

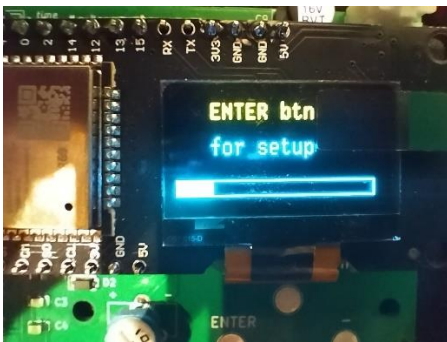
Ignition Timing Meter

TRANSMIC.FR V1R9C0

Power on the Timing Meter. A Splash screen appears during 5sec



To launch the SETUP mode, touch "**ENTER**" button, otherwise wait **10 seconds** until it goes into RUN mode:



SETUP MODE

In SETUP mode, touch "+" or "-" touchpad to select **Strokes** number:

"2 strokes" or "4 strokes with Wasted Spark", pickup on crankshaft, so 1 spark every 360 degrees: choose "2"

"4 strokes without Wasted Spark", pickup on camshaft, so 1 spark every 720 degrees: choose "4"

Touch **Enter** when done.

Touch "+" or "-" to increase **Pickup Position** relative to TDC:

Can be adjusted from 0 to 360° BTDC.

This value is used to directly display the advance in degrees BTDC.

If you let Pickup Position to zero, the time between the pickup and the spark will be displayed in microseconds and degrees.

I.e.: "ADV: -19.5 deg" means: "Spark appends 19.5degrees AFTER the first pulse of the pickup."

*So you have to do the subtraction by yourself, say pickup is set at 50° BTDC, then true advance is:
50 – 19.5 = 30.5 degrees BTDC)*

Touch **Enter** when done.

Touch "+" or "-" to select **Pickup Type**:

Choices are:

NP: for VR pickup that gives a **N**egative pulse first then a **P**ositive one or for a **H**all **E**ffect Sensor.

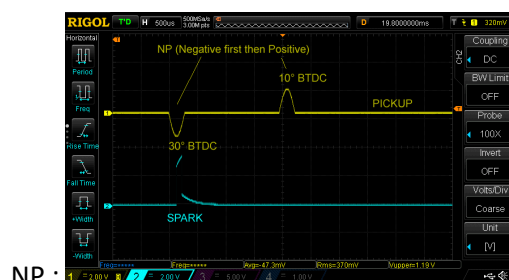
PN: for VR pickup that gives a Positive pulse first then a Negative one.

AUTO: ITM tries to detect the type of pickup.

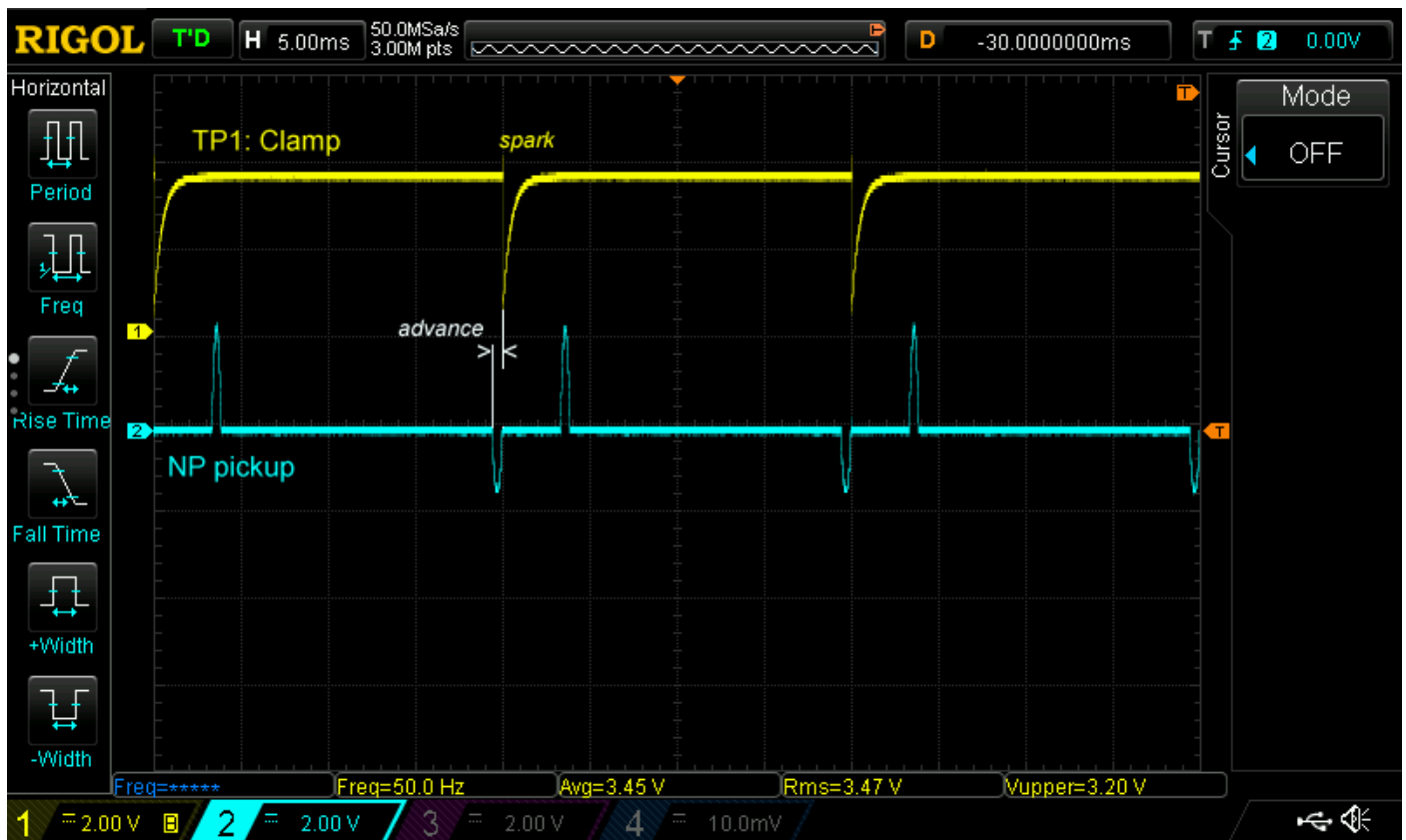


If you are already sure of the polarity, avoid automatic detection and set it directly

Touch **Enter** when done.



It's important to understand that calculation starts at the pickup pulse polarity that you have chosen during setup.



If the "Pickup Type" is set to NP while the real form is PN, the device may report incorrect figures, such as -270° instead of 20° .

Touch "+" or "-" to select Display **Refresh Rate**:

Results are displayed on the screen and on the USB output at **1 to 9 seconds** interval.

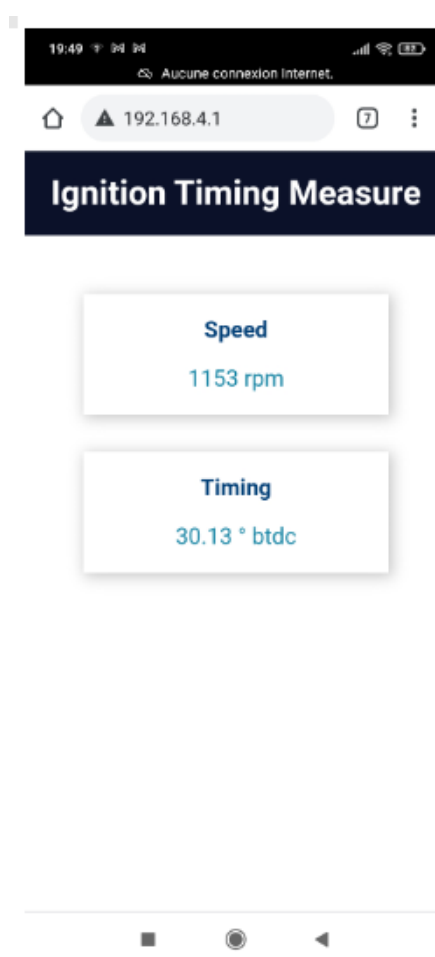
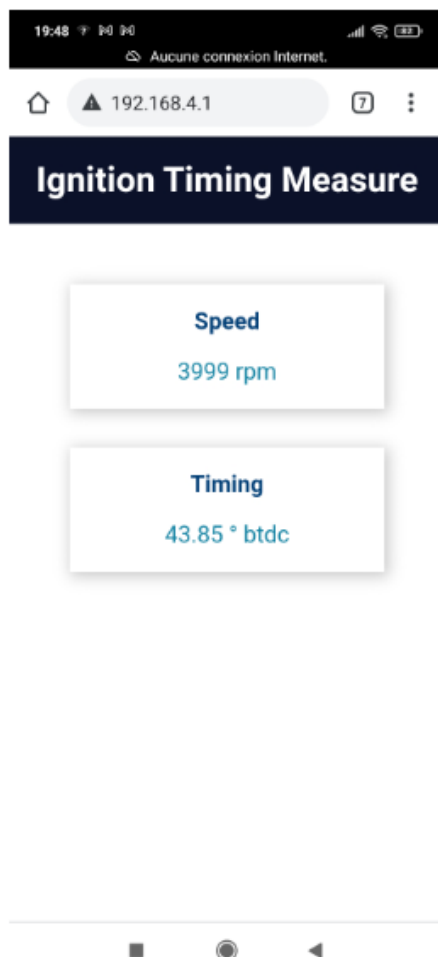
Touch **Enter** when done.

Touch "+" or "-" to select Display **Console Output**:

Either **USB**: Results are available in .CSV mode on **USB micro-B** Serial port at 115200 N.8.1. (*You may need a [driver](#)*)
or

Wifi: Results are shown on any web browser on any device connected to **Transmic_ITM** Access Point
at <http://192.168.4.1/console> SSID password: nothing or "password"

Touch **Enter** when done.



Touch "+" or "-" to change **Correction** to calibrate the device:

Can be adjusted from -2000 μ s to +2000 μ s by 10 μ steps

This value is used to change the advance displayed both in μ s and in degrees.

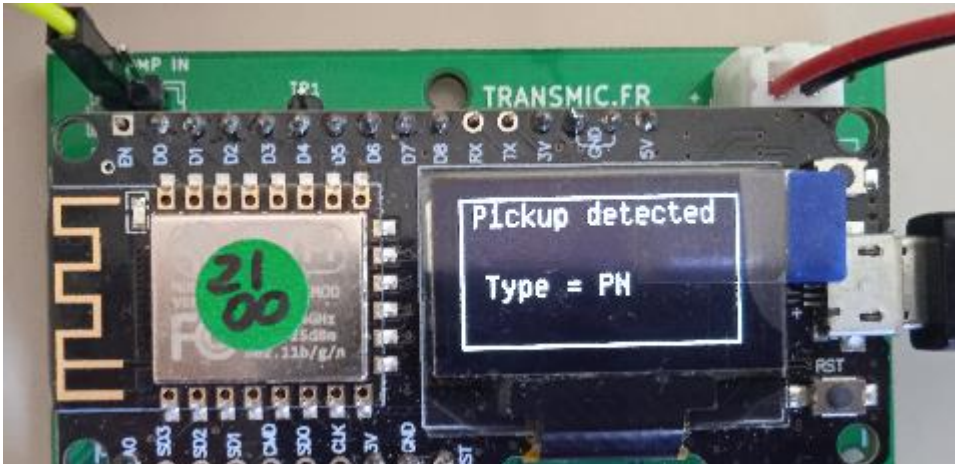
Positive Correction value	=> Increase Delay in μ s	=> Lower the advance in $^{\circ}$.
Negative Correction value	=> Lower Delay in μ s	=> Increase the advance in $^{\circ}$.

Touch **Enter** when done.

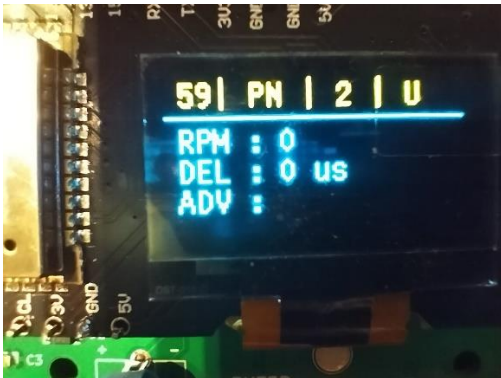
Now ITM unit is ready and waiting for a pickup signal...

In **AUTO** mode, "**Start Engine**" is displayed until a valid signal has been received and polarity detected.

In **AUTO** mode, the type of detected Pickup is displayed once a valid pickup has been seen.



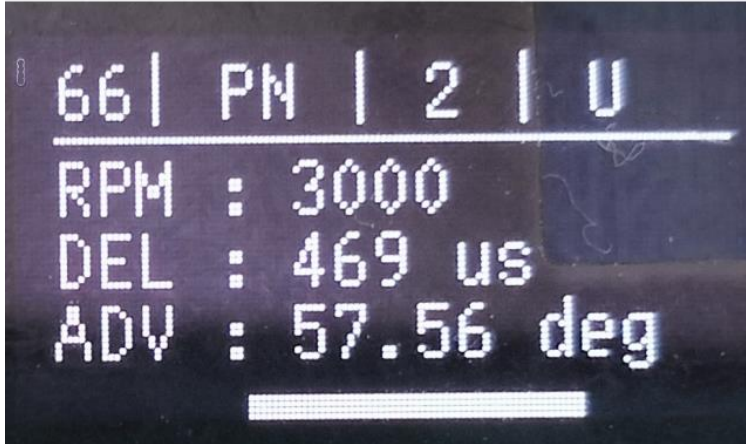
If Pickup Type is already set to **NP** or **PN**, "**Start Engine**" disappears after 2 seconds and ITM goes into RUN mode



RUN MODE

First line shows the settings

Pickup Position	Pickup wave Positive first	2 strokes	USB output or Wifi output
66° BTDC			



PN Pickup Type forced by user to Positive first.

NP Pickup Type forced by user to Negative first.

APN Pickup Type forced by user to Auto and pickup was detected as a Positive first.

ANP Pickup Type forced by user to Auto and pickup was detected as a Negative first.

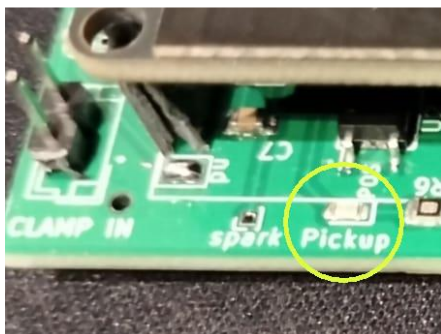
RPM : Measured from PICKUP pulses

DEL: Delay between pickup pulse and spark in microseconds

ADV: This delay for this particular RPM = this Advance timing BTDC
Positive number: Advance BTDC (Before Top Dead Center)
Negative number: Advance ATDC (After Top Dead Center = Retard)

Bottom: Advance bargraph

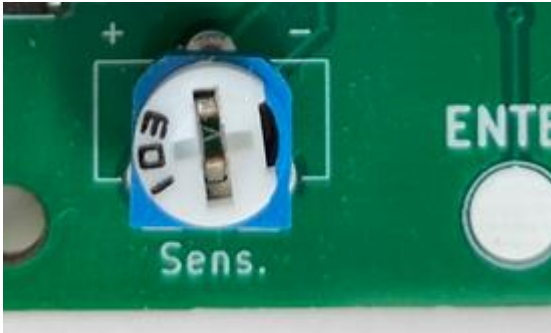
Pickup Led flashes each time a pickup is detected.



SENSITIVITY

Use an INDUCTIVE probe or just 3 to 10 turns of wire around the sparkplug cable to detects the spark.

Sensitivity is adjustable by the small trimmer:

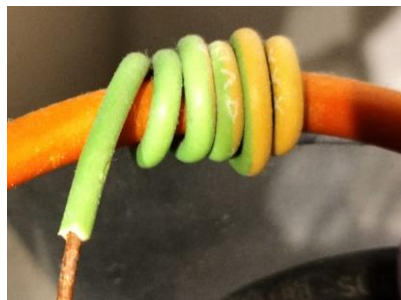


Begin with the sensitivity set to the lowest. Turn the trimmer fully CW.

Start the engine and gradually increase sensitivity by turning CCW until consistent values are displayed.



You can also add or remove loops around the spark plug cable.



INDUCTIVE PROBE

For better measures, you can buy or build an **Inductive** Probe (*A Capacitive probe won't work*)

I am using a toroid salvaged from an old PC power supply



Remove all wires:



Cut a quarter of the tore:



I use **40 turns** of around **0.5mm/24AWG** enameled wire:



Some hot glue to fix the wire :



Solder one pin header (the other end is not connected):

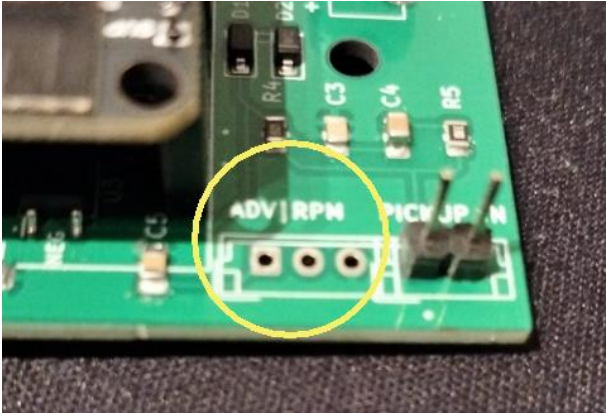


Result:



DAC OUTPUTS

Two optional 8 bits Analog outputs are available:



ADV:

- Max voltage is around +3.1v.
- Output: **Degree = mv*2/100** (ie 3100mv*2/100 = 62°)
- Max output 62° BTDC
- Steps of 12mv *2/100 = **1mv ≈ 0.25°**

RPM:

- Max voltage is around +3.1v.
- Output: **RPM = mv*3225** (ie 3100mv*3225 = 10,000rpm)
- Max output 10,000 RPM
- Steps : 10,000/255 = **1mv ≈ 40 rpm**

DRIVER

To communicate with the device through the USB connector, you will need a driver.
(*You don't need any driver for wifi*)

If you don't have it yet, then install **CH340G** driver:

Windows: <http://www.arduined.eu/tag/windows-7/>
<https://learn.sparkfun.com/tutorials/how-to-install-ch340-drivers/all#drivers-if-you-need-them>

Mac: https://wiki.wemos.cc/_media/ch341ser_mac_1.5.zip

Linux : <https://learn.sparkfun.com/tutorials/how-to-install-ch340-drivers/all#drivers-if-you-need-them>

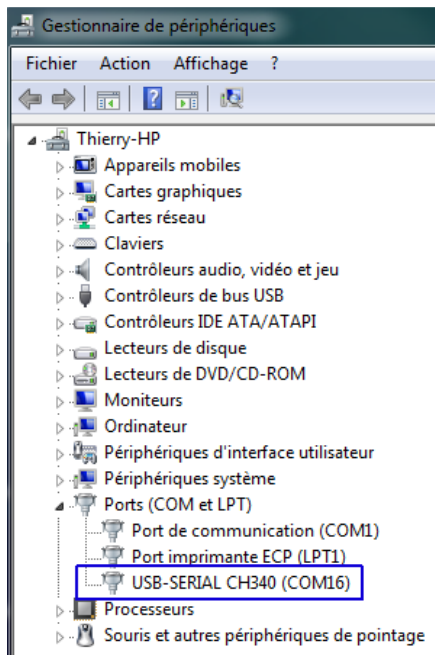
Chip Manufacturer driver http://www.wch.cn/download/CH341SER_EXE.html

Restart the PC

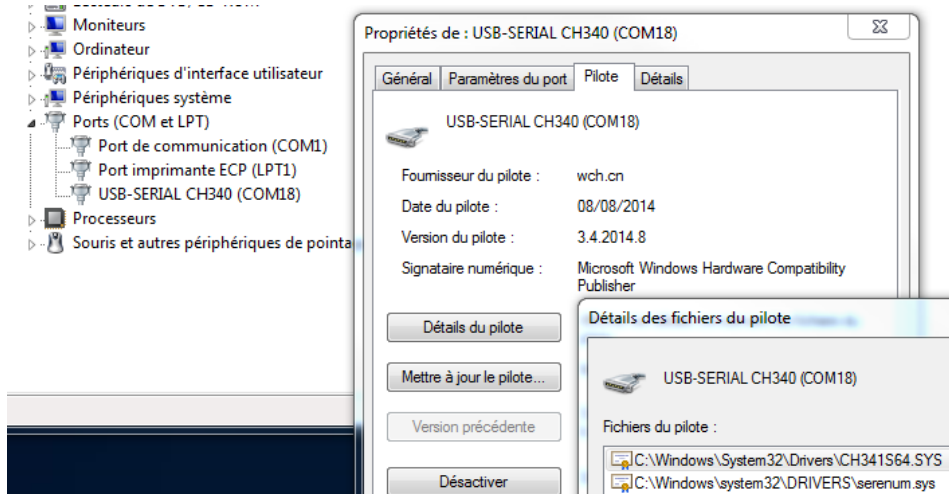
USB CONNECTION

Open "[Device Manager](#)" Scroll down, under "[Ports \(COM&LPT\)](#)" plug the USB cable to the ITM device, you should notice a new COM-port named "CH340"

Note the Port number (here COM16)



Right click for [Properties > Driver](#) tab, if another Windows driver is in there, then click on "[Update driver](#)" find and install the one for CH340.



If Windows doesn't recognize the device because the driver is missing, the new Port will appear unknown in the "[Other devices](#)" folder:

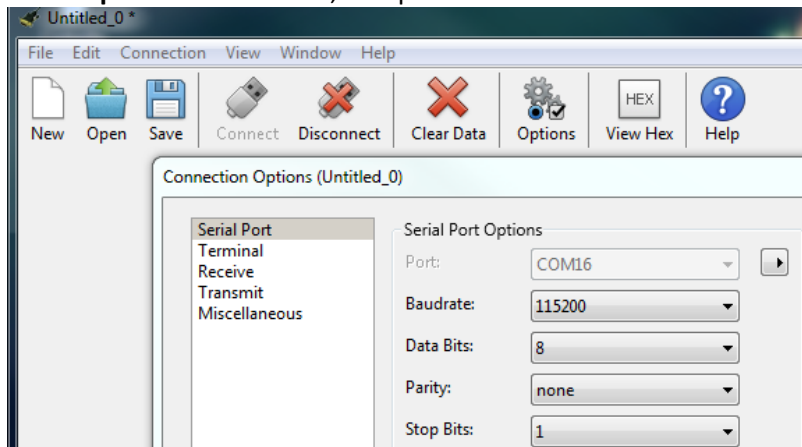


TERMINAL CONSOLE

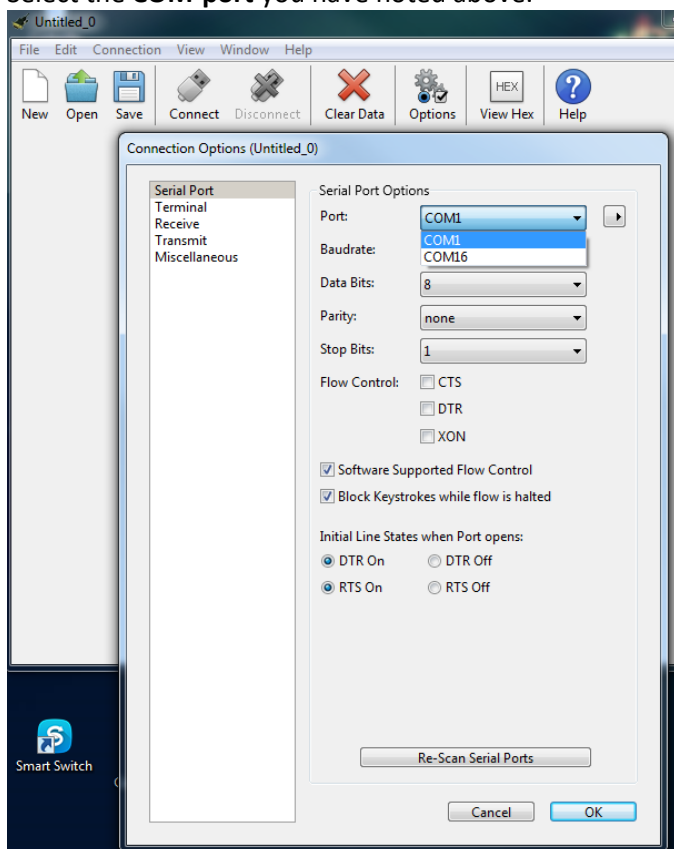
Once the driver has been installed, launch a terminal on your PC (I recommend **CoolTerm** from <http://freeware.the-meiers.org>)

But [Putty](#) or [Kitty](#), [Teraterm](#) are usable too...

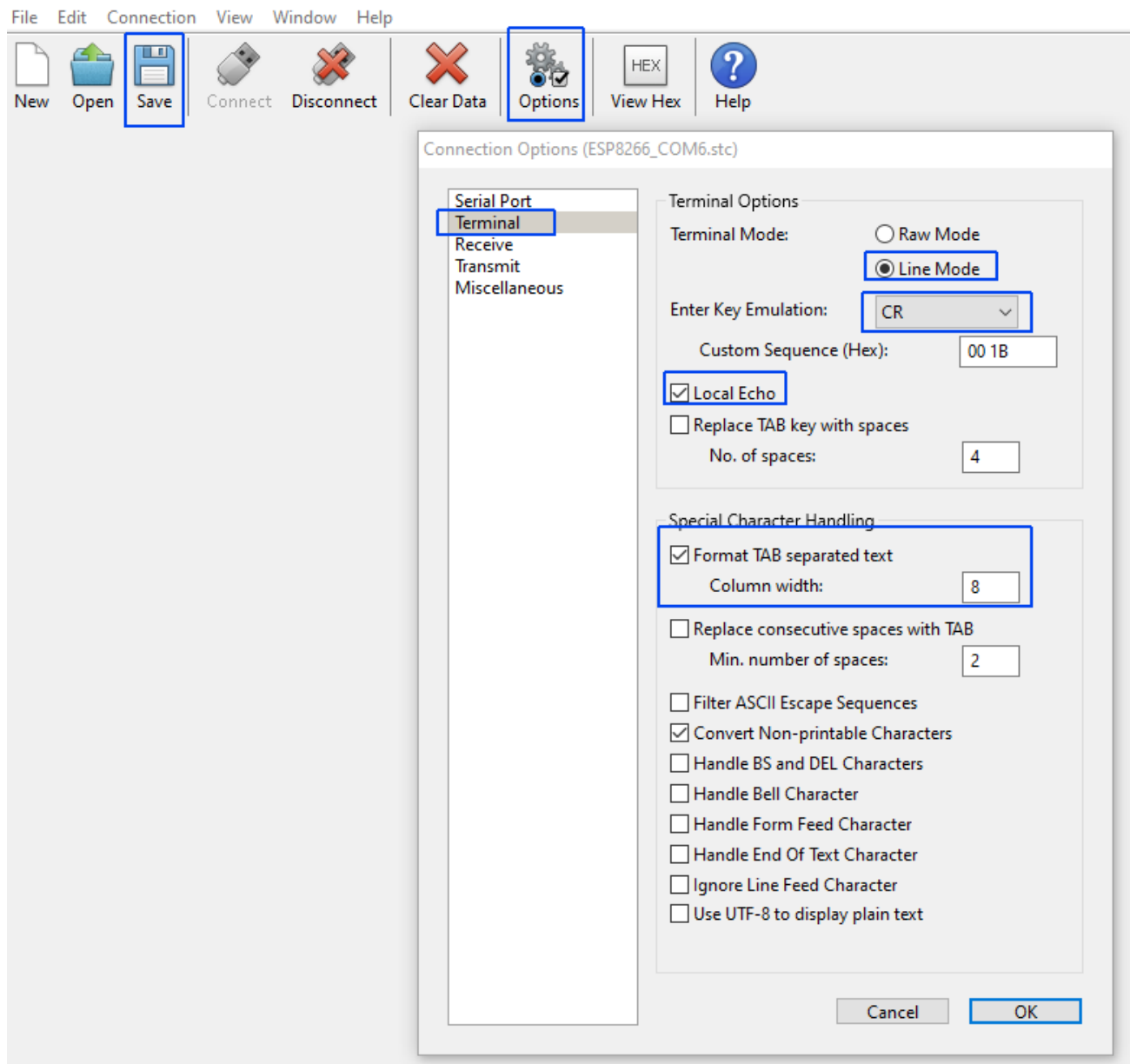
Go to **Options > Serial Port**, Setup the terminal to **115200.N.8.1**



Select the **COM-port** you have noted above.



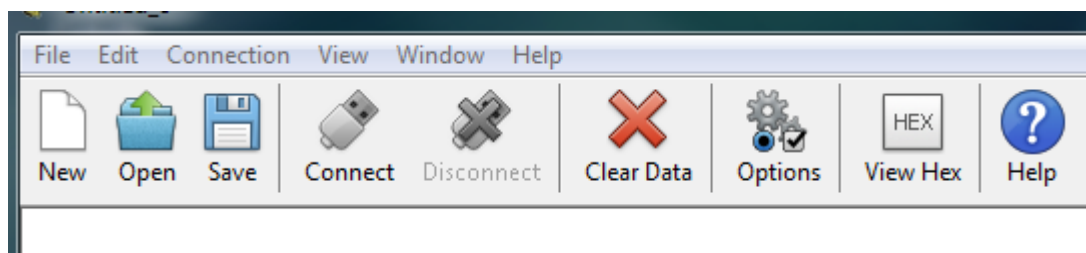
Under **Options > Terminal** check *Line Mode*, *Enter Key Emulation*, *local Echo* and *Format TAB* > **OK**.



Save this configuration

Connection

Click on "**Connect**" button



Other OS

-Android

– Use [Serial USB Terminal by Kai Morich](#) and a Male-Male USB type-C OTG connector to USB micro-B. ([video](#))

The phone must be [OTG compatible](#) with OTG turned on:

settings—additional settings—enable/disable OTG.

Mac

– Shell commands:

```
terminal
ls /dev/*usbserial*
screen /dev/cn.usbserial-xxxxxxx 115200 -L
screen /dev/tty.usbserial-xxxxxxx 115200
```

Linux

– Use a Terminal Software as [CoolTerm](#) or [Putty](#).

– Use Shell commands to find the COM-port:

```
tail -f /var/log/syslog | grep USB
dmesg | egrep --color 'serial|ttyS'
ls /dev/ttyUSB*
```

Port Configuration:

```
sudo su
stty -a </dev/ttyUSB0
stty -F /dev/ttyUSB0 cs8 115200 time 10
```

Connection to the device:

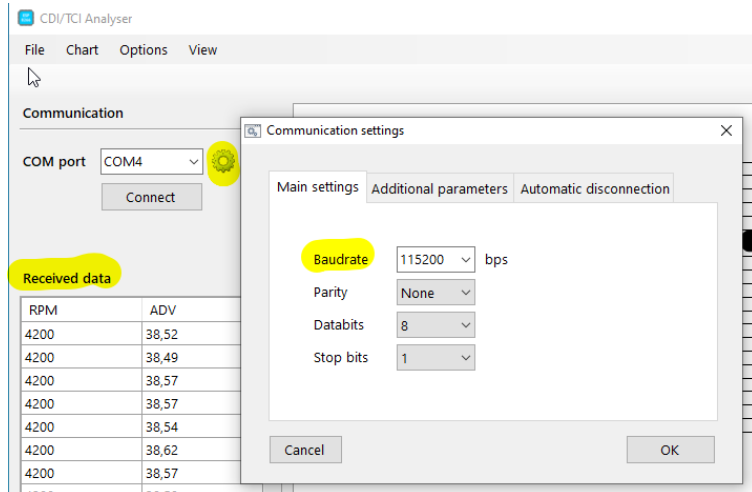
```
cat /dev/ttyUSB0 & cat > /dev/ttyUSB0
```

PLOTTER

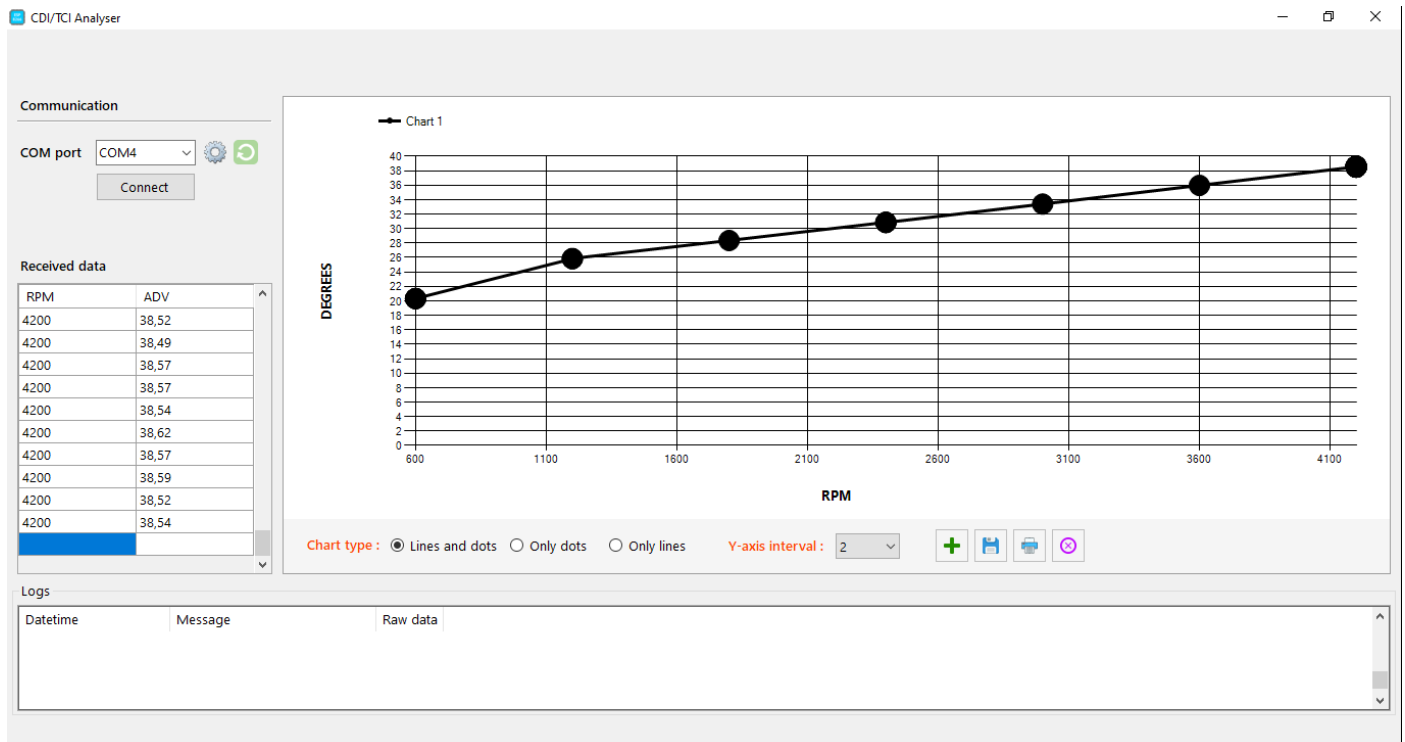
Works exclusively on Windows.

After installing the [driver](#) and displaying timing in a [terminal](#), you can use my optional program to show and map advance timing in real time.

- Connect your laptop to the **USB micro-B** port and the ITM to the bike
- Start the bike, wait for RPM and Advance to display on the led screen
- Launch *CDI-TCI Analyser.exe* on the laptop, Go to *Options > Communication Settings*



- Click **Connect**. The program plots the timing:

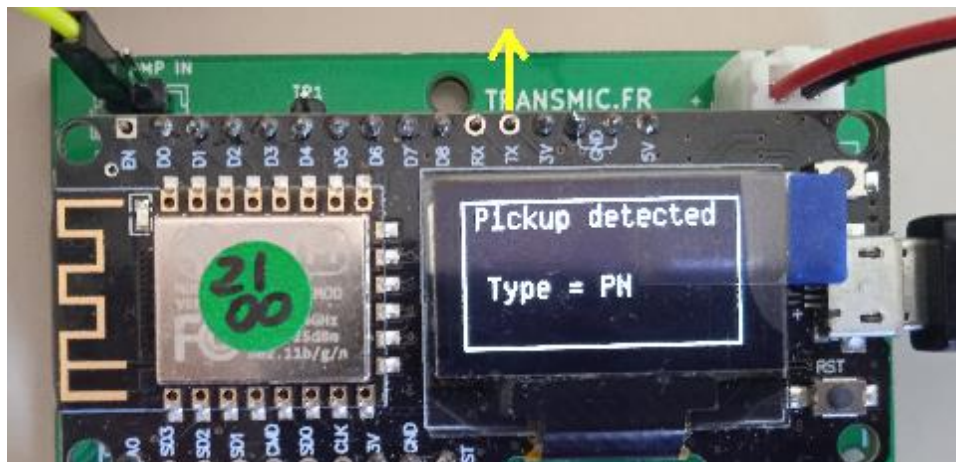
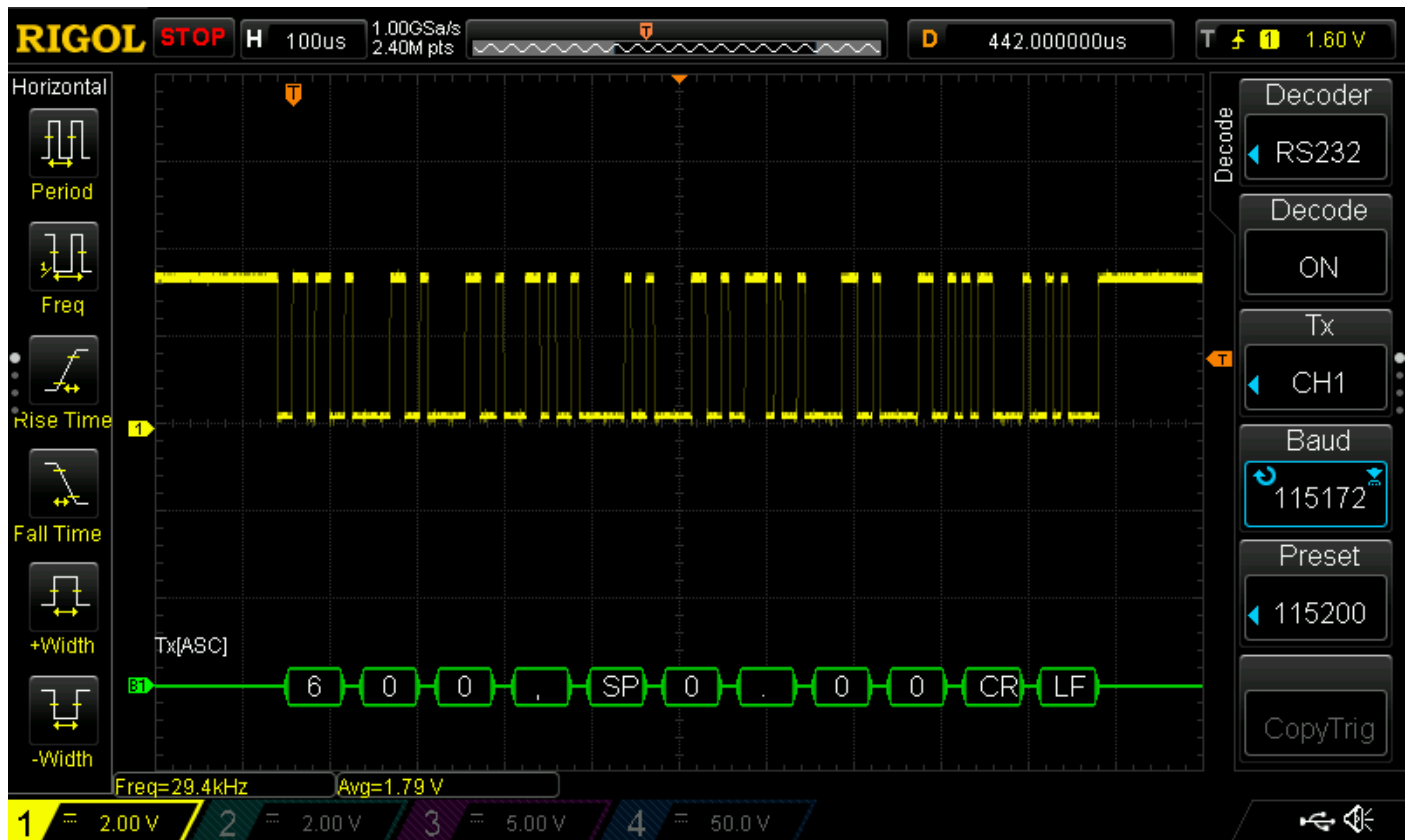


- and can displays numerous charts for comparison:



DIGITAL OUTPUT

You can also interface this device to an external device by using the **Tx** output of the **RS232 serial port** at 115200 N.8.1

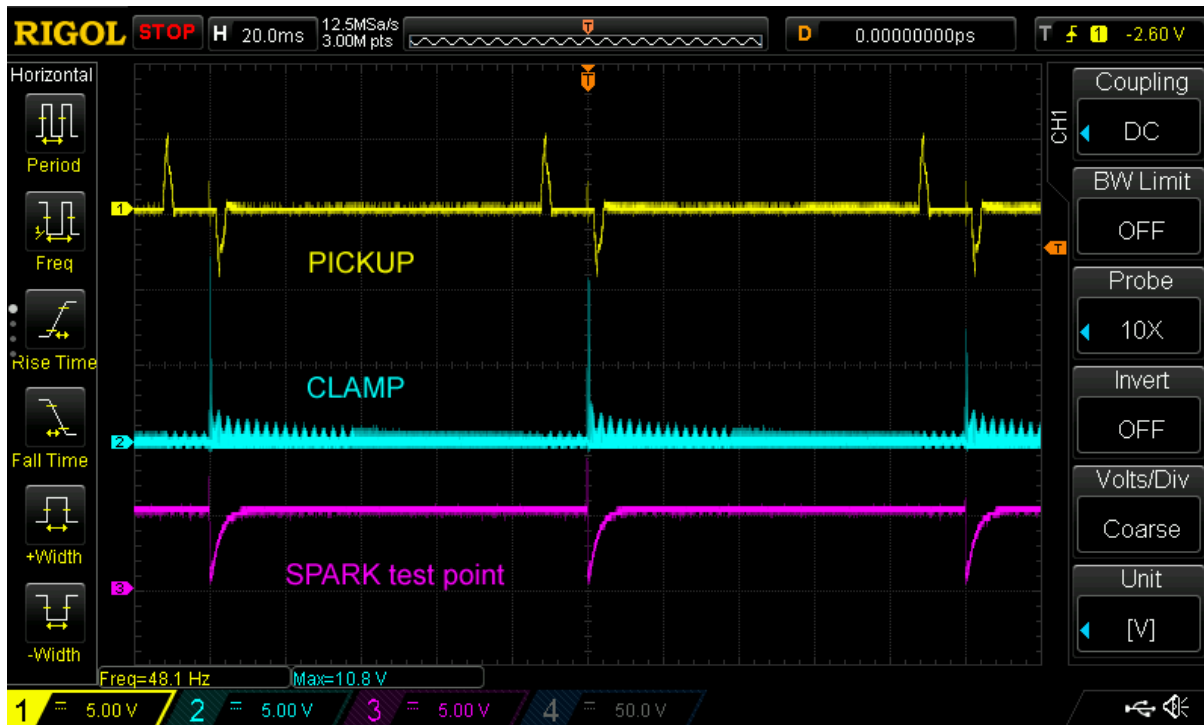
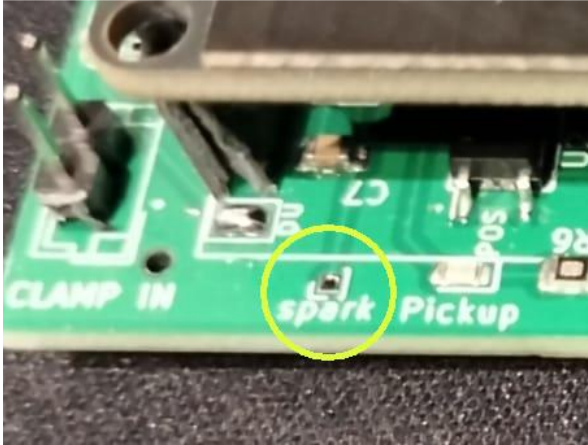


TEST POINTS

If you own an oscilloscope here are examples of what you can scope on the different Test Points.

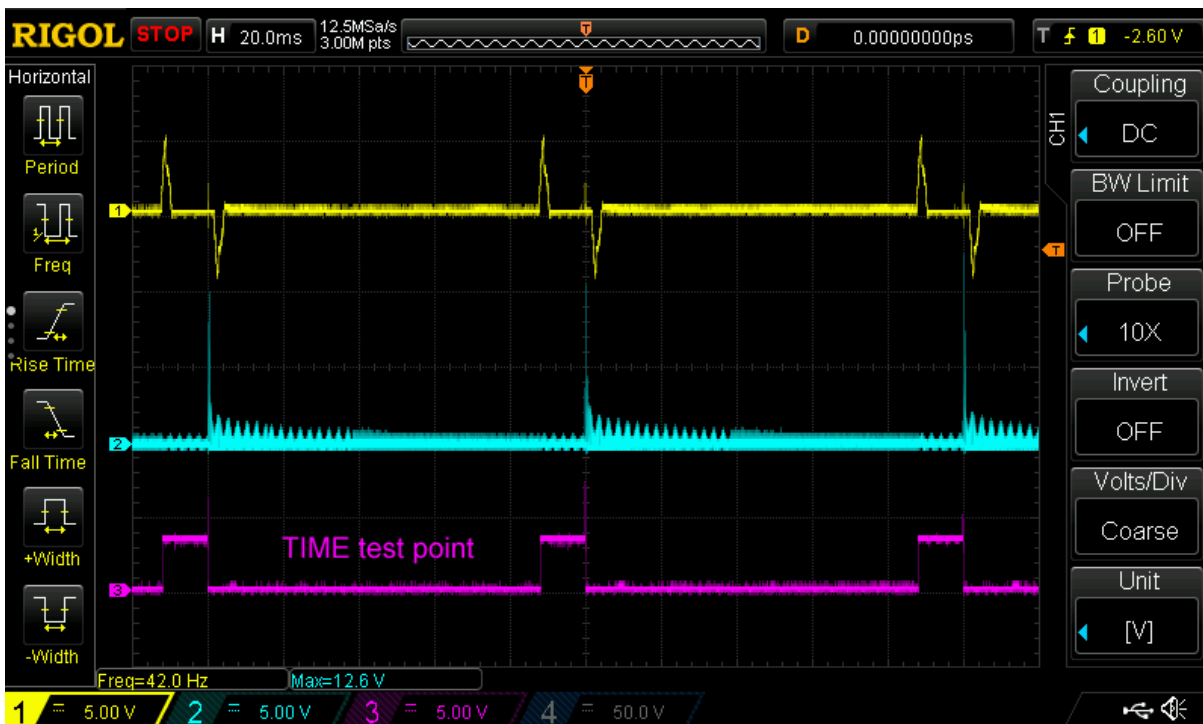
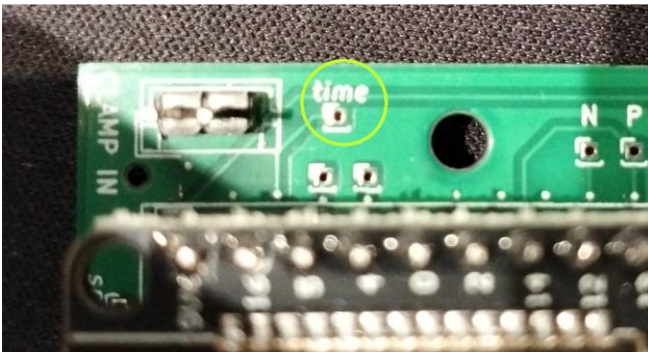


Use the **SPARK** test pad to visualize the signal detected by the clamp:





us the **TIME** test pad to visualize the delay(μ s) between pickup and spark.





use **P** or **N** test pads to visualize the pickup signal detected by the device.

