text of 6-14 digits. The reader will read the numbers from the SMS message as a telephone number and if such identification is allowed, the reader will convert the number into the desired format and transmit it to the controller, then the reader will give 1 short light signal and a sound signal.

### 3.2 Configuring the reader

The database of administrator (user) numbers and reader parameters can be configured using both SMS messages and the RS-485 interface.

#### 3.2.1 Configuring the reader using SMS messages

To configure the reader via SMS messages, you need to register the main administrator and configure the reader from the main administrator's telephone number. Available SMS commands for configuration are listed in Tables 1 - 3. Table 4 describes the designation of command parameters.

Designations in command format:

- - single space;
- [] - required parameter;
- { } - optional parameters;

Table 1. SMS commands to configure the database of telephone numbers

Command	Description
[n.pin]admin+	add a main administrator (any PIN code)
[pin]admin+[tel]■ [n.pin]{■ [tel] ■ [n.pin]■ [tel]■ [n.pin]}	add additional administrators (1 to 3)
[pin]admin-[tel]{■ [tel]■ [tel]}	delete additional administrators (1 to 3)
[pin]admin?	sends a list of additional administrators and their PIN codes in an SMS reply
[pin]user+[tel]■ [n.pin]{■ [tel] ■ [n.pin]■ [tel]■ [n.pin]■ [tel] ■ [n.pin]■ [tel]■ [n.pin]}	add a user (1 to 5)
[pin]user-[tel]	delete a user
[pin]user-all	delete all users
[pin]user?	sends a list of users and their PIN codes in an SMS reply

Only one of the specified commands is processed in each SMS message.

Table 2. SMS commands used to configure the reader parameters.

Command	Description
[pin]wieg[bit]	set the length of Wiegand
[pin]form■ [format]	set the format of code transfer via Wiegand or Dallas
[pin]iden■ call[mode]	set the mode of identification by a call
[pin]iden■ sms[mode]	set the mode of identification by text in an SMS message from any number
[pin]iden■ base[mode]	set the mode of identification by an SMS number received from the number existing in the database of numbers
[pin]gpio[terminal] ■ [level]out[time]	set the specified level on the S0 or S1 terminal for the required time if a number exists in the database of numbers
[pin]sound[mode]	reader sound control
[pin]param?	sends a list and values of parameters in an SMS reply

1 to 7 specified commands are processed in each SMS message.  
The commands are separated by a space character.

Table 3. Other SMS commands.

Command	Description
[pin]pin[n.pin]	replace your PIN with a new one
[pin]	when the identification by the database of numbers is allowed, the set code is sent to the controller
[number]	when the identification by SMS is allowed (except for numbers from the database), the number from the text of the SMS message is sent to the controller

Only one of the specified commands is processed in each SMS message.

Table 4. Designation of command parameters.

Designation	Description	Valid characters
[pin]	The authorisation PIN code of the administrator or user who executes the query (4 digits)	0 to 9
[n.pin]	Any new PIN code for the administrator or user (4 digits)	0 to 9
[bit]	number of bits of Wiegand interface	26, 34, 42, 50, 58
[tel]	The added phone number (without the "+" character or using 8 for RF numbers)	0...9
[format]	format of the telephone number transfer to the controller: BCD - binary-coded decimal representation of the number; HEX – hexadecimal representation of the number	bcd, hex
[mode]	0 – prohibit the mode, 1 – allow the mode	0, 1
[level]	TTL logic signal level	0, 1
[terminal]	Terminal number: 0 – terminal S0, 1 – terminal S1	0, 1
[time]	time expressed in tenths of a second, for example, 053 = 5.3 sec (3 characters required), 000 – turn off terminal control	000 to 255
[number]	decimal representation of the number (6 to 14 characters)	0 to 9

The default reader parameters are listed in Table 5.

Table 5. Reader parameters.

Parameter	Default parameter
Wiegand format, bit	34
Code transfer format	bcd
Identification by a call	On
Identification by the SMS text	On
Identification by the database number	On
Terminal S0 switching time, x0.1 sec.	0
Terminal S0 switching directions	0 to 1
Terminal S1 switching time, x0.1 sec.	0
Terminal S1 switching directions	0 to 1
Reader sound	On
Administrators and users in the database	No

To execute any SMS command except for sending a code from an SMS message you must log in to the reader, i.e. before the command, input the personal PIN code specified when registering the telephone number in the reader database. In addition, when the reader executes multiple SMS commands, access rights will be observed, namely:

- The main administrator can send any commands;
- Additional administrators can send any commands except for adding, deleting and reading of the main and additional administrators.
- Users can only change or send their PIN code;
- Unregistered numbers can only send a code inside an SMS message.

Examples of SMS commands (by the main administrator):

1. Add the main administrator: **1234admin+**
2. Add additional administrators: **1234admin+ 79001112233 4321 79001112255 0000**
3. Set level 1 (+5V) on the terminal S0 for 50 msec.: **1234gpio0 1out050**
4. Set Wiegand length to 50 bits (6 bytes): **1234wieg50**
5. Send the set code for administrators to the controller: **1234**

### 3.2.2. Configuring the reader via the RS-485 interface

Configuring and updating the reader firmware can be carried out using the configurator programme for Windows ("GSM Reader Configurator" at [www.ironlogic.ru](http://www.ironlogic.ru)). To connect the reader to the PC via the RS-485 interface, you must use the interface converter (see Fig. 3). We recommend the Z-397 Guard USB converter in "NORMAL" mode.

To connect the reader via the RS-485 interface, you should do the following:

- Connect wire A to terminal D0 and wire B to terminal D1 on the switched-off device;
- Combine the grounding of the converter and the reader;
- Set the jumper to position 1 (see Fig. 4);
- Turn on the power.

In this mode, the reader will send a code sequence over RS-485 in plain text.

### 3.3 Indication of the operation

The current mode of the reader's operation is displayed by the indicators "PWR" and "GSM" (see Fig. 1) and their purpose is shown in Table 6.

Table 6. Indication of the reader's operation.

Description	Indication	Sound
<b>"PWR" indicator</b>		
Power on (operating mode)	Steady green light	no
GSM modem malfunction	Steady red light	no
No SIM card or PIN code set	Steady red light	no
GSM network not found	Steady red light	no
<b>"GSM" indicator</b>		
Successful registration in the GSM network	Blue light flashes 1 time	Yes
Successful identification (call or SMS)	Blue light flashes 1 time	Yes
GSM modem initialisation	Blue light flashes repeatedly	no
GSM network level is excellent	Green light flashes 3 times	no
GSM network level is good	Green light flashes 2 times	no
GSM network level is bad	Green light flashes 1 time	no
GSM network is lost	Red light flashes 1 time	no

**Note.** The GSM network level is checked every 5 seconds.

### 3.4. How to use jumpers

The reader comes with one jumper.

It is used for programming and changing the device's mode of operation.

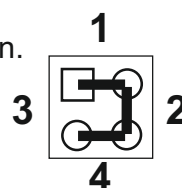
**Position 1** - activates the RS-485 interface on terminals D0 and D1 for changing parameters and updating the reader's firmware via a PC. To do this, turn the power off, set the jumper and turn the power on.

**Position 2** - standard position, does not affect the operation of the controller.

If there is no jumper, it shall be deemed to be in position 2.

**Position 3** - Not used.

**Position 4** - erases the reader's memory. The reader's database of numbers is erased and the default settings are restored. To do this, turn the power off, set the jumper and turn the power on. Upon completing the erase, the reader performs a series of short signals.



**Fig.4** Positions of jumpers.

## 4. SPECIFICATIONS

Operating frequency: .....GSM Standard  
 Telephone number identification: .....by call and SMS  
 Output interfaces: .....iButton, Wiegand (26, 34, 42, 50, 58), RS-485  
 Code transfer format: .....BCD, HEX  
 Database of numbers, pcs:  
 administrators .....4  
 - Users.....15  
 Remote antenna connector: ..... SMA-F  
 Maximum length of the communication line, m:  
 - Under the iButton protocol ..... not more than 15  
 - Under the Wiegand protocol ..... not more than 100  
 - Under the RS-485 protocol ..... not more than 10  
 DC power supply voltage, V: ..... 8 - 27  
 Current consumption (at 12V), not more than, mA: ..... 500

Switching current, not more than, mA: .....100  
Indication of operating modes: .....sound, light  
Dimensions, mm: .....65x65x20  
Case material: .....ABS plastic  
Weight, g: .....50

## 5. OPERATING CONDITIONS

Ambient temperature: -40°C to + 50°C (during operation, the temperature range of the installed SIM card should be taken into account).

Relative humidity: not more than 85% at 25°C (without condensation).

When operating conditions change, the technical specifications of the product may differ from the nominal values. The product is intended for use in the absence of precipitation, direct sunlight, sand, dust and moisture condensation.

## 6. PACKAGE CONTENTS

1. Reader CP-Z-1 GSM.....1 pc.
2. Instruction manual .....1 pc.
3. Jumper .....1 pc.
4. GSM antenna .....1 pc.

## 7. LIMITED WARRANTY

The warranty operation period is 12 months from the date of sale.

Grounds for the termination of warranty liabilities:

- Violation of the requirements of this Operation Manual;
- Existing mechanical damage;
- Existing traces of exposure to moisture and/or aggressive substances;
- Existing traces of unqualified interference in the device's wiring diagram.

During the warranty period, the Manufacturer undertakes to remove malfunctions of the device caused through the Manufacturer's fault or replace the defective product free of charge. The service life of the product: 6 years.

## 8. CONTACTS

### European & Global Wholesale Distribution Center

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The symbol of crossed-through waste bin on wheels means that the product must be disposed of at a separate collection point. This also applies to the product and all accessories marked with this symbol. Products labeled as such must not be disposed of with normal household waste, but should be taken to a collection point for recycling electrical and electronic equipment. Recycling helps to reduce the consumption of raw materials, thus protecting the environment.