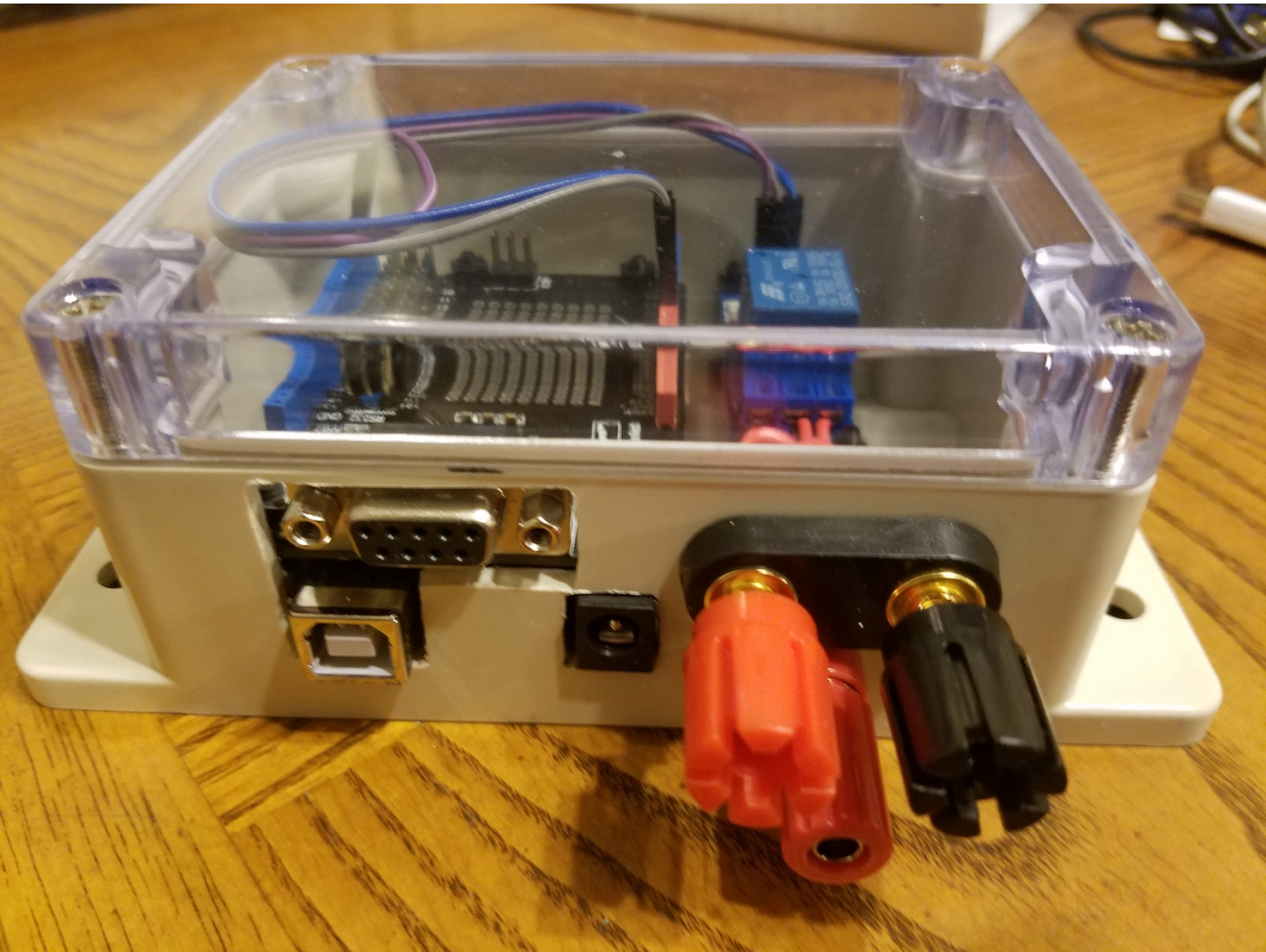


Remote Station Reboot Box (RBX)

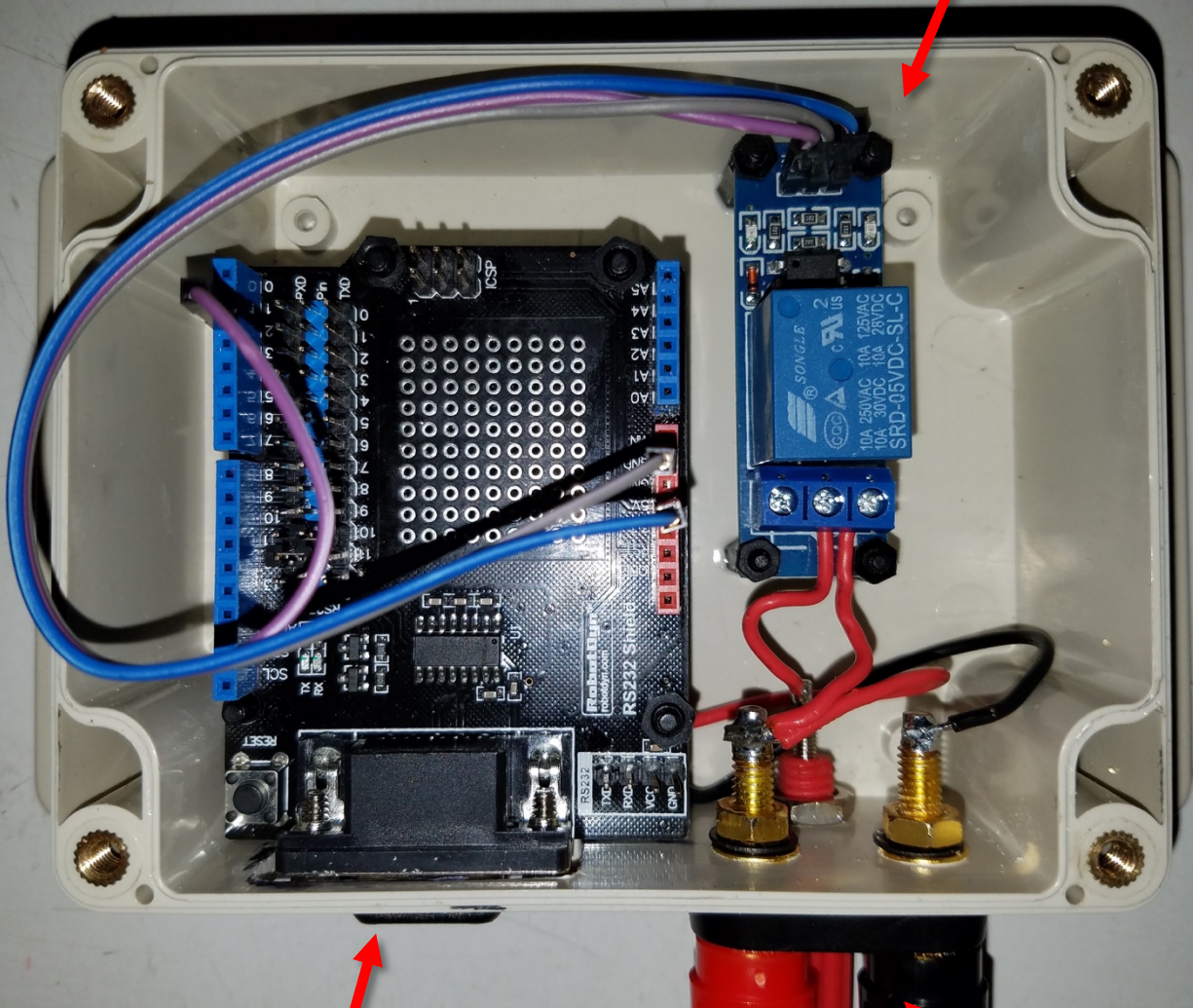
User Guide v0



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3/26/18

System Overview

Normally-Closed Relay Module



Arduino Uno R3 with
RS232 Shield for Serial
Connection to Cell
Modem

RBX Inserts Between
Battery and Power
Box to Interrupt
Station Power upon
Remote Command

Hardware Installation

1. Connect RBX's RS232 port to modem's serial port using null-modem cable with all flow control lines disconnected.

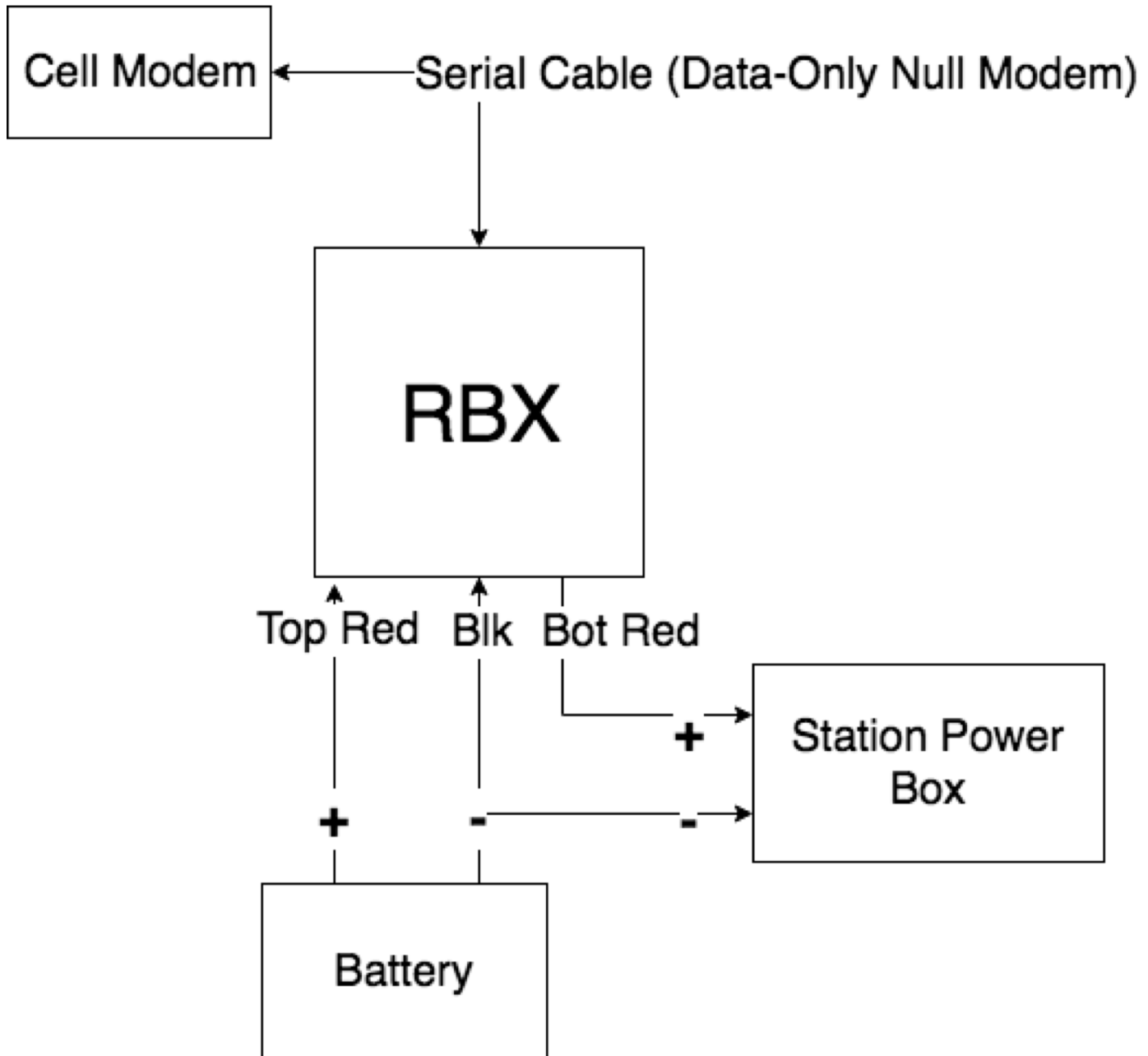


2. Connect top row red and black terminals to pos/neg posts of main station battery

3. Connect station power box positive input to bottom red terminal, and power box negative to the common (black) terminal at top right

Hardware Installation

(Block Diagram)



Modem Setup

1. To enable your modem to pass incoming UDP data through its serial port, just log into your modem's firmware on AceManager, go to the "Serial" tab and set parameters as follows. Then hit "Apply":

acemanager™ V4.0
AirLink Control Environment

SIERRA WIRELESS™

Help Logout

Upload | Download | Reboot | Refresh All

Status WAN/Cellular LAN VPN Security Services Report **Serial** Applications Admin

Last updated time : 03-29-2018 20:50:02

Expand All Apply Refresh Cancel

Port Configuration

MODBUS Address List

[-] Port Configuration

- ☐ **AT** Startup Mode Default Normal (AT command)
- ☐ **AT** Configure Serial Port 9600,8N1
- ☐ **AT** Flow Control None
- ☐ **AT** DB9 Serial Echo ON
- ☐ **AT** Data Forwarding Timeout 1
- ☐ **AT** Data Forwarding Character 122
- ☐ **AT** Device Port 5380
- ☐ **AT** Destination Port 53546
- ☐ **AT** Destination Address
- ☐ **AT** Default Dial Code TCP
- ☐ **AT** Host Authentication Mode NONE
- ☐ **AT** PPP User ID
- ☐ **AT** PPP Password

[-] Advanced

- ☐ **AT** Assert DSR Always
- ☐ **AT** Assert DCD Always
- ☐ **AT** Enable CTS Enabled
- ☐ **AT** DTR Mode Ignore DTR
- ☐ **AT** Quiet Mode ON
- ☐ **AT** AT Verbose Mode Verbose
- ☐ **AT** Call Progress Result Mode OFF

[+] TCP

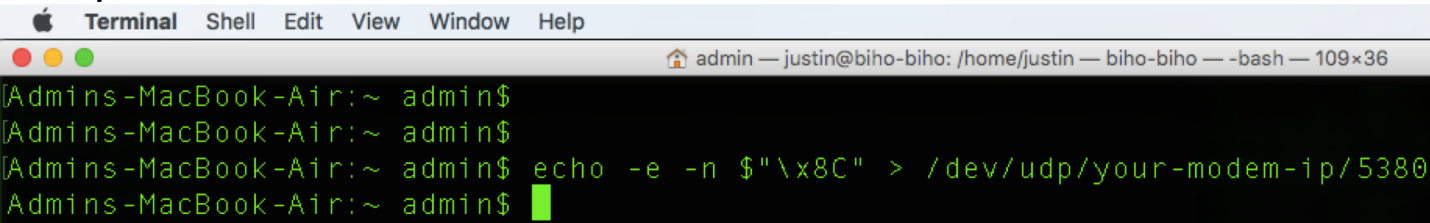
[-] UDP

- ☐ **AT** UDP Auto Answer Enable
- ☐ **AT** UDP Idle Timeout 0
- ☐ **AT** UDP Connect Last Set S53 to last IP
- ☐ **AT** Allow Any Incoming IP Allow any IP
- ☐ **AT** Allow All UDP Allow all
- ☐ **AT** UDP Auto Answer Response RING CONNECT
- ☐ **AT** Dial UDP Always Disable
- ☐ **AT** UDP Serial Delay 0

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Using the Box to Reboot a Station

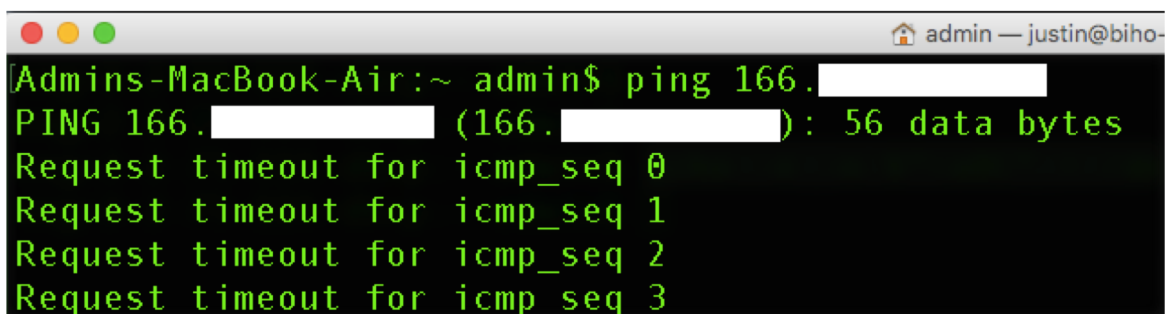
1. To reboot a station, simply send the hex byte “8C” (140 in decimal) to UDP port 5380 of the modem. On the bash terminal of any Mac you can do it like this:

A screenshot of a macOS Terminal window. The title bar shows 'Terminal' and standard window controls. The status bar at the top right indicates 'admin — justin@biho-biho: /home/justin — biho-biho — -bash — 109x36'. The terminal text shows a user at 'Admins-MacBook-Air:~ admin\$' entering the command 'echo -e -n "\$\x8C" > /dev/udp/your-modem-ip/5380' and pressing enter, indicated by a green cursor.

```
Admins-MacBook-Air:~ admin$  
Admins-MacBook-Air:~ admin$  
Admins-MacBook-Air:~ admin$ echo -e -n "$\x8C" > /dev/udp/your-modem-ip/5380  
Admins-MacBook-Air:~ admin$
```

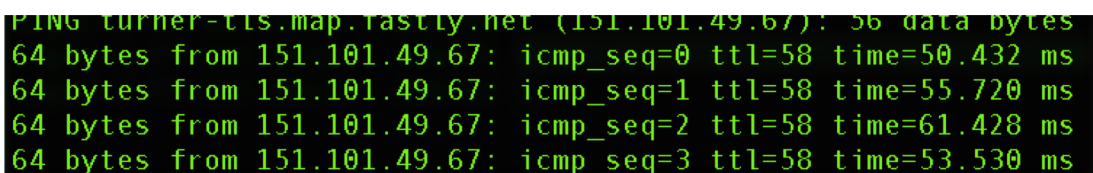
The “-e” flag tells echo to interpret “\x8C” as a hex byte, which tells the RBX it’s time to reboot your station.

2. Once you have sent the reboot command to the modem, the RBX will power off the entire station for 1 minute before powering it back on. To check to see if the RBX has done this, try pinging the modem IP address immediately. You should see no response for about 2 minutes:

A screenshot of a macOS Terminal window. The title bar shows standard window controls and the status bar indicates 'admin — justin@biho-'. The terminal text shows a user at 'Admins-MacBook-Air:~ admin\$' entering 'ping 166.' followed by a redacted IP address. The output shows four 'Request timeout' messages for different ICMP sequence numbers.

```
Admins-MacBook-Air:~ admin$ ping 166. [REDACTED]  
PING 166. [REDACTED] (166. [REDACTED]): 56 data bytes  
Request timeout for icmp_seq 0  
Request timeout for icmp_seq 1  
Request timeout for icmp_seq 2  
Request timeout for icmp_seq 3
```

3. Once the whole station has successfully rebooted after 3-5min, you should again see a ping response from the modem, and data should begin telemetering from the Reftek to your server:

A screenshot of a terminal window showing the output of a ping command. The text shows four successful ping responses from 151.101.49.67 with varying times.

```
PING turner-tls.map.fastly.net (151.101.49.67): 56 data bytes  
64 bytes from 151.101.49.67: icmp_seq=0 ttl=58 time=50.432 ms  
64 bytes from 151.101.49.67: icmp_seq=1 ttl=58 time=55.720 ms  
64 bytes from 151.101.49.67: icmp_seq=2 ttl=58 time=61.428 ms  
64 bytes from 151.101.49.67: icmp_seq=3 ttl=58 time=53.530 ms
```