ZS12x0, ZS USB PDU

User Manual

2.0, Apr 2025

ZILOGIC

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Chapter 1. Revision History

Revision	Date	Comment
1.0	1 April, 2025	Initial Revision.
2.0	17 April,2025	Updated usermanual for PDU8

Chapter 2. Introduction

The USB PDU comes in two variants: USB PDU 4 port and USB PDU 8 port

The USB PDU 4 port is capable of switching on/off one or more of the 4 power ports according to the serial command provided.

The USB PDU 8 port is capable of switching on/off one or more of the 8 power ports according to the serial command provided.

The PDU monitors and displays the total current consumption on a seven-segment display.

2.1. Applications

- Remote Power Control
- Test Automation of Embedded Systems
- Kill Switch in Robotics Applications

2.2. Operation

The USB PDU is detected as a USB2.0 serial device when connected to a PC. It has built-in command engine that accepts commands via the USB serial interface. Based on the input command, the PDU switches on/off any one or more of the 4 or 8 power ports in USB PDU. Both PDU monitor the power consumed by the relay using power monitor and display it in the seven segment display.

2.3. Specification

Parameter	Value
Output Power Sockets	4 or 8
Power Supply	240VAC, 15A
Fuse Rating	15A
Power Socket Maximum Current	13A
Total Load Capacity	3kVA
Relay Switching Life Expectancy	50,000
Maximum current sensing Range	15A
Control Port	USB2.0 Type-B

2.4. Ordering Information

2.4.1. ZS1220

- Product Name: ZS1220, 8 port USB PDU
- Part Number: ZS-PDU8-USB-P1B

2.4.2. ZS1221

- Product Name: ZS1221, 4 port USB PDU
- Part Number: ZS-PDU4-USB-P1B

2.5. Package Contents

2.5.1. USB PDU 4 Port

- PDU unit
- 15Amps Power cord
- USB2.0 Type-B cable

2.5.2. USB PDU 8 Port

- PDU unit
- 15Amps Power cord
- USB2.0 Type-B cable

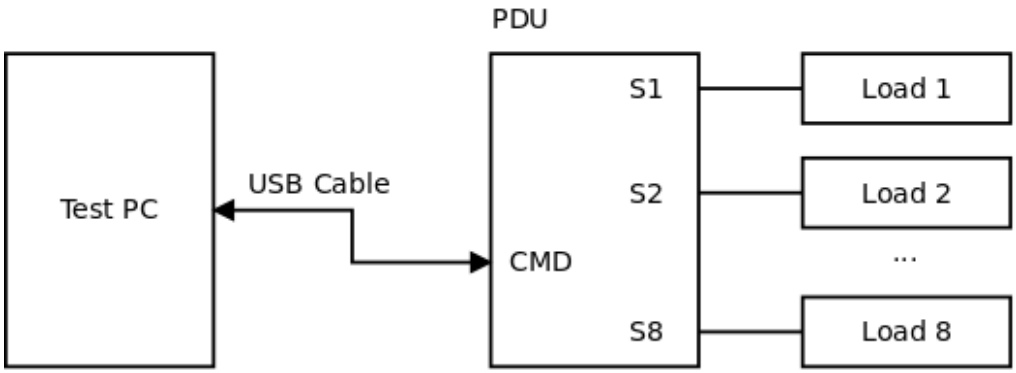
Chapter 3. Device Usage

The USB PDU is detected as a USB serial device in the PC and it helps the PC to communicate and control this module seamlessly. The Connection details, Serial port settings, power monitor and the list of available commands are discussed in subsequent sections.

3.1. Hardware Setup

The following diagram shows an example of a hardware setup. Here a test PC is connected to the PDU using a USB cable . The PDU is powered from a 15Amps power socket.

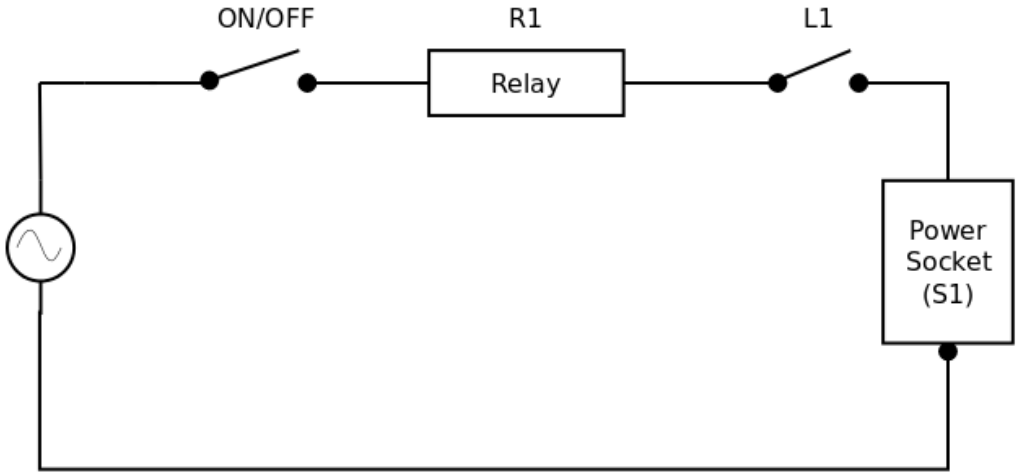
Figure 3.1. Hardware Setup



3.2. Functional Block Diagram

The following diagram shows the schematic of the connection between the power supply, switches, relay and output power socket for a single port. A switch `In` is provided for each port, that can be used to turn-off individual ports independently for emergency purposes.

Figure 3.2. Functional Diagram



3.2.1. USB Interface

- Power up the USB PDU using the 240VAC/15A supply.
- Plug the USB Type B cable from the USB PDU to the control interface (ie., PC) it will get detected as a USB Serial Device.

- In Windows OS, the device can be found as COM port under [Ports (COM and LPT)] section of device manager. If the device is not detected properly, the driver can be downloaded from the site http://www.ftdichip.com/Drivers/VCP.htm

3.3. Power Monitor

- The PDU has a built-in power monitor. The RMS current measured is provided through a seven segment display. The display provides a feedback to prevent overloading of the PDU.
- The current measured is also available through the `PM` serial command.

3.4. Serial Port Setting

In order to establish serial communication between the PDU and the control PC, the following parameters has to be set accordingly.

Parameter	Value
Baud Rate	115200
No. Bits	8
Stop bit	1
Parity	No
Flow Control	No

3.5. Command Line Interface

The USB PDU is designed to accept requests through serial commands from the control PC.

- Each command should end with `CR` `LF` (`\r\n`).
- Device will respond back with the `OK` on success, `ER:<msg>` on failure.
- Commands are case-insensitive.
- The available commands are listed below.

3.5.1. Version

The `V` command can be used to retrieve the firmware version of the device. An example command and response is shown below.

```
V\r\n
1.0.0
OK
```

3.5.2. Power Command

The `Ps` command can be used to check whether the USB PDU is powered on or off. An example command and response is shown below.

```
Ps\r\n
ON/OFF
OK
```

3.5.3. Write Command

The `W<hex>` command can be used to control multiple ports simultaneously. The ports to be turned ON / OFF should be provided as single byte argument, in hexadecimal format. Bit N in the

byte corresponds to port (N+1). If the bit is 0, the corresponding port will be turned OFF, if the bit is 1, the corresponding port will be turned ON.

```
W55\r\n
OK
```

3.5.4. Read Command

The `R` command can be used to read the status of the power sockets in the USB PDU. The status of all the ports is returned as a single byte in hexadecimal format. Bit N in the byte corresponds to port (N+1). If the bit is 0, the corresponding port is OFF, if the bit is 1, the corresponding port is ON. An example command and response is shown below.

```
R\r\n
55
OK
```

3.5.5. Set Command

The `S<port_no>` command can be used to turn on a single port that is specified in the command. The `<port_no>` should be in the range of 1 to 4 / 8 to turn on the ports 1 to 4 / 8 respectively. To turn on all ports, `Sa` command can be given. An example command and response is shown below.

```
S1\r\n
OK
```

3.5.6. Clear Command

The `C<port_no>` command can be used to turn off a single port that is specified in the command. The `<port_no>` should be in the range of 1 to 4 / 8 to turn on the ports 1 to 4 / 8 respectively. To turn off all ports, `Ca` command can be given. An example command and response is shown below.

```
C1\r\n
OK
```

3.5.7. Power Measurement Command

The `PM` command can be used to read the total current consumed on all the sockets. The response indicates the RMS current consumed in mA. An example command and response is shown below.

```
PM\r\n
1800
OK
```

3.6. Sample Python Code

The serial commands specified above can be given through Python, using the `pyserial` package. Follow the instructions in https://github.com/pyserial/pyserial to install the `pyserial`.

The `serial` module can be imported, as shown below.

```
import serial
```

Serial communication can then be established with the specified serial port settings.

```
ser = serial.Serial('/dev/ttyUSB0', 115200)
```

Now, that the serial communication is established, the serial commands can be given to the PDU.

For instance, to turn on port 1, the command can be given as shown below.

```
ser.write(b'S1')
ser.write(b'\r\n')
```

Similarly, to turn off port 1, the command can be given as shown below.

```
ser.write(b'C1')
ser.write(b'\r\n')
```

Appendix A. Limited Hardware Warranty

The warranties provided by Zilogic Systems in this Limited Hardware Warranty apply only to Hardware Products you purchase for your use, and not for resale. The term "Hardware Product" means a computing device with a specific function and limited configuration ability.

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Zilogic Systems will attempt to diagnose and resolve your problem over the phone or e-mail. Upon determination of the hardware issue is related to a malfunction of one of the Hardware Product components, an RMA process will be initiated by Zilogic Systems.

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You agree:

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- To ship back the faulty Hardware Product (or replaceable unit) suitably packaged, quoting the RMA number, to the Zilogic Systems designated location.
- You shall ship the faulty Hardware Product once Zilogic Systems approves the RMA and provide the courier name and tracking number.
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