Many trend-setting hand-held tools have appeared in the automotive repair market, especially tools for electronics diagnosis. The main trend over the last few years has been to move away from big diagnostic machines, in favor of hand-held, technician-affordable, multi-function tools.

The '90s has been the decade for the West Coast bunch, with companies such as Fluke, Tektronix, ITTI, EDGE, Snap-on Diagnostics, Vetronix, and Interro setting the trends for this type of equipment.

The focus of this article is the Interro Personal Digital Assistant, or PDA for short. The PDA is primarily a portable four channel lab scope, but it’s also a whole lot more, as you will see. It is best described as a system that is based on a hand-held PC with a PCMCIA slot (program memory card) and an interface module port. The software on the PCMCIA card and the installed interface modules define the different versions and functions of the tool. In keeping with the company’s anti-obsolescence policy, all base units from serial number 00001 to current models can be upgraded to use current software and plug-in hardware.

The instrument is sold under three different names by three different tool suppliers:

- OTC uses the Vision label.
- Matco markets the tool as the Insight.
- Interro uses the PDA designation.

I received the current version 2.53 of the PDA100A from Interro for evaluation. The unit includes software and modules for the four-channel scope and an ignition/engine analyzer. There are a
few differences between the labels and kit configurations offered by the three different companies. Some kits have more or less probes and leads. However, the main unit, software and modules are essentially the same on all versions. OTC’s Vision has a membrane keypad. The PDA and Insight have a rubber keypad.

Key features and optional accessories for the PDA include:
• A base unit, which functions as 4-channel Lab Scope.
• A 6-panel, 4-channel, Digital Multimeter. Measurements are user selectable for each panel.
• Sensor specific presets that Interro calls Autometers.
• A hand-held Ignition/Engine Analyzer module which builds on the 4 channel scope and adds a primary and secondary ignition scope for conventional (DI) and Electronic Ignition (EI) engines. Special test leads and adapters for EI systems are included.
• A complete Ignition Analyzer with raster and parade displays of primary/secondary or power/waste. A DIS test lead set is also included.
• A full-functioned Engine Tester to test cylinder efficiency.
• A module called ECVu. This module is a VIN-driven, in-system PCM and component tester that connects between the PCM and the wiring harness to dynamically test all electronic sensors, verify or condemn the operation of the PCM or any sensor or actuator connected to it. This module also allows for simultaneous (user-selectable) viewing of inputs and outputs from the ECM while road testing. Signals can be recorded and played back for detailed analysis after testing.
• The base unit can also be used as a display platform for the Interro PDA4GB and PDA5GB Emission Benches. One is a four and the other is a five gas bench.

As mentioned earlier, the current PDA software version is 2.53. If you already have an earlier version of this tool and wish to upgrade to the latest software, expect to pay approximately $199.

User Survey
I conducted a small random survey of known PDA users for this article. I asked what they liked most about this instrument. Those that had the ignition/engine analyzer module said this was their primary application for the tool. One user enthusiastically stated that he almost exclusively used the cylinder shorting and KV bar graph. Others said the ignition/engine analyzer module did not fit into their budget but found the four trace scope module was adequate for most diagnostic applications. The strategy adopted by some was to use the PDA in single channel mode for glitch detection and signal analysis and multi-channel for relationship analysis.

I followed the procedures in the manual to connect to a six cylinder DIS system, which didn’t take much time at all. I did have to make sure the test lead clips were firmly pressed to the wire or else
they would slip off. I had the option of displaying all six plug signals or viewing one at a time with or without the waste spark. As you add more signals for display they get smaller due to the limited real estate. It is almost too small with all six cylinders displayed. No problem, just don’t display so many!

According to the manufacturer, this is the only hand-held unit that offers individual cylinder analysis, including DIS (waste and power cycles). DIS waste displays are important for troubleshooting secondary ignition resistance. The unit also offers cylinder performance on a per cylinder basis (complete with cylinder shut-down and complete cranking/charging with per cylinder compression analysis).

**User Interface**

I found the user interface easy to understand and use. This opinion was shared by most of the surveyed users. There are just enough keys on the keypad and they are clearly marked, the screen is bright (with the backlight on), the menus make good use of the screen real estate by using large fonts. You are not likely to get lost in the menus, if you do, just hit the EXIT key to return to familiar ground. I did find the power key too easy to hit, which had the unintended effect of turning the tool on and off unexpectedly.

There were only a few instances where the user interface was not clear (or intuitive) to me. One is the trigger setup when using the scope function. This is done by pressing F4. Cross hairs appear on the screen. Next, the arrow keys are used to set the position anywhere on the display on any signal. At this point you may think you are done but you’re not! I found myself waiting for it to start going, then when I hit the EXIT key the trigger disappeared. Whoops, do it again, press ENTER not EXIT! This pops up a menu for slope selection, make it and press ENTER and the cross hairs turn into an arrow indicating trigger point!

The other feature that caused me some confusion was navigating between the volt and time settings of the lab scope screen. It can be confusing as to where you end up when you hit an arrow key. It might be nice to have a key dedicated as a TAB, like the one found on a computer keyboard, to cycle through all the possible stops.

The final thing I noticed is that it seems to take a while to change from screen to screen in certain situations. These of course are minor complaints and will not be a problem after you have run through the steps a few times.

The next step in the user interface is the screen, which has a resolution of 256 x 320 pixels. Its strong point is its layout. There is never too much information in the screen and this combines nicely with the easy to use menu system. With the backlight off, the display seems a little dim. With it on, it can almost be used as a flashlight at the expense of the battery. There are two dedicated keys on the front panel for contrast and backlight.

Perhaps as a result of extended backlight use, poor battery life has been an issue for some PDA users. As is true with all Ni-Cd batteries, you must cycle the battery through three complete cycles to retain full battery life. Some users informed me that they simply use the 12-volt cigarette/battery adapter to get around the battery life situation. The latest versions have an automatic battery cycle function.
Scope Performance

When evaluating any piece of test equipment, the intended application is the key to determining value. This means it’s a ‘personal thing’ and it is up to you to decide what is important and what is not.

When this meter was initially introduced as the Matco Insight and the OTC Vision, many users were concerned about the screen refresh rate and the lack of a peak detect mode. To address these issues, Interro made a change to the internal electronics and to the software. You have the latest base unit if there is a barrier between the RS-232 port and the internal PC board, which was also a point of concern. Older models can be upgraded by contacting Interro. A software update that will improve the peak detect even further is also in development.

The screen update rate, with the scope set to a single channel, is within industry norms. As you would expect, the update slows as more channels are turned on. This can be a consideration during diagnosis. It might be best to use the single channel when trying to capture an intermittent event. This also holds true when using the advanced ignition features. In the Quick Ignition mode, the screen can update as fast as seven times per second.

The scope has a maximum sample rate of 2 MHz and a maximum time/div setting of 25uS for 1 channel and 1 mS with 4 channels. Multiply this by 5 divisions across for the total time displayed. It takes a setting of 50 uS to get a good look at the 360 slots on an optical distributor at 2000 RPM. On single channel, this scope should get good pictures!

To capture intermittent glitches, Interro recommends setting the lab scope to single channel with the trigger set at a lower threshold. This is equivalent to being in what is called Normal Mode. This means that if the signal does not reach the parameters set by the trigger controls, the screen will not update.

For example, you may decide to set the trigger for the falling edge of an injector spike, then wait for the injector to short. No spike—no trigger. When using this technique, it is important to have the time division set low enough so that more than one cycle is displayed or else you will end up with only the last good event. The slower time per division gives the scope a chance to display the following bad events.

The Screen Record feature is also useful for this purpose. In this mode, up to 50 measurement or display screens are automatically saved to memory. So, when a glitch occurs you can stop the recording and thumb back through the screens. You can even play it back like a movie! It is important to note that this is not a continuous record but is based on the regular screen updates.

Storage Capacity

The Lab Scope, Quick Ignition, and Ignition Scope can all store up to 400 screens (eight files with up to 50 screens each). That means the PDA100A can hold up to 1,200 screens in total. Even the ECVu PCM analyzer can save 400 screens. All version can also save 20 snapshot reports for printing. Save and Replay on the new emission software version adds an additional eight files. Essentially, the amount of saved information is dependent on the size of the PCMCIA memory card. As the cards increase in capacity (today the maximum supported is 4 Mbytes) the capacity to save information will also increase.

If you can save it in memory, there must be a way to print it out or save it to a PC. OTC offers the OTC Wave software and Vetronix offers the PDA Wave Plus software. Both are Windows programs. PC connectivity seems to fit right in with the philosophy of the tool.

The Choice Is Yours

Interro maintains a staff of full-time product specialists all over the world to offer free equipment demonstrations and training. They also have a 800 tech support line for equipment help, parts replacement and warranties (up to three years on systems).

Bottom line: Is this meter for you? That is something you will have to decide for yourself! As is true with all of the instruments on the market, you will find strengths and weaknesses. On a positive note, I believe that Interro will be responsive to user needs and will continue to support and improve this tool.

If you would like to receive additional information about any (or all) of the three versions of this tool, Circle No. 119 for the Interro PDA, Circle No. 120 for the MATCO Insight, or Circle No. 121 for the OTC Vision.

—By Jorge Menchu