

1848ETC-HST
Allen-Bradley Historian
Product User Guide

Revision: 1.4.0

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Overview

RTA's A-B PLC Historian is the easiest way to log data from A-B PLCs. It is uniquely designed to store data in closed OT networks. The Historian allows control engineers and operators to gather time series logs of data from their A-B PLCs. These data sets allow you to increase efficiency and avoid unnecessary downtime.



Tools and documents available online: <https://www.rtautomation.com/historian-support/>.

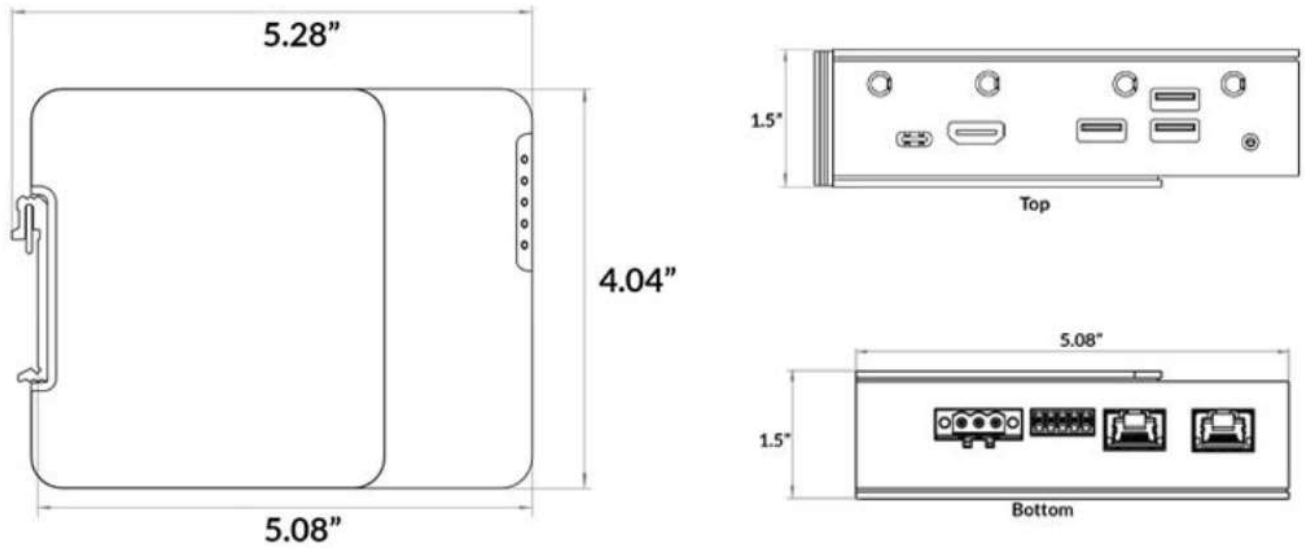
If at any time you need further assistance do not hesitate to call Real Time Automation support.

Support Hours are Monday-Friday 8am-5pm CST

Toll free: 800-249-1612

Email: support@rtautomation.com

Hardware



Powering the Gateway

- The gateway requires a 8-24 VDC power source Red = (+) Black = (-).
 - The unit draws 100mA @ 12VDC
 - The unit draws 50mA @24VDC

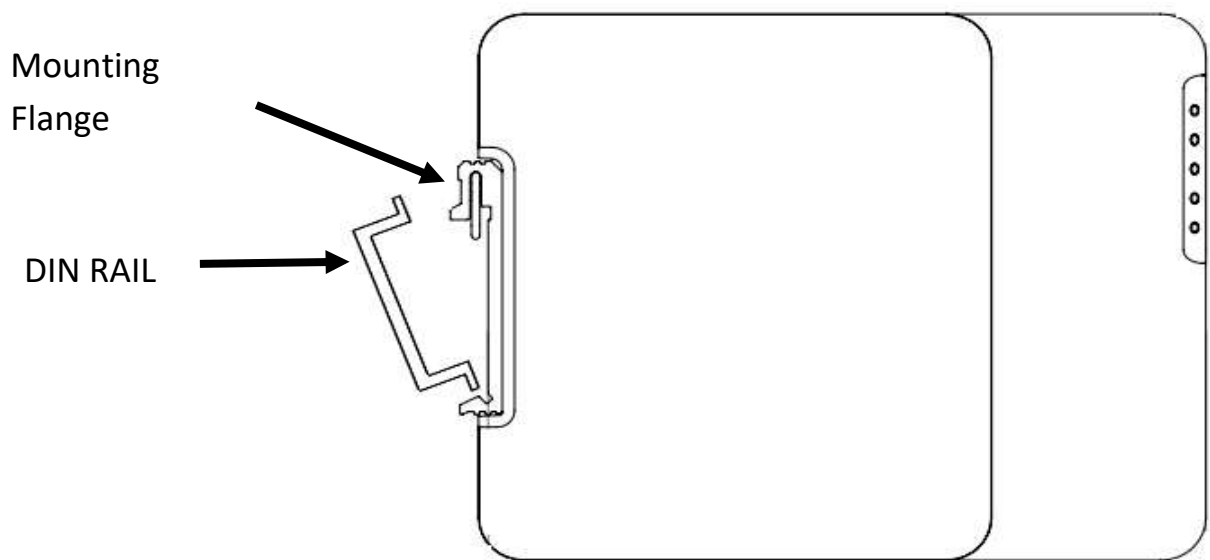


Mounting with a DIN Rail

Installing

Follow these steps to install your unit.

- 1) Mount your DIN Rail.
- 2) Hook the top mounting flange under the DIN Rail.
- 3) While pressing the 1848ETC-HST against the rail, press up to engage the spring loaded lower clip and rotate the unit parallel to the DIN Rail.
- 4) Release upward pressure.

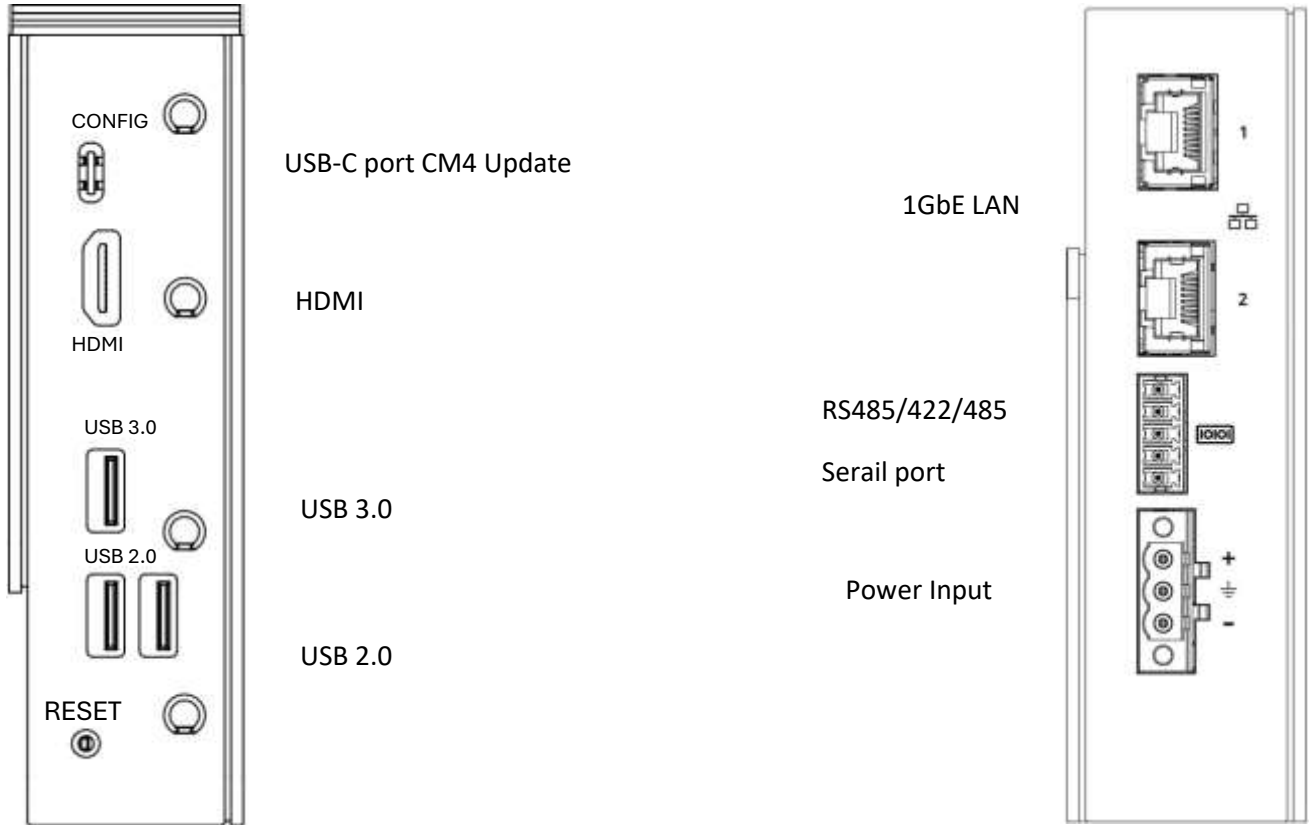


Removing

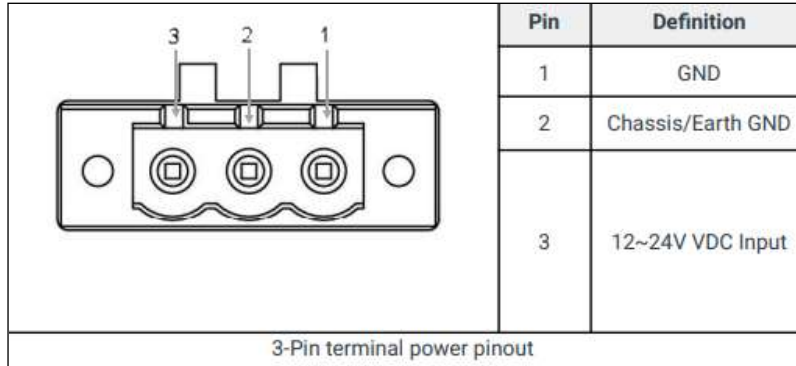
Follow these steps to remove your unit.

- 1) Press up on the unit to engage the spring loaded lower clip.
- 2) Swing top of the unit away from the DIN rail

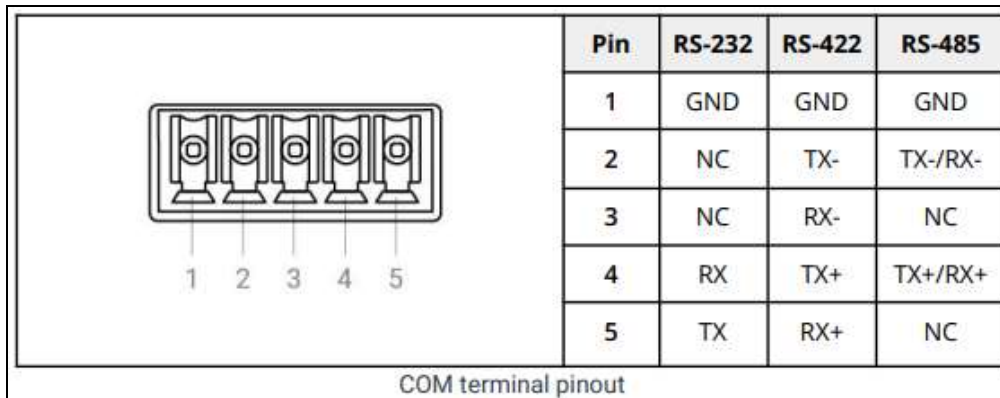
Port Connections



3-Pin Power Connector



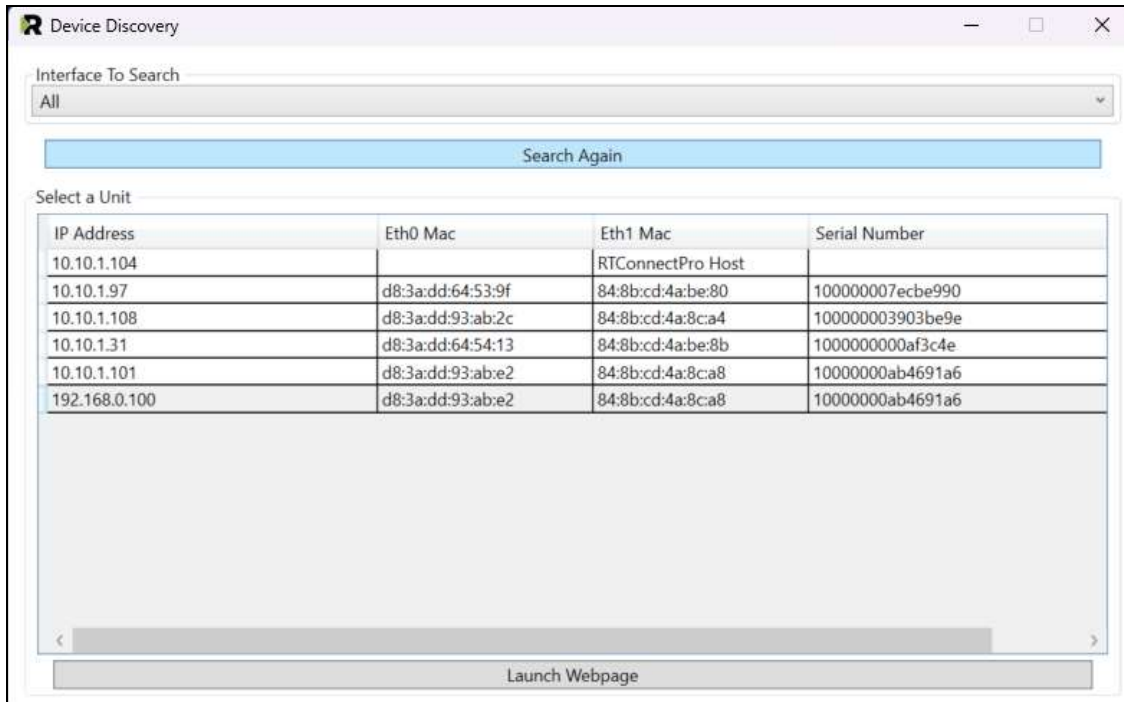
5-Pin COM Connector



Accessing the Main Page

The following steps will help you access the browser-based configuration of the Historian. By default, the historian is at the static IP of 192.168.0.100/255.255.255.0 on port 1 and DHCP on port 2.

- 1) Navigate to <https://www.rtautomation.com/historian-support/> and download Device Discovery.



- 1) Set your computer to be on the 192.168.0.X/255.255.255.0 network and ensure you are connected to port 1.
- 2) Run the Device Discovery.exe program.
- 3) Find unit under “Select a Unit”.
 - a. If you do not see the gateway in this tool, check that your computer is on the 192.168.0.X/255.255.255.0 network.
 - b. Relaunch the Device Discovery tool to see if gateway can be discovered now.
- 4) Click **Launch Webpage**. The Home page will appear.

Home Page

The main page is where important information about your Historian and its connections are displayed.

Navigation (green box below):

You can easily navigate between pages (Home, Device settings, Protocol Settings, Store and Forward and Other pages) using the buttons on the left hand side.

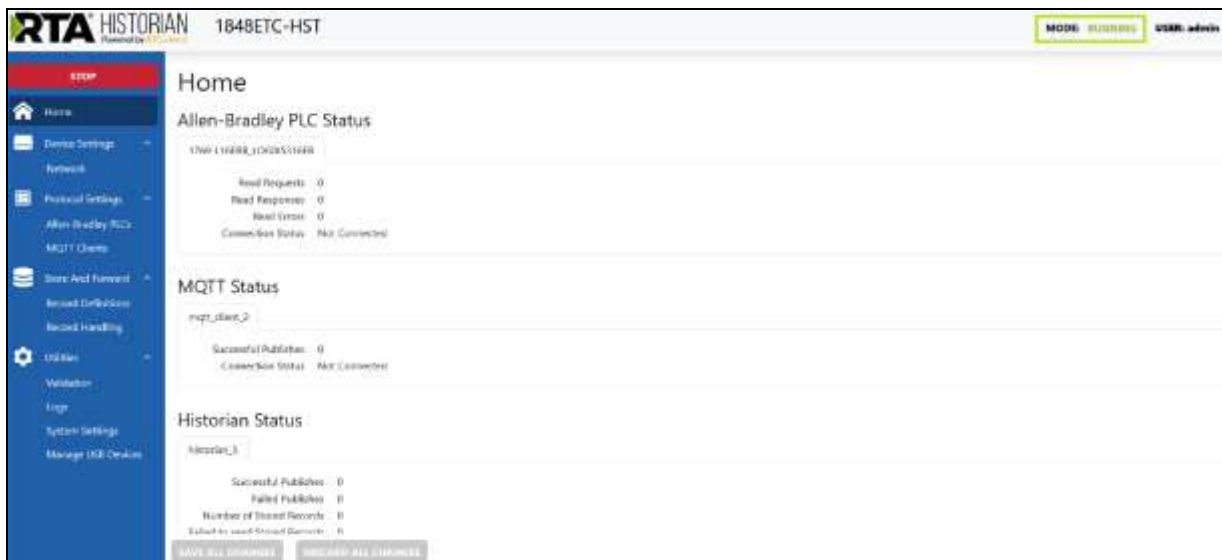
Device Status (yellow box below):

Running Mode:

- Protocol communications are enabled
- You can make changes during Running mode. Once changes are applied then you'll have to Restart the Historian for changes to be applied.

Configuration Mode:

- Protocol communication is stopped and no data is transmitted
- Configuration is allowed



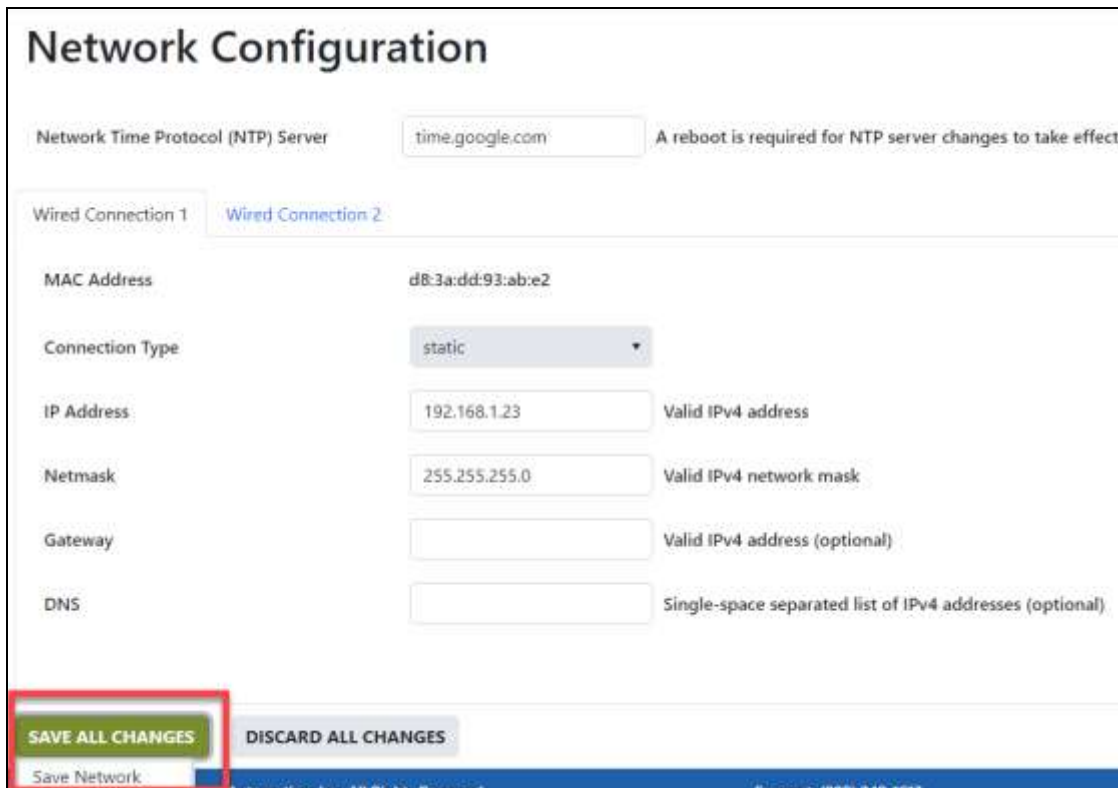
Default setting is set to DHCP. If DHCP fails, default IP address is 169.254.x.y

Device Settings

Network

The network configuration area is where you assign the IP address and other network parameters.

If you are changing the IP address of the Historian, the change will not take effect until the unit has been rebooted. After the reboot, you must enter the new IP address in the the URL.



Network Configuration

Network Time Protocol (NTP) Server: A reboot is required for NTP server changes to take effect.

Wired Connection 1 | **Wired Connection 2**

MAC Address:

Connection Type:

IP Address: Valid IPv4 address

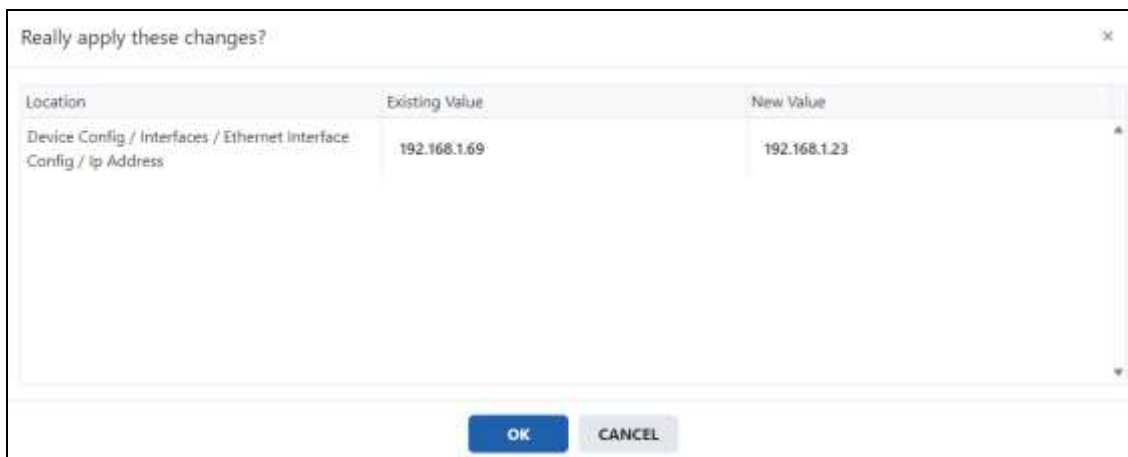
Netmask: Valid IPv4 network mask

Gateway: Valid IPv4 address (optional)

DNS: Single-space separated list of IPv4 addresses (optional)

SAVE ALL CHANGES | DISCARD ALL CHANGES

Save Network



Really apply these changes?

Location	Existing Value	New Value
Device Config / Interfaces / Ethernet Interface Config / Ip Address	192.168.1.69	192.168.1.23

OK | CANCEL

Protocol Settings

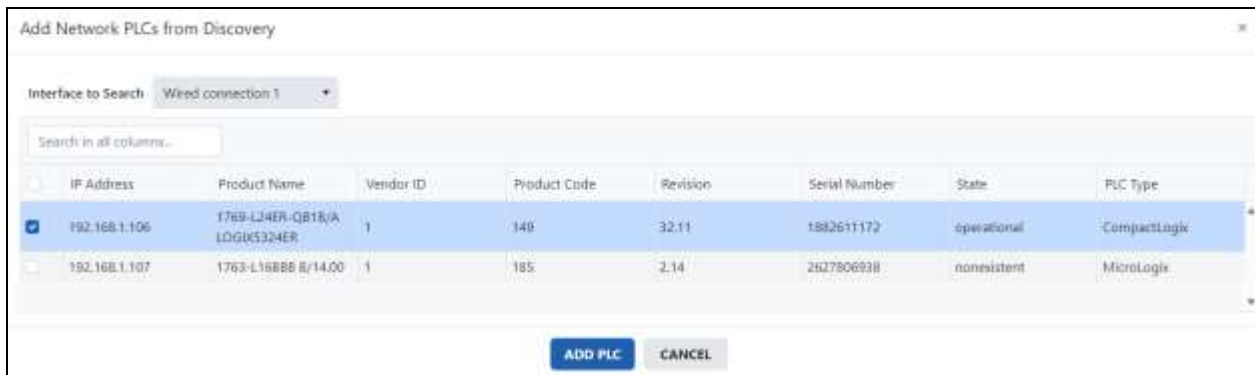
Allen-Bradley PLCs

The Historian can automatically discover up to 10 Allen-Bradley PLCs.

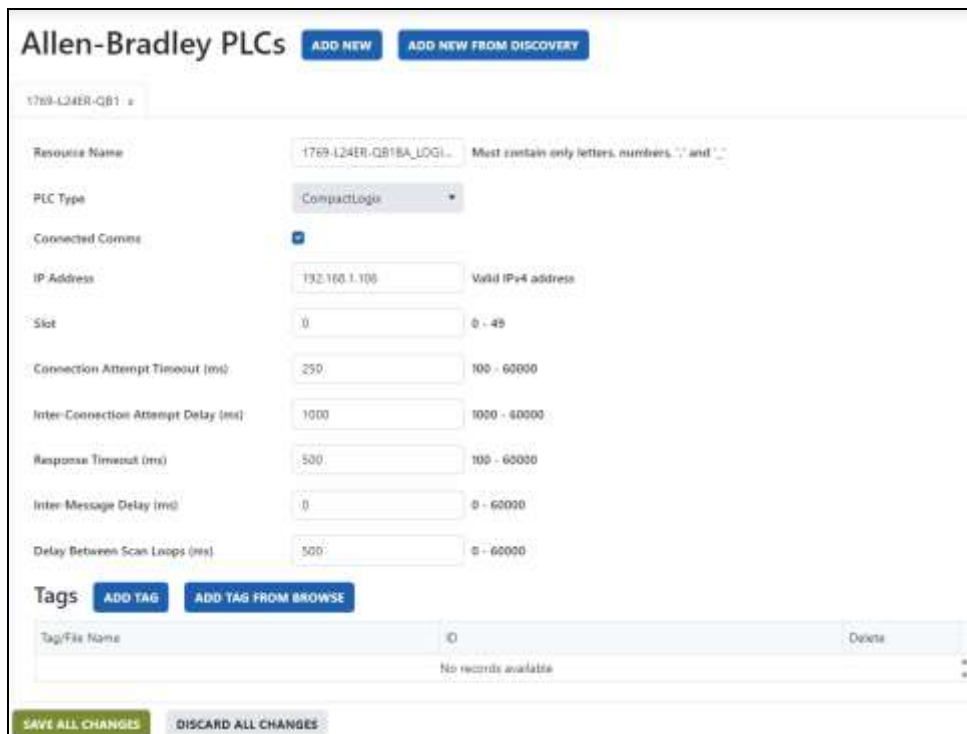


Click **Add New** if you want manually add a PLC that is on the network.

Click **Add New From Discovery** and you will see the available PLCs on your network.



Select the PLC you wish to discover and click Add PLC.



Allen-Bradly PLC configuration

- 1) **Resource Name:** Internal reference to the Historian.
- 2) **PLC Type:** Select the PLC type that matches the IP address you entered to connect with. The Unknown option is any generic EIP device that is discoverable.
- 3) **Slot:** Enter in the slot that the controller is in. For Embedded Ethernet, enter in a value of 0. All MicroLogix, SLC, and PLC5E should be set to 0.
- 4) **Connection Attempt Timeout (ms):** How long to wait for PLC to accept the connection before timing out the attempt.
- 5) **Inter-Connection Attempt Delay (ms):** Delay between failed connection attempts
- 6) **Response Timeout (ms):** Enter the amount of time the gateway should wait before a timeout is issued for a read/write request
- 7) **Inter-Message Delay (ms):** The Inter-Message Delay is a forced delay for each request the gateway sends to the PLC.
 - a. a. This setting will affect the speed at which a message is delivered and the amount of traffic the gateway adds to the network.
 - b. b. If set to 0, the gateway will communicate as fast as possible to the PLC and generate the most traffic.
 - c. c. In applications with a heavy network, it is recommended that you increase this delay to limit network traffic.
- 8) **Delay Between Scan Loops (ms):** Enter the length of time to delay between scan loops.

Tags



The screenshot shows the 'Tags' management interface. At the top, there are two buttons: 'ADD TAG' and 'ADD TAG FROM BROWSE'. Below them is a table with columns for 'Tag/File Name', 'ID', and 'Delete'. The table is currently empty, displaying 'No records available'. At the bottom of the interface, there are two buttons: 'SAVE ALL CHANGES' and 'DISCARD ALL CHANGES'.

When **Add Tag** is selected, you enter in your Tag/File Name. Click the Select Data Point.



This screenshot shows the 'Tags' management interface after clicking 'ADD TAG'. The 'ADD TAG' button is highlighted with a red box. The 'Tag/File Name' field contains 'PLC_Tag_Temp'. A 'SELECT DATA POINT' button is visible next to the field. The 'DELETE' button is also visible in the 'Delete' column.

You can give the tag a more descriptive meaning. For example, PLC_Tag_Temp is defined in the PLC, but it needs more context. Within the Historian, the tag can be given an “ID” or “description”. In this case the tag is now identified as a reference of “Temperature for cooler” with a floating point data type. If you have a tag with an array then enter in the length in accordance the to size of the Tag/File.



The screenshot shows the 'Select a Data Point' dialog box. It has two tabs: 'Choose Existing' and 'Create New'. Below the tabs is a table with columns for 'ID', 'Name', 'Type', and 'Length'. The table contains one entry:

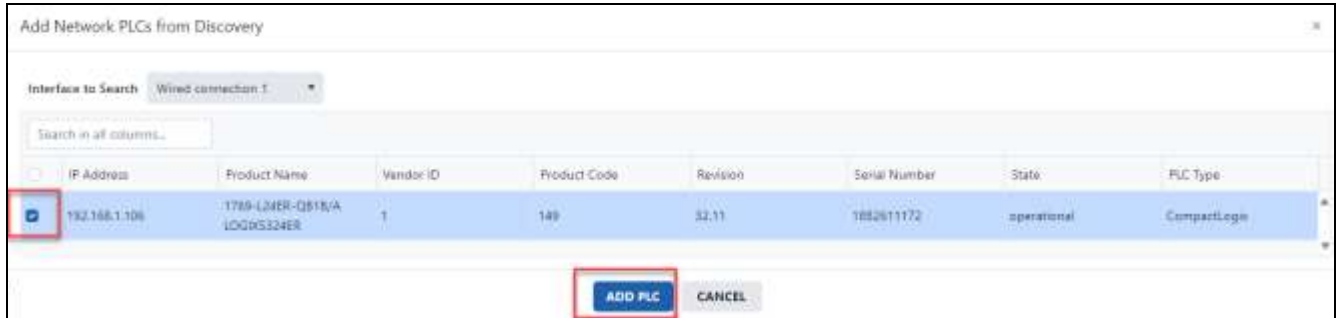
ID	Name	Type	Length
1	Temperature for cooler	float32	1

When **Add Tag From Browse** is selected, choose your PLC then click Add PLC.



This screenshot shows the 'Tags' management interface after clicking 'ADD TAG FROM BROWSE'. The 'ADD TAG FROM BROWSE' button is highlighted with a red box. The 'Tag/File Name' field contains 'new tag'. A 'SELECT DATA POINT' button is visible next to the field. The 'DELETE' button is also visible in the 'Delete' column.

NOTE: Browsing File Names for Micrologix, SLC and PLC5 is not currently supported.



Once your tags are discovered, select which ones the Historian can monitor, click **Add Tags**.



All tags that were selected will be displayed shown below. Once completed click **Save All Changes** and **Save Application**, click **OK**.



Really apply these changes?

Location	Existing Value	New Value
App / Data Table / BB_Gen_Solar3_Power_uptime (ID: 2)		Created
App / Data Table / BB_Gen_Solar2_Power_uptime (ID: 3)		Created
App / Data Table / BB_Gen_Solar1_Power_uptime (ID: 4)		Created
App / Data Table / A2PLC_Port0 (ID: 5)		Created
App / Resources / 1769-L24ER-QB1BA_LOGIX5324ER_2 (ID: 2)		Created

Apply changes ×

Applying changes requires device to stop momentarily.
Would you like to stop and start the device?

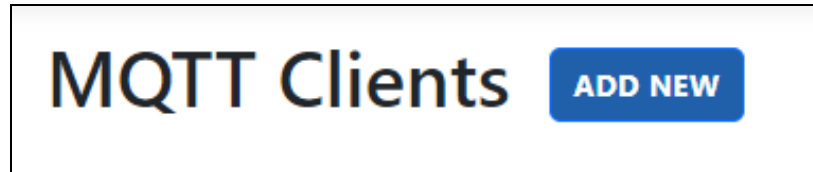
If the Historian Mode is in Running, then you'll have to Stop and Start for the changes to take affect.

RTA HISTORIAN 1848ETC-HST MODE: **RUNNING** USER: admin

STOP ⚠ You have saved changes that have not been applied. Changes will be applied after stopping.

MQTT Clients

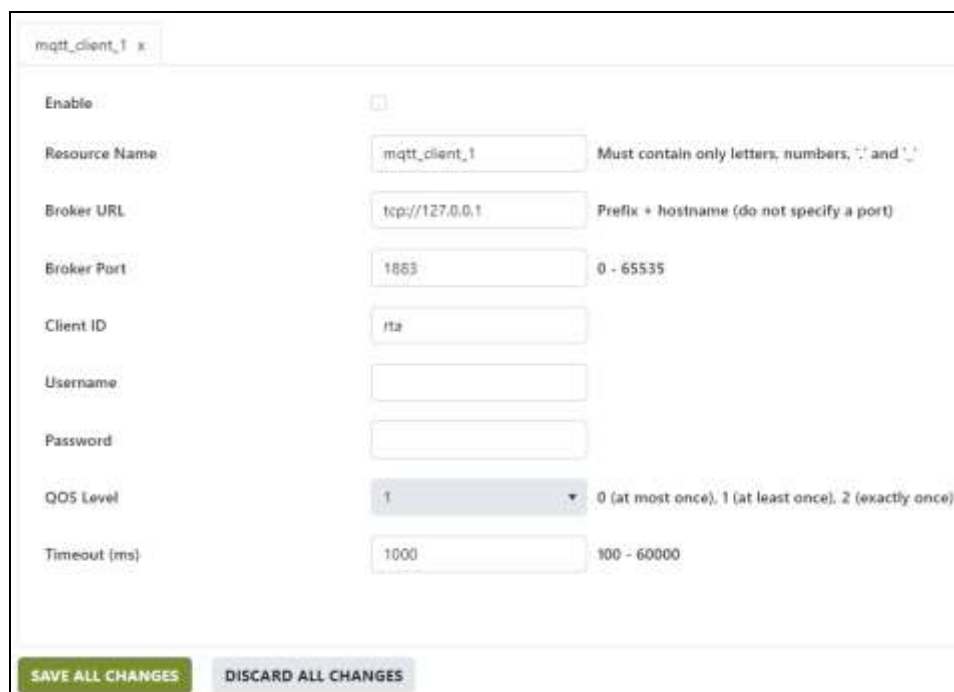
MQTT can have up to 10 connection.



Click **Add New** to add a MQTT Client.

MQTT Configuration

- 1) **Resource Name:** Enter the name to be used when referring to this MQTT Client.
- 2) **Broker URL:** Enter the unique MQTT broker Ipaddress/URL.
- 3) **Broker Port:** Enter the TCP port for the MQTT broker to open the connection.
- 4) **Client ID:** Enter the Client ID to be use when connecting to the broker.
- 5) **Username and Password:** Enter if authentication to the MQTT broker is required.
- 6) **QOS Level:** Select the QOS Level MQTT Messages should be published with.
- 7) **Timeout (ms):**Enter the amount of time in milliseconds to wait before closing the connection if communication with the broker is lost.

A screenshot of a web form for configuring a MQTT client. The form is titled "mqtt_client_1 x" in a small grey box at the top left. It contains several fields: "Enable" with a checked checkbox; "Resource Name" with a text input containing "mqtt_client_1" and a tooltip "Must contain only letters, numbers, '-' and '.'"; "Broker URL" with a text input containing "tcp://127.0.0.1" and a tooltip "Prefix + hostname (do not specify a port)"; "Broker Port" with a text input containing "1883" and a tooltip "0 - 65535"; "Client ID" with a text input containing "rta"; "Username" and "Password" with empty text inputs; "QOS Level" with a dropdown menu set to "1" and a tooltip "0 (at most once), 1 (at least once), 2 (exactly once)"; and "Timeout (ms)" with a text input containing "1000" and a tooltip "100 - 60000". At the bottom of the form are two buttons: "SAVE ALL CHANGES" in a green box and "DISCARD ALL CHANGES" in a grey box.

Store and Forward

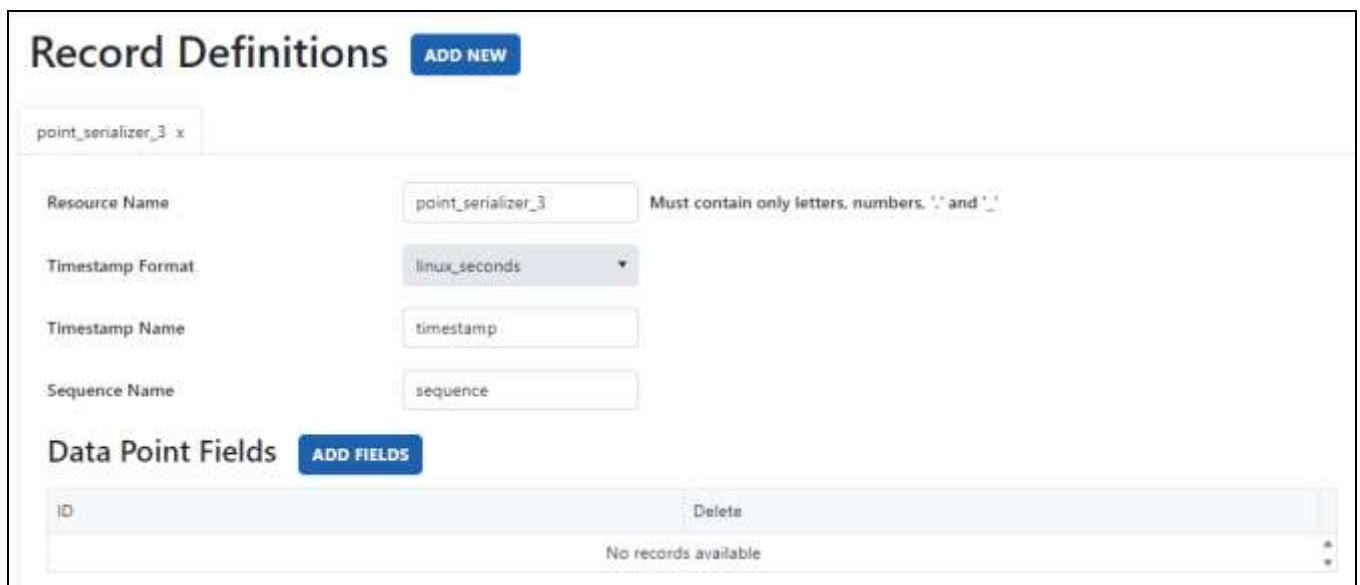
Record Definitions

The Record Definitions page is used to define one or more point serializer. A point serializer enables the building of a JSON formatted payload to be stored or published to MQTT.

Click the **Add New** button next to Record Definitions to add a new Record Definition.



- 1) **Resource Name:** Enter the resource name to be used when referencing this Record Definition.
- 2) **Timestamp Format:** Select the format for the timestamp in the MQTT JSON payload.
 - a. **linux_seconds:** Seconds since Jan-1st-1970
 - b. **linux_milliseconds:** Milliseconds since Jan-1st-1970
- 3) **Timestamp Name:** Enter the name/label for the timestamp in the MQTT JSON payload.
- 4) **Sequence Name:** Enter the name/label for the sequence number in the MQTT JSON payload.



The screenshot shows the 'Record Definitions' form. At the top, there is a header with the text 'Record Definitions' and a blue 'ADD NEW' button. Below the header, there is a search bar containing 'point_serializer_3'. The form fields are: 'Resource Name' with the value 'point_serializer_3' and a note 'Must contain only letters, numbers, "." and "_"'; 'Timestamp Format' with a dropdown menu set to 'linux_seconds'; 'Timestamp Name' with the value 'timestamp'; and 'Sequence Name' with the value 'sequence'. Below the form fields, there is a section titled 'Data Point Fields' with a blue 'ADD FIELDS' button. Underneath, there is a table with columns 'ID' and 'Delete'. The table is currently empty, and the text 'No records available' is displayed at the bottom of the table.

5) Click the **Add Fields** button to add PLC tags to the MQTT JSON Payload. The **Select One or More Data Points** Window should pop up. The table should be populated with tags from the configured PLCs.

6) Select the tags to add to the JSON payload by clicking the checkbox on the left and clicking okay.

Select One or More Data Points					
<input type="checkbox"/>	ID	Name	Type	Length	Value
<input type="checkbox"/>	2	BB_Gen_Solar3_Power_uptime	int32	1	
<input type="checkbox"/>	3	BB_Gen_Solar2_Power_uptime	int32	1	
<input type="checkbox"/>	4	BB_Gen_Solar1_Power_uptime	int32	1	
<input type="checkbox"/>	5	A2PLC_Port0	string	82	

Record Handling

The Record Handling page is used to configure how often data is sampled as well as how it will be stored locally or forwarded to MQTT.

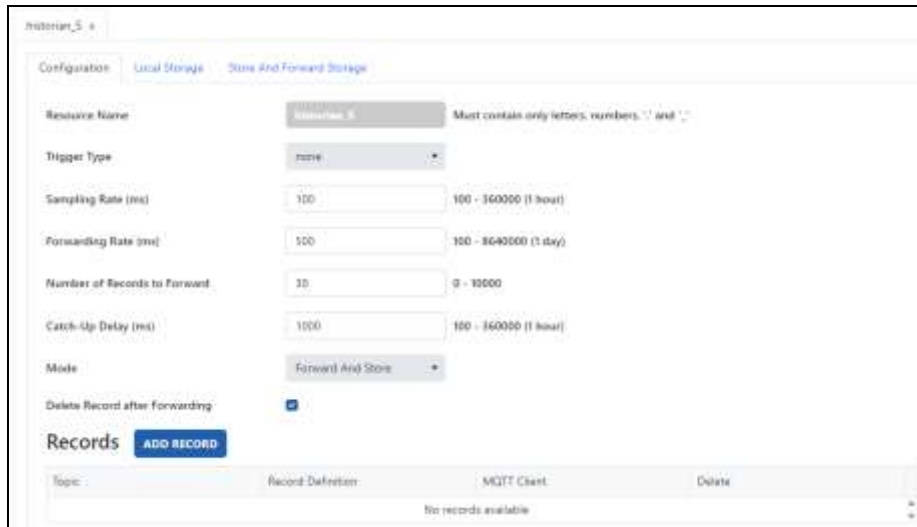
Click the Add New button next to Historians to add a new Historian configuration.



Configuration

- 1) **Resource Name:** Enter the name used when referring to this Historian.
- 2) **Trigger Type:**
 - a. **None:** Records will be recorded cyclically based on the sampling rate.
 - b. **Pointchange:** Records will only be recorded when there is a change of value in the configured trigger point.
- 3) **Sampling Rate (ms):** Enter how long to wait between sampling data to log to the Historian in milliseconds.
- 4) **Forwarding Rate (ms):** Enter how long to delay between cyclic publishes to the MQTT Broker in milliseconds.

- 5) **Number of Records to Forward:** Enter the maximum number of records that can be forwarded to MQTT in one publish.
- 6) **Catch-Up Delay (ms):** The forwarding rate to use after a disconnect has occurred to catch up to the most recent records. This should always be lower than the Forwarding Rate.
- 7) **Mode: Forward, Forward and Local Storage and Local Storage:**
 - a. **Forward:** Forward data to MQTT without storing any data locally on the Historian.
 - b. **Forward and Local Storage:** Forward data to MQTT and store the data locally on the Historian.
 - c. **Local Storage** Store the record locally only, do not forward to MQTT.
- 8) **Delete Record after Forwarding:** Select whether to delete record from local storage after it has been forwarded to MQTT.



- 7) Click the **Add Record** button to add a record which will be used to associate an MQTT topic, a Record Definition, and an MQTT client.

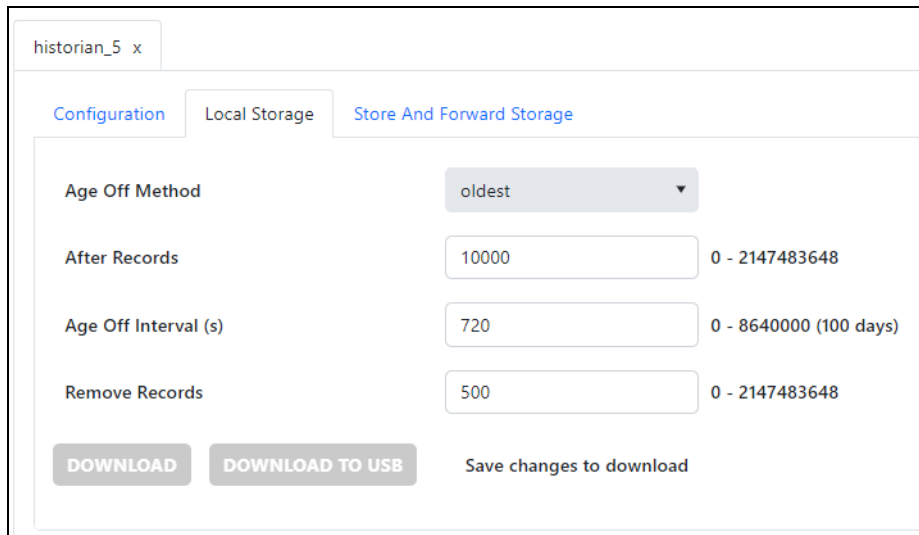


- 8) **Topic:** Enter the MQTT topic the record should be published to.
- 9) **Record Definition:** Use the dropdown to select the Record Definition to be stored or forwarded to MQTT.

10) **MQTT Client:** Select the MQTT Client to be used when publishing data to MQTT.

Local Storage

The local storage tab is used to define the parameters for data that will be stored locally on the Historian to be retrieved via direct download or USB.



historian_5 x

Configuration Local Storage Store And Forward Storage

Age Off Method oldest

After Records 10000 0 - 2147483648

Age Off Interval (s) 720 0 - 8640000 (100 days)

Remove Records 500 0 - 2147483648

DOWNLOAD DOWNLOAD TO USB Save changes to download

1) Age Off Method:

- a. **Oldest:** When set to oldest, the oldest records will be aged off and removed from the record database.
- b. **Newest:** When set to newest, the newest records will be aged off and removed from the record database.

2) **After Records:** The maximum number of records that can be stored by this Historian before records start getting aged off. If there are more records than the configured number, the Historian will age off the number of records configured in the Remove Records configuration until there is fewer records than the configured number.

3) **Age Off Interval (s):** The interval at which the Historian will age off records. Every time this interval is hit, the Historian will age off the number of records defined in the Remove Records configuration.

4) **Remove Records:** The number of records that will be aged off when hitting the age off interval or max number of records.

5) **Download:** Allows the user to download the currently stored records as a database, CSV, or PDF directly to their PC.

- 6) **Download to USB:** Allows the user to download the currently stored records as a database, CSV, or PDF to a USB Storage Device plugged into the Historian device.

Store And Forward Storage

The store and forward tab is used to define the parameters for data that will be forwarded to MQTT and stored locally temporarily if no MQTT connection is available.

Configuration	Local Storage	Store And Forward Storage
Age Off Method		oldest
After Records	10000	0 - 2147483648
Age Off Interval (s)	720	0 - 8640000 (100 days)
Remove Records	500	0 - 2147483648

1) Age Off Method:

- a. **Oldest:** When set to oldest, the oldest records will be aged off and removed from the record database.
- b. **Newest:** When set to newest, the newest records will be aged off and removed from the record database.

2) **After Records:** The maximum number of records that can be stored by this Historian before records start getting aged off. If there are more records than the configured number, the Historian will age off the number of records configured in the Remove Records configuration until there is fewer records than the configured number.

3) **Age Off Interval (s):** The interval at which the Historian will age off records. Every time this interval is hit, the Historian will age off the number of records defined in the Remove Records configuration.

4) **Remove Records:** The number of records that will be aged off when hitting the age off interval or max number of records.

Utilities

Validation

The validation page is used to easily view any errors in the configuration. If the Save Changes button is greyed out and say “CHANGES INVALID: SEE VALIDATION” come to this page to easily review any errors that may be preventing the configuration from saving and running.

Validation Validation successful		
Severity	Location	Message
Information	Application	Validation successful
Information	Network	Validation successful

Logs

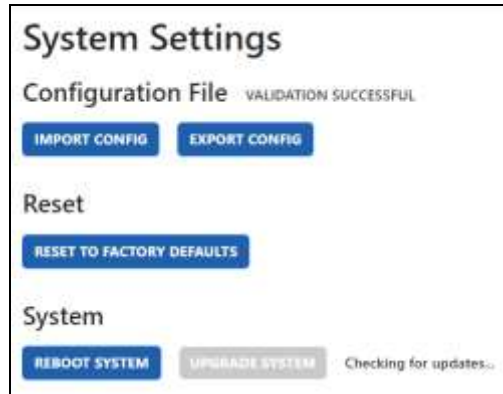
The logs page can be used to see diagnostic messages while the Historian is running. These messages include items such as:

- 1) **Errors:** Failure to connect to a configured PLC or MQTT Broker.
- 2) **Information:** App information such as process starting or stopping, records being aged off, data successfully being published to MQTT, etc.

Load previous 5 messages		
Timestamp	Level	Message
8-2-2024 11:28:17.377 AM	Information	Historian: rta_engine_moduleinfo_readdir lib libpaho-mqtt3a.so
8-2-2024 11:28:17.378 AM	Information	Historian: rta_engine_moduleinfo_readdir lib librtm-etc-discovery.so
8-2-2024 11:28:17.378 AM	Information	Historian: rta_engine_moduleinfo_readdir lib test-discovery-library-interface
8-2-2024 11:28:17.378 AM	Information	Historian: rta_engine_moduleinfo_readdir lib libz.so
8-2-2024 11:28:17.378 AM	Information	Historian: rta_engine_moduleinfo_readdir lib librtm_pointserializer_user_jstrn.so

Jump to latest

System Settings



1) **Import Config:** Import an existing configuration

- a. **Import Application:** Import only application configurations, does not affect network configurations
- b. **Import Network:** Import only network configurations, does not affect application configurations.
- c. **Import All:** Import both Network and Application configurations.

2) **Export Config:** Saves the configuration to a file called User_Config.json.

3) **Reset to Factory Defaults:** Reverts the Historian to shipped defaults, this will cause the loss of all configurations except network settings.

4) **Reboot System:** Shuts down and then reboots the Historian device.

5) **Upgrade System:** When connected to the internet, the Historian is able to check for updates and can be updated to the latest version if a newer version is available by pressing the Upgrade System button. When updates are available the revision numbers will be listed next to the Upgrade System button.

Manage USB Devices

The Manage USB Devices page is used to scan for, view, and safely eject connect USB storage devices.

