



AiM Webinar
"Custom Sensors in RaceStudio3"
5/26/20
Edited Q&A

1 **Q:**Does that rotary sensor have enough resolution and response to measure suspension travel?

A:[Answered live]

2 **Q:**Matt just mentioned that the sensor outputs are up to 12 volts. If your battery voltage drops below 12 volts is that a problem?

A:[Answered live]

3 **Q:**Do you use any fuel flow sensors?

A1:We don't sell any flow sensors but, as long as it can output 0-5V, we can make a custom sensor.

A2:[Answered live]

4 **Q:**Do you have sensors for tire temps and pressures?

A:[Answered live]

5 **Q:**Which sensor is easier to configure between Bosch vs GM?

A:If it's 0-12V, either should be fine on our end.

6 **Q:**Will you show how to connect a single wire sensor to an AiM channel?

A1:Typically, you could either terminate the sensor to a mating connector for one of our channels (usually 719) or you could cut the 719 connector off our patch cable and connect the white signal wire to the signal wire for the sensor.

A2:If it is a resistance style output you would need to convert using a pull up resistor. We should be showing it closer to the end.

7 **Q:**Will you show best practices for doing a custom calibration for a temp sensor?

A:There shouldn't be a calibration for a temperature sensor. The voltage table should outline mV to temperature.

8 **Q:**Matt, can you touch on sampling rates that are required or best for standard sensors?

A:[Answered live]

9 **Q:**How much of this information is applicable to the Solo 2 DL?

A1:Solo2 DL can get input only from ECUs, not from sensors .

A2:[Answered live]

10 **Q:**The AiM harness provides +5V ref and the +12V on the 719 push connectors. What is the max current that can be drawn from each circuit?

A:50mA per channel is a good rule to follow but each channel is using a shared voltage generator. Every 2 channels can have 100mA total.

11 **Q:**What is that acceleration sensor that Matt showed? 3-Axis?

A:It looked like a Texys sensor. I believe they sell single and multiple axis sensors.

12 **Q:**Does the Channel Expansion module work with a Solo2 DL?

A:No. For the most part the Solo2 DL is not expandable. Exceptions being things like LCU-One and Smartycam.

13 **Q:**I have converted some single wire electric sensors for temp (Autometer) and have used various methods to create the temp/V calibration. Has Matt done this and what is his preferred method?

A:Roger will be touching on this towards the end of the webinar.

14 **Q:**Is there going to be better filtering in the RS3 Analysis?

A:Yes, we're coding/adding some more possibilities for filtering.

15 **Q:**If one sensor is 5Hz and another is 20Hz? When comparing them, does the 5Hz data point show up 4 times before it changes or does it show up as "no data" relative to the 20Hz rate when recorded?

A:It is interpolated between each data point so we can find the shape of the data by calculating the curve between each data point

16 **Q:**Does each sensor need to be assigned to a specific port on the channel expansion hub hardware?

A1:Each sensors needs to be configured for the correct input channel, this is true for the data logger channels and any expansion channels.

A2:Yes, you would need to have the sensor configured to the channel that you have it connected to. If you aren't using a channel, no need to assign anything, simply uncheck it.

17 **Q:**How is that steering angle related to the actual wheel angle?

A:Those things are relative to each other, but the ratio will depend on your steering box and other steering geometry.

18 **Q:**Is converting steering wheel angle to an “intended corner radius” just a pure math channel function?

A1:There's no conversion from steering wheel angle to corner radius, maybe 'intended corner radius' can be done with some conversion factor.

A2:[Answered live]

19 **Q:**Is the calibration setup the same in RS2?

A:The calibration is a bit different in RS2, but the same principles apply. If you have specific questions about that we would be happy to help after the webinar – 800.718.9090 or support@aimsports.com

20 **Q:**Matt, It doesn't seem like there's much resolution with only 200mv between -90° and 90°. Is that an issue?

A:[Answered live]

21 **Q:**Isn't this steering wheel angle, not steered angle? is there going to some info on best practice on this?

A:[Answered live]

22 **Q:**Does vibration put noise into the string pot signal?

A:It might depend on the quality of the sensor and what you have it connected to but usually it shouldn't. it's a spring-loaded cable and is just measuring the distance that cable is pulled out.

23 **Q:**Do you think the throttle position sensor output is affected by voltage with engine running or just ignition on?

A:We use 5v regulated voltage to power position sensors. The voltage value is not changed by alternator/battery voltage levels.

24 **Q:**Is an AiM sensor more accurate than ECU TPS?

A1:That's a tough one. You can calibrate our sensor to exactly what 0-100% is. Some TPS sensors are on the throttle body which obviously can't be 0 when the car is running.

A2:It depends on how important the ECU deems the data of the throttle pedal. Some can report values to the .001 but it all depends on the ECU. A typical ECU will be 8 bit (0-256), whereas AiM is 12 bit (0-4096).

25 **Q:**If you don't have scale pads, but know the ground is at -3 degrees, can you recalibrate the accelerometers to compensate?

A:No, it would zero the accelerometers at -3 degrees. Most tracks will have a pad for leveling.

26 **Q1:**I typically run a Mychron5 or MXS. Where can I find out the overall data capacity of each unit; both sampling rate and total storage?

A1:The Mychron5 and MXS have 4GB of memory. As for sampling rate; for the Mychron5 the configuration and frequencies are somewhat locked and can't be changed. For the MX Series, The sampling rate is very dynamic and depends on how many alarms, shift lights, display pages, ECU channels, analog channels, etc. are configured. You can easily manage 10,000Hz of combined channel data. If you choose an ECU protocol with just a few channels, you have more computing power for other channels. So, it's really difficult to state where the limit is.

Q2:the MXS doesn't have any more memory than a Mychron5? Aside from the larger screen, what is the advantage of the MX series if it doesn't offer more storage?

A1:The MXS 1.2 is much more flexible as far as sensors, CAN/ECU inputs, digital outs, and customization.

A2:The MX series is intended for automotive racing and the Mychron5 is intended for karting. The MXS 1.2 has the ability to run just about any sensor you would like, ECU communication, larger display, digital outputs, square wave RPM input (if needed) and the list goes on.

A3:Inputs, expandability, sampling frequencies, custom sensors, 3 CAN busses, serial input, k-line, USB and WiFi, real-time math channels, flexibility, and more.

27 **Q:**My custom sensor list is empty.

A1:It's time to build some custom sensors then. Good thing you are in the webinar today!

A2:It will be until you create some :)

28 **Q:**How would you calibrate a sensor that is not linear, like a fuel level sensor that varies due to tank shape, etc?

A:You can build a curve in the custom sensors: Fill the tank liter by liter and take note of mV readings. Then enter them into the calibration table of the customer sensor.

29 **Q:**My new AiM oil pressure sensor reads -4 psi when the engine is not running; can I use that custom calibration process to correct this?

A:Yes you can. If you read the mV value at zero and create a custom sensor you can filter that out.

30 **Q:**Can you use the ECU fuel channel as the basis for a custom math channel with a custom fuel curve?

A:[Answered live]

31 **Q:**Is there a way to filter only the data sent to the dash and not the data recorded for later analysis?

A:[Answered live]

32 **Q:**Might also be worth reminding folks that the old dashes only have 12V on channels 4-8.

A:[Answered live]

33 **Q:**What unit of measurement would a custom fuel level sensor read in?

A:You are able to define the unit of measurement when building a custom sensor. So, you can read in percent, gallons, decimal, etc.

34 **Q:**Will the MXS take 12V input for a 0-12v sensor?

A:You can set the voltage input from a sensor up to 13000mV.

35 **Q:**What is the “impedance input” for an MXL2?

A:It’s a different way to input the sensor curve: mV vs value, or impedance vs value. It depends on sensors, and on what information you have for them.

36 **Q:**So my 0-12V Brake pressure sensor will not work on my Evo3/Pro?

A:If the output is 0-12V, no. If the sensor just needs 12V power, yes.