# AVR-IoT WG Development Board

Out of The Box and into The Cloud in 30 Seconds

Microchip and Google have partnered to provide you with the ideal foundation for building your next cloud-connected design. Combining a powerful AVR® microcontroller, a CryptoAuthentication™ secure element IC and a fully certified Wi-Fi® network controller these boards offer the most simple and effective way to connect embedded applications to Google's Cloud IoT core platform.
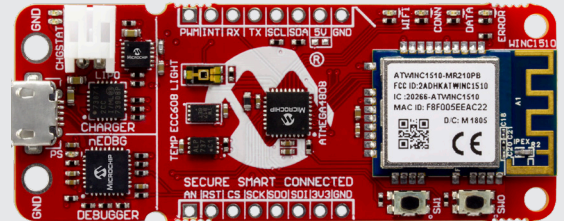
Key Features

- Secure IoT functionality
- Li-Po battery port and charger
- mikroBUS™ footprint supports over 500 ad-on boards
- USB power, debugging, and UART communication
- Drag-and-drop programmer
- Light and temperature sensor

Secure

The integrity of any network is determined by its weakest link. As the attack surface of IoT devices continues to grow with clear acceleration, security can no longer be an afterthought. The AVR-IoT WG Development Board entrusts its encryption to the latest in Microchip's CryptoAuthentication portfolio, the hardware based ATECC608A. By employing ultra-secure key storage, cryptographic countermeasures and obscuring private keys from both users and software this secure element ensures the highest fidelity of your transmission into the Cloud.

Smart

The centerpiece of this design is the powerful yet efficient ATmega4808. Equipped with 48 KB of Flash and 6 KB of RAM, this MCU gives you room to expand upon the inherent IoT functionality of the board. This added memory space, coupled with an extensive family of Core Independent Peripherals (CIPs) delivers you the ideal IoT development platform. With support from both award-winning Integrated Development Environments (IDEs) and graphical development tools, you have full access to the latest rapid prototyping technologies. This board is the perfect starting point for new IoT designs, while providing existing devices with an easy path of migration into the internet of things.

Connected

The critical component that propels your design into the Cloud is Microchip's ATWINC1510, a single-band 2.4 GHz network controller that was specifically optimized for low-power IoT applications. Featuring extremely low-power consumption, the ability to store various security certificates, and 8 Mb of on-board Flash memory this device offloads all networking tasks from the main CPU while automatically providing a secure socket connection and server authentication to the Google Cloud.

Beyond

The software/hardware development environment that Microchip and Google have created makes for an easy transition from prototype to production. Each board comes with a pre-associated Google Cloud account — when you are ready to start taking your own ideas to the Cloud, you can effortlessly make your profile private. The on-board mikroBUS connector allows for both the seamless integration of any MikroElektronika Click Board™ and the ability to quickly interface with other devices that support the popular mikroBUS footprint. With over 500 click boards to choose from this board can rapidly be made into an IoT enabled motion detector, heart rate monitor, or anything else you can imagine.

MICROCHIP

Featured Devices

ATmega4808 AVR Microcontroller

- 8-bit, high-performance AVR RISC CPU
- 256 bytes EEPROM
- 48 KB Flash and 6 KB SRAM
- 4× 16-bit timer (TCA/TCB)
- 20 MIPS/DMIPS CPU speed
- 3-UART, 1-SPI, 1-I2C peripherals
- 28- and 32-pin packages
- Event system
- Vectored interrupts
- Rich family of Core Independent Peripherals (CIPs)

ATECC608A Secure Element

- 1 mA typical operating current
- Protected storage for 16 keys
- Ephemeral key generation and key agreement in SRAM
- Encryption/authentication for messages to prevent on-board attacks
    ### Supported Algorithms
    - Elliptic Curve Diffie-Hellman (ECDH)
    - SHA-256
    - Elliptic Curve Digital Signature Algorithm (ECDSA)
    - AES-128 ECB/GCM

ATWINC1510 Wi-Fi Network Controller

- IEEE® 802.11 b/g/n 20 MHz (1 × 1) solution
- Single spatial stream in 2.4 GHz ISM band
- Supports IEEE 802.11 WEP, WPA, WPA2 security
- Supports full networking stack (including TLS)
- UART, SPI peripherals
- 8 Mb Flash memory
- 28-pin package

MCP9808 Digital Temperature Sensor

- .25°C typical accuracy
- –40°C to +125°C operating range
- Configurable temperature window limit
- Configurable critical temperature limit
- Configurable measurement resolution: 0.5°C, 0.25°C, 0.125°C, 0.0625°C

MIC33050 Voltage Regulator

- 600 mA PWM control scheme
- HyperLight Load®
- Input voltage range (V): 2.7 to 5.5
- Output voltage (V): 1.0, 1.2, 1.8, 3.3, Adj
- Typical quiescent current draw of 20 µA
- >85% efficiency at 1 mA

MCP73871 Battery Charger

- Preset charge voltage options (V): 4.10, 4.20, 4.35 or 4.40
- Complete linear charge management controller
- Charge safety timers
- Temperature monitor
- Integrated pass transistors
- Integrated current sense
- Low Battery status indicator (LBO)
- Power-Good status indicator (PG)
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