



### How to Calibrate the Alarm Trip Angles and Buzzer Setting:

#### Notes

- A. Range of alarm adjustment is 1 through 30° (or in Percent Grade mode up to 58%)
- B. When setting the positive (+) alarm angle also set the negative (-) angle to the same value.
- C. GREEN LED is activated at angles before the alarm setting.
- D. RED LED is activated at angles beyond the alarm setting. (Yellow LED is not active)
- E. Alarm angles and buzzer enable are saved until they are recalibrated to new settings.
- F. Power must be off before calibration can take place.
- G. MIN/MAX button is the same as “enter” and is used to store the calibrated alarm angle and buzzer settings.
- H. REL button is used to raise and lower the alarm angle during calibration and toggle the buzzer OFF and ON.
- I. During the calibration mode, the RDI will resume normal operation after 30 seconds of inactivity. Remember the MIN/MAX button must be pressed in order to save the new calibrated values.

#### Calibration

1. Turn off power to RDI
2. Hold the MIN/MAX button in and turn on power.
3. When the display reads CAL ON release the MIN/MAX button.
4. “UNITS 10°” will be displayed. To change UNITS to Percent Grade (%) depress the REL button until “%” is displayed. Then press the MIN/MAX button once to save the UNITS setting.
5. “ALRM (current trip angle)” will be displayed. 10° (or 18%) is the default setting.
6. To change the alarm angle, depress and hold the REL button until the alarm angle is displayed. The angles always increase first to the end of the range then decrease to the beginning of the range.
7. When the desired angle is achieved release the REL button. Depress the MIN/MAX button once to save the new alarm angle and proceed to the next buzzer calibration.
8. The display should read “BUZR (current Buzzer setting).”
9. Depress and hold the REL button and the setting should toggle between “OFF” and “ON”.
10. Depress the MIN/MAX button once to save the new buzzer setting and proceed to normal operation.
11. RDI is now calibrated and working in normal operation. The display should indicate the current tilt of the box.

### Connecting the RDS7-BB-09 to a PC (RS232 Serial Output)

If using a laptop computer in conjunction with the RDS7-BB Ball Bank Indicator a modified power cord is needed, which is split to provide both a serial port connector and a cigarette lighter adapter. (Model RDS7-BB-09 is automatically supplied with this cable). In the case of USB port only, an RS232/USB converter is also needed.

#### How to connect a PC to the RDS7-BB-09 using Windows 7 or 8 (USB Connection)

1. Additional hardware Required:
  - a. USB to serial converter (IO Gear Model GUC232A or equivalent)
  - b. PC with windows 7 or 8 installed.
  - c. 12V power source or accessory output in the vehicle.
2. Software needed:
  - a. Download the free version Real Term 2.0.070\_setup.exe software from the web site: <http://sourceforge.net/projects/realterm/>
  - b. Click the “Download” button and save the file to the Downloads folder in windows.
  - c. Close the internet connection when the download is complete.
  - d. Double click RealTerm\_2.0.0.70\_setup.exe to install the software.
3. Connect the Power/Output cable to the RDS7-BB-09 and the USB converter to the serial output connector (DSUB-9).
4. Apply power to the RDI via the cigarette lighter adaptor.
5. Attach the USB converter to a USB port and wait until it is recognized by the Computer.
  - a. A message will appear at the bottom right of the screen with the port # when the installation of the USB converter is finished.
  - b. Remember the port #.
6. Click the Windows Start Button at the bottom left of the screen and open the Realterm IC2 software.
7. Click the “Baud” down arrow and choose Baud 9600.
8. Click the” Port” down arrow and choose the port # that was displayed during the installation of the USB Converter.
9. Click the Change button to save the setup.
10. Click the “Display” button and display as ASCii.
11. Click on the black screen and the RDS7-BB-09 output data should be displayed.

#### To record and save the Data to a file

1. Click the” Capture” tab and enter a file name in the File box.
  - a. Example: c:\temp\capture.txt
  - b. Remember to include the “.txt“ to make it easier to import this file to Notepad, or Excel later.
2. Click “Start: Overwrite” to create a new file or overwrite and old file.
3. Click “Start Append” to add data to an existing file without losing the existing data.
4. The data will no longer be displayed in the Black display screen but will be written to the file that was created or appended to.
5. Click “Stop Capture” to end the data collection to the file.
6. The output will be displayed on the Black Display screen again.



- 7. Open the file to view the collected data.
- 8. If using Excel, the data is Delimited with a coma.

**How to connect a PC to the RDS7-BB-09 using Windows XP or older (Serial Port Connection)**

- 1. Connect the serial port connector to the COM1 (or COM2) port on the computer for RS232 communication. Make sure to use the serial port and not the parallel port.
- 2. Click on the Windows START menu on the computer. Then click on PROGRAMS > ACCESSORIES > HYPERTERMINAL > HYPER TERMINAL.
- 3. A “Connection Description” window should pop up. Enter a filename under “Name”. Keep the default for Icon. Click OK.
- 4. A “Connect To” window will pop up that will ask you to enter details for the phone number that you want to dial. In the “Connect Using” space select the COM port you are using - either COM1 or COM2. Click OK.
- 5. A “COM1 OR COM2 Properties” window will pop up. Select the following Port Settings:

TABLE 1: RS232 PORT SETTINGS TABLE	
<b>BITS PER SECOND</b>	9600
<b>DATA BITS</b>	8
<b>PARITY</b>	NONE
<b>STOP BITS</b>	1
<b>FLOW CONTROL</b>	NONE

Click OK.

- 6. At this point HyperTerminal should be connected. The RDS7-BB indicator should be recording a continuous stream of angles to the laptop (see Table 2). The angles are output approximately every 250msec - one angle per line. (If data is not being processed click on CALL > CONNECT.) To stop the flow of data, click on CALL > DISCONNECT. The angles on screen are assigned a (+) for right turns and a (-) for left turns. Data flow can also be controlled through the RDS7-BB unit by the MIN/MAX button. When this button is pressed, data from the unit is temporarily halted until it is returned back into normal mode. In practice, we recommend you press the MIN/MAX button two times to stop data collection - this will display the last MAX reading recorded. While driving and ready to start recording data press the MIN/MAX button one more time to “Reset” the unit. It will resume sending data to the computer.
- 7. To save data in HyperTerminal, click on FILE > SAVE. Click SAVE AS to change the data file name.
- 8. To transfer data to an EXCEL sheet click on the following in Hyperterminal: EDIT > SELECT ALL > EDIT > COPY.
- 9. Open up EXCEL, create a new sheet and click on EDIT > PASTE. From there the data can be graphed.



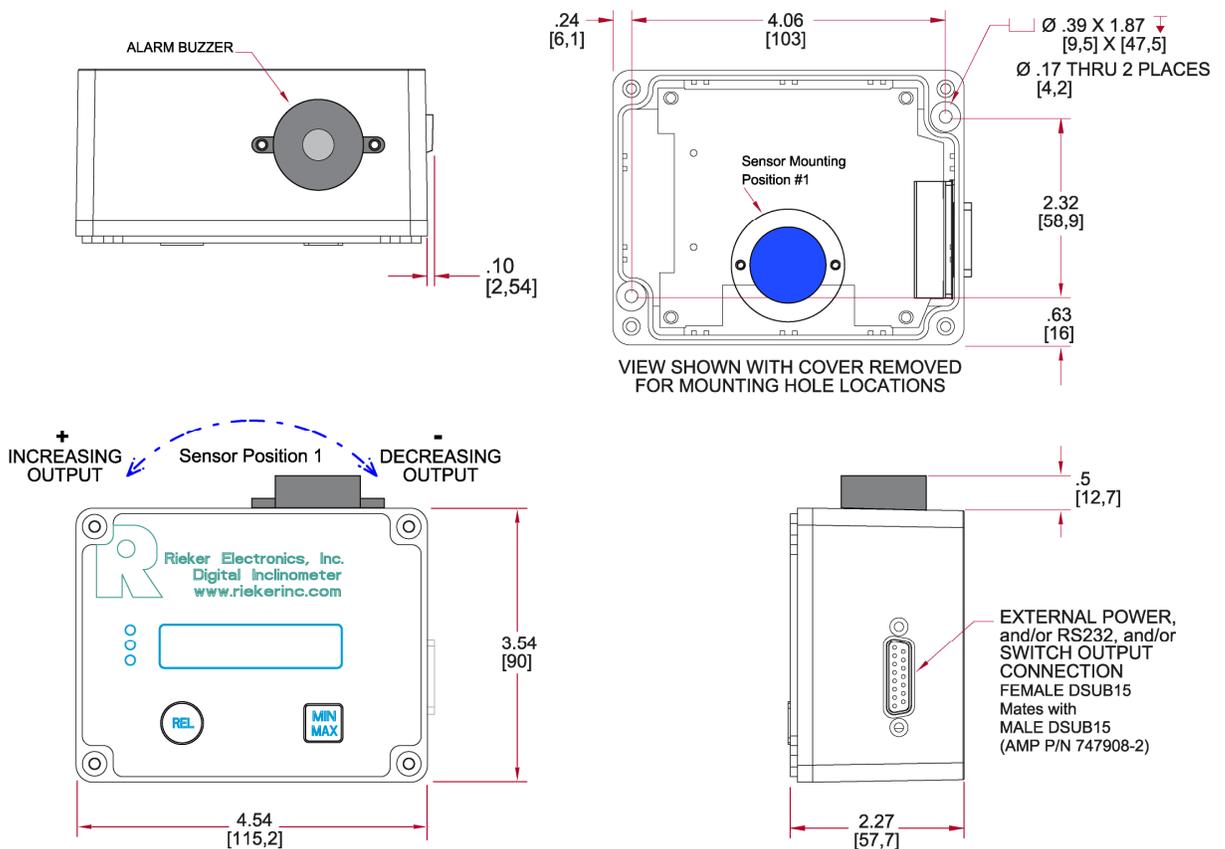
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# RDS7-BB-09

## Supplement for RS232 Output

TABLE 2: RS232 FORMAT	
DATA OUTPUT CONTINUOUSLY	Every 250mSec
DATA OUTPUT IN ASCII FORMAT	sign character "+" or "-" space character or tens digit (if less than 10° will output space than digit) units digit decimal point tenths digit hundredths digit space character "0" carriage return line feed
EXAMPLES	10.50° will be output as +10.50 [cr] [lf] -5.30° will be output as - 5.30 [cr] [lf]
OVERRANGE ON THE RIGHT SIDE (OR POSITIVE SIDE)	will give +99.99 [space] [cr] [lf]
OVERRANGE ON THE LEFT SIDE (OR NEGATIVE SIDE)	will give -99.99 [space] [cr] [lf]

FIGURE 1: RDS7-BB-09 Dimensions (inches [mm])



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