Atmel’s Latest Software Tools Release Boosts Productivity

Atmel START Debuts alongside Atmel Studio 7

White Paper

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If you write embedded system code, all eyes are on you. Today more functionality is implemented in software than ever before. So anything that lets you finish the job more quickly will ease the pressure you feel and contribute directly to company revenues and profits.

Atmel® START, the latest release of Atmel Studio 7, and the Atmel Power Probe combine to give you a huge productivity boost when writing code for Atmel ARM®- and AVR®-based microcontrollers (MCUs). And what may surprise you is that, while your application programming will benefit from this boost, you will also spend less time on non-application code.
Opportunities for Productivity

Software productivity has typically been measured in simple terms like “lines of debugged code per hour,” but that metric really focuses only on application coding. With embedded systems, there’s much more to be done than simply writing application code.

- You must configure the software architecture so that the application code has access to the resources it needs when executing. In the past, this largely meant connecting software drivers to the underlying circuit board through a board-support package (BSP). But increasingly sophisticated applications require extensive middleware and libraries for communications and other high-level functionality. Knitting these layers together is complex and time consuming to research and assemble.
- You will want to reuse existing code from prior successful projects wherever possible. But different processors have often required different integrated development environments (IDEs) and build flows. As a result, the migration can take far too much effort and time.
- While a universal tool is good, overburdening an IDE with every feature that might ever be needed for any project clutters an interface and make it less efficient to use.
- You can lose a significant amount of time migrating proof-of-concept applications from a prototyping environment like Arduino to a production platform for full commercialization.
- Sifting through documents and online searches to figure out how to bring the pieces together burns a lot of time.
- Speed of execution is no longer the primary system requirement; however, energy efficiency increasingly is. While speed has historically been easy to measure, power has not been. It’s even more difficult to decide which parts of a program are consuming too much energy.

All of these concerns conspire to reduce software development productivity. The latest updates to the Atmel tools portfolio address them by:

- Launching Atmel START, a graphic tool for creating the software architecture
- Modernizing the Atmel Studio user interface
- Unifying all devices under a single IDE – Atmel Studio 7
- Customizing Studio 7 installation for each project
- Enabling an easy transition from prototype to production, from Maker to Market
- Enhancing the Help system to keep project-relevant information a click away
- Enabling power profiling, analysis, and debug with improved visualization using the new Atmel Power Probe

Faster Project Creation

A completely new tool – Atmel START – is being launched to speed the creation of the software architecture. While some of its capabilities have been available through a series of wizards in older versions of Atmel Studio, Atmel START provides a unified graphical approach to connecting an application with the hardware and middleware resources it needs.
Figure 1-1. Low-level hardware connection and resource details, along with their drivers, can be easily configured with the easy-to-use Atmel START graphic interface.

You can explore the availability and implications of different devices, different features, and alternative middleware components, and then acquire and configure them as if the tool were a “software vending machine.”
Atmel START makes it straightforward both to see what your software stack looks like and to add to it.

Atmel START enforces consistency to ensure that the set of blocks you’ve put together will perform successfully. If selected software components need specific hardware support, then Atmel START confirms that such dependencies have been met – and if not, it makes suggestions. If the choice of one piece of middleware means that other software resources are required, then those are automatically loaded as well.

Atmel START generates code for any IDE, not just Atmel Studio. It is a web-based tool, which means it requires no installation. And, unlike wizards, it also creates a configuration file that it can read in the future if you want to make changes to the system and generate new code.

**Atmel Studio 7 – More Efficient than Ever**

With this release, the Atmel Studio 7 IDE now sports a modern user interface, compatible with the most recent operating systems – including Windows 10. Its greater responsiveness means that you can navigate and complete tasks more efficiently and quickly. It supports all Atmel MCUs – both ARM and AVR architectures – in a single, unified environment.
Atmel’s Latest Software Tools Release Boosts Productivity [WHITE PAPER]

Figure 1-3. Atmel Studio 7 has a completely updated look, unifying development of code on any Atmel processor under one tool

This provides the obvious benefit of familiarity, minimizing any learning curves at the start of a new project. Thanks to a uniform environment, it also makes it easier to reuse portions of projects simply by copying modules across, all within the same environment. Designs started in a Maker environment like Arduino can be migrated easily into Studio 7 for refinement into a production design.

The Help system has been much more tightly integrated into Atmel Studio 7. F1 brings you directly into context-sensitive help, taking into account the specific device you’re working with. If, for example, you need more information on the nature of a particular register, then clicking that register in the Atmel Studio 7 IDE and then hitting F1 will take you into the specific datasheet page with the information you need.
An offline mode provides access even when no connection is available. While online mode uses your computer’s web browser, offline mode presents information in a dedicated viewer. With offline mode, the Help information is downloaded to your computer for access whether or not you have a connection. If a connection is available while you’re in offline mode, you’ll be alerted when some of your downloaded Help information has updates available. And if you look for something that hasn’t yet been downloaded, the Help system automatically goes online to retrieve the document if you have a connection at that time.

Leveraging the Atmel Data Visualizer, it is now possible to use Atmel Studio to profile the current consumption of your embedded application. Power data is sampled by a dedicated measurement circuit...
available on the Atmel Xplained-PRO development boards, for the ultra-low-power Atmel® | SMART SAML series of MCUs, or by the dedicated Power Debugger if you are using a different MCU or your own board.

You monitor your application’s power behavior in real-time while debugging. This allows you to immediately identify hot spots in your code and shows you where you are exceeding requirements – or simply where there are opportunities for improvement.

Critically, once you’ve identified where you’d like to reduce power, the Data Visualizer enables you to identify the instruction that was executing while a specific power sample was taken. The Data Visualizer correlates program counter values with power samples so that, by clicking on the sample you wish to know more about, you are immediately taken to that part of your application. You can restructure and rewrite any routines that are drawing more power than you want, or perhaps identify hardware that can be put to sleep.

Now for the first time, you have a tool that lets you optimize power in the same way that you optimize speed for any Atmel processor. You debug just as you ordinarily would – but now with power as one of the parameters to be profiled. This can shave weeks from your schedule on those designs with tight power requirements.

**Summary**

Atmel has focused squarely on software productivity with its release of Atmel START, Atmel Studio 7, and the new Atmel Power Probe. New projects can launch much more quickly using Atmel START to simplify the provisioning of the software resources and hardware connections that the application will need. Atmel Studio 7 now supports all Atmel processors, and a modernized interface and improved Help integration keep you productive as you write your application code.

Atmel Power Probe makes it dramatically easier to meet increasingly stringent energy requirements for battery-powered systems. Visibility into those parts of the code contributing to too much energy usage, which would otherwise take enormous amounts of time to identify, can now be quickly and efficiently located.

These productivity enhancements promise to dramatically improve your ability to ship increasingly sophisticated devices that rely on ever-larger amounts of software for capabilities your customers demand.

**Editor’s Notes About Atmel Corporation**

Atmel Corporation (Nasdaq: ATML) is a worldwide leader in the design and manufacture of microcontrollers, capacitive touch solutions, advanced logic, mixed-signal, nonvolatile memory and radio frequency (RF) components. Leveraging one of the industry’s broadest intellectual property (IP) technology portfolios, Atmel® provides the electronics industry with complete system solutions focused on industrial, consumer, security, communications, computing and automotive markets.

Today, microcontrollers are just about everywhere, powering an expansive array of digital devices. Many are calling this the era of The Internet of Things, a highly intelligent, connected world where Internet-enabled devices will outnumber people. Atmel is pleased to be at the heart of this movement, developing innovative technologies that fuel machine-to-machine (M2M) communication and the “industrial Internet.”

Further information can be obtained from the Atmel website at www.atmel.com.

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