

# ADC iBeam and VelociGraph

## Troubleshooting Guide

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### Initial Checks

1. If you are using a VelociGraph on this system, please refer to the error codes section of the VelociGraph manual. This should allow you to pinpoint the sensor(s) causing trouble.
2. Verify that the sensor receivers are receiving power. There is a green LED that should be on. If the LED is on, but dimmer than the LED of the 2nd sensor, you may have a sensor problem.
  - o Some errors will cause the LED to turn RED. In this case, disconnect power to the sensor system and contact ADC immediately.
3. Inspect the receivers for marks from impact or damage. The iBeam sensors are sensitive instruments, and can easily be damaged by impact.
4. Verify that the cable connection to the receivers is good. To check the wiring, switch the cables on the receivers and check if the error code remains the same. If the error code changes, this may indicate a problem with the cable.
5. Be sure that there is nothing interfering with the sensor view. If there is anything between the emitter and receiver, the sensors will not see the ball. Sometimes dust or debris will block the emitter.
6. If you are not using a VelociGraph, ensure that you are properly powering the sensor system. You will require 24 VDC, 2.5 Amp, regulated power for two sets of screen sensors and a VelociGraph (the standard setup). If you are using an enclosed VelociGraph, verify that the power supply is operating correctly using an electrical meter.

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## Review VelociGraph Data

If a VelociGraph is in use on this system, and the VelociGraph is in Mode 1 (FPS) or Mode 2 (M/S), the first check is to watch the display on the VelociGraph after a shot is fired.

**This does not work for Mode 0, 4 or 5.**

Does the VG03 display change after a shot?

YES:

- In Mode Review the error codes on the screen. The VelociGraph will in
- This would indicate the iBeam Sensors are working, but the VG03 is not communicating with the PC.
- Check the communication cable between the VG03 and the PC.
- Check the COM ports in Device Manager and make sure the COM port for the VG03 is appearing.
- Make sure that the COM port in Device Manager matches the COM port setting for the interface.

NO:

- The VG03 is not transmitting speed data because it is not receiving any pulses from the iBeam Screen sensors. The next step is to connect via iBeam Worx to the iBeam Screen Sensors.

If errors on the screen do not pinpoint the issue, or the VelociGraph is in Mode 0, 4 or 5, then reviewing the raw data coming out of the VelociGraph will usually reveal the error. This section describes using the terminal program FoxTerm to read the raw data.

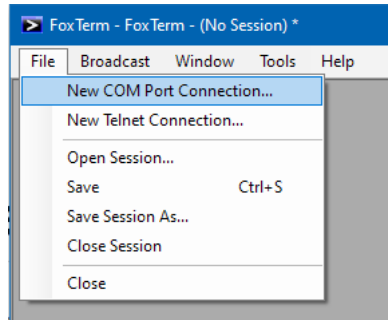
You will need a computer connected to the VelociGraph. If you have not already, make sure you have installed the FoxTerm program, which is a free download on our website.

[https://automateddesign.com/download/foxterm\\_1\\_5\\_3\\_0.zip](https://automateddesign.com/download/foxterm_1_5_3_0.zip)

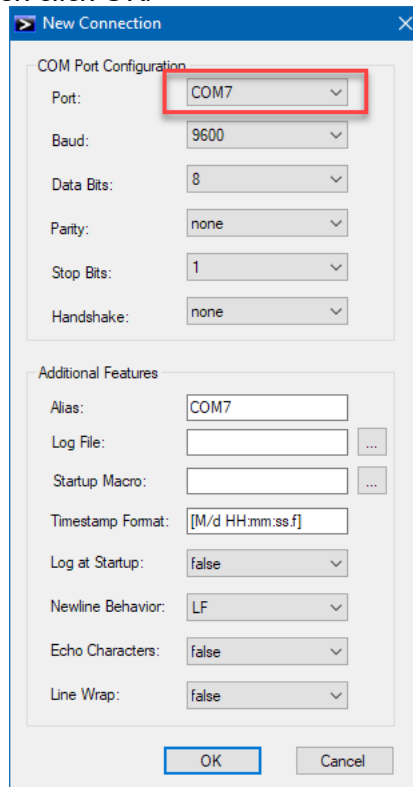
Make sure all programs on the computer are closed, particularly iBeamWorx, VG03 Config and any other programs that may be trying to use the COM port connected to the VelociGraph.

Open the FoxTerm program. Select File->New COM Port Connection...

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Select the COM port connected to the VelociGraph. Make sure the communication settings match as shown, then click OK.



If the terminal is immediately filling up with raw data from the VelociGraph, that means your iBeam sensors are firing at rest and their sensitivity needs to be adjusted. Use iBeamWorx to increase the sensitivity by 3 points until the iBeam receivers are stable.

Fire the system. The raw data from the VelociGraph will be displayed. Note any error codes displayed. For help from ADC support, copy/paste the raw data displayed and email to ADC tech support.

Look at the raw data and try to pinpoint the source of the problem. We can focus our attention on that sensor.

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- Is there a specific sensor that is not responding?
- Is there a specific sensor that is generating multiple pulses?

If no data comes in from the VelociGraph when you fire, then the VelociGraph is not receiving pulses from the sensors.

- First, ensure that connections to the VelociGraph are proper.
  - A common error is to connect receivers to the emitter connections on the VG03. Trace back the cable to ensure connections.
  - Another common error is to connect receivers in the wrong order. Trace back the cable to connections are in the proper order.
- Ensure the alignment of the sensors. Each receiver must be in perfect alignment with its respective emitter. Use a long straight-edge to ensure alignment. It is also possible to review the sensor value of a receiver using iBeamWorx to check that it is receiving enough light.
- If the connections and alignment are proper, then we need to increase the sensitivity of the sensors.

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## View and edit using iBeamWorx

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*iBeamWorx cannot connect to the receivers through the VelociGraph. You must connect directly and individually to each iBeam Receiver to connect via iBeamWorx.*

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*iBeamWorx cannot connect to multiple sensors at once. You can only change the values for one sensor at a time. Therefore, if you have two or more iBeam sensors, you will need to connect to each one individually to make changes. The receivers do NOT talk to each other.*

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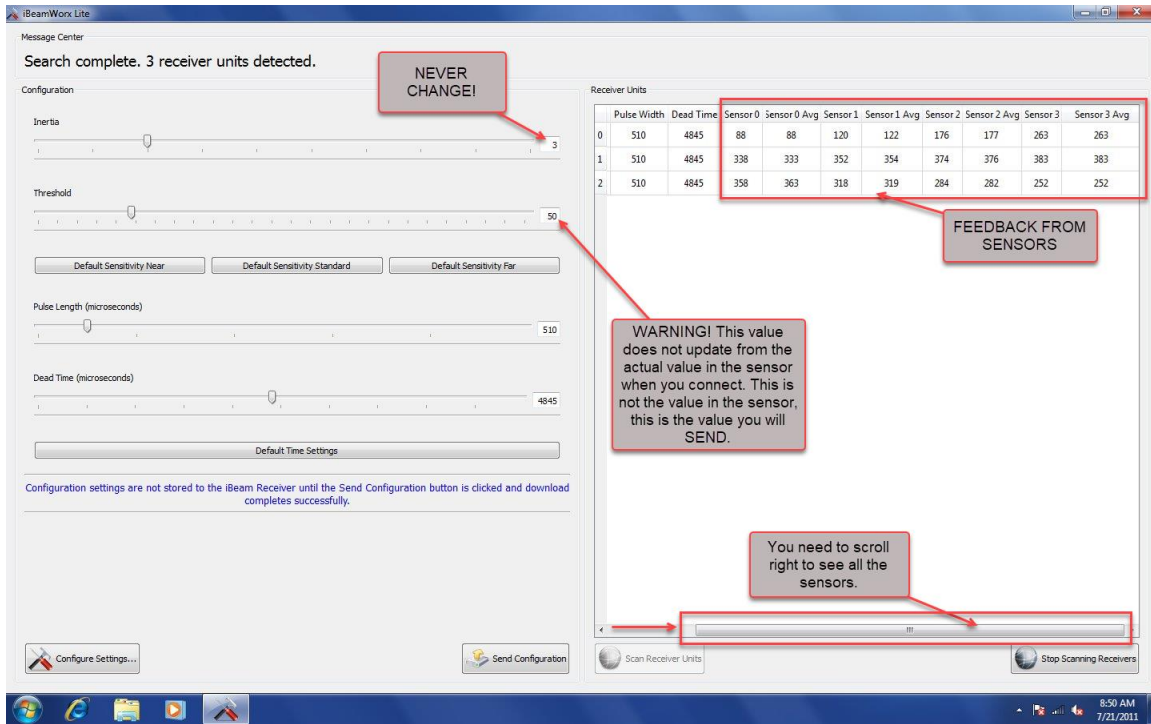
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*For brevity, this manual will not give instructions on how to use iBeamWorx. For that, please see the iBeamWorx manual, available from our website in the Downloads section.*

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When using iBeamWorx to troubleshoot, we want to review the sensor feedback. After connecting to a sensor, scroll over to the right to display the current value. The values update about once per second.

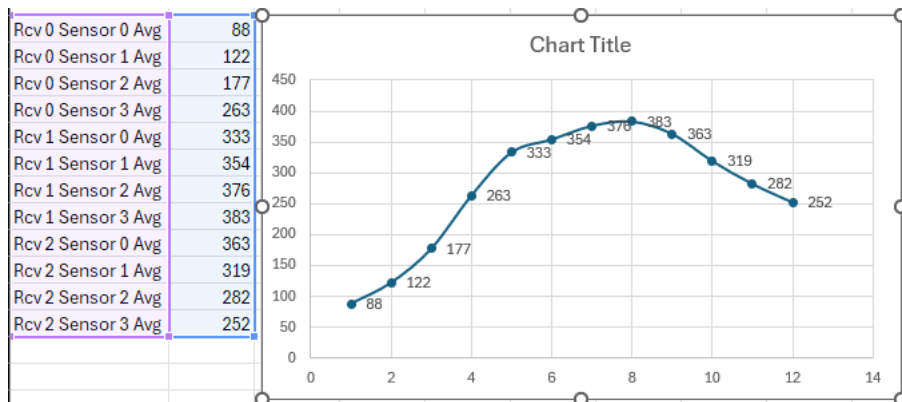
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To get help from ADC, take a screen capture of this screen and email it to ADC support.

Generally speaking, if the average reading for an individual sensor is 40 or below, that is an unusable situation.

We expect that the feedback from individual sensors overall feedback would follow a “frown.” If we were to plot the values above, we would see the following:

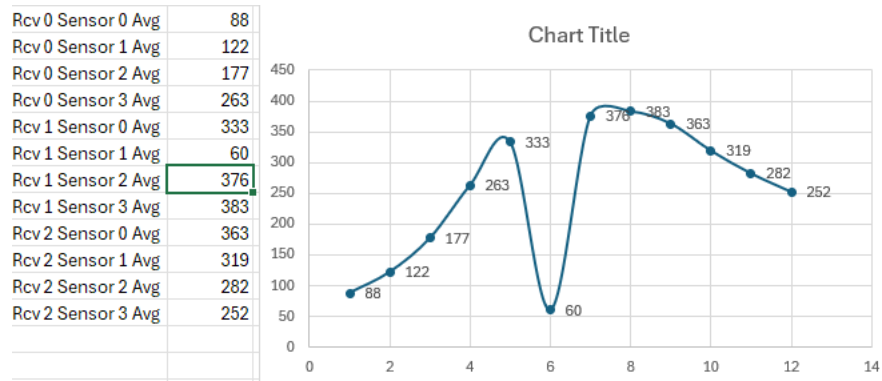


In this example, one end of the receiver is receiving significantly less light than the other end, so we would want to check alignment of the receiver and its matching emitter. However, we can't automatically assume this is the problem. The physical installation of

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the sensor, how it is mounted into a machine, the design of the machine, can affect how the light that the sensor receives on the edges.

What we never want to see is an unreasonable pattern like the following. This would indicate a failure in one of the receiver boards.



To make the sensors more sensitive, we DECREASE the threshold. We adjust three points at a time. A threshold of 70 is MORE SENSITIVE than a threshold of 80.

**Standard Settings for ADC Applications**

Offset	Dead Time	Sensor 0	Sensor 0 Avg	Sensor 1	Sensor 1 Avg	Sensor 2	Sensor 2 Avg	Sensor 3	Sensor 3 Avg
0	23	4845	88	88	120	122	176	177	263
1	23	4845	338	333	352	354	374	376	383
2	23	4845	358	363	318	319	284	282	252

To make the sensors less sensitive, we INCREASE the threshold. We adjust three points at a time. A threshold of 90 is LESS SENSITIVE than a threshold of 85.



**Standard Settings for ADC Applications**

The screenshot shows the iBeamWorkx Lite configuration window. A red box highlights the 'Threshold' slider, which is set to 50. A table titled 'Receiver Units' is also highlighted, showing sensor data for three units. Annotations include: 'Pulse Width Adjustment' pointing to the 'Pulse Length' slider; 'Dead Time' pointing to the 'Dead Time' slider; 'Scan Current Receiver Settings' pointing to the 'Scan Receiver Units' button; 'Send New Configuration' pointing to the 'Send Configuration' button; and 'Sensor feedback' pointing to the 'Receiver Units' table. A box labeled 'Sensor feedback' contains the text: '2. Read what the actual value is here.' Another box contains: '3. Set this value 3 points higher.' A box labeled '4. Send configuration to sensor.' points to the 'Send Configuration' button. A box labeled '1. Connect to iBeam Sensor' points to the 'Scan Receiver Units' button.

Receiver Units	Offset	Dead Time	Sensor 0	Sensor 0 Avg	Sensor 1	Sensor 1 Avg	Sensor 2	Sensor 2 Avg	Sensor 3	Sensor 3 Avg
0	23	4845	88	88	120	122	176	177	263	263
1	23	4845	338	333	352	354	374	376	383	383
2	23	4845	358	363	318	319	284	282	252	252

## What to do if you can't connect via iBeamWorx

- It is important to remember that iBeamWorx cannot connect to the iBeam Receiver through the VelociGraph connection. To communicate with an iBeam Receiver, make sure to connect the programming cable directly between your PC and the iBeam Receiver's programming port.
- Make sure that the serial port is set properly. See Appendix A: Determining the Serial Port for instructions.
- A common problem is that the iBeam Receiver to which you are trying to connect is pulsing constantly; the receiver cannot communicate in this condition. Make sure nothing is blocking the sensor and that it is being illuminated by its emitter.
  - On newer sensors which have a sticker indicating Firmware 1.5 or later, completely blocking the sensor so that it is fully dark will trigger an idle state, making communications possible.
  - On older sensors, this can be a difficult problem.
    - Repeated attempts will usually be successful, eventually. Be sure to close iBeamWorx and re-open between attempts to ensure the serial connection fully closes.
    - Try turning off the ambient lights. That may settle the receiver so that connection is possible.
    - Try fully blocking the receiver. In some scenarios, the receiver will stop pulsing. In others, it will pulse more.
    - Placing the receiver directly on to the emitter, flooding it with light, will almost always stop the receiver from pulsing, but requires removing the receiver.
- Any time iBeamWorx fails to communicate ("Timeout. No response from network. Check connection"), it is important to close iBeamWorx, then re-open before retrying the connection. This will ensure the serial port fully disconnects from the receiver.
- Make sure to try a different programming cable if one repeatedly fails. The USB adapter may be defective.

If, after a length of time, you cannot establish connection to the iBeam Receiver, then either a cable has come loose internally to the unit or one of the internal cards is damaged. Contact ADC to arrange sending in the unit for service.

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## Obtaining Support from ADC

To contact ADC Support:

- Email: [support@automateddesign.com](mailto:support@automateddesign.com)
- Phone: (630) 783-1150 USA
  - International: 00-1-630-783-1150
  - Japan: 010-1-630-783-1150

ADC will respond to phone and email communication during our normal business hours.

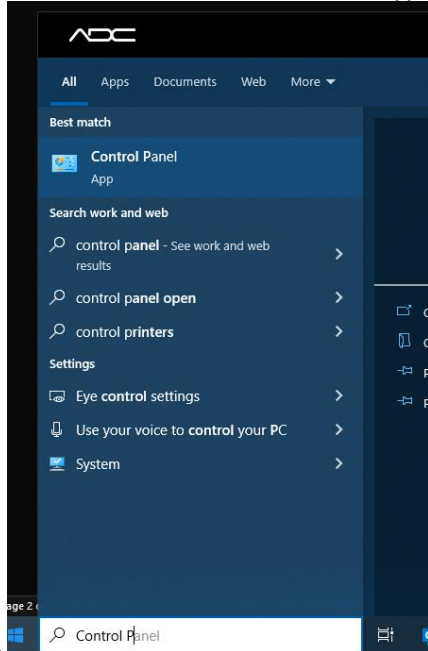
Please note that web meetings, remote support and off-hours communication is only available to customers with an active support contract for a specific system.

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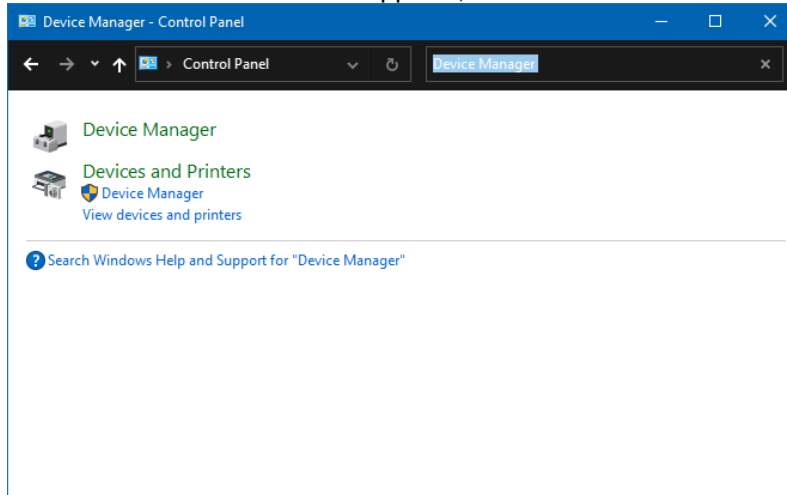
## Appendix A: Determining the Serial Port

A COM port on a Windows computer is named simply COMx, where x is a number (i.e. COM1, COM5, COM7). When you plug in the USB->Serial adapter to the computer, Windows assigns a named COM port to the device. There is no way to predict this COM port name, but it is easy to find out which name has been assigned.

1. Make sure the USB->Serial Adapter is connected to the computer.
2. Open the Windows Start Menu and type: Control Panel



- 2.1. Select Control Panel.
3. Select Control Panel.
4. When the Windows Control Panel appears, locate the search box and type: Device Manager

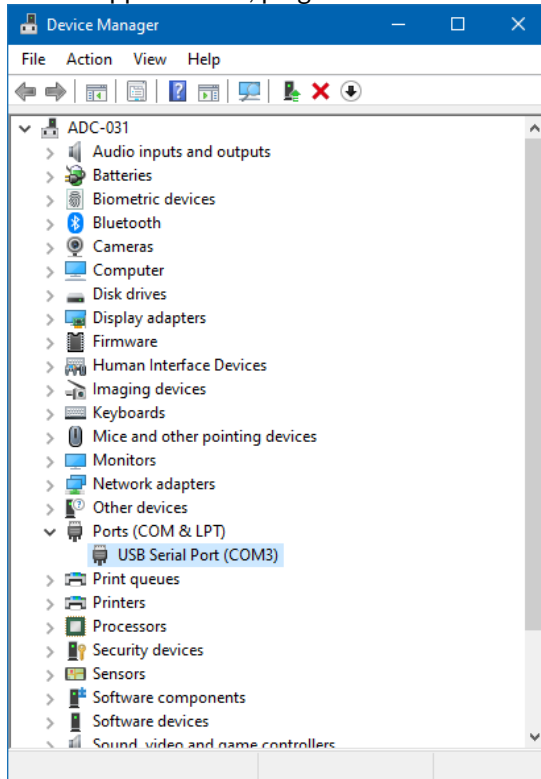


- 4.1. Select Device Manager
5. Select Device Manager

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6. In the device tree, expand Ports (COM & LPT). The COM port for the USB adapter should be displayed there.

6.1. NOTE: Other pre-existing COM ports will also be displayed. If multiple COM ports are displayed, remove the USB->Serial adapter from the computer. One of the ports listed will disappear. Then, plug the USB->Serial Adapter into the



6.2.

6.3. In the case of this example, the COM port of the connected USB->Serial adapter is COM3

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