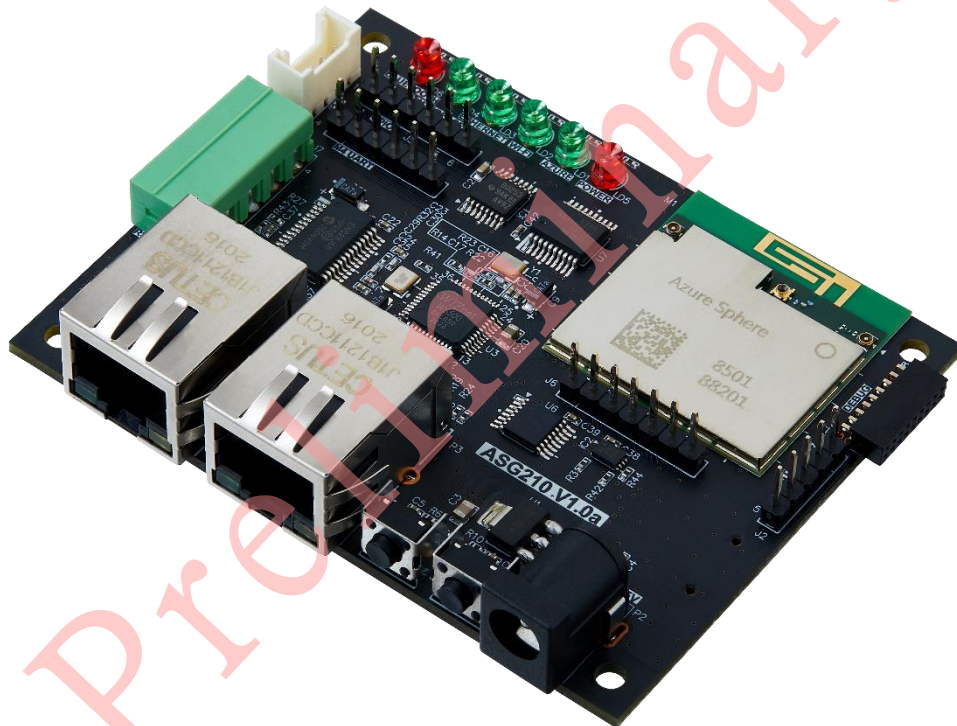


ASG210 Datasheet

Version 0.9.1



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For more information, visit our website at <https://www.wiznet.io/>

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1. ASG210

1.1. Overview

WIZnet's ASG210 is an Azure Sphere guardian module designed to retrofit the brownfield systems that seek to add data communication with cloud service and secure remote access. ASG210 supports various interfaces - GPIOs/I2C/UART(RS232/485/422) - to help reduce additional cost and add high-level security and cloud service.

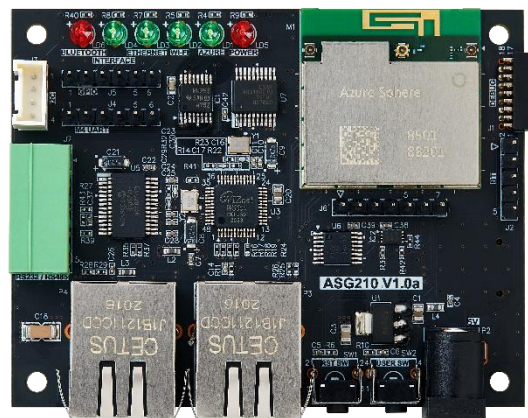


Figure 1. Azure Sphere Guardian 210

1.2. Features

- Data transfer between private network and public network
- Supports GPIOs/I2C/UART(RS232/485/422) interfaces
- Certificate management
 - By console
 - By Azure Sphere Service
 - By Configuration tool thru Ethernet (*Under development*)
- Support TLS session in private network
- Support BLE software download and debug interface for JLINK
- Auto switching between Wi-Fi and Ethernet for public networks optionally
- Support USB interface for debug and programming
- Support M4 Core UART debugging interface

1.3. Specification

Item		Description
MCU		MediaTek MT3620 (Single ARM Cortex A7 Core, Dual ARM Cortex M4 Dual Core)
Operating System		Customized Linux Kernel by Microsoft
WAN	HW	<ul style="list-style-type: none"> Wi-Fi (2.4G/5G Dual band 1T1R) 10 Base-T Ethernet (Microchip Ethernet)
	SW	Client application to a Cloud service on Azure IoT
	LEDs	LEDs output: Link, Active
LAN	HW	10/100 Base-T Ethernet (WIZnet Hardwired TCP/IP)
	SW	Supports following Hardwired TCP/IP protocols: <ul style="list-style-type: none"> TCP Server/ TCP Client DHCP Server/ DHCP Client SNTP Server UDP <i>(More TCP/IP protocols will be updated for various brownfield network systems)</i>
	LEDs	LEDs output: Link, Active
BLE	HW	<ul style="list-style-type: none"> BT5.0 with U.FL Ext.antenna Nordic nRF52 BLE connected to UART
SD Card Slot	HW	Support Micro SD Card
I2C	HW (SEL)	Support I2C Connector
UART		Support User-selected RS232/485/422 (Transceiver chip mounted)
GPIOs	Status LEDs	6 Status LEDs: BLE Status, LAN Ethernet Data communication, WAN Ethernet Link, WAN Wi-Fi Connection, Server Connection, Power
	Input Button	<ul style="list-style-type: none"> Reset Button: HW Reset User Button: Can be used as User-defined Button
	4-Pins	4CH GPIO Header pins (can be used by PWM output)
Power		5V2A (Power Consumption - TBD)
Dimension		Base PCB: 80mmX62mm
Case		Preliminary <i>(To be changed for Wi-Fi communication)</i>
Environment		Operating Temperature: -25 ~ 70 Storage Temperature: -40 ~ 85 Operating Humidity: 20 ~ 95 Storage Humidity: 0~95

Table 1. ASG210 Specification

2. System Architecture

System Architecture describes entire system which is ASG210 applied to Brown-field network and connected to Cloud Server and Management service

2.1. Block Diagram

ASG210 can send data via various interfaces to the cloud server and management service.

2.1.1. GPIOs, UART, I2C Operating System Block Diagram

In ASG210, M4 and A7 Cores of MT3620 can access to GPIOs, I2C, UART interface to communicate with user existing system, Brown field. ASG210 supports user-selected RS232/485/422 communication on mounted transceiver chip as well.

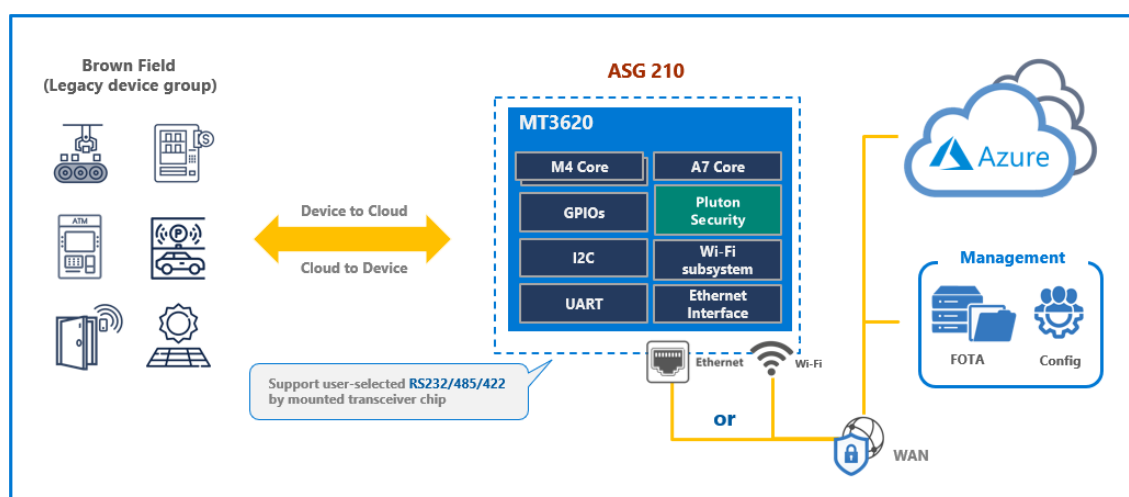


Figure 2. ASG210 GPIOs/UART/I2C operating system Block Diagram

The received data from GPIOs/I2C/UART is sent to Azure cloud or management service on Azure Sphere security system via public network, Ethernet, or Wi-Fi. In the same manner, the existing system can receive data from Azure cloud or management service via Azure Sphere security system. It allows users to access the system remotely with guaranteed high-level security.

2.1.2. Dual Ethernet Operating System Block Diagram

In ASG200, M4 Core of MT3620 is connected to W5500, which is WIZnet's hardwired TCP/IP chip with SPI interface. Since the hardwired TCP/IP stack is embedded in W5500, software TCP/IP stack is not required on the M4 Core for ethernet communication. M4 Core only receives data parsed by W5500 then sends it to A7 Core on inter-core communication. A7 Core secures this data on Azure Sphere security system and sends it Azure Cloud via public network.

Software as a Service toward IoT Edge Cloud (WIZnet, Inc.)

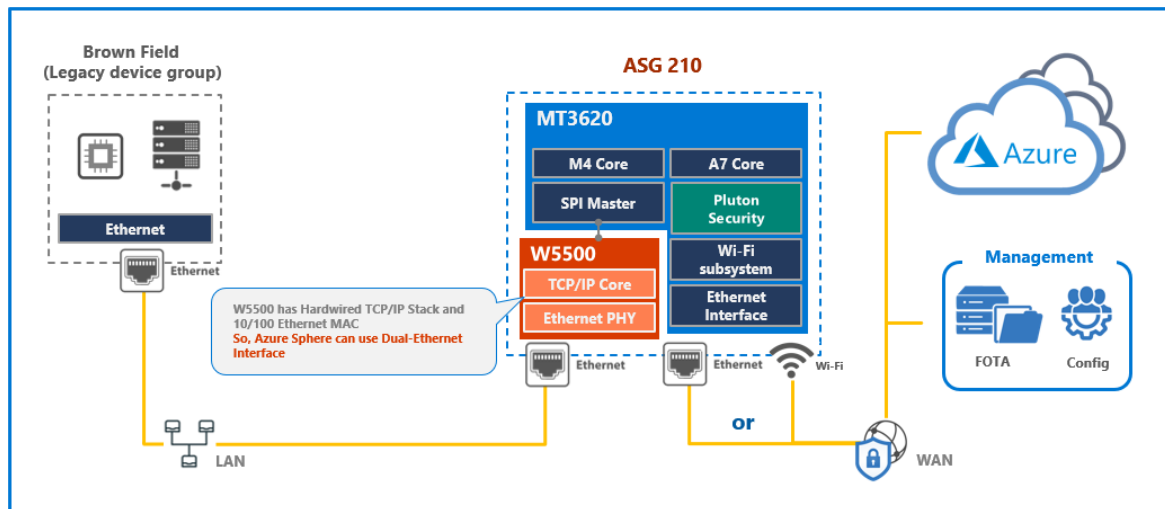


Figure 3. ASG210 Dual Ethernet operating system Block Diagram

W5500 is only connected with the SPI interface to M4 Core. Hence, the data communication between the brownfield system and W5500 is out of Azure Sphere security system. However, W5500 can filter the ethernet packets used in data communication and allow reliable Ethernet communication even if heavy traffic occurs, such as a DDoS attack.

3. Installation Overview

Users need two lan cables, a micro usb cable, a 5V2A power adaptor, and a debugger board to install ASG210. The debugger board can connect to ASG210's debug-pin-headers for debugging and programming.

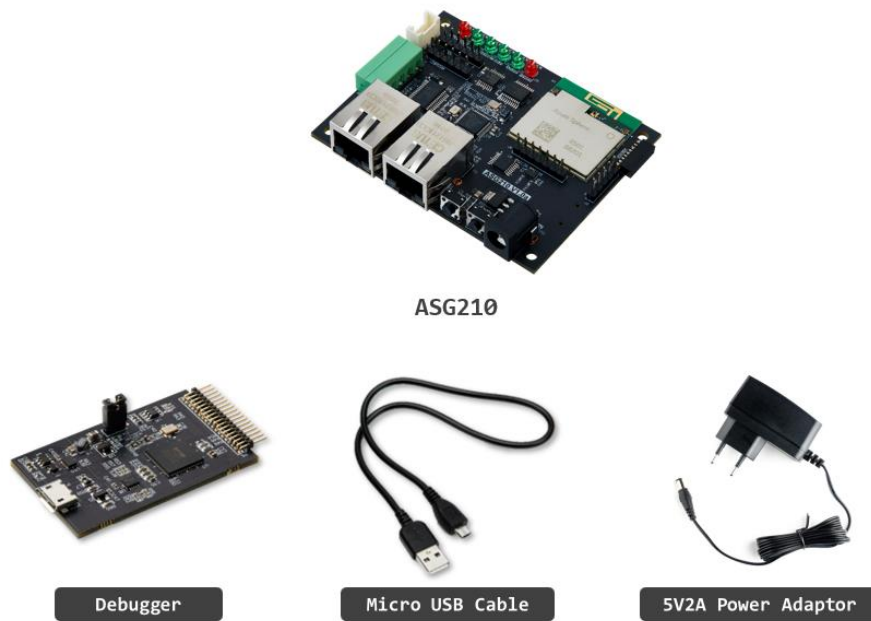


Figure 4. ASG210 Components

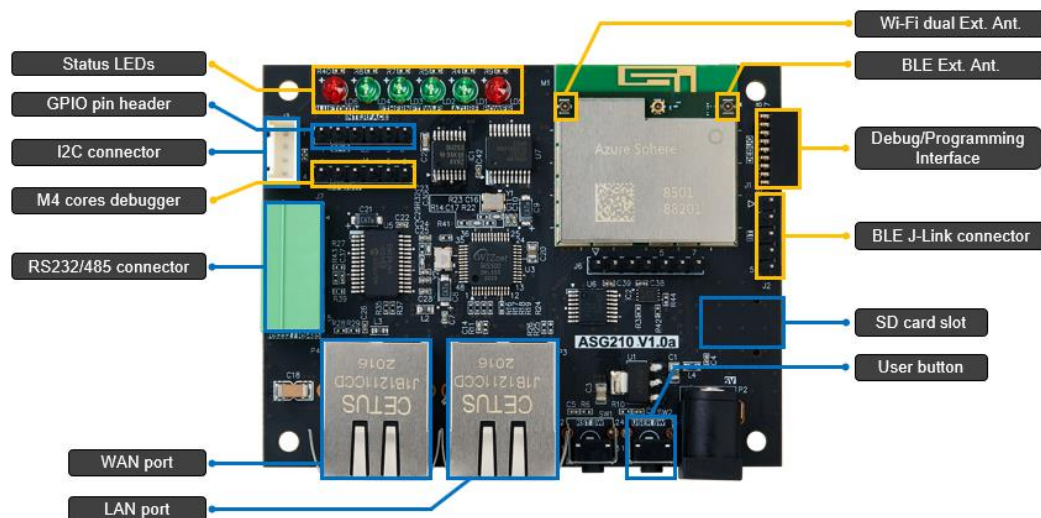


Figure 5. ASG210 External description

3.1. ASG210 LED Status

An overview of ASG210 LED status as follows:

Status LEDs	Color	Description
POWER	Red	Confirmation that 5V supply rail voltage is ok
AZURE	Green	Ready to communicate with Azure Cloud
Wi-Fi	Green	Activate Wi-Fi

ETHERNET	Green	Activate WAN, ETH0 port
INTERFACE	Green	Received data from LAN, ETH1 port
BLUETOOTH	Red	Activate Blue-tooth

Table 2. LED Status description

4. Hardware Specification

4.1. Dimensions

4.1.1. Base PCB

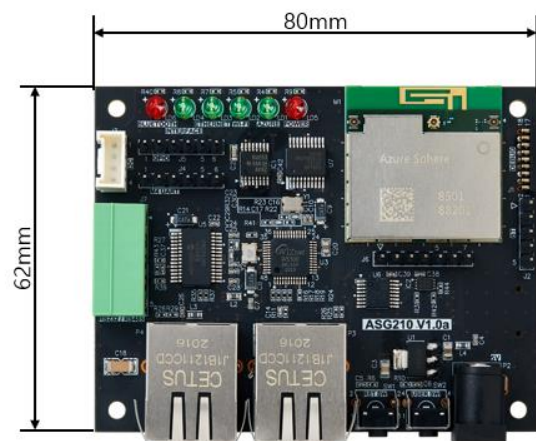


Figure 6 ASG210 Base PCB Dimension

4.2. DC Power Cable Specification

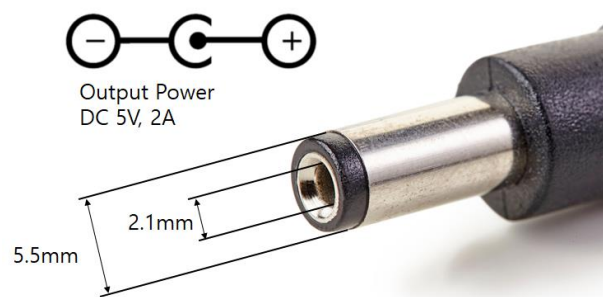


Figure 7. ASG210 DC Power cable specification

5. Resource

5.1. Software Checklist

Libraries and Samples	Github Repository
ASG210_Software	Github Repository Link
ASG210_Application	Github Repository Link

Table 3. Libraries and Samples Github Repository

Document History Information

Version	Date	Description
Ver. 0.9.0	15SEP2020	Preliminary Release
Ver. 0.9.1	23OCT2020	Typo correction

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