

INCA V7.1 Tool Performance

Rapidly rising expectations fulfilled

Hybridization, energy management, and more stringent emission limits are quickly leading to greater demands on automotive control. For pre-calibrating electronic control units to handle these increasingly complex demands, ETAS INCA – the measurement, calibration, and diagnostic software – is regarded as the tool of choice. Version 7.1 offers much greater performance and usability. What’s more, INCA will begin delivering new features on a quarterly basis.

“Out of memory.” Depending on the research engineer’s disposition, this message is met with either an aggravated sigh or an outburst of profanity. And it happens all the time with electronic control unit (ECU) applications. When pre-calibrating ECUs, engineers must keep their eye on an ever growing number of control variables and undertake increasingly more precise measurements and comparisons – and this means their software systems take up more and more memory.

“Most recently, electrification and preparations for the Euro 6 emissions standard triggered virtually explosive growth in memory requirements,” reports Hans-Juergen Schmidt-Fürst, Director of Global Customer Support at ETAS. Just two years ago, 40,000 labels were integrated in the configuration of electronic control units. Today it is 140,000 – and rising. Against this backdrop, “Out of memory” messages come as no surprise.

Something had to happen. And now something has happened: ETAS’ rollout of the 7.1 version of the INCA measurement, cali-

bration, and diagnostic software, which began a few months ago. “By quadrupling the memory depth and utilizing Windows resources much more efficiently, we’ve been able to push the limits outward to a great extent,” adds Schmidt-Fürst.

Thanks to this performance boost, it is now an absolute exception that memory-related disruptions occur in the workflow. Many users had eagerly awaited the improvements. Some of them went so far as to switch over during ongoing application projects, even opting to work with beta versions of INCA V7.1.

Kilian Schnellbacher, Product Manager, supervised the rollout. Despite isolated customer compatibility issues, he draws a positive preliminary conclusion: “V7.1 is a success with users not only because of the increased performance, but also because of the optimized usability,” he says. In fact, much of the optimized usability is directly related to the increased performance. Take the example of comparing up to 14 different data sets, each one comprising more than 18,000 labels: on the one hand, only the expanded memory depth makes

these kinds of comprehensive comparisons possible. On the other hand, application data sets can now also be compared in parallel with an ongoing experiment.

Up to now, the experimentation environment and the INCA module for comparing alternative data sets were separate. To call up calibration data from previous experiments, calibration engineers had to close the experimentation environment. “In INCA V7.1 it is possible to directly open the Calibration Data Manager (CDM) in order to compare the variable values currently used by the working page and reference page,” explains Schnellbacher. Users can choose between displaying entire datasets or just the values of the currently selected control variables.

It is particularly in the light of this option that conducting a quick preliminary comparison during an ongoing experiment is a big hit. Now, calibration engineers can immediately intervene in the analysis during a measurement if they notice conspicuous measurement curves. “All the while, they can stop or scroll back the display with the



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new, optimized oscilloscope, and more closely scrutinize measured values,” describes Schnellbacher, “and then return to the display of the current measurement in real time.”

This analysis function is not the only thing to improve operation of the new oscilloscope. “We put a lot of effort into achieving quick configurability and intuitive operation,” says Schnellbacher. There is, for instance, the option to scale the oscilloscope’s measuring range by mouse-click. Previously this could be done only by entering numerical values. What’s more, users can specify in advance whether the axis should be automatically scaled up in the event of unforeseen measurement deflections. Last but not least, the view can be split if measurement signals are to be assigned to different groups in order to get a more clear-cut representation of the measurement curve.

A further feature of INCA V7.1 makes it possible for users to color-code both measurement variables and calibration variables. In particular, large teams and project managers – who must keep track of the progressions of calibration variables

over periods of many months – benefit from this detail. This means they can quickly tag important variables across all layers of the software and, if necessary, establish relationships between measurement and calibration variables. And, in order to allow measured data from test vehicles to be logically assigned to the individual road sections even after a long period of time, ETAS integrated a map tool into INCA version 7.1’s measurement data analysis module. This uses GPS data to quickly and easily locate road sections and section topographies in OpenStreet-Map maps.

Users immediately took advantage of many of these new possibilities. Schmidt-Fürst views this with a smile and a heavy heart. “Of course we’re pleased that V7.1 has been so well received. However, because customers are now also exhausting the greatly expanded comparison possibilities, and thus including more and more labels, it’s only a matter of time before this version, too, reaches its limits,” he says – even though INCA V7.1 maxes out the computing power of multi-core PCs.

ETAS is reacting to this demand growth. Instead of launching a new major release every two to three years, customers will now be provided with service packs on a quarterly basis. These gradually enhance the scope of features of INCA V7.1. “This exceptional responsiveness entails a learning curve for us,” admits Schnellbacher, “because by moving to successive releases, we leave ourselves less time for testing and stabilization, of course. The transition resulted in compatibility problems, which are the last thing anyone in the middle of a hectic application project wants to see. Short release cycles are a challenge that we must overcome.” Nonetheless, Schmidt-Fürst and Schnellbacher have received a lot of positive feedback from customers on INCA V7.1. And the transition is also running increasingly trouble-free. “We are firmly convinced that the structured process, with quarterly service packs, is the right way to cope with the ever-increasing demands in our customers’ ECU universe,” sums up Schmidt-Fürst.