

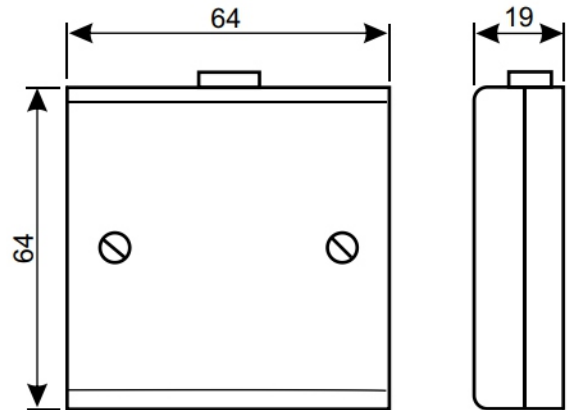
# Converter Z-397 Guard USB/RS-485 User Manual

## 1. GENERAL INFORMATION

**Converter Z-397 Guard USB/RS-485**, hereinafter referred to as Z-397 Guard USB/RS-485, is intended to connect the devices with interface RS-485 to a personal computer, using a USB interface.

### PRODUCT FEATURES:

- 1) A galvanic separation unit up to 1000 V (USB interface line/RS-485 interface line) is provided to exclude the influence of pulse interference exerted by a PC power supply unit on devices connected to the PS and vice versa;
- 2) Connection to the PC and power supply via USB;
- 3) Operation via a virtual COM-port;
- 4) Automatic identification of information exchange speed;
- 5) Automatic identification of transmittance direction: in the initial condition the converter is waiting for data both from the connection channel and from the PC. In case of simultaneous transmittance, the PC will prevail. Transition from the transmittance condition to the reception status on any speed does not increase 5 microseconds after transmittance of the last stop-bit in the data package. Controlling the transmittance direction via RTS is ignored and does not influence upon operation of the converter;
- 6) Existence of **jumpers** (two groups of jumpers):
  - The first group of jumpers is located near the USB outlet and is intended to select one of four operation modes which will be described below.
  - The second group of jumpers is located near the RS-485 outlet. In the ON position, a load resistor 120 Ohm is connected to AB lines to suppress echo if the converter is connected the **last** in the circuit.



### Special Abilities

Support of the network controller Z-5R Net and combined reader/controller Matrix II Net. In specific modes, this converter allows you to detect and adjust IP addresses of the above devices using any terminal programme. In addition, you can set the time in controllers and read events. Moreover, it significantly facilitates the primary network initialization due to automatic fixing of conflicting IP addresses and recording unknown cards in controllers.

## 2. CONNECTION USING RS-485

The RS-485 interface allows you to connect up to 256 devices per line, where only one twisted pair cable is used for connection. For that the half duplex mode of connection had to be abandoned, i.e. only one device can transmit information, the others only listen. The case where two or more devices transmit cannot be identified by these devices, as, for example, it is made in CAN or Ethernet interfaces. For this reason, all communication protocols are built on the package principle of transmittance with confirmation of information received.

When connecting devices using the RS-485 interface, you need to consider the following:

- 1) All devices must be connected using the line configuration, i.e. the cables must go from one device to another in turn.

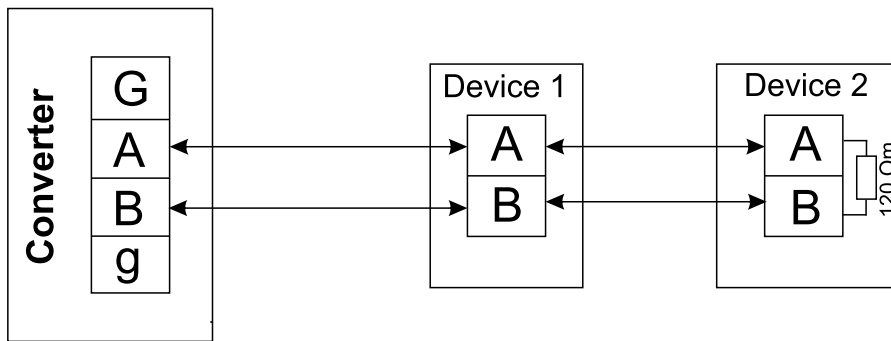
Various star or tree configurations are unacceptable (however, if it is strongly required and the distance is small, up to 30 m, you may risk, but remember – the interface in such a way is not required to work);

2) To connect the device, a twisted pair cable must be used (for example, the blue wire from cable 5 is connected to “A”, and the blue-and-white to “B”; if the cable is screened, it must be connected to “G” or “g”);

3) For correct interface operation you need to install two terminal resistors of 120 Ohm on both line ends. They need to dampen echo. This is crucial for long lines. If the converter is in one end of the line, than, to connect the resistor just switch the switcher 4 to the ON position.

4) In case of connecting a lot of devices (more than 20), you should locate them at approximately the same distance from each other. Also, do not forget that the maximal length of the line is 1200 m;

5) Although the interface can physically and with software serve 255 devices, it is not recommended to use it up to the limit. If you need a long connection line you should minimise the number of devices or at least locate them evenly. If there are a lot of devices, try to reduce the whole connection line length.

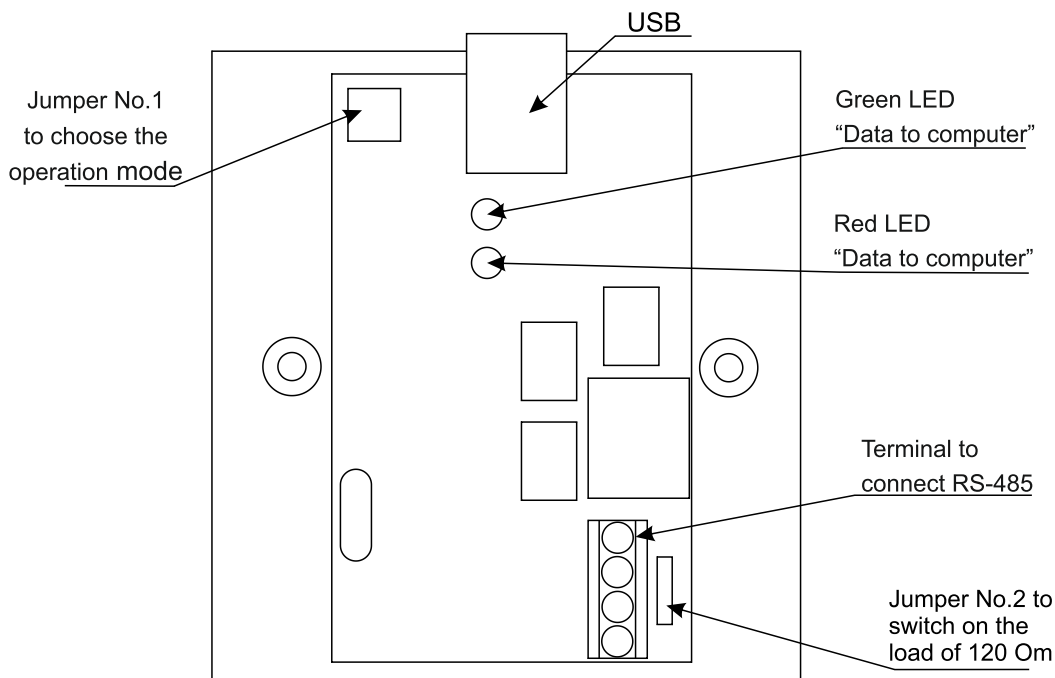


Connections diagram for devices using the RS-485 interface.

### CONNECTION USING USB

This converter is connected to the computer via a free USB-port by the AB cable supplied in the package. The major benefits of such a solution are:

- 1) At present, practically all computers have installed USB-ports;
- 2) USB-ports connect hot plugging, i.e. you can plug in and plug out such devices without witching the computer off;
- 3) USB-ports provide the plugged devices with power supply (up to 500 mA);
- 4) All USB devices support the Plug-&-Play standard, which make it possible to install required drivers almost automatically (you just need to insert the disk and follow the operation system instructions).



## Driver Installation

After first connection of the converter to the computer, the Windows operation system will find a new device. It happens not at once, but takes no more than 30 sec. If no message on finding the new device appeared within a minute, than Windows knows this device and required drivers are already installed. After appearance of a message on a new device, to install a driver, you should install the disk supplied in the package to the CD driver and specify it as a location for searching drivers. Windows, when identifying the drivers, will offer to install them. You should agree. When installing drivers in Windows XP you will get a message on the lack of Windows certificated for tested compatibility. In this event, you should offer installation. There will be two of such messages, since at first the installation of the driver for USB will be made and then the installation of the driver of the virtual COM-port.

## Port Searching

Since the logic of distribution of COM-ports in Windows is not described anywhere, therefore all the below information will be based on the practical experience.

It was established, that Windows reserves names from COM1 to COM127, and COM0 as a limit, for each new virtual port. The assigned number is linked to the USB device and then never released. Thus, if the computer has only two physical COM-ports: COM1 and COM2, the new port will not have to be COM3.

For exact identification of the number, where the converter is connected to the computer, you should:

1. Click with the right mouse button on the "My computer" icon and then choose in the appeared menu the most bottom item "Properties".
2. Press the button "Device Dispatcher" in the appeared window.
3. Click with the left button on plus against the group "Ports (COM and LTP)".
4. Find the device number in the group opened.

Attention! Some programmes cannot open ports with the numbers of more than 8. In this event, click with the right mouse button for the context menu to this device and choose the item "Properties". In the appeared window, move to the "Port Setting" tab, press the "Advanced" button on it and assign the necessary port number. This number should be specified in connection programmes which work with the devices. No need speed adjustment. The converter will operate on the speed, which the connection programme sets for the port.

## 3. OPERATION MODE

The required operation mode of the converter is set with moving the jumper No.1 to one of four positions.

The correspondence of the position to the mode is specified on the converter board.

### 3.1. Standard Converter Mode - "NORMAL"

The mode of the ordinary RS-485 converter. Automated identification of transmittance speed and direction. Indication of transmittance direction.

### 3.2. Network Verification Mode - "TEST"

Controller network verification mode. This converter mode allows you to verify and adjust the network on the basis of the Z-5R Net network controller and Matrix II Net combined reader/controller.

To work in this mode you need to open the converter port with any terminal programme, for example, Hyper Terminal, and adjust the following connection parameters:

Speed.....230400  
Data bits.....8  
Even parity.....No  
Stop-bits.....1  
Flow regulation.....No

**Entering all the commands must be completed with pressing the "Enter" button.**

### "Info" Command

After connecting the converter, go the computer in order to verify the connection, you need to give the identification command "1". In case of correct connection, the following information will display in the terminal programme window:

**The converter gives an answer to this programme in any model.**

### **“Time” Command**

It allows you to set the time in controllers.

Examples of commands:

T – Time request

T 12:30:00 – Setting the time only

T 21-01-09 – Setting the date only

T 12:30:00 21-01-09 – Setting both the time and the date.

Time is 0:00:00 0-00-00 - Time and Date not setup

Time is 12:30:00 21-01-09 – Date and Time

After any command, if the time and date are setup, the clock synchronisation of all know controllers with the time in the converter is fulfilled (see the “Scan” command).

### **“Scan” Command**

It allows you to find connected controllers.

Command example:

S – Scan the RS-485 line

During scanning, the controller finds controllers. If their network address was already met or is located out of 2015 range, it re-assigns them to the first free network address.

Command result:

```
Scan start  
Net addr = 4, Serial number = 139, type - Z5R-Net  
Net addr = 6, Serial number = 151, tupe - Z5R-Net - NEW  
Net addr = 7, Serial number = 132, type - Matrix-II-Net - REMOVED
```

The additional message “NEW” means that the controller has been detected at the first time, while the message “REMOVED” means that the controller has not been detected and will be deleted from the list.

### **“Ctrl” Command**

It displays additional information about controllers detected.

Command example:

C – Display information about all controllers detected.

C4 – Display information on the controller with the network address 4

Command result:

```
Net addr = 4, Serial number = 139, type - Z5R-Net  
Door times (*0.1s): open lock 30, wait open 0, wait close 0  
Timezone1 from 00:00 to 23:59 days-7F  
Timezone2 from 00:00 to 23:59 days-7F  
Timezone3 not active  
Timezone4 not active  
Timezone5 not active  
Timezone6 not active  
Timezone7 not active  
Cards use 11 from 2024
```

### **“Event” Command**

It displays the list of events for one or all controllers.

Command example:

E – Display all new events for all controllers detected

E4 - Display all new events for the controller with network address 4

Command result:

**Ctrl 4 SN(139) Pnt[2480:2480] 0 events.  
 Ctrl 6 SN(151) Pnt[17A8:17B8] 2 events.  
 Ctrl 6 EVENT[17A8] 23/02 19:28:51 {00}Door 0. Open by button  
 Ctrl 6 EVENT[17B0] 23/02 19:28:51 {10}Door 0. Passage was  
 Ctrl 7 SN(132) Pnt[00D8:00D8] 0 events.**

**“Adr” Command**

It allows you to change the controller's network address.

As the first parameter, the serial number of the controllers is specified, and as the second parameter – the new network number. The new address must fall within the limits 2-105 and be vacant.

Command example:

A139 33 – Assign the network address 33 to the controller with S/N 139.

Command result:

**Controller 139 change net address from 4 to 33.**

After the “Scan” command:

**Net addr = 6, Serial number = 151, type - Z5R-Net  
 Net addr = 7, Serial number = 132, type - Matrix-II-Net  
 Net addr = 33, Serial number = 139, type - Z5R-Net**

**LIST OF COMMANDS**

No.	Command	Description	Result
1	I(Info)	Request for information on converter	Information on the converter and licenses installed
2	T(Time)	Request/setup of date, time It allows you to setup time and date with different commands	Current time and date will be recorded to controllers during next event scanning
3	S(Scan)	Scanning RS-485, all addresses out of limits 2..33 will be reassigned automatically	Information on controllers detected
4	C(Ctrl)	Getting information for the specified controller or for all of them	Actual information about the controller
5	E(Event)	Requesting information for the specified controller or for all of them about new events	Displaying information on events
6	A(Adr) <b>A SN N</b> <i>SN – serial number N – new network address</i>	Setup the network address (N = 2..33) The new address must be free	Message on successful setup or failure reasons

### 3.3. Network Initialisation Mode – “ACCEPT”

This mode is purposed for the fast launch of the setup network without software installation on the computer. In this mode, the converter periodically scans the network aiming at searching controllers. For newly detected controllers, it setups the network address. Then it reads events. When detecting in the events an attempt to access using an unknown card, it the writes the number of this card to the controller, and after that it sends a distant command to open the door. The operation control of this mode is possible using the terminal programme.

```
Scan result {}
Scan result {}
Scan result {2,6,7}
Ctrl 2 EVENT[2488] 23/02 19:28:51 {05} Door 1. Open by key
num [1] Ctrl 2 EVENT[2490] 23/02 19:28:51 {11}Door 1.
Passage was
Scan result {2,6,7}
Scan result {2,6,7}
Ctrl 6 EVENT[1548] 23/02 19:28:55 {02}Door 0. Unknown key
[1901] 162,32936
Card success added.
Ctrl 6 EVENT[1550] 23/02 19:28:55 {08}Door 0. Open by
network
Ctrl 6 EVENT[1558] 23/02 19:28:55 {10}Door 0. Passage was
Scan result {2,6,7}
```

Connection parameters – same as for the **TEST** mode:

Speed.....230400  
Data bits.....8  
Even parity.....No  
Stop-bits.....1  
Flow regulation.....No

In this mode, all events are displayed automatically, which happened in controllers. Also, there is a capability to setup the time by the “Time” command (see the “TEST” mode).

### 3.4. Software Support Mode – “ADVANCED”

This mode is purposed for the converter to operate under specific software. In this mode, the converter implements a number of functions increasing software reliability and provides license protection.

## 4. SPECIFICATIONS

Maximal length of the connection line, m, up to:

- using RS-485 protocol.....1200  
- using USB protocol.....1.8  
Operation mode indication:.....LED  
Receipt/transmittance speed, Bod, up to:.....115200  
Computer connection interface, power supply:.....USB  
Case material.....plastic  
Dimensions, mm.....64x64x19  
Weight, g, up to .....80

## 5. PACKAGE CONTENTS

- Converter Z-397 Guard USB/RS-485... 1 pcs.
- USB-cable A-B.....1 pcs.
- CD with Windows drivers.....1 pcs.
- User Manual.....1 pcs.

## 6. OPERATIONAL CONDITIONS

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

## 7. LIMITED WARRANTY

Device is covered by limited warranty for 24 months.

The warranty becomes void if:

- this Manual is not followed;
- device has physical damage;
- device has visible traces of aggressive chemicals exposure;
- device circuits have visible traces of tamper by unauthorized parties.

While covered, the Manufacturer will repair the device or replace any broken parts, free of charge, where fault is caused by manufacturer's defect.

Product lifetime – 6 years.

## 8. CONTACTS

### Authorized representative in the European Union:

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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.

