Features:

- Gateway of Modbus TCP to Modbus RTU/ASCII
- ◆ Two Configurable RS-232/422/485 serial ports
- Each serial port can be configured as Modbus Master or Modbus Slave mode
- Each serial port supports up 16 Modbus TCP master
- Each serial port supports up to 32 Modbus TCP slave
- One 10/100 Mbps Ethernet ports
- One serial console port
- Support Web configuration console
- Windows configuration utility included
- Support Telnet and serial console command

Specification:

CPU: 32-bit microcontroller Serial port: Port1: RS-232/422/485 Port2: RS-232/485 Baud rate: 1200 to 921600 bps Flow control: None/Hardware/Xon Xoff Data bit: 5 to 8 Stop bit: 1 to 2 Operation mode: Modbus Gateway: Slave RTU Slave ASCII Master RTU Master ASCII S2E Gateway TCP server TCP client Protection: 15KV ESD Ethernet: 10/100 Mbps, RJ45 Protection: 1500V Magnetic isolation Serial console port: RS-232: 115200 baud rate, None flow control, 8 bits data, 1 stop bit Power: 9~40 VDC power jack and terminal block

Dimension: 108x78x25 mm (HxWxD) Operating Temperature: 0~70°C Storage Temperature: -20~85°C

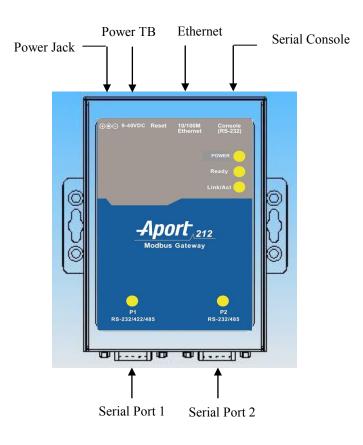
Packing List

- 1. Aport-212 Modbus Gateway
- 2. Artila CD

Optional accessory

- 1. CB-RJ2CON-100: Serial Console Cable
- 2. DK-35A: DIN RAIL Mounting Kit
- 3. PWR-12V-1A: 110~240VAC to 12VDC 1A Power Adaptor

Layout



Power Connector

Connecting 9~40VDC power line with the Aport 211 terminal block or the power jack. If the power is properly supplied, the Power LED will keep solid yellow color.

Serial Port Connector

Serial Port uses a Male DB9 connector and it includes RS-232, RS-422 or RS485 signal and pin assignments are described as follow:

Pin No.	RS-232	RS-422	RS-485
1	DCD*	TXD-	—
2	RXD	TXD+	_
3	TXD	RXD+	DATA+
4	DTR*	RXD-	DATA-
5	GND	GND	GND
6	DSR*		—
7	RTS		_
8	CTS	_	_
9			_



LED Status

The LED provides the Aport 212 operation information. The LED status is described as follow:

Power LED: Power LED keeps ON if power (+9VDC to +40VDC) is correctly input to Aport 212.

Ready LED: Ready LED keeps ON when Aport 212 firmware is ready for operation.

Link/Act LED: Link and Activity LED will turn ON when the Ethernet cable is connected. When there is network data traffic, this LED will flash.

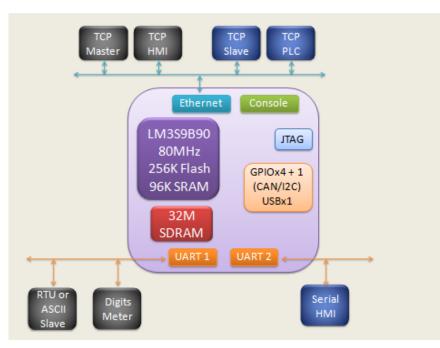
RX/TX LED: The RX/TX LED is a dual color LED that indicates the serial data traffic. The Yellow LED stands for receiving data and Green LED means transmitting data.

Factory default setting

IP Address: 192.168.2.127 Netmask: 255.255.255.0 Serial Port : RS-232 Baud rate: 115200 Data : No parity,8 bits,1 stop bit Flow control: None Serial Console port: RS-232 Baud rate: 115200 Data: No parity,8 bits,1 stop bit Flow control: None Web console: http://192.168.2.127:5003 Telnet console: telnet 192.168.2.127 5001

Configure Device: 00-13-48-FF-FF-F0					
	Basic Settings Advan	ced Options			
	ltem	Value		^	
Upgrade	Information				
	Firmware Version	FMW V1.005			
	Model Name	Aport-212			
	MAC	00-13-48-FF-FF-F0		=	
Reboot	Basic Settings				
	Device Name	Aport-212			
O I	Lan Settings				
Default	IP Configure	Static	~		
Settings	IP Address	192.168.2.127			
	Netmask	255.255.255.0			
× 1	Gateway	0.0.0.0			
<i>~</i> ••	UART1 Settings				
Disconnect	Interface	RS-232	*		
	Baud Rate	115200	*		
	Parity	NONE	~		
	Data Bits	8	~		
	Stop Bits	1	*		
	Flow Control	NONE	~	~	
	Change Pas	sword 💊 Save to Dev	vice		

Modbus gateway operation



Modbus gateway acts as a communication interpreter between Modbus TCP and Modbus RTU/ASCII. When Ethernet is connected to a Master device such as a Human Machine Interface (HMI), the serial port will be configured as a Slave RTU/ASCII to connected to Modbus slave device such as digital meter. On the contrary, if Ethernet is connected to a Slave device such as PLC, then serial port should be configured as a Mater RTU/ASCII.

Slave RTU/ASCII mode

When Modbus Masters are Ethernet devices, up to 16 Master devices can access the same serial port to communicate with the serial Slave devices. Maximum 64 Master TCP request can be buffered and Unit ID (UID), which is used to address the serial device, can tell Aport-212 which serial port to send the command. In figure slave RTU shown as follow data with UID 1 to 123 will go to port 1 and 124 to 247 will use port 2. Sometimes, it is difficult to use UID as the device address, you can use address offset to provide the flexibility. If the address offset is applied,

Slave address=UID+ address offset

Response time out

Time out setting is used to check if the slave responses to the Aport-212's Modbus command in time. In the case of time out, Aport-212 will discard the request of Modbus TCP command and issue a TCP exception if it is enabled.

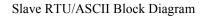
TCP exception

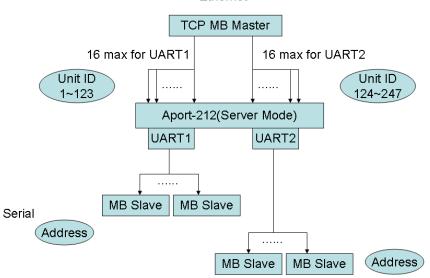
The function allows Aport-212 to send the exception code to remote TCP devices. Currently two exception code is supported:

Exception code: 0x0A

- 1. Unknown UID
 - 2. TCP request overflow

Exception code: 0x0B 1. Serial slave device time out





Ethernet

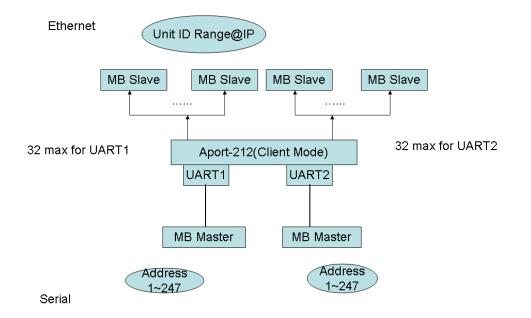
Master RTU/ASCII mode

When Modbus Master are serial devices, up to 32 TCP slave devices can be accessed by a serial Modbus Master. Aport-212 uses UID to decide the IP address and port of the TCP slave device to connect to. Except function is also available to serial Master when there is unknown TCP slave or connection is not established.

Exception code: 0x0A

- 1. Unknown address of TCP slave
- 2. TCP slave is not connected





S2E Gateway

Aport-212 also supports Serial to Ethernet conversion when you select S2E mode. In the S2E mode, data is transferred to and from serial to Ethernet interface without any data conversion. Therefore Aport-212 provides a transparent data tunnel between serial device to Ethernet device. Aport-212 supports both TCP server and TCP client mode. In TCP server mode, Aport-212 waits for TCP client device to initialize the connection. On the other hand in TCP client mode, Aport-212 starts connection to the other TCP server.

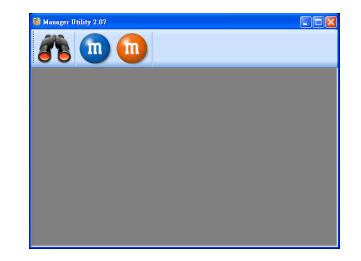
Install Manager Utility Software

Aport-212 comes with Artila CD where you can find many useful software utilities. You need to install Manager Utility first in order to configure the Aport-212. To install the Manager Utility, please find the ManagerUtilitysetup.exe as shown following



Broadcast search

Once start Manager utility, you can click telescope icon to search the Aport-212 in the network.



Configure Aport-212

Once Aport-212 is discovered, Manager will show following information.

Password:

password is enabled. (default setting is disabled)

CommandEnable: Telnet command port is enabled.

n 🔗 🗢 🔌						
b Device_Name	Model_Name	IP	MAC	Password	CommandPort	CommandEnable
Aport-212	Aport-212	192.168.2.127	00-13-48-FF-FF-FF		5001	Enable
		h	ide message window			
		h	ide message window			_
nak and		h	ide message window			
rch end nd device: 1		h	ide message window			

Double click the Aport-212 to configure, you will see following screen



Basic Setting

Basic setting is read only.

🔧 Config	igure Device: 00-13-48-FF-FF-FE				
	Basic Settings Advanced	Options			
	Item	Value	•		
Upgrade Firmware	Information				
	Firmware Version	FMW V1.003 #			
	Model Name	Aport-212			
Reboot	MAC	00-13-48-FF-FF-FE	=		
Device	Basic Settings		_		
	Device Name	Aport-212			
	Lan Settings				
Default Settings	IP Configure	Static 💌			
Settings	IP Address	192.168.2.127			
	Netmask	255.255.255.0			
Disconne	Gateway	0.0.0.0	_		
ct	UART1 Settings				
	Interface	RS-232 🗸			
	Baudrate	115200 ▼			
	Parity	NONE			
	Databits	8	1		
	Stopbits	1	1		
	Flow Control	NONE	1		
	UART1 OP Mode				
	Operation	Slave RTU Mode 🔹 🔻			
	Listen Port	502	-		
	🤌 Chang	e Password 🛛 🥳 Save to	Device		

UART Operation Mode

To configure Aport-212 operation mode, please scroll down the screen to the UART operation mode section. UART1 refers to the port1.

🔧 Config	🔧 Configure Device: 00-13-48-FF-FF-FF 📃 🗾				
	Basic Settings Advance	d Options			
	Item	Value	•		
Upgrade Firmware	Data Bits	8 🗸			
	Stop Bits	1 🗸			
	Flow Control	NONE 🔻			
Reboot Device	UART1 OP Mode				
	Operation	Slave RTU Mode 🛛 🔻			
	Listen Port	Modbus Gateway Slave RTU Mode	=		
Default	UID Min	Slave ASCII Mode	-		
Settings	UID Max	Master RTU Mode Master ASCII Mode			
	Address Offset Response Timeout ms	—S2E Gateway			
Disconne	TCP Exception	TCP Server TCP Clinet			
ct	Idle Timeout sec	0			
	UART2 Settings				
	Interface	RS-232 💌	-		
	Serial port Operation				
🤌 Change Password 🧭 Save to Device					

X Sconfigure Device: 00-13-48-FF-FF Basic Settings Advanced Options C Value Item . Upgrade UART1 OP Mode Firmware Operation Master RTU Mode - \otimes Edit TCP Slave Table Reboot Serial Exception Enable -Device Idle Timeout sec 0 UART2 Settings X ModBus TCP Slave Table for UART 1 Delete UID Min UID Max IP Address Port ▶ 1 248 2 250 192.168.2.151 502 Add Delete Submit Modbus TCP Slave Table 0 Change Password Save to Device

Slave RTU or ASCII Mode

UID Min~Max: The UID range that data to direct to this serial port

Address offset: The option allow Slave address to be

Slave address=UID+Address offset

Response timeout: the timeout setting allows Aport-212 to discard corresponding TCP request if the serial device does not response to the Modbus command in time.

- TCP Exception: Enable or disable the TCP exception function
- Idle Timeout: Allow Aport-212 to disconnect the TCP section if there is no data traffic and timeout.

- Edit the TCP Slave Table as UID range and IP address mapping.
- Serial exception: Enable or disable serial exception
- Idle Timeout: Allow Aport-212 to disconnect the TCP section if there is no data traffic and timeout.

Master RTU or ASCII mode

TCP server mode

When you use TCP server mode, you can select Listen port and Idle Timeout as followed

👈 Configur	Sconfigure Device: 00-13-48-FF-FF-FF 🛛 🔀				
	Basic Settings Advance	d Options			
	Item	Value			
Upgrade Firmware	UART1 OP Mode				
	Operation	TCP Server 💌 📼			
🛞	Listen Port	4001			
Reboot Device	Idle Timeout sec	0			
Device	UART1 Data Packing	✓			
Default	Serial port Operation				
Settings	🔑 Change F	'assword) 🧭 Save to Device			

TCP client mode

When you use TCP client mode, you can select Remote IP, Port, when to connect and Idle Timeout as followed

👈 Configur	S Configure Device: 00-13-48-FF-FF-FF 🛛 🔀				
	Basic Settings Advance	d Options			
	Item	Value	^		
Upgrade Firmware	UART1 OP Mode				
	Operation	TCP Clinet 💌			
	Remote IP	0.0.0.0			
Reboot Device	Remote Port	4003			
Device	Connect When	Startup 🔽			
	Idle Timeout sec	0			
Default	UART1 Data Packing		~		
Sermits	Settings Serial port Operation				
	Change Password 🥳 Save to Device				

UART Data Packing

When choosing TCP server or TCP client mode, you can decide how to pack your serial data before sending them to TCP port. You can pack the data with time i.e. Interval Time-out, with data length, or with delimiter character such as carriage return.

👈 Configur	e Device: 00-13-48-FF	-FF-FF	×	
	Basic Settings Advance	d Options		
	Item	Value	^	
Upgrade Firmware	UART1 Data Packing			
	Enable	Interval Timeout ms		
		0		
Reboot	Enable	Force Length		
Device		0		
	Enable	Delimiter char(e.g. 0d0a)		
Default		0000		
Settings	UART2 Settings		~	
	Serial port Operation			
	Senar port Operation			
	Change Password 🥳 Save to Device			

Force Length: Pack the length of serial data before forwarding data to Ethernet port

Interval Timeout: the period of time to forward data to Ethernet Port **Delimiter Character**: Wait for the Delimiter Character before forwarding data to Ethernet port. The Delimiters are maximum two bytes Hex format ASCII code. If you use Carriage Return (CR) and Line Feed (LF) as delimiters, you can specify 0D0A or 0d0a.

Advanced Options

Advanced options is used to select following settings

👈 Configur	Sconfigure Device: 00-13-48-FF-FF-FF				
	Basic Settings Advanced	l Options			
	Item	Value 🔼			
Upgrade Firmware	Web Server Settings				
	Enable	Enable 💌			
	Listen Port	6060			
Reboot Device	Idle Timeout sec	5			
Device	Alive Timeout sec	5			
	TCP Command Settings				
Default	Enable	Enable 🔽			
Settings	Listen Port	5001			
	Idle Timeout sec	0			
	Alive Timeout sec	5			
	Console Settings	✓			
	Web server enable/disable				
	Ange Pa	assword 🥳 Save to Device			

Web Server Settings

Enable: Enable and Disable Web server

Listen Port: Web server port number (default web server is 80, if you use port 6060, you can add port number at the end of the IP such as http://192.168.2.127:6060

Idle Time: Disconnect when no traffic and timeout

Alive Timeout: Send an ack package when timeout. If no response, disconnect the section

TCP Command Settings

Enable: Enable or disable TCP Command port. Listen Port: Port number Idle time: same as Web server settings Alive timeout: same as Web server settings

Please refer to the Appendix for the Command set

Serial Console and Debug Port Settings

Serial Message Enable: Enable serial console command only or enable console and debug message

TCP Enable: Enable TCP console command only or enable console and debug message **Listen port**: Debug port number

Idle time: same as Web server settings

Alive timeout: same as Web server settings

Message Option: Debug message option

Please refer to the Appendix for the Command set

👈 Configur	e Device: 00-1.3-48-FF	-FF-FF	×		
	Basic Settings Advanced	d Options			
	Item	Value	^		
Upgrade Firmware	Console Settings				
	Serial Message Enable	Enable 🔽			
🛞	TCP Enable	Debug Message Enable 🛛 🗸			
Reboot Device	Listen Port	5002	-		
	Idle Timeout sec	5	-11		
	Alive Timeout sec	5			
Default	Message Option	0			
Settings	Accessible IP Settings		~		
	tcp console enable/disable				
	🔑 Change Pa	assword 🥳 Save to Devic	•		

Accessible IP Settings

You can limit the user IP to access Aport-212 by the Accessible IP settings. Aport-212 will check if the remote IP comes from the allowed IP address. If not, it will deny the connection. 0.0.0.0 stands for no restriction in access.

👈 Configur	Sconfigure Device: 00-13-48-FF-FF-FF				
	Basic Settings Advance	ed Options			
	Item	Value			
Upgrade Firmware	Accessible IP Settings				
	[0] IP Address	0.0.0.0			
	[0] Netmask	0.0.0.0			
Reboot Device	[1] IP Address	0.0.0.0			
Device	[1] Netmask	0.0.0.0			
	[2] IP Address	0.0.0.0			
Default	[2] Netmask	0.0.0.0			
Settings	UART1 Settings	×			
IB Door Action access the device					
	IP Range that can access the device				
	🥬 Change H	Password 🥳 Save to Device			

Alive Check Timeout

This setting allows user to configure the Alive Timeout settings for UART1 and UART2

👈 Configur	Sconfigure Device: 00-13-48-FF-FF-FF				
	Basic Settings Advanced Options				
	Item	Value 🔼			
Upgrade Firmware	UART1 Settings				
	Alive Timeout sec	5			
	UART2 Settings				
Reboot Device	Alive Timeout sec	5			
	IP Range that can access the device				
Default Settings	🥟 Change P	assword 🥳 Save to Device			

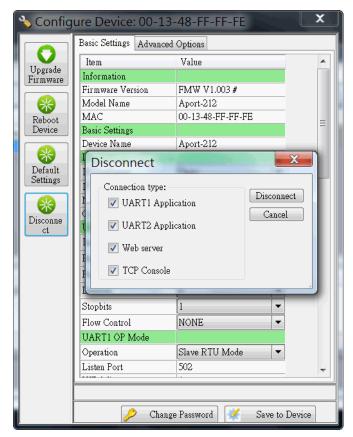
Quick Command Button

Upgrade Firmware: Use this button to upgrade Aport-212 firmware if necessary.

Sconfigure Device: 00-13-48-FF-FF-FE			X		
	Basic Settings Advanced Options				
	Item	Value			
Upgrade Firmware	Information				
	Firmware Version	FMW V1.003 #			
	Model Name	Aport-212			
Reboot	MAC	00-13-48-FF-FF-FE	=		
Device	Basic Settings		-		
	Device Name	Aport-212			
Default Settings	Select File	X			
Disconne ct	Select Firmware file JM3S9B90\Aport212\1003\build\output\merge.aff Browse OK Cancel				
Databits 18					
	Stopbits				
	Flow Control	NONE -			
	UART1 OP Mode				
	Operation	Slave RTU Mode 🔻			
	Listen Port	502			
	Change Password Save to Device				

Quick Command Button

Reboot device: This button will force remote Aport-212 reboot Default settings: This button will load the factory default settings to Aport-212 Disconnect: This button can use to stop the serial UART operation, TCP console or Web Console



Web Console

Web console allows user to use web browser to configure Aport-212. To open the web console, enter the IP address and port number as

http://192.168.2.127:5003

User can use Web browser to configure the Basic setting of Aport-212.

00-	Device Settings - Windows Internet	💌 🗟 😽 🗙 🚰 Google		
_	AE 検視(Y) 我的最要(A) 工具(会 愛 建築的網站 - 名) 網頁快速 Device Settings		L具(Q) • 🔞 •	
Configure Device Settings				
	Item	Value		
	FW Version	FMW V1.003 #		
	MAC	00:13:48:FF:FF:FF		
	Basic Settings			
	Device Name	Aport-212		
	Lan Settings			
	IP Configure	Static		
	IP Address	192.168.2.127		
	Netmask	255.255.255.0		
	Gateway	192.168.1.150		
	UART1 Settings			
	Interface	RS-232		
	Baudrate	115200		
	Parity	NONE		
		Submit Cancel	<u>.</u>	
成		G - 網際網路 G -	🔍 100 % 🔹	

Login with Password

If password is enabled, you need to use User: admin Password: (your password) to start the web console



Command Line Interface

Aport-212 supports Command Line Interface (CLI) configuration. Users can use CLI in Telnet console port and serial console to write their own manager utility software. Make sure the Command option is Enable in TCP Command Setting and Serial Console setting.

The Command format is

[G/S]:Command=Parameter {carriage return}

For example

G:ip_ip=

Will get the ip address

S;ip_ip=192.168.2.127

All command are terminated by a carriage return (0x0d).

G:ip_ip= A:ip_ip=192.168.2.127 G:txt_dn= A:txt_dn=Aport-212

Remember to save and reboot the Aport-212 by command

S;save=1 & reboot=1

Please refer to Appendix A for the Command list.