



Azure Sphere Chip Module



Chip Module -Avnet

Already available with built-in (chip) antenna. External antenna version (UFL connector) will be released soon. (P/N AES-MS-MT3620-UFL-M-G)

P/N:AES-MS-MT3620-M-G Supplier Code: AVD (AVID, an Avnet Company)



Actual size is only 33 mm x 22 mm !!



Completed Certifications

Certification	Region	Status
FCC	USA	Completed
IC	Canada	Completed
CE	Europe	Completed
MIC	Japan	Completed
RCM	Australia, New Zealand	Completed

Chip Module – Ai-Link

Interface:

- UART×2
- PWM X 8 (Future release)
- ADC X 4 (Future release)
- GPIO: 14 GPIO pins with multi-functions

WIFI features:

- Single band 2.4GHz WiFi module
- Supported IEEE 802.11b/g/n
- Supported channel: 1-13
- Single PCB trace antenna (no antenna diversity)
- Option to fit U.FL/IPX connector for external antenna instead of trace antenna

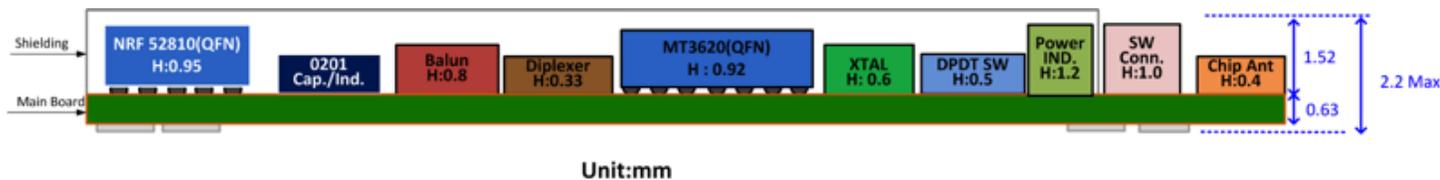
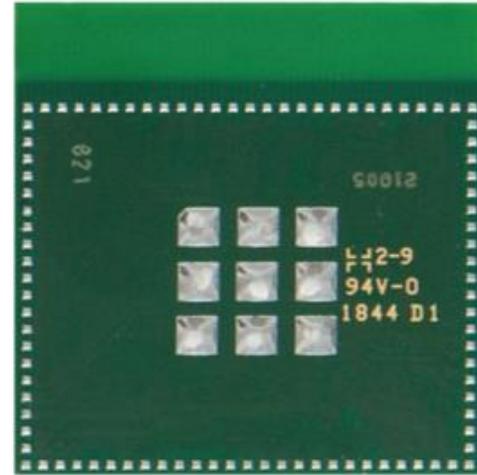
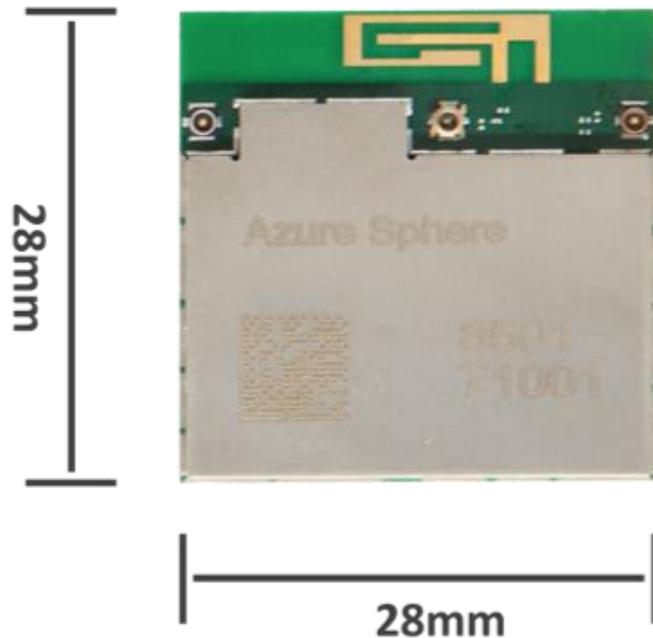


TOP VIEW



BOTTOM VIEW

Chip Module – US1 (WiFi & Bluetooth Combo Module)

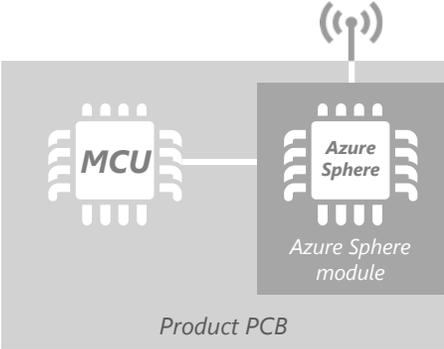
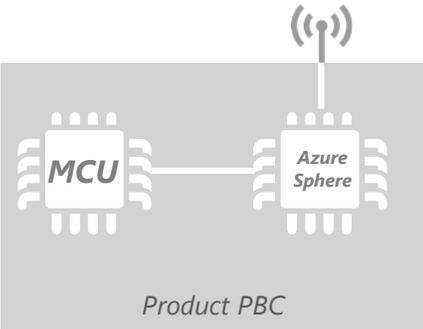
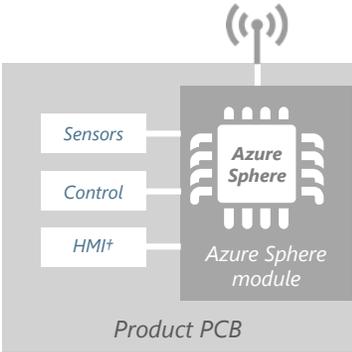
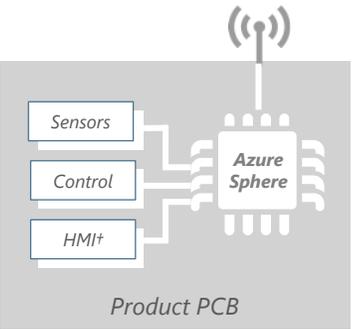


- Module dimension: 28mm x 28mm x 2.2mm [max.]
- Supported Interface: I2S/I2C/SPI/UART and GPIOs
- Host power supply: +3.3v +/-10% -1A typical –Main supply
- Operating Temperature: -40 ~ 85 Degrees

- Key features
 - Different interface options as SPI/ I2S/ I2C/ UART/GPIOs
 - Two antenna: dual band print antenna design; external antenna for diversity or BLE
 - Dual band 1T1R mode and Bluetooth Core Specification 5.0
 - Security support for WPA WPA/WPA2 personal
 - Green Design Compliance



Azure Sphere MCU and module application scenarios*

	module	implementation	chip
<p>architecture</p> <p>complement existing MCU</p>	 <p>Upgrade existing devices by adding a Azure Sphere module to existing MCU, connected by serial, SPI etc.</p>		 <p>Use a Azure Sphere MCU to provide connectivity in conjunction with an application-specific MCU.</p>
<p>replace existing MCU</p>	 <p>Add connectivity to existing or new devices by wiring simple sensing, control and HMI to a Azure Sphere module.</p>		 <p>Use a Azure Sphere MCU to implement all the on-device logic and provide connectivity.</p>

* Hybrid combinations possible
 † HMI: human-machine interface



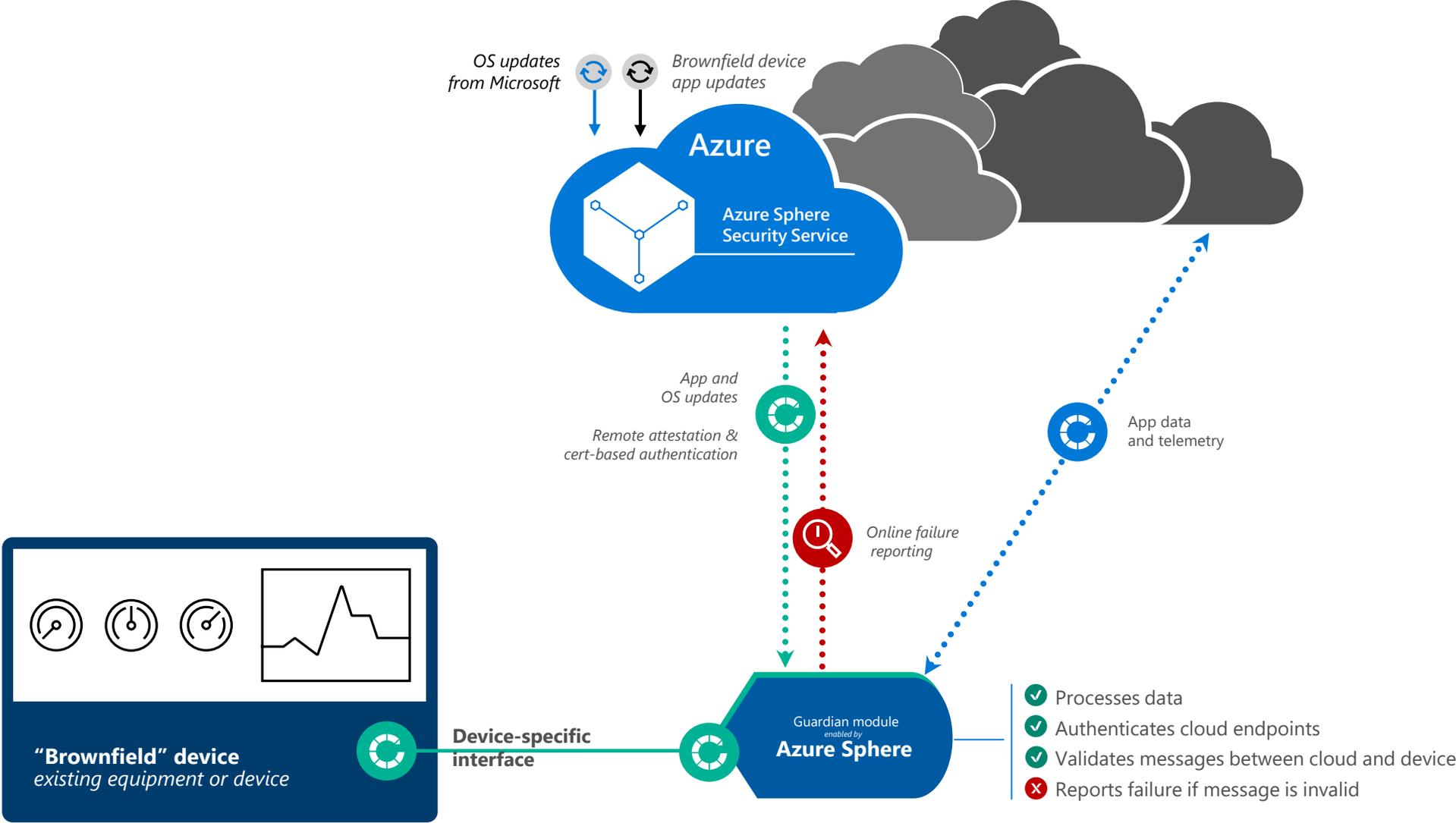
Azure Sphere Guardian Module



Two types of implementations

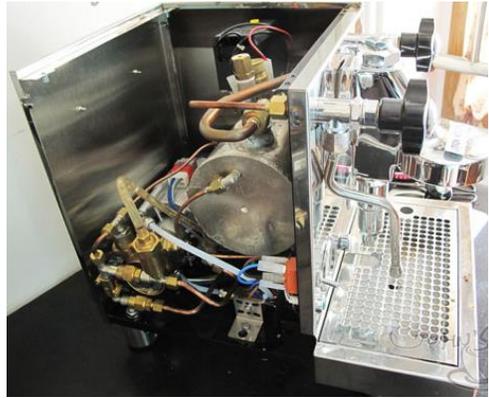


Guardian modules enabled by Azure Sphere



Example – Coffee Machine

Greenfield



**Re-layout
SW Integration
Antenna Finetune
Qualification
Regulatory
Time to Market**

Brownfield



**Just Connect
SW Test
After Market**

Brownfield opportunity in key verticals

Retail	Infrastructure	Mining and Manufacturing	Logistics and Transportation
<ul style="list-style-type: none"><li data-bbox="122 491 642 596"> Grocery<li data-bbox="122 618 642 743"> Quick Service Restaurants<li data-bbox="122 765 642 891"> Department and Fashion Stores<li data-bbox="122 912 642 1038"> Retail Banking<li data-bbox="122 1059 642 1185"> Gas Stations<li data-bbox="122 1206 642 1332"> Consumer Goods	<ul style="list-style-type: none"><li data-bbox="728 491 1248 596"> Hotels<li data-bbox="728 618 1248 743"> Smart Cities<li data-bbox="728 765 1248 891"> Electric and Gas Utilities	<ul style="list-style-type: none"><li data-bbox="1335 491 1880 596"> Food and Beverage Manufacturing<li data-bbox="1335 618 1880 743"> Mining<li data-bbox="1335 765 1880 891"> Automotive Manufacturing	<ul style="list-style-type: none"><li data-bbox="1951 491 2471 596"> Fleet Transport<li data-bbox="1951 618 2471 743"> Insurance<li data-bbox="1951 765 2471 891"> Airport<li data-bbox="1951 912 2471 1038"> Railway

Guardian Module Target Endpoint Devices

HVAC Systems
Parking Gates
Elevator
Parking Meters
Dishwashers
Parking Payment Machines
Refrigerator / Freezer
Stove
Oven
Microwaves
Exercise Equipment
Motion Sensors
Burglar Alarm Control
Electricity Meters
Escalator
Coffee Maker

Guardian Module - Divvy

DEVICE SPECS



Power supply

Voltage: 12-24VDC
Current: 100mA (Typical)



Interfaces

Output – 2 x relay c/w separate NC, NO and COM ports
Input – 4 x Opto-Isolated inputs
USB, Ethernet, 2 x LED, 2 x Switch



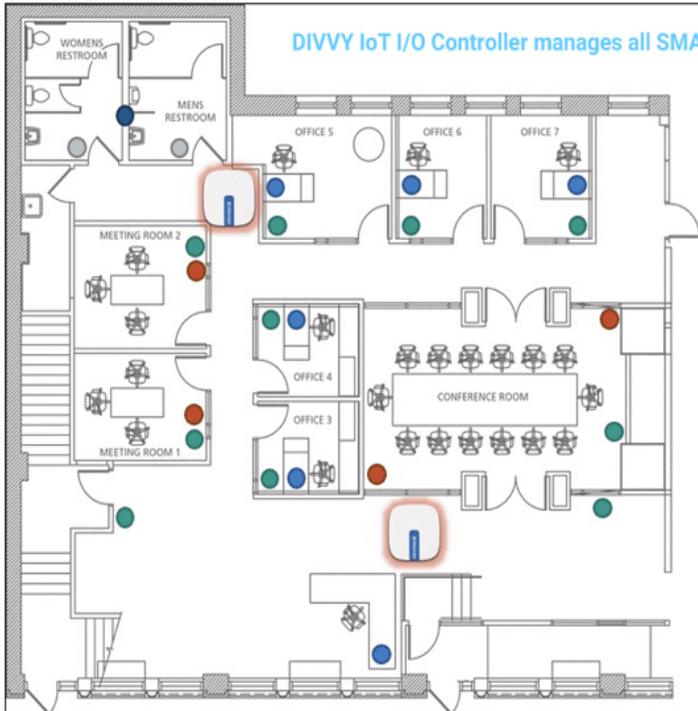
Durability

Operating temperature range:
-20°C to 85°C



Integration

DIVVY IoT system integration for fast data transmission and frictionless I/O experience



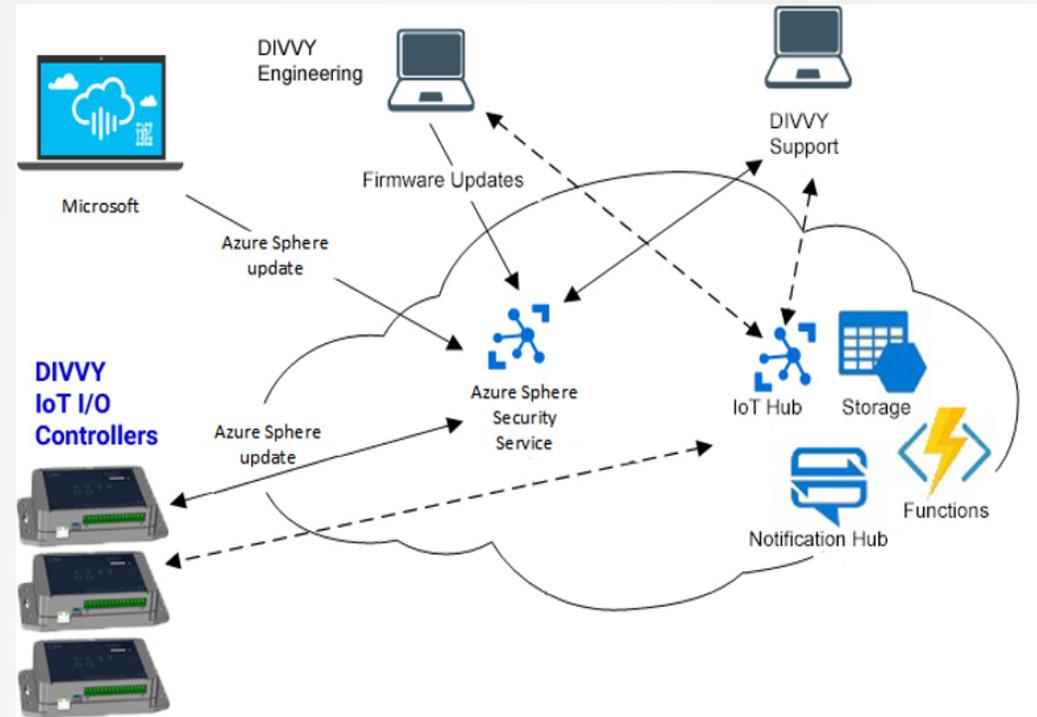
DIVVY IoT I/O Controller manages all SMART building functions



- Room Occupancy Sensor
- Desk Presence Sensor
- Maintenance Sensor
- Building Control Unit
- Comfort Sensor

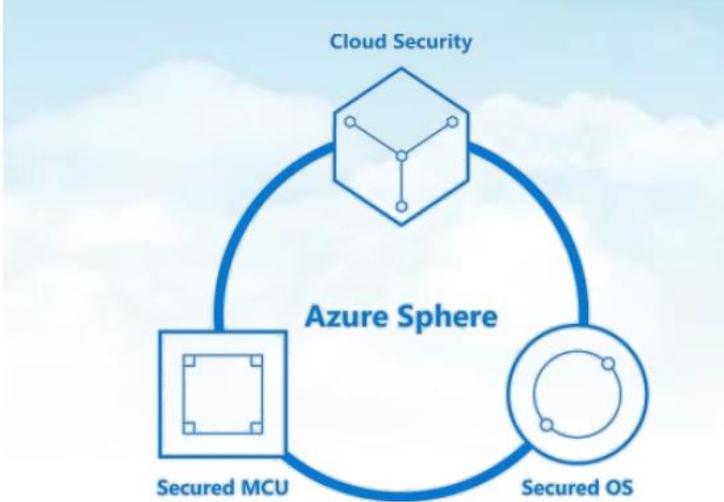
IoT Applications

- Room Occupancy & Scheduling
- Desk Presence / Availability
- Climate Control & Monitoring
- Building Controls Integration
- Smart Lighting



Guardian Module – Advantech

**Modularized
High Adaptability
IoT Nodes**



WISE-S214
4AI/4DI



WISE-S250
6DI, 2DO
1 RS-485



WISE-S251
6DI
1 RS-485

Guardian Module – Wiznet (dual Ethernet Ports)



ATM



Vending Machine



BMS in IDC

Existing IoT Device

Private Ethernet

LAN
(Ethernet)

WIZNET Guardian Module



WAN
(Ethernet or Wi-Fi)

IoT Device to AZURE IoT
2 port Ethernet



AZURE IoT Cloud

Guardian Module – Wiznet (dual Ethernet Ports)



Guardian Module – Avnet

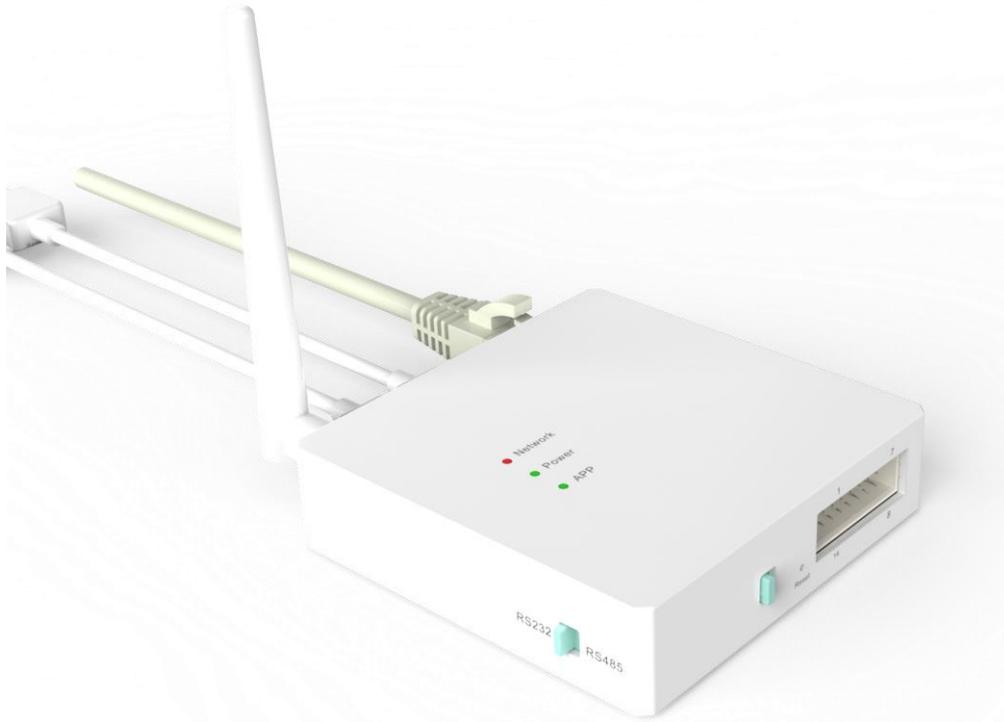
Already Available USD 99.95 (qty. 1)

A finished product, it's using Avnet Module

P/N: AES-MS-MT3620-GUARD-1

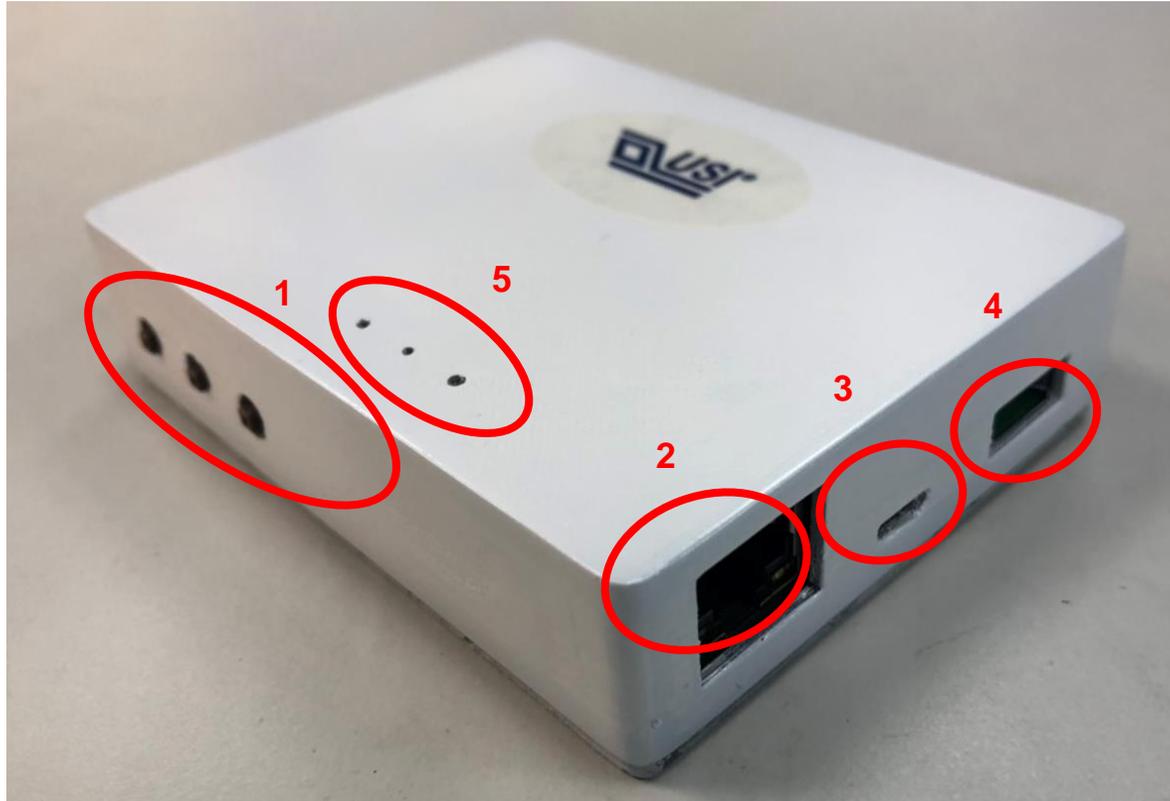


Guardian Module – Ai-link



- Downstream – RS232 / RS485/ RJ45
- Upstream - Wifi / RJ45

Guardian Module - USI



Dimension:

90 x 71 x 22 mm

1. **Button**
2. **Ethernet**
3. **Micro USB**
4. **RS232/485 Header**
5. **LEDs**

Azure Sphere board – USI

(for customer's customization or own enclosure design)

- Board with Azure Sphere USI Chip Module Embed
 - WiFi Dual band 1T1R mode
 - Bluetooth Core Specification 5.0
- Physical
 - Visual diagnostic LEDs: Power, Wi-Fi, BLE
 - 3 Buttons: One Power Rest, Two for System Configuration
 - One RJ-45, 10 Mbps Ethernet LAN port
 - One Micro USB Port
 - 5 Pin Connector for RS232 or RS485
- Product Dimension:
 - 9 cm x 7.1 cm x 2.2 cm (3.54 x 2.8 x 0.87 inches)





Azure Sphere Starter Kit



Starter Kit – Avnet

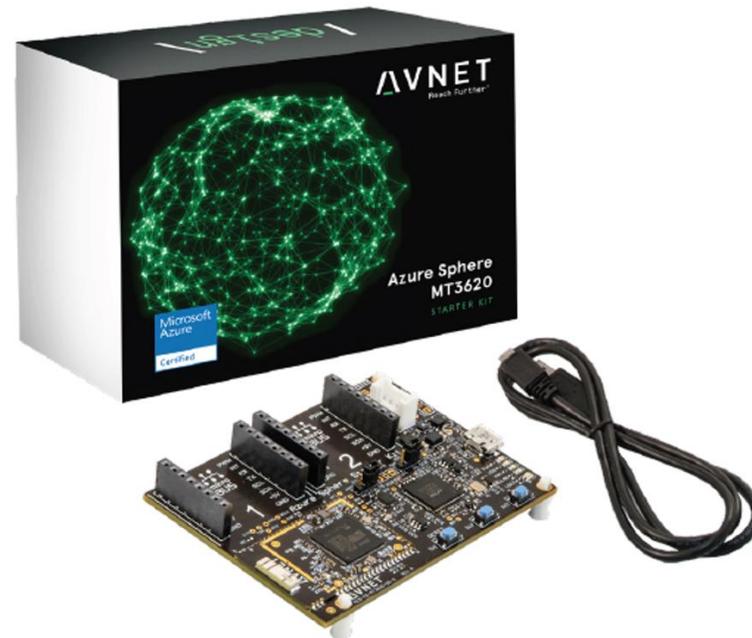
Already available

Yes the customer can use it in their product

500+ (3rd party) interface boards available

P/N: AES-MS-MT3620-SK-G

Supplier Code: AVD (AVID, an Avnet Company)



AVNET

Starter Kit – Avnet

Avnet Sphere Module

- Onboard dual-band chip antenna
- Includes 32kHz XTAL for RTC and LP operation
- Will not support I2S audio or M4F UARTs

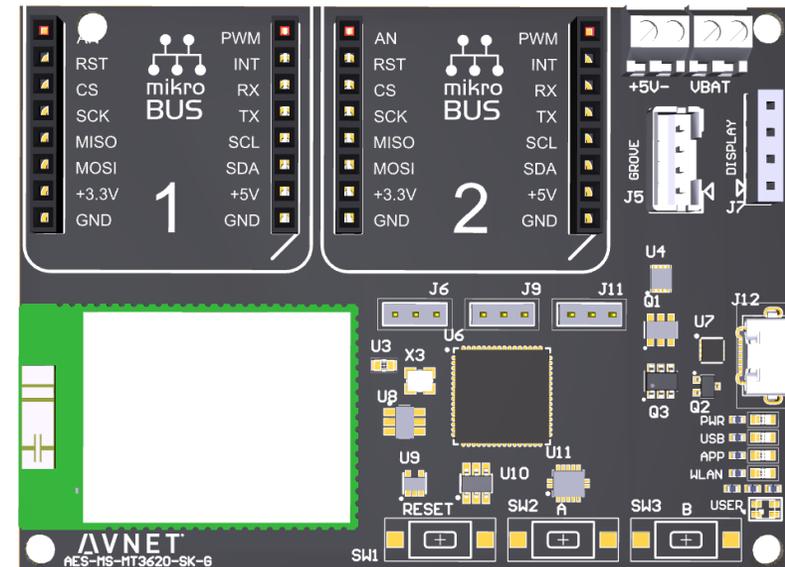
FTDI USB-to-serial bridge

The 4 port FT4232HQ supports:

- Service UART
- Debug UART
- Recovery UART
- SWD JTAG interface
- SYSRST_N and RECOVERY signals

Onboard LEDs

- 3V3 Power LED - Green
- USB activity LED - Amber
- App. Status LED - Blue
- Wi-Fi Status LED - Yellow
- User LED - RGB



Onboard Button Switches

- Reset Switch
- User Switches (A and B)

Onboard Sensors

- LSM6DS0 (3D Accelerometer, 3D Gyro, Temperature)
- LPS22HH pressure sensor (can provide elevation info)
- Ambient Light Sensor (Analog)

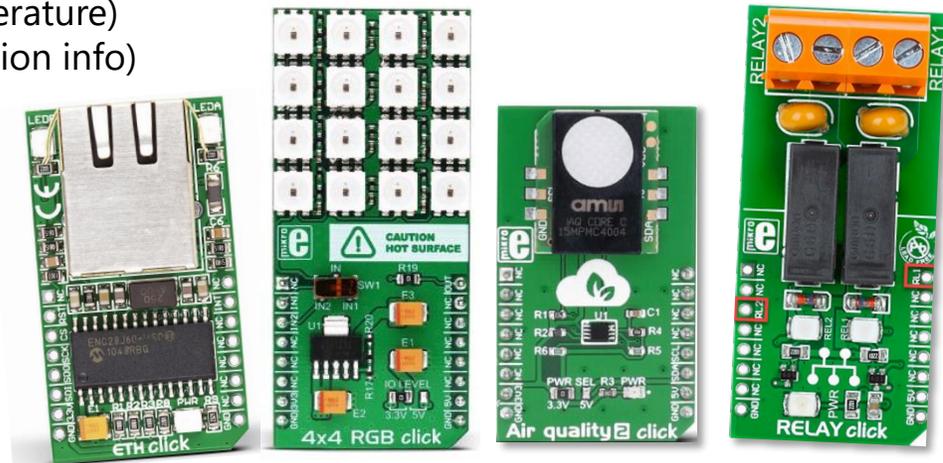
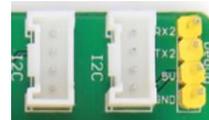
Click Board Expansion (from MikroE)

<https://www.mikroe.com/click>

- Two Click board sockets
- Over 530+ different Click boards available!
(3 new Click boards being added per week!)

Other Connectors

- 2-pin battery connector
- Grove connector (I2C)
- OLED display connector



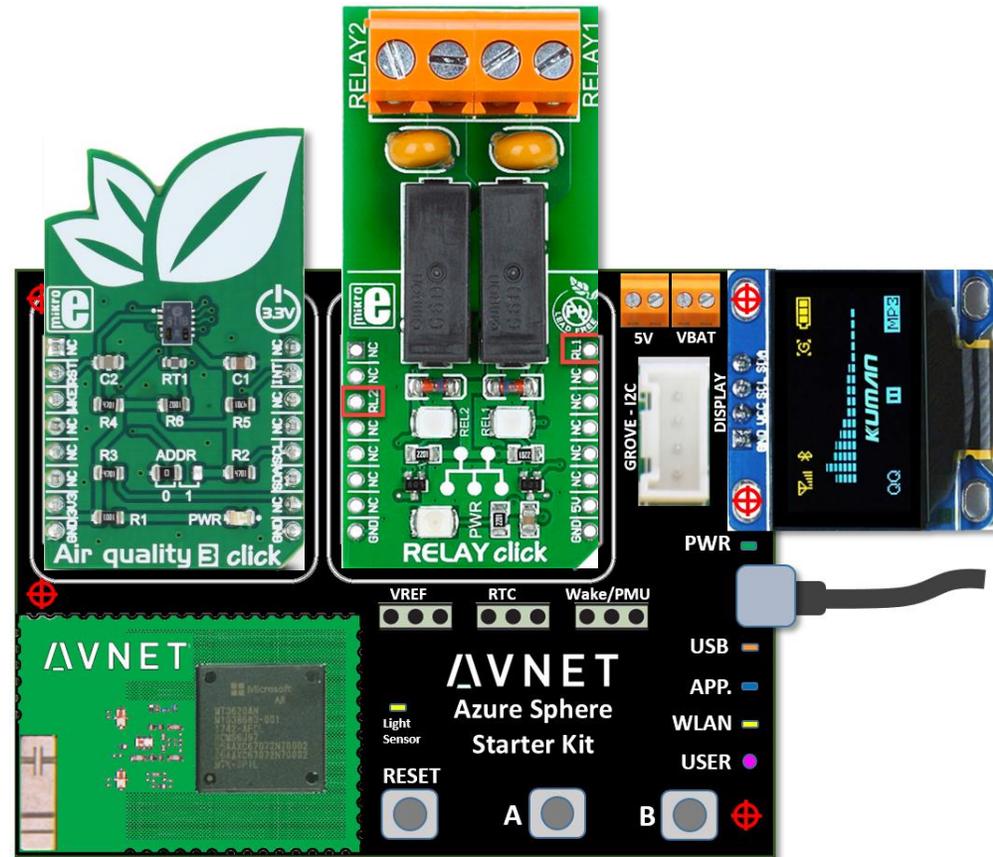
Functions such as:

- Additional User RGB LEDs
- SPI to Ethernet bridge
- Sensors, Relays, etc
can be added using Click boards!

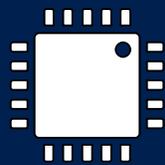
Starter Kit Expansion...

Mock-up shows expansion possibilities with:

- [Air Quality 3 Click board](#)
- [Dual Relay Click board](#)
- [0.96" OLED 128 x 64 display \(I2C\)](#)
- [I2C Grove connector \(I2C\)](#)



Let's secure the future.



SECURED FROM THE SILICON UP