

White Paper

Atmel Software Framework : Bring Excellence
to Embedded Projects

ASF for A Higher Credibility with Affordable
Time and Effort

ReliSource's Successful Expertise in Atmel Software Framework (ASF)

ASF Provides software drivers and libraries to build applications for Microchip devices. ReliSource has successfully applied these Atmega software tools and established an RF communication system using AVR XMEGA® MCU for developing applications for remote data monitoring system via a device called Gateway for large scale deployment. An embedded software was integrated with Gateway and the system was able to transmit and display the data within a 100 meter of radius. However, the Atmel software framework (ASF) provides these software drivers and libraries to build applications also for Atmel megaAVR®, AVR UC3 and SAM devices. It has actually been designed to help develop and cluster the different components of a software design.

How ReliSource Turned the Dream Projects Into Reality With ASF

While Atmel Software Framework is made available with a number of utilities for various applications and services (Figure 1), ReliSource has applied its drivers and libraries from ASF Software Module to build a remote monitoring project via RF communication to transmit data over a certain distance so that the application and systems becomes robust.

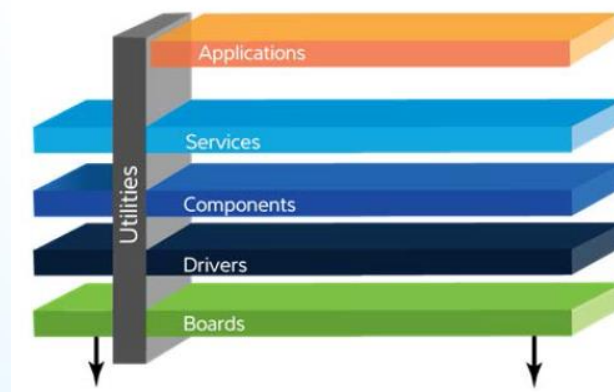


Figure 1. Block diagram of ASF utilities (www)

Each ASF version is released in two ways:

- As an extension to Atmel Studio 6
- Stand-alone zip package of the whole ASF directory

Atmel Studio IDE: Atmel Studio 7 is the integrated development environment (IDE) for developing and debugging Atmel ARM® Cortex™-M and Atmel AVR® microcontroller (MCU) based applications [1]. Content and features of Atmel Studio 6 include:

- Solutions and projects creation,
- A powerful editor with visual assist and plug-ins support to enhance the IDE,
- A GNU C/C++ Compiler for generating target executables,
- The ASF and ASF-oriented wizards,
- Programming & Debugging mode supporting all Atmel debuggers, programmers and the AVR simulator. In debugging mode, the IDE presents MCU status in nicely formatted views, giving fast access to critical system parameters.

- Atmel Gallery

ASF Software Module: A software entity that does not have an int main(void) function (e.g. a USART software driver, a USB stack). ASF modules are provided by the Drivers, Components and Services layers from ASF. An ASF module may be statically and/or dynamically configurable.

Use Case-1: Embedded Application

ReliSource's Embedded & Firmware Engineering team works 24x7 to design and develop cutting-edge products applying libraries and drivers that Atmel Software Framework provides to meet its clients demands ensuring the following applications:

- I2C, UART, SPI driver protocols embedded within MCU
- Writing code and identifying bugs in Embedded Software codes
- In the detection and solution of codes
- Measuring accuracy & creating dashboards using BI/AI
- Maintaining standards/regulations as HIPAA, ISTA, NIST & FDA regulations
- Speed and efficient service & delivery
- 24x7 support in prototyping and testing

Use Case-2: Radio Frequency Communication Application

ReliSource has been developing high-performing & innovative electronic device prototypes with Atmel Software Framework for 15+ years in both indoor and outdoor Radio Frequency applications using the Atmel Software Framework (ASF) tools maintaining industry standards.

- Interfacing XMega MCU
- RF applications for wireless communications
- Transmission of data over a distance of around 100 meters
- Functioned at 950 Mhz
- Gateway with an embedded computer built in for cloud storage of data
- 24x7 support in prototyping and testing

Functionality of Atmel Software Framework (ASF)

The minimum supported ASF version is 3.40.0. To install Atmel Software Framework, the download packages are available which can be opened in IDE. Supported Products: Atmel Studio 7.0

Owners: Microchip & Asfteam

Authors: Microchip

Tags: Atmel_Studio_7.0 & ASF

With No dependencies, the latest version is Atmel Software Framework 3.49.1.2036 [2]

Essential Solutions Using ASF that ReliSource Can Provide in Future

ReliSource's expertise inclining to Atmel Software Framework in solving problems by means of developing sophisticated embedded products ensures their further potentiality in developing smart appliances and industry based products to meet the client demand from around the world as well as to play role in IR 4.0 by collaborating with electronics and IT industries applying ASF's items, ports and boards. Besides the ASF module that comes along the ASF framework, there are two other items in the ASF:

- **ASF Application (aka ASF Example):** A software entity in the ASF that can be built into an executable. This can be: a demo application, or an example of usage of an ASF module. ASF applications are provided by the Drivers, Components, Services and Applications layers. An ASF application used as an example of usage of one ASF module is called an ASF Example. An ASF application may be statically configurable.
- **ASF Board:** Abstraction layer for each Atmel kit supported in the ASF. Usually associated with one device. The "special" board named "User board" is an empty board abstraction layer used to create a user-specific/custom board.
- **Ports:** There are also four ports of the ASF, one for each Atmel family of devices: megaAVR, AVR XMEGA, AVR UC3 and SAM. The common top folder gathers modules and applications shared amongst several architectures: in some cases the implementations are shared while for some modules only the API is common. For the latter, the common folder thus also contains ports for each Atmel family of devices. The thirdparty top folder contains modules and applications with licenses other than the Atmel ASF license. As for the common folder, thirdparty is not dedicated to one family but contains instead ports to for each Atmel family of devices [3].

References:

1. http://ww1.microchip.com/downloads/en/appnotes/atmel-8431-8-and32-bit-microcontrollers-avr4029-atmel-software-framework-user-guide_application-note.pdf
2. <https://gallery.microchip.com/packages/4CE20911-D794-4550-8B94-6C66A93228B8/>
3. www.atmel.com/asf