ASG200 Datasheet

Version 0.9.1

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

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1. ASG200

1.1. Overview

WIZnet's ASG200 is an Azure Sphere guardian module with Ethernet interfaces for both public and private networks. Whereas a general Azure Sphere module supports only one Ethernet interface to interact with Azure Sphere Pluton OS, ASG200 has an additional Ethernet interface. WIZnet's hardwired TCP/IP is embedded on the extra interface and allows a legacy device having only one ethernet interface send data to the cloud server via Azure Sphere Security system.

ASG200 supports various network application protocol libraries, making it easy to apply in brownfield scenarios. ASG200 will parse the received data from a brownfield system in a private network and securely send it to the cloud server.

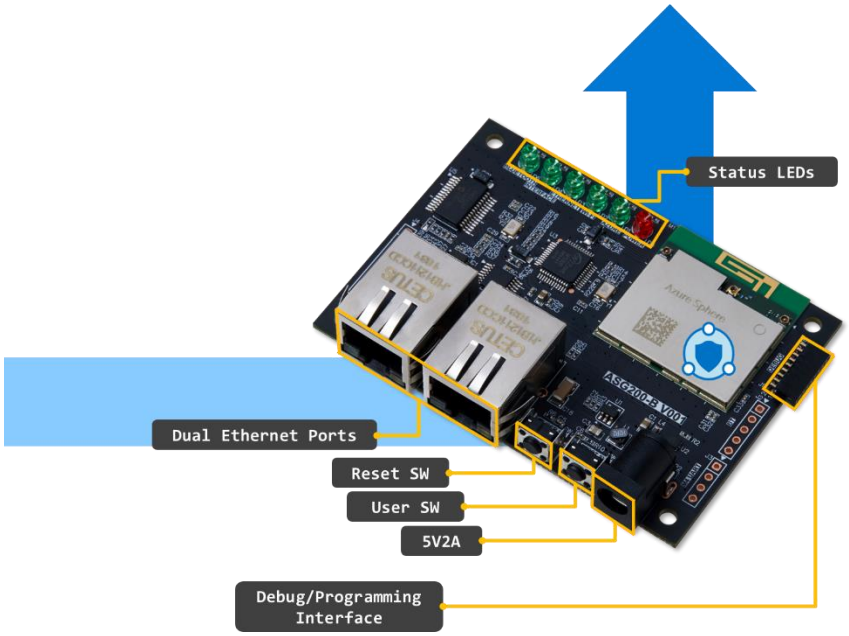

Figure 1. Azure Sphere Guardian 200

1.2. Feaures

- Data transfer between the private network and the public network
- Certificate management
  - By console
  - By Azure Sphere Service
  - By Configuration tool thru Ethernet (***Under development***)

- Support TLS session in private network
- Auto switching between Wi-Fi and Ethernet for public networks
- Support USB interface for debug and programming

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	Wi-Fi (2.4G/5G Dual band 1T1R) Ethernet (Microchip Ethernet)
	SW	Client application to a Cloud service on Azure IoT
	LEDs	LEDs output: Link, Active
LAN	HW	Ethernet (WIZnet Hardwired TCP/IP)
	SW	Supports following Hardwired TCP/IP protocols: • TCP Server/ TCP Client • DHCP Server/ DHCP Client • SNTP Server • UDP *(More TCP/IP protocols will be updated for various brownfield network systems)*
	LEDs	LEDs output: Link, Active
GPIO	Status LEDs	Five Status LEDs: LAN Ethernet Data communication, WAN Ethernet Link, WAN Wi-Fi Connection, Server Connection, Power
	Input Button	One User Button: Can be set as HW Reset or User-defined Button
	Pin header	18 pin headers are FTDI board connector for Azure Sphere debugging and programing
Power		5V2A (Power Consumption -TBD)
Dimension		Case: 85x62x35 mm Base PCB: 77x55x18 mm
Case		Preliminary *(To be changed for Wi-Fi communication)*
Environment		Operating Temperature: -25 ~ 70 Storage Temperature: -40 ~ 85 Operating Humidity: 20 ~ 95 Storage Humidity: 0~95

Table 1. ASG200 Specification

2. System Architecture

System Architecture describes entire system which is ASG200 applied to brown field network and connected to Cloud Server and Management service

2.1. 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 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.

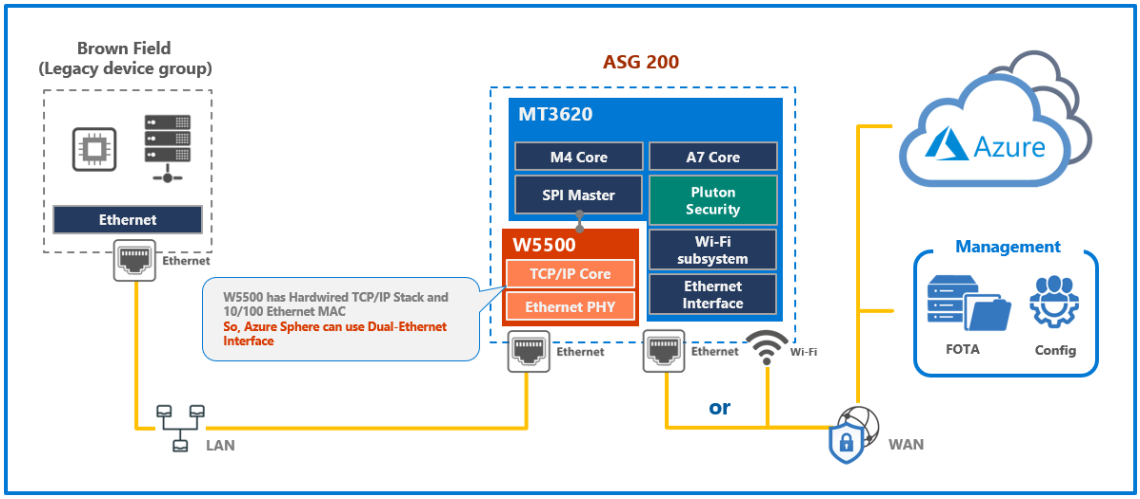

Figure 2. ASG200 Block Diagram

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 ASG200. The debugger board can connect to ASG200 18pin headers for debugging and programing ASG200.

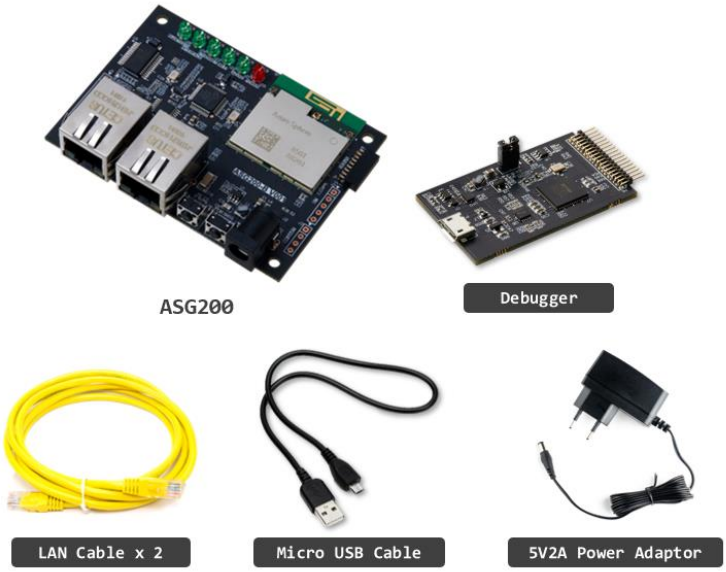

Figure 3. ASG200 Components

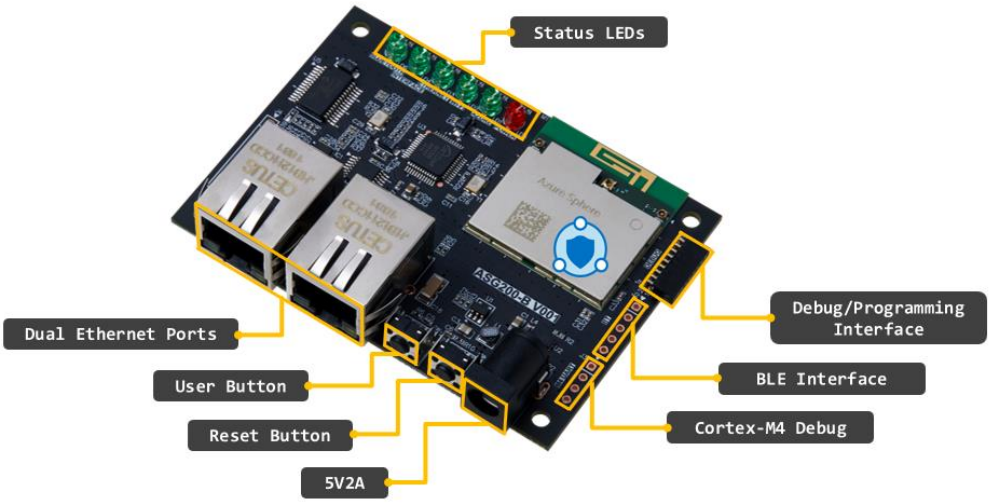

Figure 4. ASG200 External description

3.1. ASG200 Connections

An overview of how ASG200 interface to the equipment in local network is as follows:

1. Power provided to ASG200 with 5V2A power adaptor, power status LED turned on.
2. For equipment with as Ethernet interface, connect Ethernet cable from ASG200's LAN port to the equipment.
3. Connect another Ethernet cable from ASG200's WAN port to internet router for public network.
4. Once connected, the LEDs on ASG200 should be as follows:

Status LEDs	Color	Description
Power	Red	Confimation that 5V supply rail voltage is ok
Azure	Green	Ready to communicate with Azure Cloud
Wi-Fi	Green	Activate Wi-Fi
ETH0	Green	Activate WAN port
ETH1	Green	Received data from LAN port
BLE	Red	Activate Bluetooth

Table 2. LED Status description

4. Hardware Specification

4.1. Dimensions

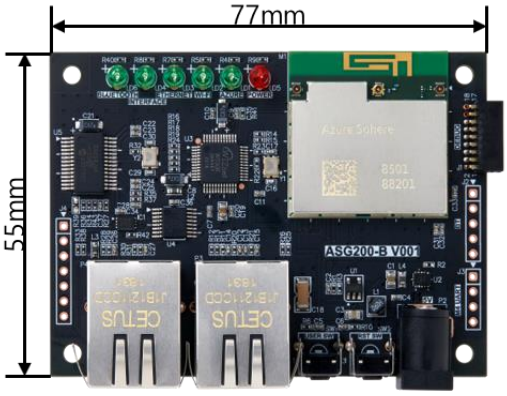

Figure 5 ASG200 Base PCB Dimension

4.2. DC Power Cable Specification

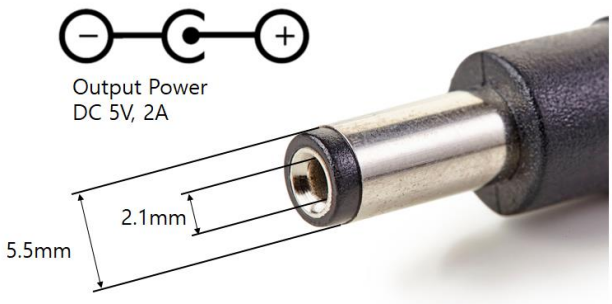

Figure 6. ASG200 DC Power cable specification

5. Resource

5.1. Software Checklist

ASG200 Application	Github Repository
ASG200_App	Github Repository Link

Table 3. ASG200 Application Github Repository

Libraries and Samples	Github Repository
ASG200_m4_Software	Github Repository Link

Table 4. Libraries and Samples Github Repository

Document History Information

Version	Date	Description
Ver. 0.9.0	8JUN2020	Preliminary Release
Ver. 0.9.1	22Oct2020	ASG200 revision with USI Azure Sphere module

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