

THE ARROW QUADRO IoT WI-FI KIT: a faster route to success in the Internet of Things market

They don't call it the "Internet of Everything" for nothing. These days, almost every product is eligible to become part of the Internet of Things (IoT) — from the electric toothbrush to the jet engine.

The addition of internet connectivity has become a key ingredient of a new generation of "smart products," i.e., devices that combine sensing, processing, and communications capabilities with internet-based services and applications. The world's leading businesses are rushing to offer these smart IoT products to gain an edge over the competition.

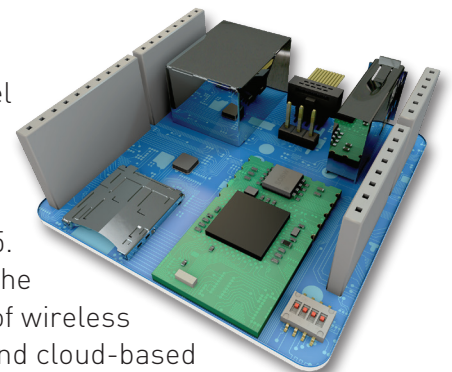
Because of this, the total available market for IoT devices is expected to double during the next three years, rising to about 1.6 billion units in 2019, up from 800 million in 2016, according to a forecast compiled by Cypress Semiconductor Corp.

To accelerate their time-to-market, companies are turning to IoT kits, if you will, to provide the essential building blocks required for IoT development efforts.

Today, Arrow Electronics has introduced two new kit solutions, both complete with its own powerful set of tools designed to streamline the process of evaluating, prototyping, and going into production with new IoT device designs.

The Arrow Quadro IoT Wi-Fi Kit

The Arrow Quadro IoT Wi-Fi Kit is based on a two-level solution, with each level composed of two types of wireless modules. The modules in the kit are dubbed the PCBM-1GC, the PCBM-1GC-IMP005, the Shield SH-PCBM 1GC, and the Shield SH-PCBM-1GC-IMP005. All of these modules are specifically tailored to meet the requirements of the IoT world with their combination of wireless and wired communications, processing capabilities, and cloud-based application technology.



Additionally, the various modules are designed to accommodate developers at all skill levels, from hobbyists to enterprise engineers. With their easy-to-use form factors,

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accessible connection options, and minimal costs, the kit's modules make it simple to get started on an IoT project while also enabling a free range of creative development.

A look inside the kit modules

The PCBM-1GC, referred to as 1GC, and PCBM-1GC-IMP005, shortened to 1GC-IMP, feature a small-form-factor printed circuit board (PCB) with dimensions of just 18 x 30 mm. Both versions are based on CYW43907, a new, high-performance chipset from Cypress Semiconductor, incorporated in the 1GC and 1GC-IMP005 modules from Murata. The CYW43907 is a highly integrated device, comprising a large number of functions required for embedded applications. This helps to simplify designs and drive down the costs of producing high-volume IoT products.

The CYW43907 integrates an ARM® Cortex® R4-based applications processor optimized for low-cost and minimal power consumption. The 32-bit Cortex provides a combination of horsepower and efficiency that makes it suitable for a wide range of IoT applications. The 2MB of on chip RAM provides embedded SW developers with ample room to support user applications, cloud connectivity, and ever changing ecosystem specifications such as Apple Homekit. And with support for Ethernet, one can easily bridge the divide from legacy wired networks to secure wireless connections to the cloud.

The chipset also incorporates a single-stream IEEE 802.11n MAC/baseband/radio, a dual-band 5-GHz and 2.4-GHz transmit power amplifier (PA), and a receive low-noise amplifier (LNA). These components provide receiver and transmit paths for the Wi-Fi wireless local area networks used with IoT devices.

With the 2.4-GHz band becoming increasingly crowded with signals from IoT devices, the dual-band connectivity allows products to switch to the less-congested 5-GHz band. A dual-band WLAN ceramic antenna located on the 1GC module also supports this capability.

Furthermore, the CYW43907 supports optional antenna diversity, allowing improved radio frequency (RF) performance in difficult environments that IoT products might encounter in the field; worth noting, though, is the 1GC-IMP module contains a single antenna only to reduce board space.

Both the 1GC and 1GC-IMP are designed for mounting on a custom PCB to easily add powerful IoT capabilities to a product concept. The modules include two types of solder pads: external edges and bottom balls, providing all of the connections needed for any design.

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Arrow Quadro IoT Wi-Fi Kit — Powered by Cypress WICED® Studio Brings Connected Solutions to Life

Along with providing the hardware elements required to produce an IoT product, the 1GC includes Cypress' Wireless Connectivity for Embedded Devices (WICED) Studio Development platform to allow developers to bring their connected solutions to life.

WICED is a comprehensive software development kit (SDK) that works with the hardware on the 1GC. It integrates support for multiple wireless technologies and required protocols which, in turn, simplifies the process of implementing connectivity to leading cloud services such as Amazon Web Services, IBM Bluemix, Microsoft Azure, and Alibaba Cloud.

Products developed with WICED are largely able to communicate, exchange data, and use information with other devices throughout various IoT systems; WICED also provides developers with design flexibility when working with MCUs.

Arrow Quadro IoT Wi-Fi Kit — Powered by Cypress and Electric IMP Delivers Seamless Cloud Experience

Physically, the 1GC-IMP is similar to the 1GC, but its specifications include fully integrated hardware, operating system, security, application programming interfaces, and cloud services provided by IoT platform company, Electric Imp, Inc.

The 1GC-IMP solution is best suited for developers who need to get to market quickly with an IoT product that requires a cloud connection. The addition of IMP capabilities decreases cost and time to market while increasing security, scalability and flexibility.

Worth noting — the 1GC-IMP module includes separate flash memory to store the Electric IMP operating system, and supports IMP's over-the-air update capabilities.

The Shield SH-PCBM-1GC and Shield SH-PCBM-1GC-IMP005

The Shield SH-PCBM 1GC and Shield SH-PCBM-1GC-IMP005 — called the Shield 1GC and Shield 1GC-IMP for short — are PCBs that incorporate the WICED and IMP platforms, and expand their capabilities.

The Shield solutions are PCBs with dimensions of 54 x 54 mm and are compatible with the Arduino specification. Arduino is an organization that offers an open-source electronics platform based on low-cost, easy-to-use hardware and software. Because of these attributes, Arduino's PCBs appeal to both professional designers and hobbyists interested in learning about electronic systems.

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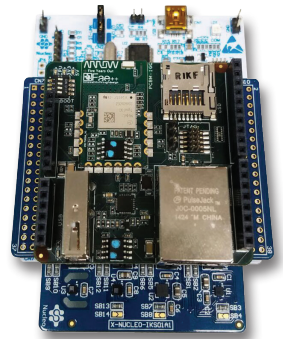
The Shield PCBs add Ethernet, USB, and advanced cloud computing resources to the 1GC and 1GC-IMP modules. They also include a JTAG connector to program the Cortex R4 processor.

The WICED version embeds an EEPROM that contains a MAC address that can be used by the Cortex to identify the physical address of the board. It also includes support for the Micro SD Card.

The IMP version, on the other hand, eschews the EEPROM and the Micro SD Card.

A smart solution for developing smart products

In the era of the Internet of Everything, success hinges on the rapid development of compelling new IoT products. By providing a powerful set of building blocks in the form of the Quadro IoT Wi-Fi Kits, Arrow has given companies the tools they need to succeed in the market for smart IoT products — and have helped to create a community of developers who can use these technologies to exercise their creativity.



To learn more, go to Arrow.com