460xxAWS-NNA4
Protocol Gateway

Getting Started Guide for AWS IoT Core

Table of Contents

1   Document information

1.1   Naming conventions

The Part numbers of products in the 460-gateway product line consist of multiple components, each supplying additional information about the product itself. A simple breakdown of this format can be found below:

$$460P1P2\text{-}NXXX \rightarrow 460AAWS\text{-}NNA4$$

460 – The 460 indicates the product is part of Real Time Automations 460 protocol gateway product line.
P1 – The information in the P1 section indicates what the first mating technology is. In the example above A is being used. As can be seen in the table below this indicates Serial ASCII is mating technology 1.
P2 – The information in the P2 section indicates what the second mating technology is. When connecting to the AWS IoT Core the second mating technology will always be AWS.
NXXX – The information in the NXXX section indicates the hardware model the gateway is utilizing. There are several different hardware models available each with different certifications and available connectivity options. This guide is specific to the NNA4 hardware platform.

The table below provides a full list of available mating technologies, their protocol abbreviation, and the full part number when paired with AWS IoT Core.:

Mating Technology	Abbreviation	Full Part Number
EtherNet/IP Adapter	ES	460ESAWS-NNA4
EtherNet/IP Scanner	EC	460ECAWS-NNA4
EtherNet Tag Client	ETC	460ETCAWS-NNA4
DF1 Master	DFM	460DFMAWS-NNA4
BACnet MS/TP Manager	BM	460BMAWS-NNA4
BACnet MS/TP Responder	BMS	460BMSAWS-NNA4
BACnet/IP Client	BC	460BCAWS-NNA4
BACnet/IP Server	BS	460BSAWS-NNA4
Modbus RTU Client	MM	460MMAWS-NNA4
Modbus RTU Server	MRS	460MRSAWS-NNA4
Modbus TCP Client	MC	460MCAWS-NNA4
Modbus TCP Server	MS	460MSAWS-NNA4
PROFINET Server	PS	460PSAWS-NNA4
Siemens S7 Client	SC	460SCAWS-NNA4
Serial ASCII	A	460AAWS-NNA4
ASCII Over TCP/IP	TCP	460TCPAWS-NNA4

1.2 Document revision history

Version 1.0, published 2/28/24

1.3 Applicable operating systems for this guide

The RTA gateway is configurable via any device with network capabilities that is able to run a web browser. Known supported browsers are Internet Explorer, Microsoft Edge, Google Chrome, Firefox, and Safari.

2 Overview

The 460xxAWS-NNA4 is a protocol gateway solution that enables the connectivity of a variety of mating protocols to the AWS IoT Core.
Supported mating technologies include Modbus TCP, Modbus RTU, BACnet MS/TP, BACnet/IP, EtherNet/IP, DF1, PROFINET, Siemens S7, ASCII over TCP/IP, and Serial ASCII. With a wide range of available mating technologies, the 460xxAWS-NNA4 provides many options to get factory floor data to the cloud.

3 Hardware description

3.1 Datasheet

460ESAWS-NNA4
460ECAWS-NNA4
460ETCAWS-NNA4
460DFMAWS-NNA4
460BMAWS-NNA4
460BMSAWS-NNA4
460BCAWS-NNA4
460BSAWS-NNA4
460MMAWS-NNA4
460MRSAWS-NNA4
460MCAWS-NNA4
460MSAWS-NNA4
460PSAWS-NNA4
460SCAWS-NNA4
460AAWS-NNA4
460TCPAWS-NNA4

3.2 Standard kit contents

1x 460xxAWS-NNA4 Gateway
1x 3' power cable with flying leads
1x CAT5 crossover cable
1x Din rail mounting bracket
Optional: 1x wall wart power supply

3.3 User provided items

A computer with network capabilities and an installed web browser.
12-24v power source if not purchased as an optional add on with the 460 gateway.

3.4 3ʳᵈ party purchasable items.

None

3.5 Additional hardware references

NNA4 2D CAD Drawing
NNA4 3D CAD Drawing
NNA4 Scale Engineering Drawing

4 Set up your development environment

4.1 Tools installation (IDEs, Toolchains, SDKs)

RTA IP Setup Utility – Used to find the gateway and assign an IP address for the first time.
RTA Auto Update Utility – Used to load any firmware updates into the gateway.

The RTA IP Setup Utility and RTA Auto Update Utility can be found here.

Information on using the RTA IP Setup Utility to assign an IP address and access the web based configuration page can be found here.

5 Set up device hardware

All information about 460xxAWS-NNA4:
Product Page Links: https://www.rtautomation.com/?s=aws&post_type=product

To find the gateway, set an IP address, and access the web based configuration, follow the steps outlined in this document.

Specific information such as LED states and powering the gateway can be found in the products user guide which is available on the product page.

6 Setup your AWS account and permissions

If you do not have an existing AWS account and user, refer to the online AWS documentation at Set up your AWS Account. To get started, follow the steps outlined in the sections below:

- Sign up for an AWS account
- Create an administrative user
- Open the AWS IoT console

Pay special attention to the Notes.

7   Create resources in AWS IoT

Refer to the online AWS documentation at Create AWS IoT Resources. Follow the steps outlined in these sections to provision resources for your device:

- Create an AWS IoT Policy
- Create a thing object
  - When specifying thing properties while creating the thing object, ensure to create a named shadow.

Pay special attention to the Notes.

8   Provision the device with credentials

1. Run the IPSetup.exe utility to find the gateways IP address on a DHCP enabled network or follow the steps outlined in this document to set a static IP address.
2. Save off the private key and certificate files obtained when creating the thing object to your desktop, keep these files in a secured location.
3. Download the **Starfield Class 2 Certification Authority Root Certificate** from Starfield Techs certificate repository here, or via a direct download link here.
4. Within your Windows Task bar, right click and open a new Windows/File Explorer folder or go into your start menu and type File Explorer.
5. You should now have a window that looks like the image below.

Windows 10
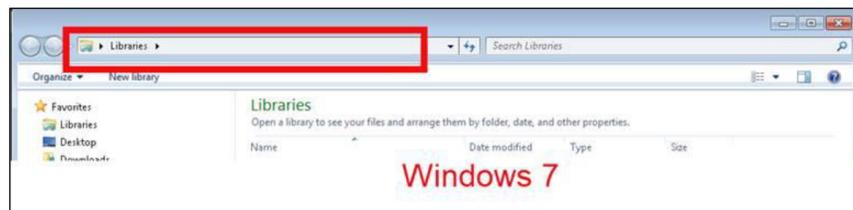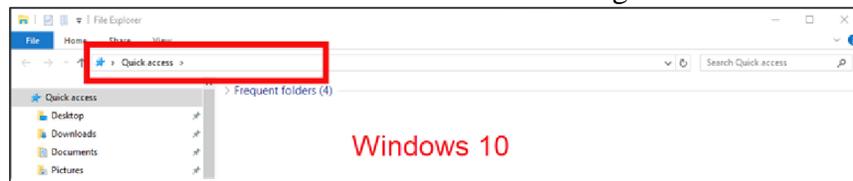
Windows 7

6. In the address bar (within the red box shown above) type ftp://xxx.xxx.xxx.xxx (IP Address of RTA gateway).
   a. You will then see a pop-up window, Username: ffs Password: rtarocks
   b. Paste the certificates and private key into this ftp session, close out the session by exiting out.

9   Build the demo

1. Download the example project template files [here](#).
2. On the RTA gateways webpage, navigate to **Other > Export/Import Template**.
3. Using this page, upload both the **RTA_AWS_Example_Config.DMAP** and **RTA_AWS_Example_Config.QT** files.
   a. Only one file can be uploaded at a time so each file will need to be browsed for and uploaded individually.
4. On the left side of the webpage navigate to **Other > Time Configuration.**
   a. An NTP Server will need to be configured on this page for the connection to AWS to function.
   b. Alternatively, the time can be set manually on this page while the gateway is in configuration mode. This method is not recommended as the time will be reverted in the event of a power cycle to the RTA gateway.

10 Run the demo

1. On the left, navigate to the Load From Template page.
2. In the "Add Device From Template" dropdown, select **RTA_AWS_Example_Config** and click the "Add Device" button.
3. Navigate to the MQTT Client page.
4. A device labeled AWS 1 should have been created.
5. Within the device configuration, ensure the correct ethernet port is selected.
6. Enter a Client ID to be used when connecting to the AWS IoT Broker.
7. Enter the Device Shadow URL.
   a. This can be obtained by navigating to the things shadow in AWS IoT Core.
   b. Only the portion of the URL after https:// up to the .com is required.
      i. Ex. **a2qzrsob8h7549-ats.iot.us-east-1.amazonaws.com**
8. Ensure the proper ethernet port is selected for AWS comms in the device configuration section.
9. Click **Save Parameters** at the bottom of the page.
10. Click restart now on the left side of the page to reboot the gateway into run mode and start the application.

11 Verify messages in AWS IoT Core

1. In the AWS IoT Core, navigate to the MQTT Test Client.
2. Use the MQTT Test Client to subscribe to the RTA_Test_Publish topic.
3. The topic should be published to with an incrementing value once every second.

12 Troubleshooting

Please see the *Diagnostics – MQTT Client* section of the user guide for troubleshooting information.

460AWS-NNA4 User Guide: https://www.rtautomation.com/userguides/460AWS-NNA4_Userguide.pdf

Real Time Automation provides technical support free of charge. Support hours are 8am-5pm CST M-F. Support contact information can be found below:

      Phone: 1-800-249-1612
      Email: Support@rtautomation.com
      Web: https://www.rtautomation.com/support/

For more information, refer to the AWS online documentation on *Troubleshooting AWS IoT*.