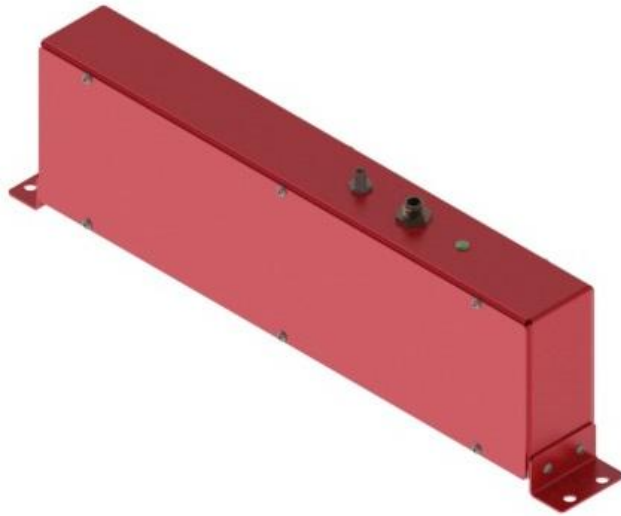




Instruction Manual

www.automateddesign.com



iBeam Sensors

2011

INTRODUCTION

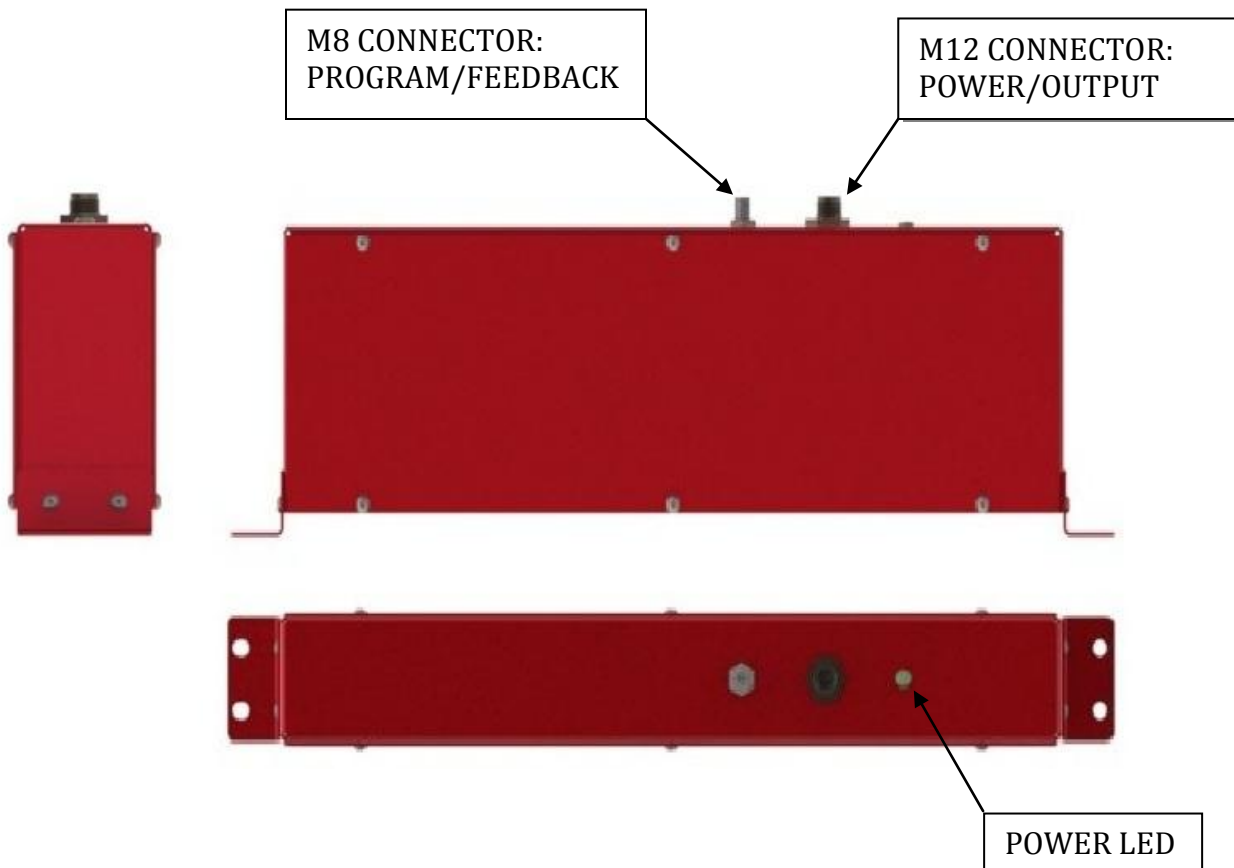
This manual will introduce you to the new ADC iBeam sensors. They have been designed and built to offer the highest accuracy in speed sensing. The new design offers many advances that will be explained in the following pages. New features include software selectable sensitivity, feedback from the sensors, and a new modular circuit board design that allows for easier maintenance.

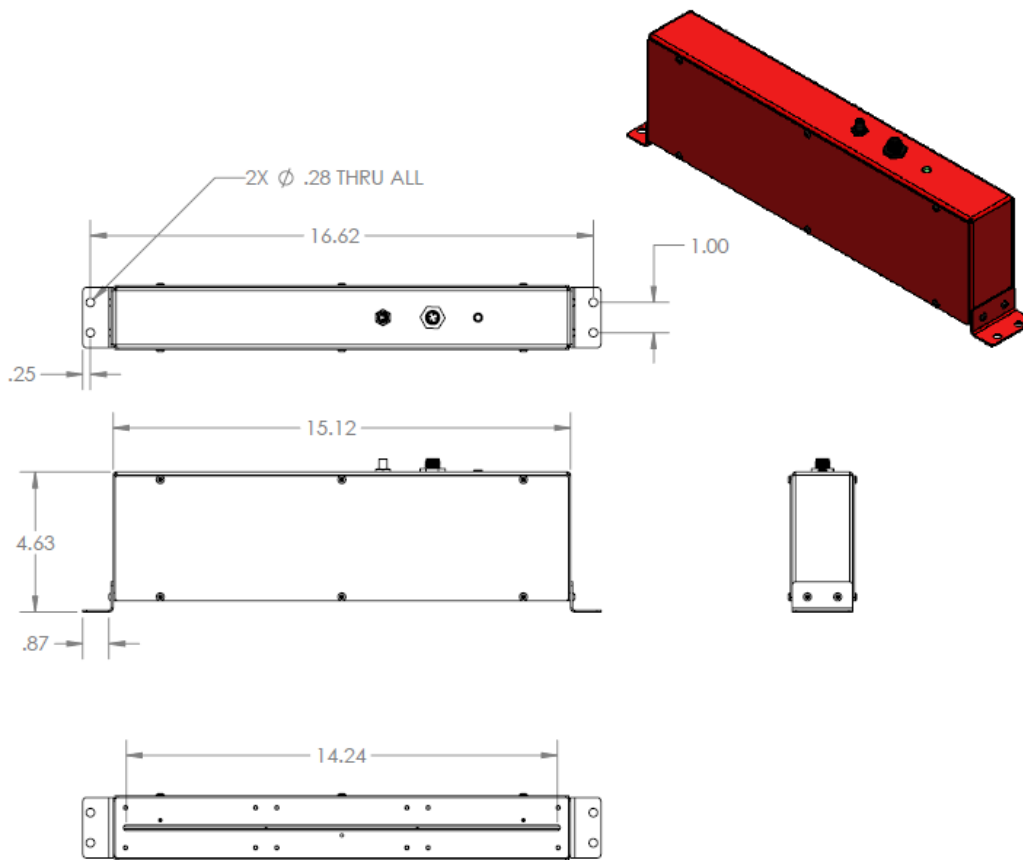
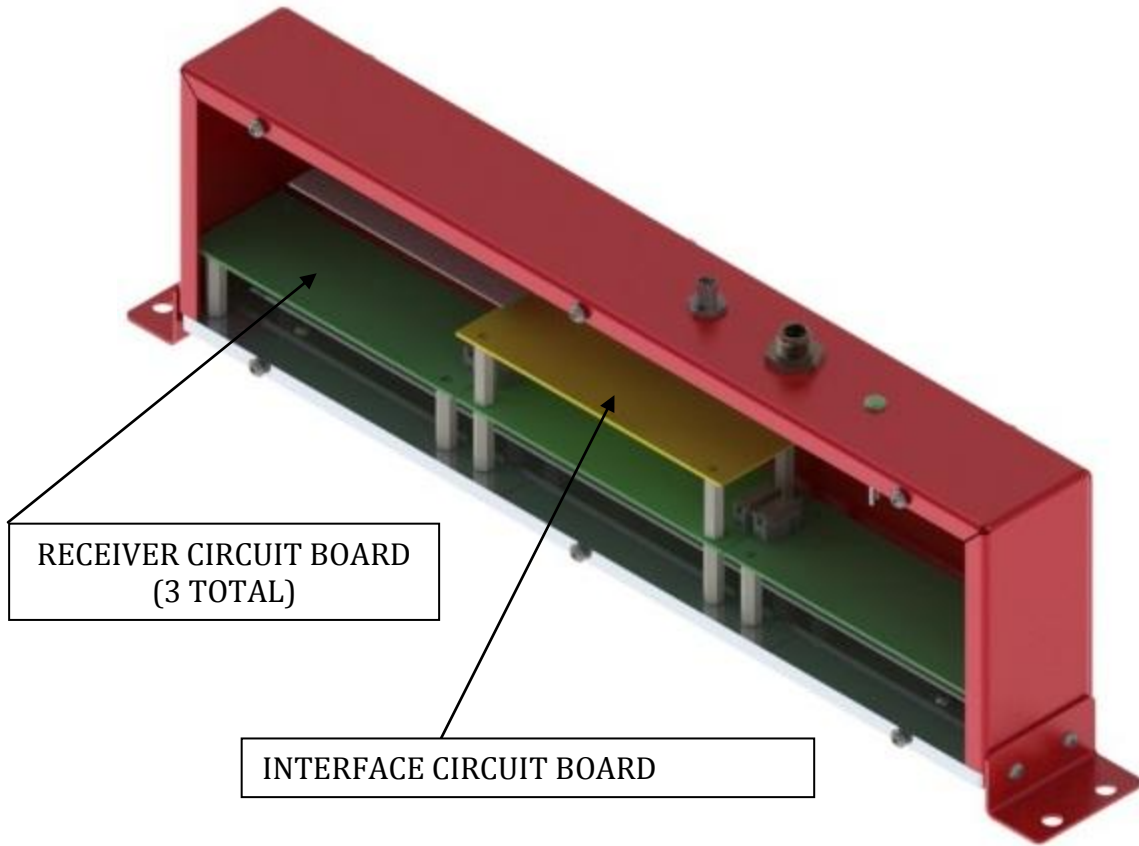
OVERVIEW

Each Set of iBeams sensors includes (1) receiver, and (1) emitter. The housings are the same outside dimensions, and both use an M12 4-Pin connector for power.

The Receiver:

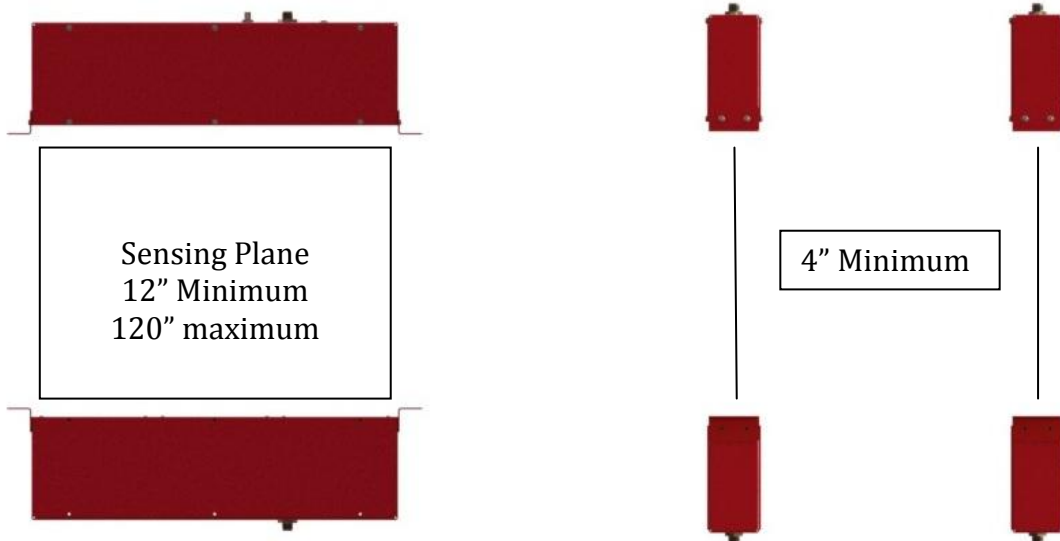
Each receiver has 2 cable connections on the top of the housing. The larger M12 connection is for the Power and Output. This cable must be connected for operation. The second, smaller connector is the programming and feedback connection.





SENSOR INSTALLATION

In order to get velocity feedback, it is required to have at least two sets of iBeam sensors. One set consists of (1) receiver, and (1) emitter. The following is a basic setup for sensing ball speed.

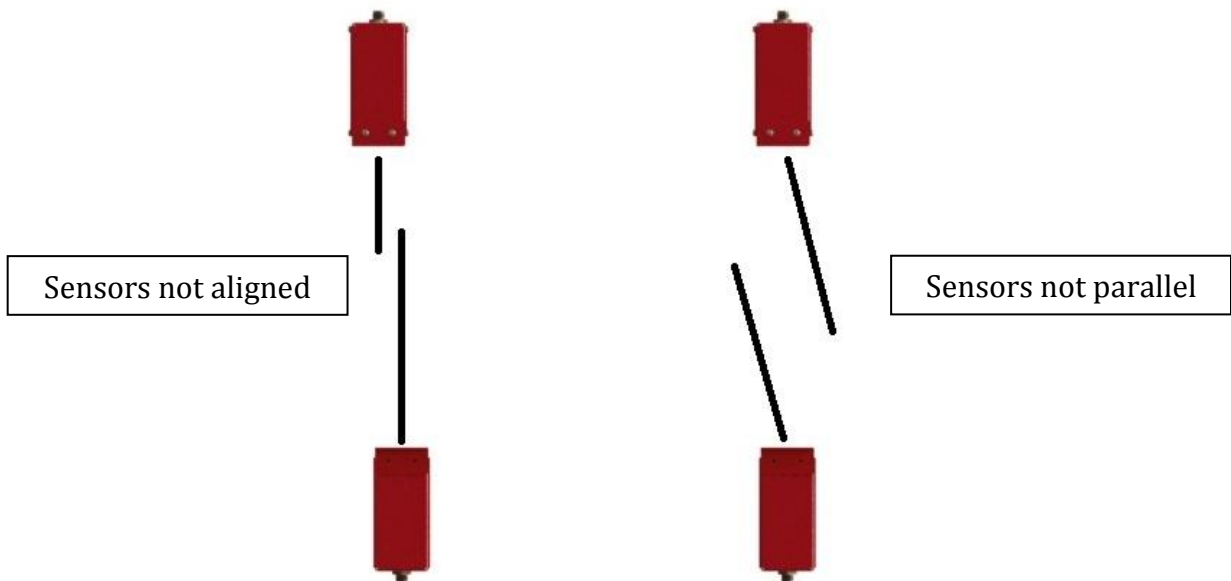


MOUNTING THE SENSORS

There are (2) clearance holes (for a 1/4-20 screw) on each side of the sensor. These are the mounting holes. Make sure that there are no obstructions in front of the sensing slot when mounting the units.

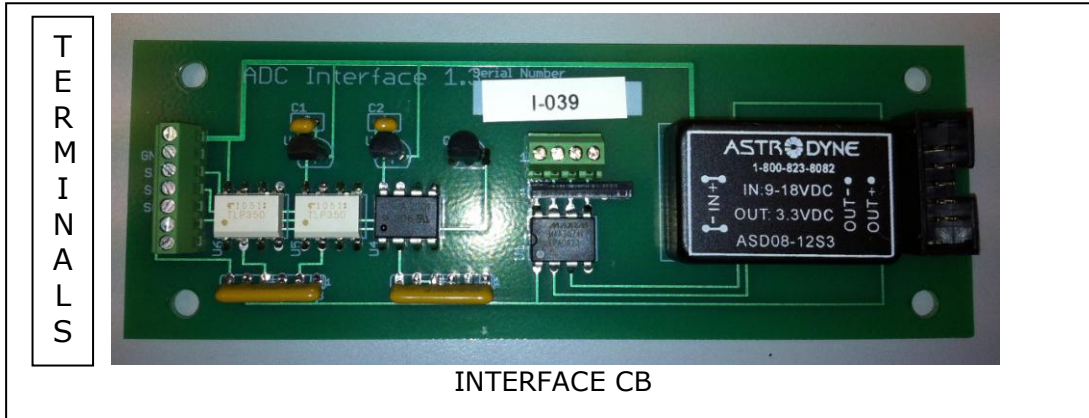
VERIFYING SENSOR ALIGNMENT

ALL *iBeam* sensors must be installed such that the receiver 'sees' the light curtain from the emitter. You must verify that the Receiver Slot is in line with the emitter slot. Also, the face plates need to be parallel to each other. The sensors require an accurate mounting frame in order to provide accurate velocities.



CHOOSING YOUR OUTPUT VOLTAGE:

Each sensor is capable of outputting 5, 15, or 24VDC. **It is always best to specify your desired output voltage when ordering your iBeams sensors.** However, if you need to select a different voltage (or are not sure what the current voltage is), this is done by accessing the Interface Circuit Board. Remove one of the side panels to do so. On Each Interface CB, there is a row of 7 terminals on the left hand side.



The terminals are as follows:

- **V+** Sensor Power (24vdc)
- **GND** Sensor 0VDC
- **S24** 24VDC Output
- **S15** 15VDC Output
- **S05** 5VDC Output
- **A** LED Anode
- **K** LED Cathode

SENSOR OUTPUTS

Moving the black OUTPUT Wire between S24, S15, and S05 is how you select **5, 12, or 24VDC**. To do so, you need to remove one of the side panels on the sensor to access the terminals. Using a small flat head screw driver, loosen the terminal, remove the wire, and insert to the desired Output terminal. Once in position, tighten all screw terminals in the strip.

USING THE PROGRAM/FEEDBACK CONNECTION:

This (M8-4Pin) connection is only used when you wish to change the sensitivity, change the pulse width, or monitor the intensity of the sensors. The 2325-CAB (Programming cable) and 2325-422 (USB Converter) must be purchased to make any sensitivity, pulse, or intensity changes.

Insert the USB Plug into the computer's USB port. Insert the M8 Plug into the program port on the sensor. You are now ready to launch the **iBeamWorx** Configuration Software.



Par# 2325-422

iBeamWorx CONFIGURATION SOFTWARE

Using the **iBeamWorx Configuration** Software, you can set the sensitivity, pulse width, and record intensity of the unit. In the past, a series of Dip Switches were used. This is no longer necessary due to improvements of design. The sensors are "Self Adjusting" for a wide range of conditions.

The advantage of recording the intensity allows the units to be calibrated, inspected, and assists in trouble shooting. You will now also be able to see and record the affects of LED life cycles.

The screenshot shows the iBeamWorx Lite software interface. A box labeled "Standard Settings for ADC Applications" points to the configuration sliders for Inertia, Threshold, Pulse Length, and Dead Time. A box labeled "Sensor feed back" is positioned over the Receiver Units table. Callouts at the bottom identify buttons for "Pulse Width Adjustment", "Dead Time", "Scan Current Receiver Settings", and "Send New Configuration".

Standard Settings for ADC Applications

Message Center
Search complete. 3 receiver units detected.

Configuration

Inertia: 3

Threshold: 50

Default Sensitivity: Near, Standard, Far

Pulse Length (microseconds): 510

Dead Time (microseconds): 4845

Default Time Settings

Receiver Units

	Pulse Width	Dead Time	Sensor 0	Sensor 0 Avg	Sensor 1	Sensor 1 Avg	Sensor 2	Sensor 2 Avg	Sensor 3	Sensor 3 Avg
0	510	4845	88	88	120	122	176	177	263	263
1	510	4845	338	333	352	354	374	376	383	383
2	510	4845	358	363	318	319	284	282	252	252

Configuration settings are not stored to the iBeam Receiver until the Send Configuration button is clicked and download completes successfully.

Buttons: Configure Settings..., Send Configuration, Scan Receiver Units, Stop Scanning Receivers

System tray: 8:50 AM, 7/21/2011

Callouts: Pulse Width Adjustment, Dead Time, Scan Current Receiver Settings, Send New Configuration

The pulse width is the length of time the output will remain “active” after being triggered. The pulse width can be set through the iBeam software package. The rising pulse (active high) output will transition from low to high upon being triggered, and then remain high for the selected period of time. The falling pulse (active low) output will transition from high to low upon being triggered, and then remain low for the selected period of time.

Both outputs are disabled for 3.5 milliseconds after turning off to eliminate false triggers caused by the projectile still being in the curtain.

The proper pulse width setting is only a function of the speed-measuring equipment (chronograph) that is being used. ‘Slower’ chronographs may require longer pulses in order to function properly. ***In the cases where the chronograph is the ADC VelociGraph, the pulse width should be set to a minimum value.***

CABLE CONNECTIONS

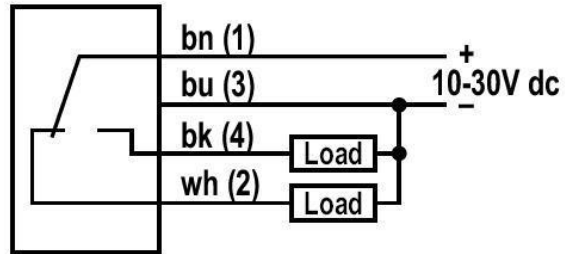
2325-422 Programming Cable/USB Converter

The Programming cable consists of an M8 Socket on one end, and a RS422/USB converter on the other. Explanation of the cable is as follows:

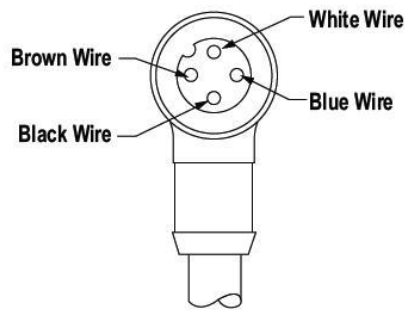
Screw Terminal	RS485	RS422	SENSOR CONNECTION	
1	D+	TX+	3	Blue
2	D-	TX-	4	Black
3		RX+	1	Brown
4		RX-	2	White
5	GND	GND		

Hookups

PNP (Current Sourcing) Models



(Emitters have no connection to bk and wh.)



Female M12 Cable End

For Connections to LEGACY iBEAM Cables, Use Supplied M12 Converter (KF90, or KFD)

Pin 1: Old Cable Red

Pin 2: ---

Pin 3: Old Cable White

Pin 4: Old Cable Black