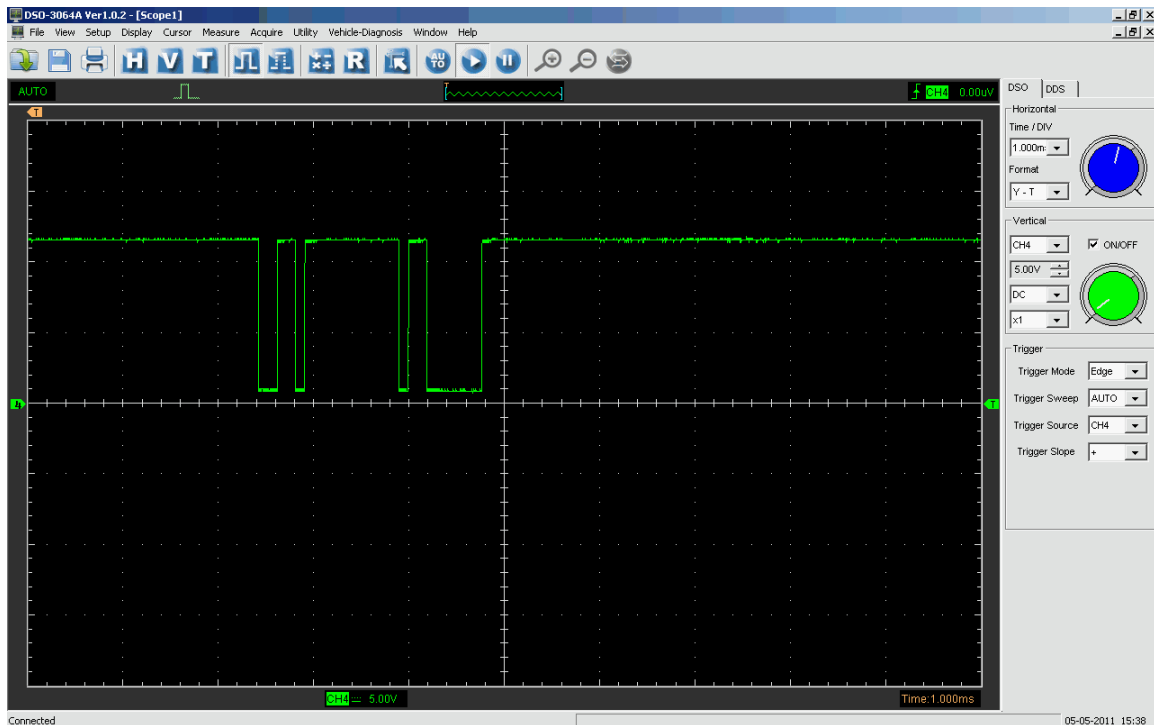




The Oscilloscope

With the advent of modern scan tools, the oscilloscope seems to have passed the modern technician by and not used as often as it should.

Modern oscilloscopes with their many attachments and options, offer far more information than the modern scan tool and multi-meter combined.



This seminar will introduce the oscilloscope and all available tools to diagnose any installed controller, input or output device.

If there's an electrical signal, the oscilloscope can measure it.

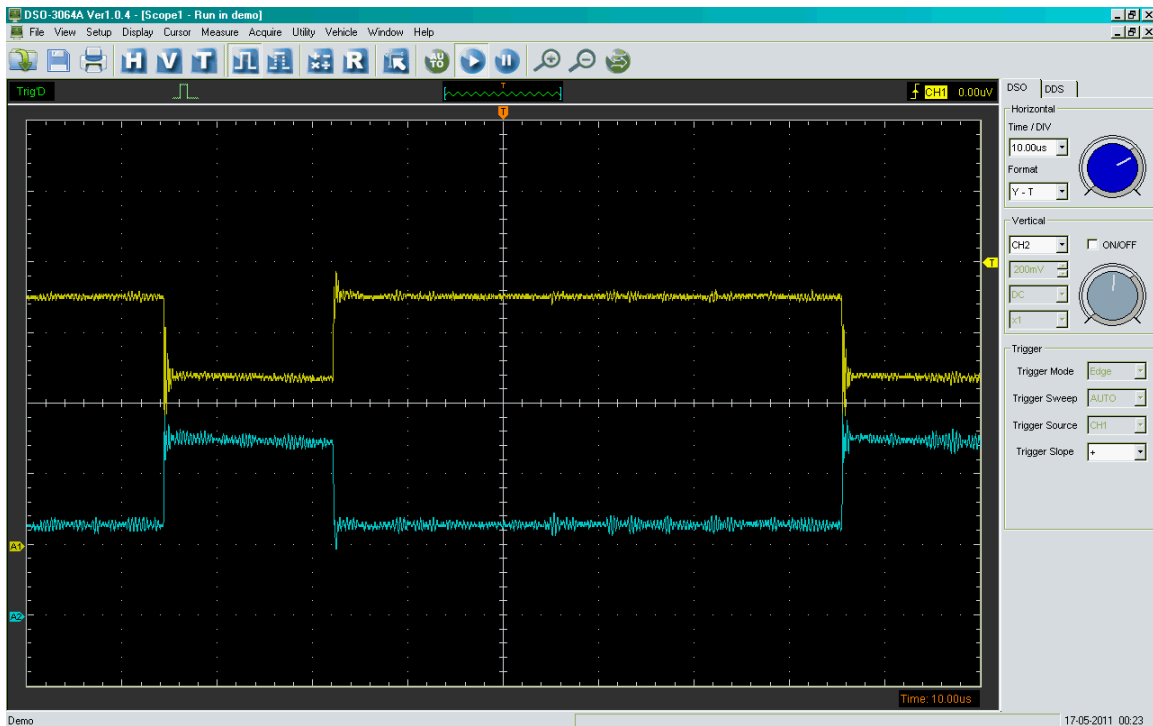
The key is to "understand" and "evaluate" the waveform.

The result will be an effective and profitable diagnosis.

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The oscilloscope seminar is strictly hands on with real time example images that the attending technician will be able to duplicate, save and reuse for future diagnostics and repairs.

Any technician that has an oscilloscope of any make or model is welcome to use it during the seminar. All oscilloscopes can be graded, measured and discussed. PC based oscilloscopes will be available for all to use.



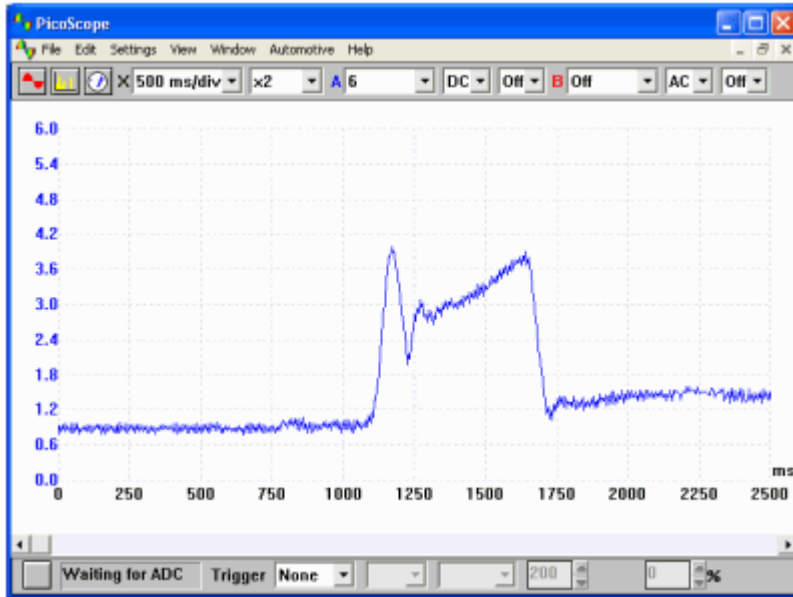
This class is NOT only for VW and Audi models. This class is for anything that resembles a “heartbeat”.

Various scan tools will also be available to “match” and “verify” scan tool data to the oscilloscope in use. Anything from ignition, duty cycles, “K and L” line, CAN data, A/C status, ABS, Security systems to Parking Aid can be looked at in a waveform.

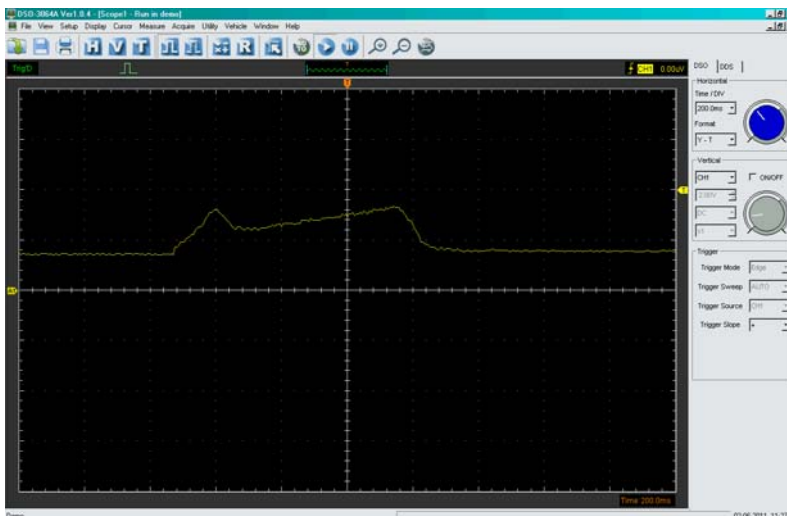
An oscilloscope (also known as a scope, CRO, DSO or, an O-scope) is a type of electronic test instrument that allows observation of constantly varying signal voltages, usually as a two-dimensional graph of one or more electrical potential differences using the vertical or 'Y' axis, plotted as a function of time, (horizontal or 'x' axis). Although an oscilloscope displays voltage on its vertical axis, any other quantity that can be converted to a voltage can be displayed as well. In most instances, oscilloscopes show events that repeat with either no change, or change slowly - [Wikipedia](#)

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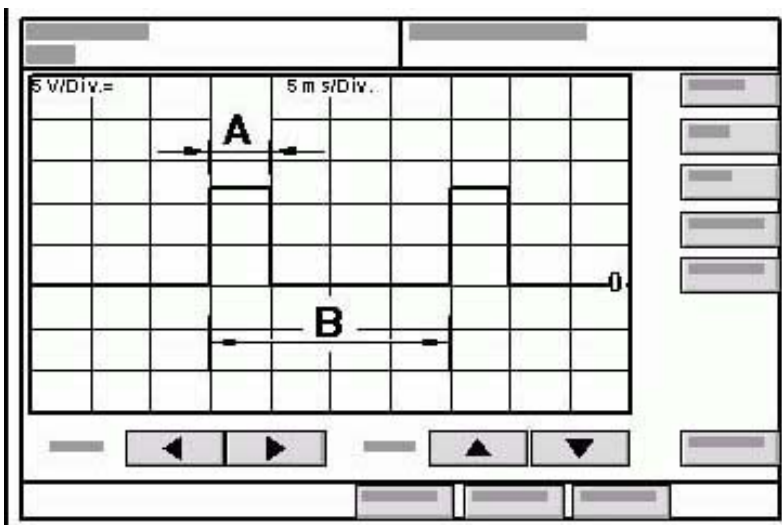
All modern oscilloscopes have the ability to measure and record voltage and current against a time scale. It is the interpretation of the waveform that many technicians struggle with.



The PicoScope image of a Mass Air Flow sensor has distinct attributes that are common with only one type of air flow meter.

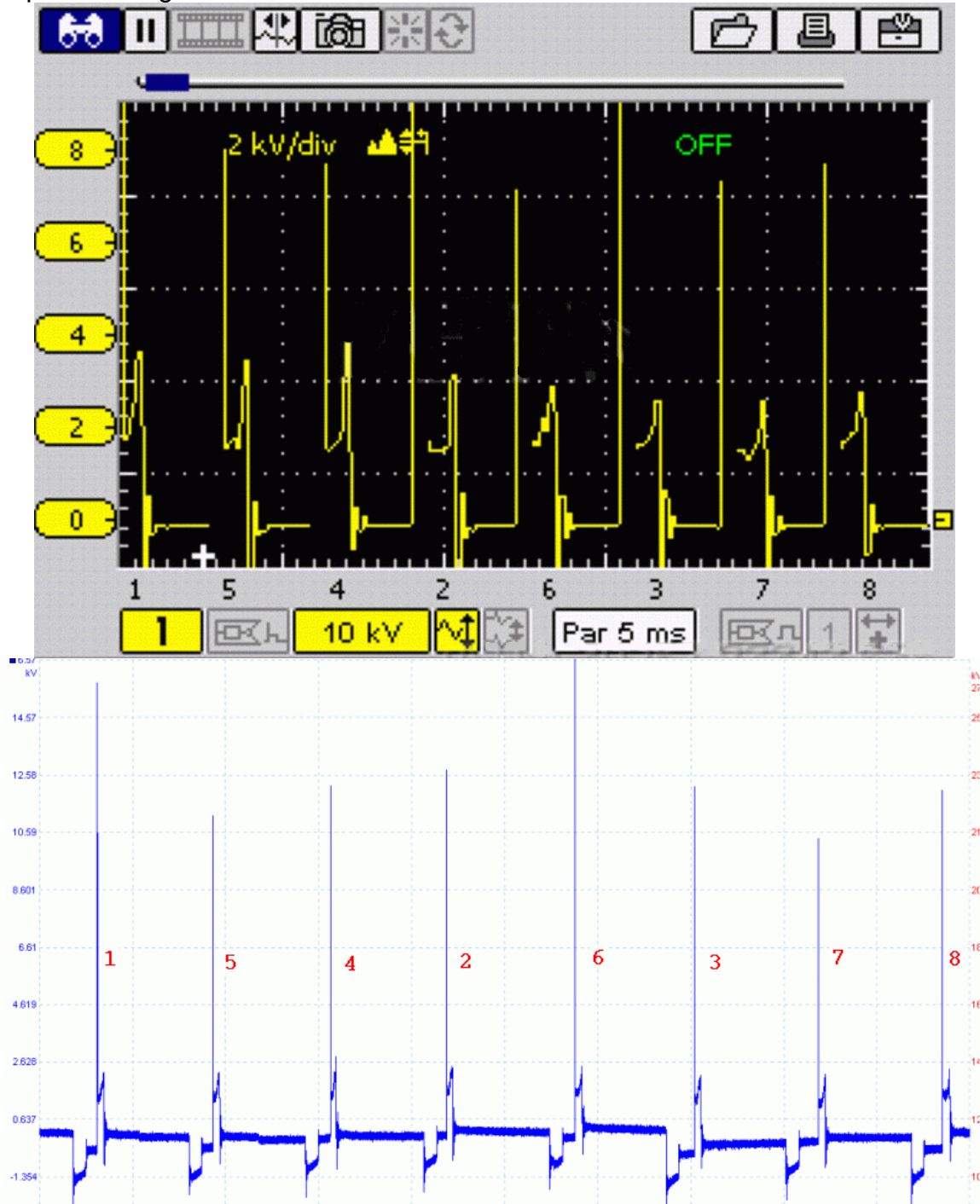


The Hantek image of the same Mass Air Flow sensor has different attributes than the earlier image but which version is correct?



This image is from a factory scan tool indicating a digital duty cycle for a current A/C system. This class will offer the same duty cycle on different labsopes.

Searching for a good scope and using that scope to determine the difference between a good waveform to an unreliable image can make a huge difference in a precise diagnosis.

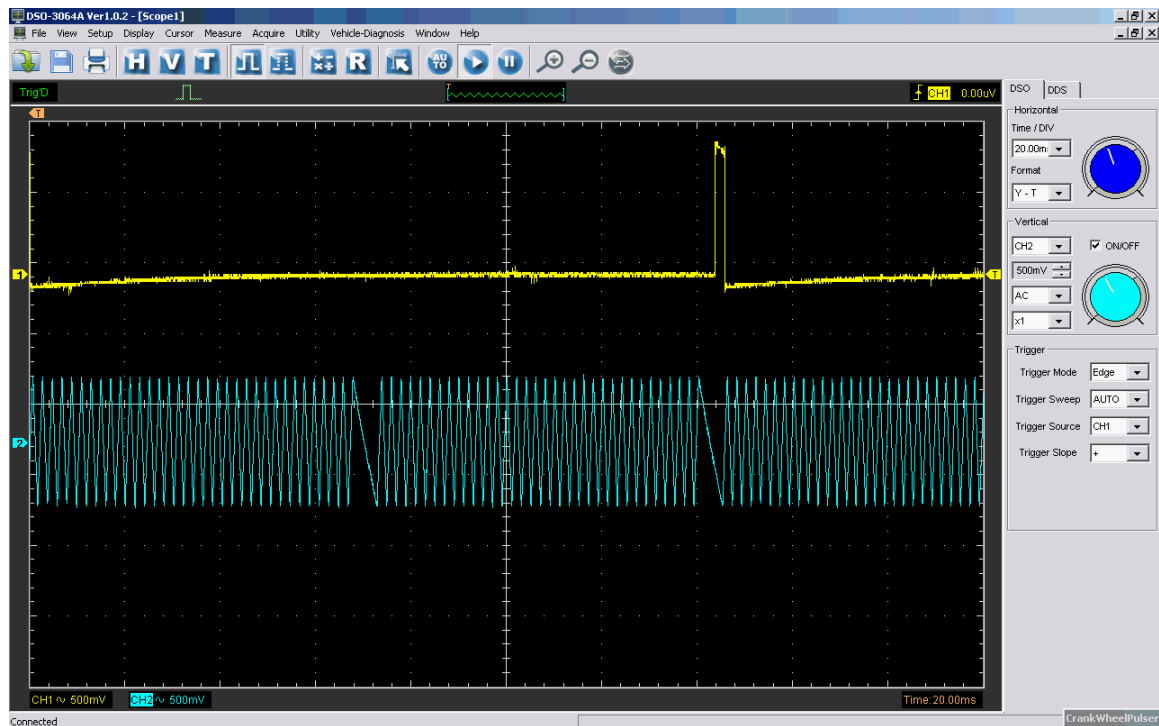


Here are two identical images but one is offering unreliable data in a secondary wave parade. In this game, speed and millions of samples per second is the only way to find that anomaly and glitch within a reasonable time.

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The seminar will include screen imaging software to work in harmony with the oscilloscope if PC based. If not, the user will be taught to use digital camera imaging where the representation of the image can be saved for later use.

All attending technicians will be offered a waveform generator that is PC based and used through the internal sound card to connect to any oscilloscope to test and learn with. Here is one example:



This image was created and read from the internal sound card to a 4 channel oscilloscope. This simple bench test was from a 4 cylinder engine sound generator using inexpensive leads.

The seminar will include waveforms from:

- Engine input and output sensors
- Engine primary and secondary ignition systems
- CAN network messages and status
- HVAC pressure cycling and blend door analysis
- ABS speed sensors
- Positive and negative pressure transducers
- Transmission speed sensors and pressure solenoids
- Duty cycle fuel pumps
- Immobilizer key readers
- D/C motor current ramping
- Anything that has a "heartbeat"

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Prerequisites for this seminar:

- An open mind
- Your oscilloscope if possible
- A digital camera if possible
- The will to step into an advanced level of analysis

What you will learn:

- Image capturing
- Image transfer
- Image correlation
- Research skills

Most important of all, you will learn from all of the participating technicians that are working on the same vehicles and using similar scan and measuring equipment.

**Schedule your reservation for this class by contacting:
Euro Systems Automotive Training Inc. at 1-866-245-7602
Reservations and seating is limited.**



Secure Payment options.



Seminar Date:	January 13th, 2012 at 6:00 PM to 9:00PM January 14th, 2012 at 8:00 AM to 5:00PM
Host facility:	Laramie Garage 87 rue Lois Gatineau, Quebec J8Y 3R5 Oliver MacQuat (Owner) 819-771-4232 laramie.garage@gmail.com

If you have a lab scope, bring it. Bring your laptop and memory stick if possible. Bring your note book because this class is mostly hands on and you will need to take notes and learn how to gather all of the images that all participants have worked on through out the seminar.

“there are no answers, it’s the choices that are made” A. Ferron

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