

Connecting to the Zikodrive ZDSPUART (ZDSPUARTUART) Via UART

(Firmware V1.0 for Zikodrive ZDSPUART)

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Introduction

This guide will help you get started with getting the Zikodrive ZDSPUART Driver running the V1.0 Standard Dosing firmware up and running through UART protocol. This guide does not go into details on installation of software nor does it go through the basics of serial protocol. Its intention is to get an engineer with all the basic knowledge up and running with the protocol quickly.

If you require additional information that is not included within this guide, please contact Zikodrive Motor controllers.

Required connecting cable to PC

The Zikodrive ZDSPUART requires a 0-5V TTL UART signal for the basic UART protocol to work. Any cables that meets this specification is acceptable however Zikodrive recommend the FTDI TTL-232RG part.

The wires labels required are:

GND

RX

TX

The remaining wires (if any) should be taped back and kept out of the way. It is the responsibility of the user to ensure connections between these three wires and the Zikodrive ZDSPUART box header.

The Drivers for the cable should auto install, if they do not they can be found on the FDTI website (<http://www.ftdichip.com/FTDrivers.htm>).

Software download

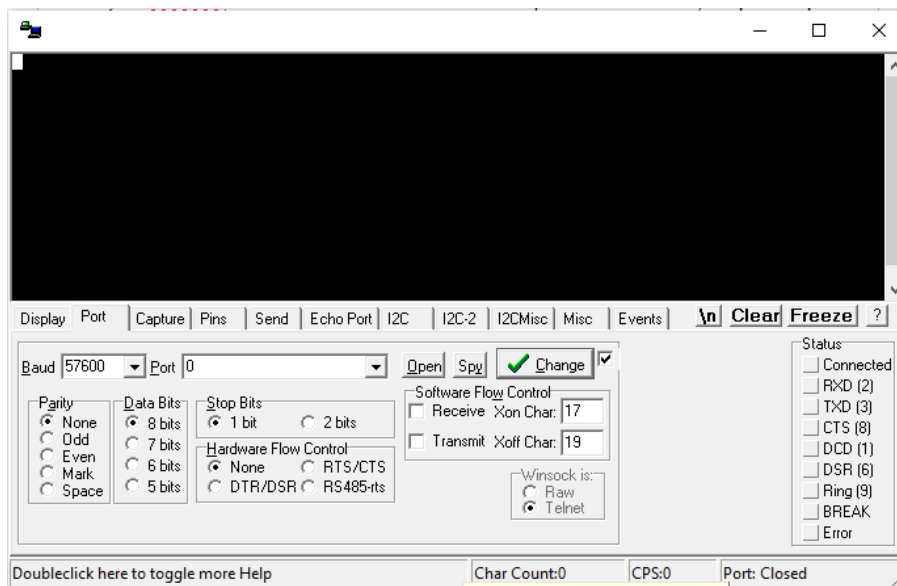
Any terminal software that has the capability of transmitting and receiving serial data in either a binary or a Hexadecimal format is acceptable. However throughout this guide we will be utilising a free software called Realterm. The software download can be found here (http://sourceforge.net/project/showfiles.php?group_id=67297) and additional information on the software can be found here (<http://realterm.sourceforge.net/index.html#downloads> Download).

Software set up & Test

Once installation has completed and all the drivers for the FTDI cable have successfully been installed, the Realterm software can be started. The first objective is to ensure your port is open.

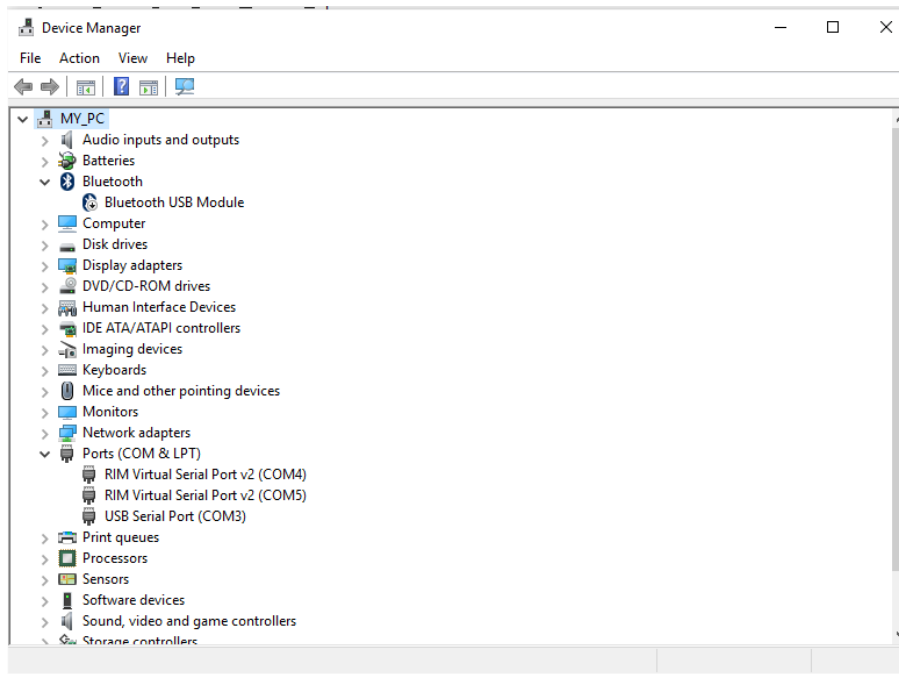
Opening the Port

Click the Port TAB just below the black screen, you should see the screenshot shown below:

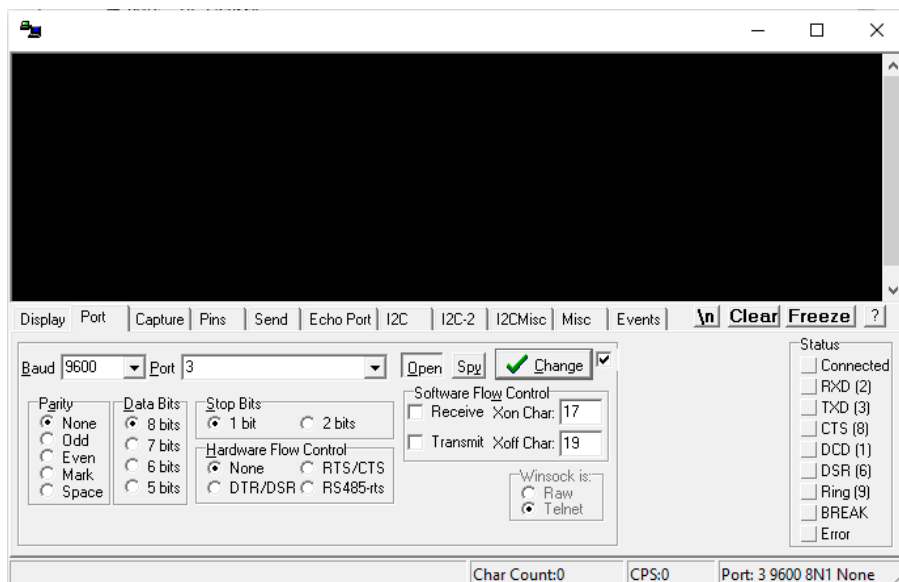


Please make the following changes:

- Change the Baud rate to 9600
- Select your Port, now this depends on which USB port you plugged your FTDI cable into. If your drivers were successfully installed rescan all the ports. If the Port is still not found you will need to access the Ports via your PC's device manager to find the correct one. You can see on the screenshot below that this one is connected to COM3.



- Leave the other options as default (Parity – None; Data bits – 8; Stop bits – 1; Hardware flow control – None; and leave software flow control boxes unchecked).
- Once all these options are correct, press the “Open” button to open the com port. Once done you should see a screen like this:



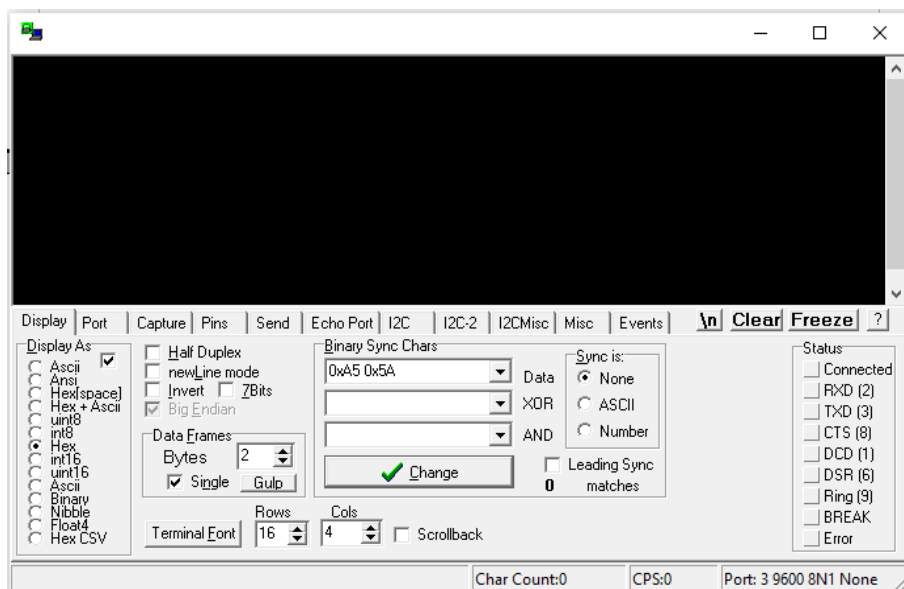
Please note in the bottom right hand corner, the port saying that it is open along with all its parameters “3 9600 *N1 None”.

Setting up the display

To ensure that we can read the code returned from the Zikodrive ZDSPUART driver back to us, we need to ensure that the display is showing the in the correct format. To do this, click on the “DISPLAY” TAB on the far left and make the following changes:

- Display as “Hex”
- Data Frames Bytes = 2 (it will not let you have one for some reason)
- Check the box saying “single”
- On the Binary Sync Charts the drop down menu choose the “0xA5 0x5A” option.

Your screen should now look like this:



Once the port is Open and all the settings have been updated, we can move onto testing the software and FTDI cable.

Testing the software and FDTI cable

Before we connect up to the Zikodrive ZDSPUART driver, a quick transmit and receive test can be completed by shorting our the RX and the TX pins (yellow and orange on the FTDI TTL-232RG cable).

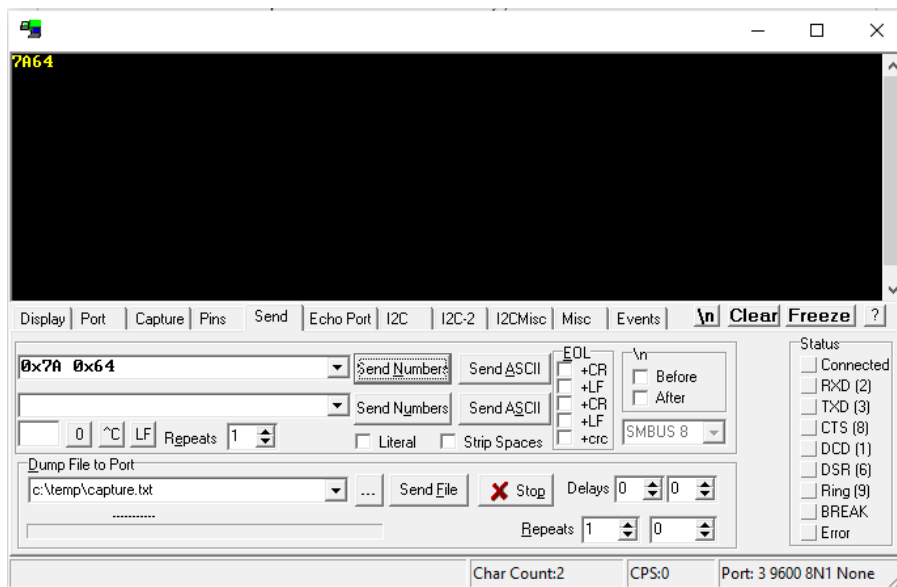
Click on the “SEND” TAB just under the black screen.

In the top Text box we can now write a test Hexadecimal serial string. For example:

```
0x7A 0x64 //Ascii code for zd//
```

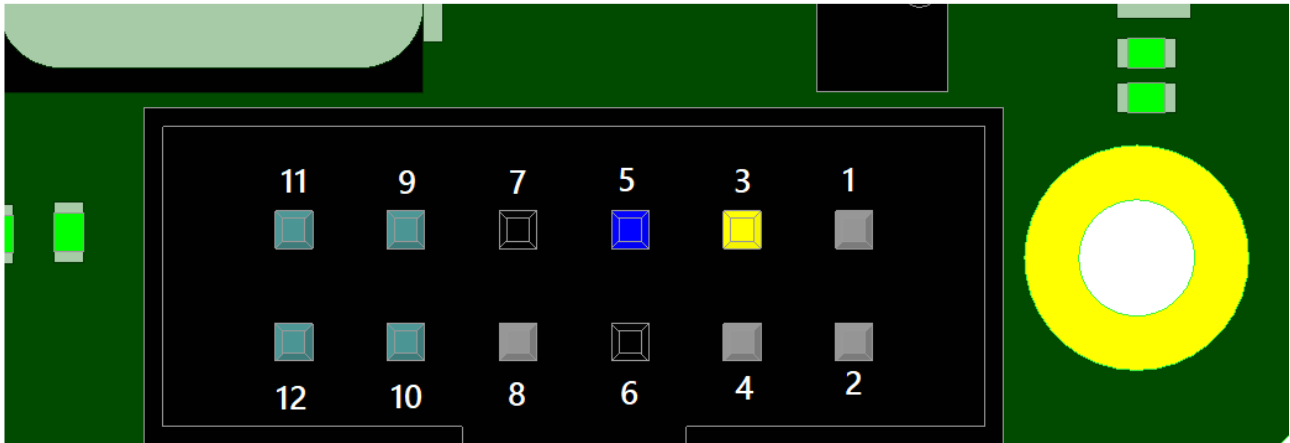
Always ensure a space is left between each byte.

If all the setup is correct and the RX and TX wires are shorted together, once you press the “SEND NUMBERS” button you should see 7A64 displayed on the top right hand corner of the black screen as in the screen shot below:



Zikodrive ZDSPUART connections to UART

When connecting to the Zikodrive ZDSPUART, you need to ensure that the TX (transmit) from the FDTI cable goes into the TX (receive) of the Zikodrive ZDSPUART.



5	=	RX	//Connected to TX of FDTI cable//
3	=	TX	//Connected to RX of FTDI cable//
7/6	=	GND	//Connected to GND of FDTI cable//
12	=	Repeat Run,	Connect to GND to repeat the last setting.

The UART Protocol

The protocol used is non-standard and has been developed by Zikodrive to provide a fast and efficient data transfer. This is the most basic variation of the protocol and is not intended for use in electrically noisy environments or safety critical applications.

The Data is transmitted and received in 8bit Bytes in a binary which we will displayed in a Hexadecimal format. To easily transition between decimal, and hexadecimal you can either use the programmer mode on the PC calculator, or use an online 'translator' programme (for example <https://www.mathsisfun.com/binary-decimal-hexadecimal-converter.html>).

All values are sent through to the Zikodrive ZDSPUART controller in one packet of data (a stream of bytes), starting off with the Speed (2 bytes), the number of revolutions (2 bytes) the acceleration/deceleration (1 byte).

Whenever a parameter is sent with two or more bytes the most significant byte (MSB) must be sent through first.

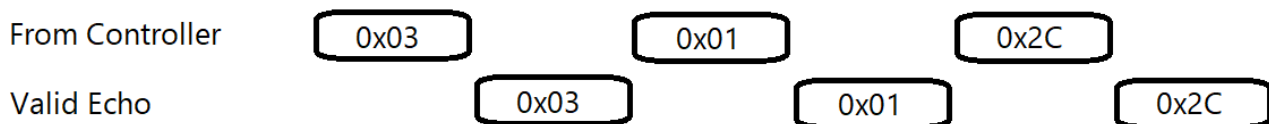
Each parameter is assigned a register in the ZDSPUART memory. 0x03 is assigned to the Speed, 0x07 is assigned to the Revolutions and 0x0F is assigned to the Acceleration/Deceleration.

To ensure the correct data is been transferred, the protocol works off an echo system where every byte accepted by the Zikodrive ZDSPUART will echo the stored value back to the controller.

Changing the Speed setting

The speed is the first set of parameters that need to be sent within the packet. So as if a speed of 300 is to be sent, the protocol would be as follows.

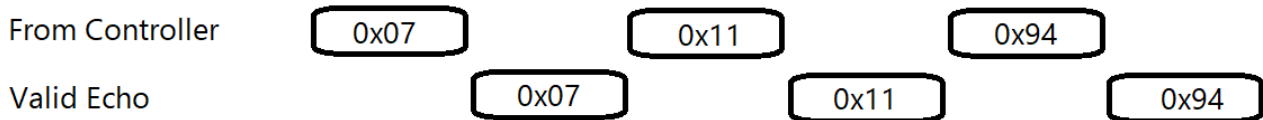
300 in decimal gives a value of 0x01 0x2C in hexadecimal (using programmer calculator or [Website](#)), and we know the register is 0x03 so Protocol will start with:



Changing the Revolutions setting

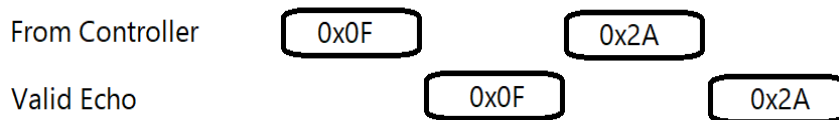
Each digit on the revolutions setting is equivalent to 1/10 of a revolution. So say we wanted to rotate the motor 450 revolutions we will need to send value of 4500 to the Zikodrive ZDSPUART.

4500 in Hex gives 0x11 0x94 and the register value is 0x07, so the Revolutions part of the protocol goes like this:



Changing the Acceleration/Deceleration setting

Just the same as the Speed and Revolutions with the Register value of 0x0F. So



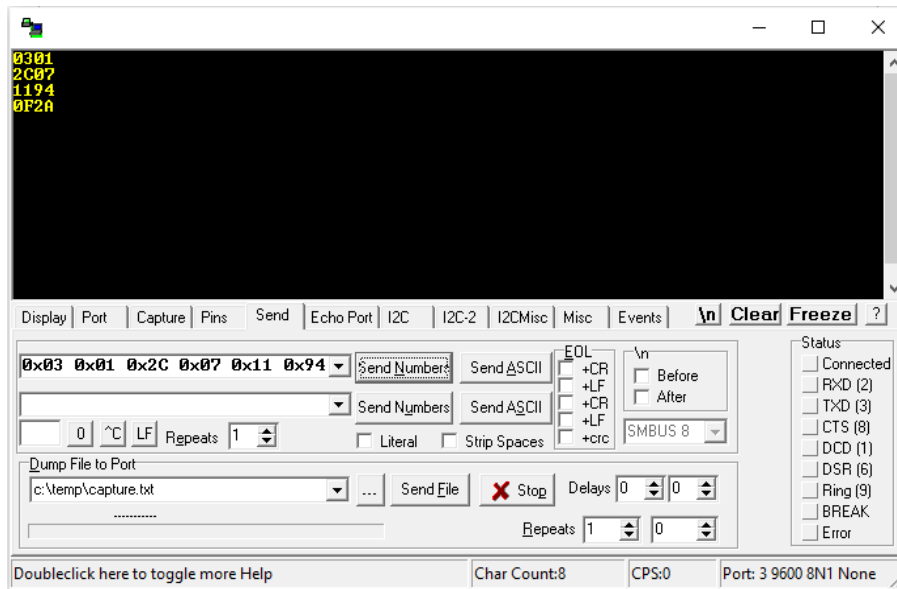
acceleration/deceleration value of 42 Hex value of 0x2A and the Data is as follows:

Combining the data packet

To combine all the values and registers we just put them together in on string starting from the speed and ending with the acceleration/deceleration.

From Controller	0x03 0x01 0x2C 0x07 0x11 0x94 0x0F 0x2A
Valid Echo	0x03 0x01 0x2C 0x07 0x11 0x94 0x0F 0x2A

When the data is sent, the following screen can be seen:



If you have any questions about using the ZDSPUART please visit www.zikodrive.com where you can contact our technical support team via online chat or phone.

Terms of Sale

All Zikodrive Motor Controllers are designed to be a component incorporated within equipment manufactured by our customers and are not suitable for use by an end user. As such, none of our motor controllers are CE marked. It is entirely the buyer's responsibility to ensure that all Zikodrive Motor Controllers and other related products meet the required specification and safety requirements for applications in which they are used.

The use of Zikodrive products in safety critical applications is entirely at the buyers risk, and the buyer agrees to defend, indemnify and hold harmless Round Bank Engineering Ltd from any and all damages, claims, suits, or expenses resulting from such use. Round Bank Engineering Ltd. is not responsible for injury or damage of any kind, including but not limited to, injury, death, damage, property damage/loss or any other type of loss which may arise in whole or in part from the use of Zikodrive Motor Controllers.

RETURNS

Subject to the terms provided herein, all returns for exchange, refund or credit must be made within fourteen (14) days from the date of delivery All questions or comments relating to returns should be sent directly to enquiries@zikodrive.com or by calling us direct on +44 (0) 333 123 7130.

In order to qualify for an exchange, refund or credit, the product must be in re-sellable condition, which shall be determined at Zikodrive Motor Controller's sole discretion. Factors affecting the re-sellable condition of a controller/motor/accessory include, but are not limited to: obvious signs of use or abuse; customer negligence; excessive wear and tear and/or damaged/missing product or parts.

Where it is determined, at Zikodrive Motor Controller's sole discretion, that the controller/accessory is, in fact, re-sellable, Customer will be given a full refund or credit for the product, less the cost of shipping. Customer should expect a refund within 30 business days of Zikodrive Motor Controller's receipt of the controller/accessory.

CUSTOM PARTS AND PRODUCTS DO NOT QUALIFY FOR REFUND OR CREDIT.

WARRANTY

Zikodrive Motor Controllers warrants to the original purchaser that any part of its controller/accessory purchased will be free of defects in workmanship and parts for a period of twelve (12) months from the date of delivery (hereinafter "Warranty Period"). During the Warranty Period, Zikodrive Motor Controllers will, at its option: (1) provide replacement parts necessary to repair the product; (2) replace the product with a comparable product; or (3) refund the amount Customer paid for the product upon its return.

Replacement parts or products will be new or serviceably used, comparable in function and performance to the original part or product, and warranted for the longer of thirty days for the US or the remainder of the warranty period. Any additional purchases or upgrades will not extend this warranty. This product warranty covers normal use only.

This product warranty does not cover damage caused during shipment and any damage caused by: actions that are beyond Zikodrive Motor Controller's control, including (but not limited to) impacts, fluids, fire, flood, wind, earthquake, lightning or similar disaster, war, lockout, epidemic, destruction of production facilities, riot, insurrection, or material unavailability; unauthorized modifications, attachments or peripherals; improper use, environment, installation or electrical supply; improper maintenance; any other misuse, abuse or mishandling.

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