

# Z-2 BASE

## Adapter for standalone controllers and readers programming using PC User Manual

### 1. OVERVIEW

**Z-2 BASE Computer Adapter** is a multifunctional device serving the following purposes:

- Programming of standalone controllers Z-5R, Matrix-II K by loading the keys/cards database from a PC directly to controller memory via a special socket, or storing that database from controller memory to a PC.
- Saving the keys/cards database from a PC into a DS1996L-compliant key, for further copying into Z-5R or Matrix-II K controllers at the customer's site, and from customer's site to a DS1996L-compliant key to a PC).
- Connecting any card standard reader (EM-Marine, Mifare, HID etc.) to a PC via iButton (Dallas Touch Memory) or Wiegand protocol, -- so that card serial numbers can be fed into the PC. A built-in 12 V DC voltage converter providing up to 150 mA current allows powering the connected reader right from this adapter, without a need for a power converter. It is also possible to control the indication on a connected reader by commands from the PC.
- Connecting to a PC via keyboard emulation protocol (USB-HID) to enter the acquired serial numbers in a specified text format, as if from a standard keyboard. (Custom firmware version required).
- Connecting to an external controller via a card reader emulation (iButton or Wiegand protocols), to transmit acquired cards/keys serial numbers to that controller by commands from a PC.
- Most of the listed above tasks are solved by the BaseZ5R software, available FREE from <http://www.ironlogic.me>.

### 2. INITIAL POWER-ON

Because the adapter draws quite significant current from a PC USB port, we recommend to connect with the cable supplied with device. Work with other cables is not guaranteed.

Before initial power-on, please download drivers from <http://www.ironlogic.me> and unpack them to a folder of your choice.

Connect the adapter to a PC USB port, wait for system requesting a driver location and point it to the folder with unpacked driver files.

After the driver is installed, Device Manager will list another COM port. This confirms that the installation was correct.

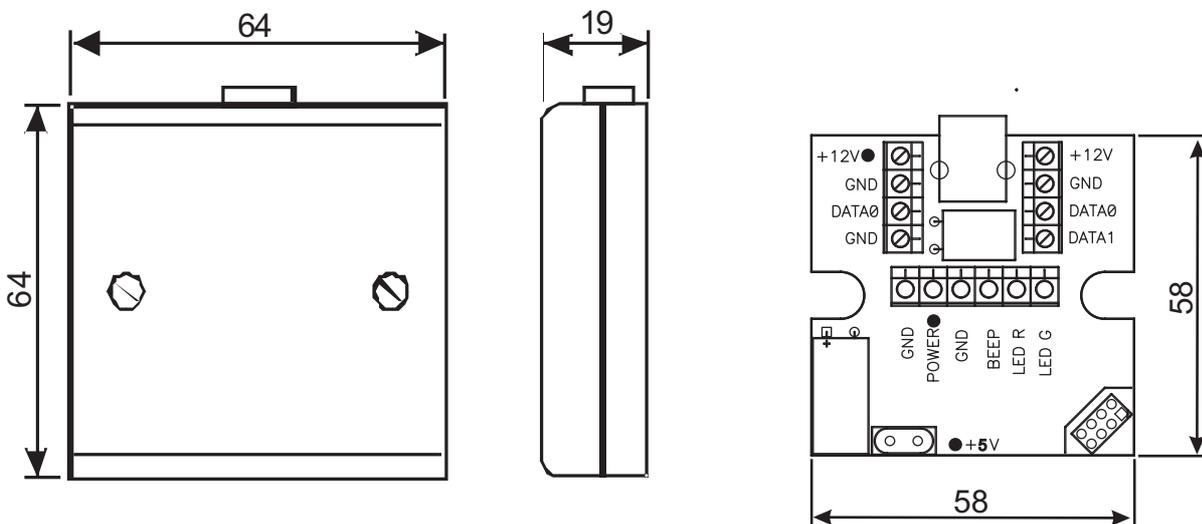
Features of this device are defined by the firmware downloaded into it and control software for PC.

Useful information about working with this adapter can be found on the manufacturer's website at <http://www.ironlogic.me>.

**3. SPECIFICATIONS**

Computer Interface: .....USB 2.0 (CDC/HID)  
 Max. distance from a PC: ..... 1.8 m.  
 Consumption current from a USB port: ..... 100 mA.  
 Consumption current with reader attached: ..... ≤ 450 mA.  
 Maximum allowed consumption current from a 12 V converter: ..... 150 mA.  
 Supported protocols: ..... iButton, Wiegand.  
 Bit width of Wiegand protocol: ..... Auto.  
 Casing material: ..... Plastic.  
 Dimensions, mm: ..... 64 x 64 x 19.  
 Gross weight: ..... 150 g.

Device dimensions are presented in Figure:



**4. TERMINALS PURPOSE**

<b>+12V</b>	Power output for external devices
<b>GND</b>	Ground, power (-)
<b>DATA 0</b>	iButton DATA0 for Wiegand
<b>DATA 1</b>	iButton DATA1 for Wiegand
<b>LED G</b>	Green LED external control by commands from PC
<b>LED R</b>	Red LED external control by commands from PC
<b>BEEP</b>	Buzzer external control by commands from PC
<b>POWER</b>	Managed +12 V output to power external devices by commands from PC

**5. VISUAL INDICATION**

<b>+5V</b>	Flashing green LED means that the device is powered from a USB port and operating normally.
<b>+12V</b>	Red LED denotes the correct +12 V converter operation.
<b>POWER</b>	Red LED denotes that +12 V is being fed to POWER output.

**6. COM-Port EMULATION OPERATION**COM port settings:

- Baud rate: 19,200 baud
- Data bits: 8
- Parity bits: None
- Stop bits: 1
- Flow control: None

## ASCII commands:

<b>I</b>	Adapter Information.
<b>R</b>	iButton™ Card Re-read.
<b>A и Z</b>	Set and Clear +12 V on POWER output.
<b>S и X</b>	Set Low (0 V) and High (+5 V) levels of BEEP signal.
<b>D и C</b>	Set Low (0 V) and High (+5 V) levels of LED R signal.
<b>F и V</b>	Set Low (0 V) and High (+5 V) levels of LED G signal.

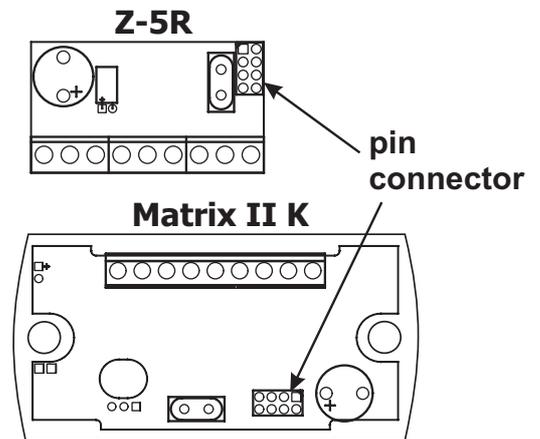
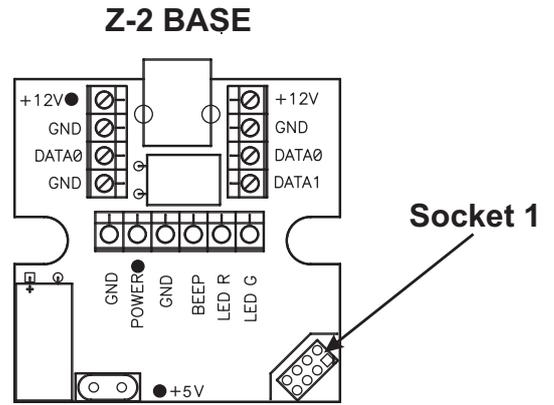
**Note:** Control commands may change if the firmware is changed.

## 7. PROGRAMMING VIA SOCKET 1 CONNECTOR

To work directly with standalone controllers' memory, this adapter has a connector called Socket 1. The Socket 1 connector provides power to the connected controller and enables the data interchange with its memory by means of BaseZ5R software.

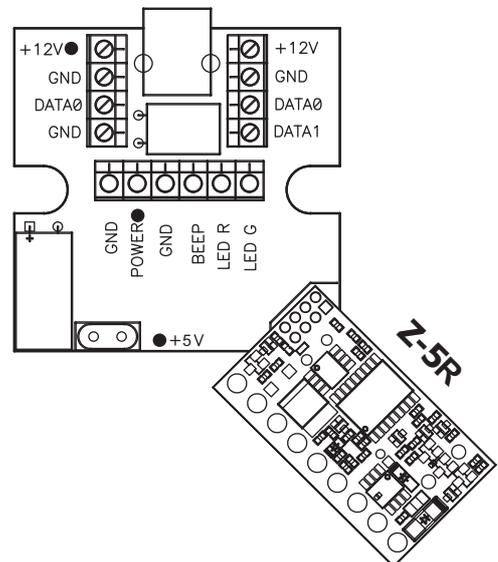
The Socket 1 terminals have a life of about 200 connections. Best practice is to fit an additional connector to the Socket 1, or use it only when it is impossible to program the controller via DATA0 and GND terminals.

Both Z-5R and Matrix-II K controllers have a symmetric service pin connector for adapter connection via Socket 1.



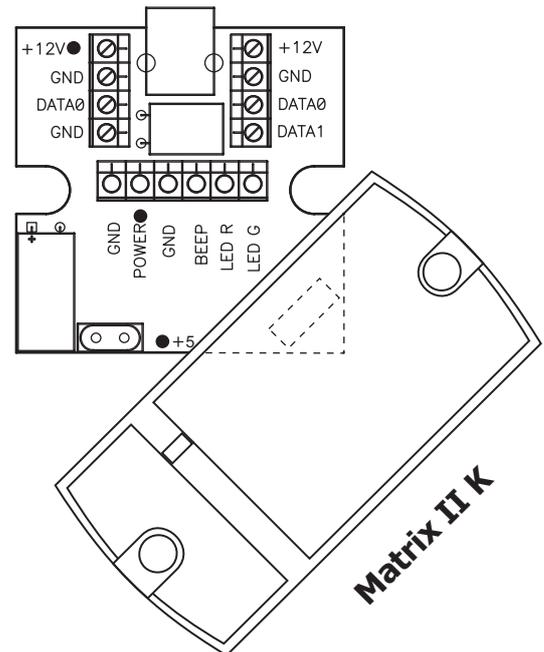
### 7.1. Connecting a Z-5R.

The Figure shows how to connect a Z-5R controller to this adapter. Connection is possible at any time.



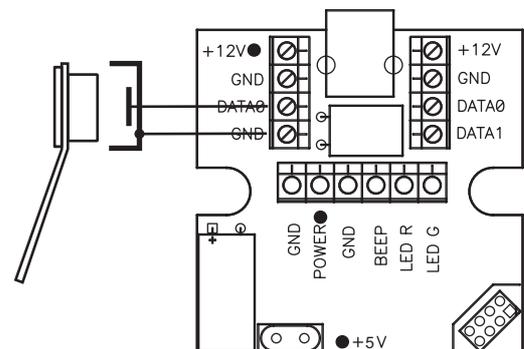
## 7.2. Connecting a Matrix-II K.

The Figure shows how to connect a Matrix-II K controller to this adapter. Connection is possible at any time.



## 7.3. Working with a DS1996L-compliant Key

To work with a DS1996L-compliant key, connect a contactor as shown on this Figure. Information interchange with the key requires the BaseZ-5R software.



## 8. CONNECTING A READER

The adapter allows connecting a reader and using it to feed card serial numbers into a PC. Connection is done to the terminals. Terminals with the same name are internally joined within the adapter and allow connection to any of them.

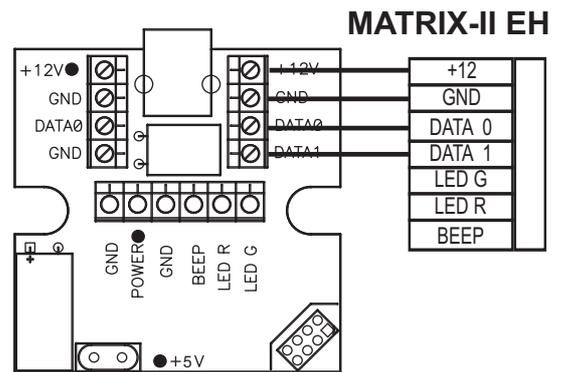
The reader can be powered by the adapter if its maximum consumption current does not exceed 150 mA. The adapter also automatically detects reader connection protocol iButton™ or Wiegand (whose bit width is auto-detected, too).

Information about successfully acquired codes is transmitted into a COM port in a specified text-based format, which can be set by Format.exe utility found in the drivers distribution archive.

A connected reader does not preclude normal Socket 1 operation. This means it is possible to make any exotic card type reader into desktop-based.

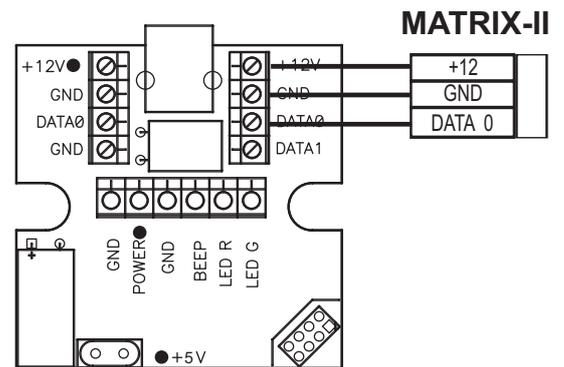
### 8.1. Via Wiegand protocol

Here is an example of how to connect a reader via Wiegand protocol. The reader is powered from the adapter. When a code is transmitted (once) by the adapter, its check bits are verified to decide if transmission went OK.



### 8.2. Via iButton protocol

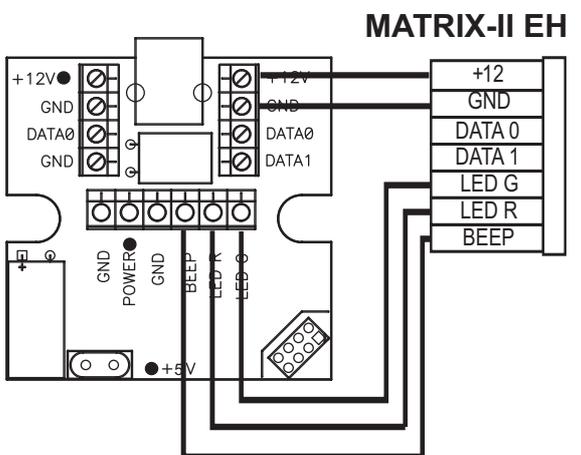
The figure below shows an example of how to connect a reader via iButton protocol. When the adapter detects the PRESENCE signal from the reader on iButton bus, the card code is read three times in a row by “Read ROM” (0x33) command. If all three reading results are the same, the code is deemed to be successfully acquired.



### 8.3. Controlling LEDs and sound

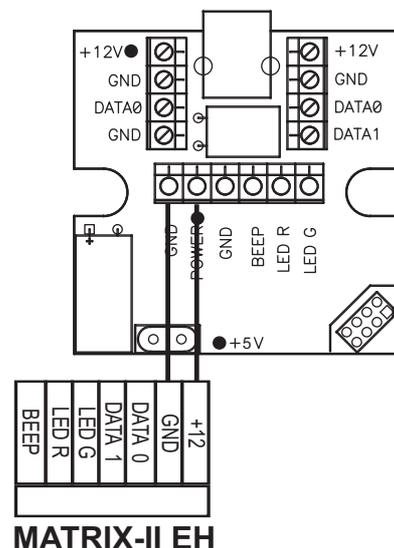
If corresponding signals are connected to the adapter (as per the Figure below), it becomes possible to manage the reader audial and visual indication by COM port commands (as per p.4 above).

All indication control signals have 5 V level.



### 8.4. Controlling reader power

When reader power is connected to POWER terminal, it becomes possible to turn it on and off by the COM port commands. (as per p.4 above). Please remember that maximum total current of all 12 V devices, including those connected to POWER terminal, cannot exceed 150 mA.



## 9. CONNECTING IN KEYBOARD EMULATION MODE

To set an adapter into keyboard emulation mode, use Prg\_RDAI1.exe software to load USB\_HID\_Vxx.rom custom ROM into the adapter. The necessary files are located in the drivers distribution archive.

When the custom firmware has been flashed, the PC operating system detects a new keyboard. Typically, to get information via COM Port, an application had to open it as an additional device and handle the data on its own. With keyboard emulation, the transferred information gets uploaded into operating system's keyboard buffer without using COM ports just like typing on a standard keyboard.

With a reader connected like that, an acquired card number can be automatically transferred straight into any application (such as Excel, Word, a browser etc.).

This method enables to enter card codes directly into active field of ACS software which does not support reader connections via a virtual COM port, or when working on a remote terminal. Also, this method enables converting any external card reader into a desktop-based one.

## 10. CONNECTING IN READER EMULATION MODE

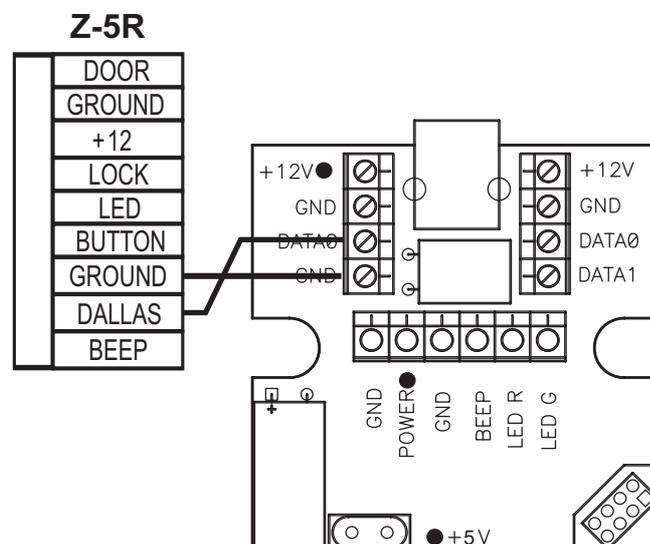
Note: The described below features are additional, and full operational compatibility with other devices is not guaranteed.

For example, under control of external software, the adapter can emulate a reader connected via iButton or Wiegand. This allows using a PC to initialise the memory of standalone controllers which lack the direct memory write capability.

Another example is using this adapter in a car park ACS. External automatic number plates recognition (ANPR) software is running on a PC with a connected video camera. The codes corresponding to car number plates are transferred by this adapter via iButton or Wiegand protocol straight into the controller operating the exit barrier.

More examples can be found on this adapter webpage at <http://www.ironlogic.me>.

An example of adapter connection to a controller in the reader emulation mode via iButton protocol is shown at the figure below.



## 11. MOUNTING

The adapter is designed for mobile use. In case where fixed use is required, e.g. if a reader is to be connected to it, the mounting box coming with the adapter, allows mounting the adapter on a flat surface. There are holes at the bottom of the mounting box for that purpose.

The adapter PCB compact size allows even installing it inside another external reader casing. In this case, however, please ensure that USB cable connector is somehow fixed in place, as there are no mounting bits provided for it.

## 12. PACKAGE CONTENTS.

Z-2 BASE Adapter .....	1
USB AB cable .....	1
Mounting box .....	1

## 13. OPERATIONAL CONDITIONS

Recommended air temperature: 5...40°C.

Humidity: ≤ 80% at 25°C.

If operational conditions are differing from described above, device specifications can deviate from specified values.

The controller is to be operated in absence of: precipitation, direct sunlight, sand, dust, water condensation.

## 14. LIMITED WARRANTY

This device is covered by a limited warranty for 24 months from the date of sale.

The warranty becomes void if:

- This Manual is not followed;
- Device has physical damage;
- Device has visible traces of exposure to moisture and aggressive chemicals;
- Device circuits have visible traces of being tampered with by unauthorised parties.

Under active warranty, the Manufacturer will repair the device or replace any broken parts, FREE of charge, if the fault is caused by manufacturing defect.



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.



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