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.

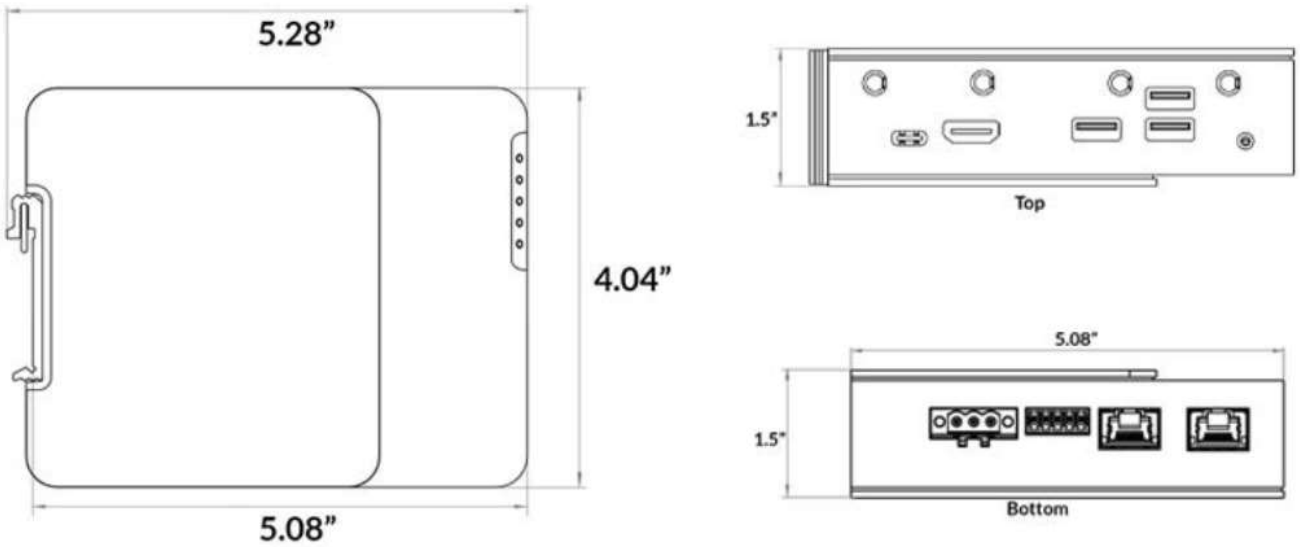
Tools and documents available online: https://www.rtautomation.com/historian-support/.

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

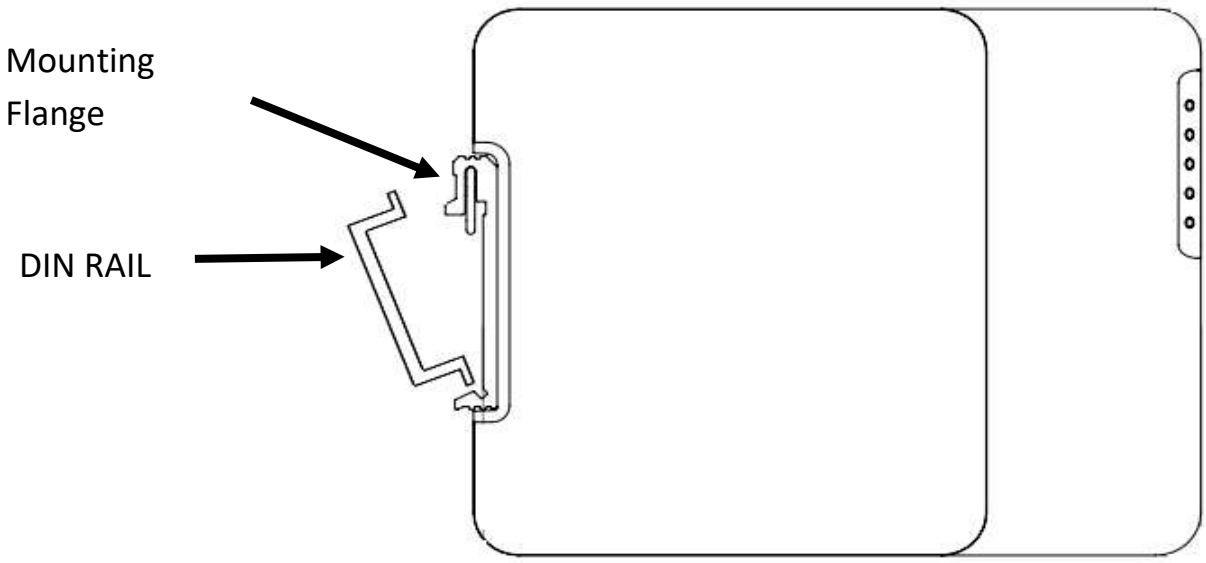
- The gateway requires a 8-24 VDC power source Red = (+) Black = (-).
    - The unit draws 100mA @ 12VDC
    - The unit draws 50mA @24VDC

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.

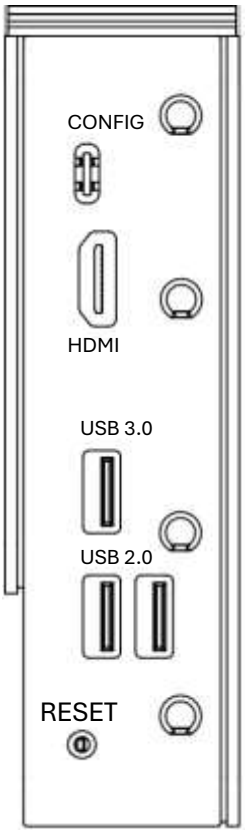


Removing

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



USB-C port CM4 Update

HDMI

USB 3.0

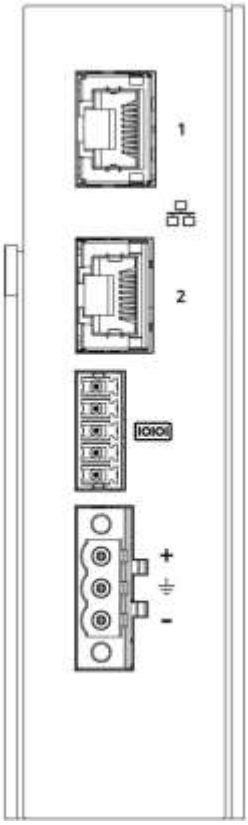
USB 2.0

1GbE LAN

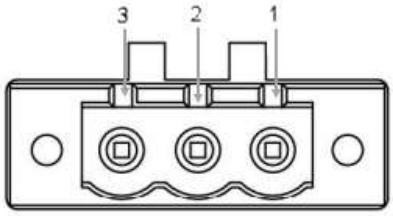
RS485/422/485

Serail port

Power Input



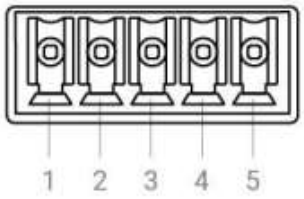
3-Pin Power Connector



Pin	Definition
1	GND
2	Chassis/Earth GND
3	12~24V VDC Input

3-Pin terminal power pinout

5-Pin COM Connector



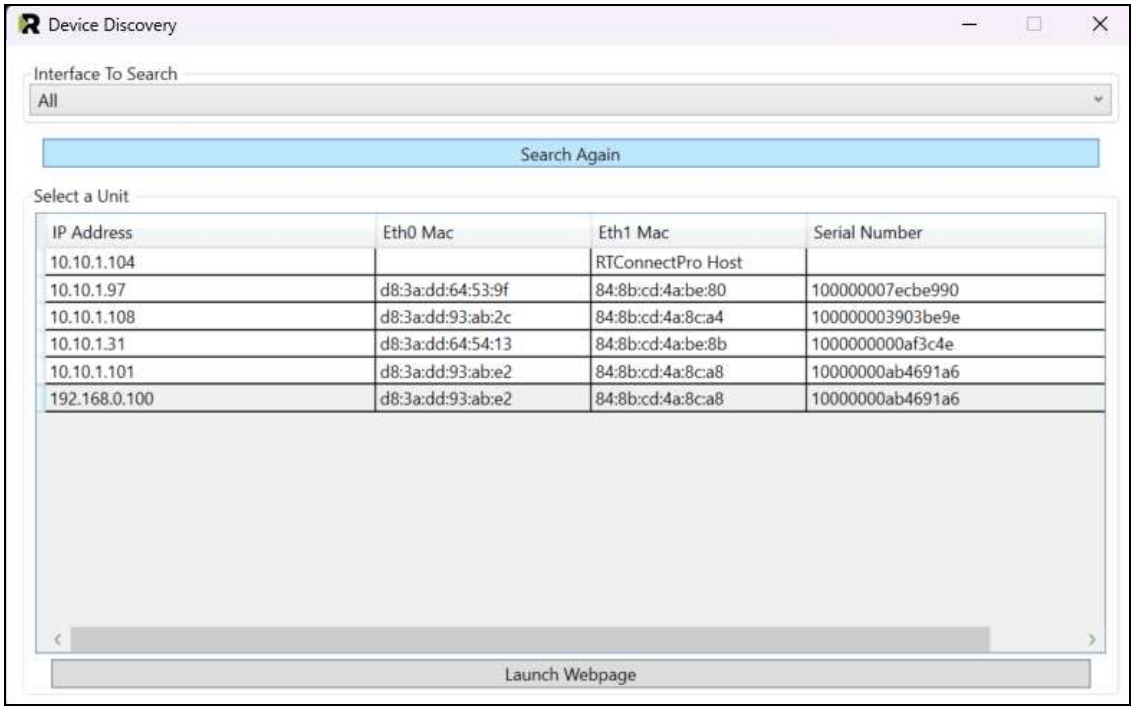
Pin	RS-232	RS-422	RS-485
1	GND	GND	GND
2	NC	TX-	TX-/RX-
3	NC	RX-	NC
4	RX	TX+	TX+/RX+
5	TX	RX+	NC

COM terminal pinout

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 bow 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

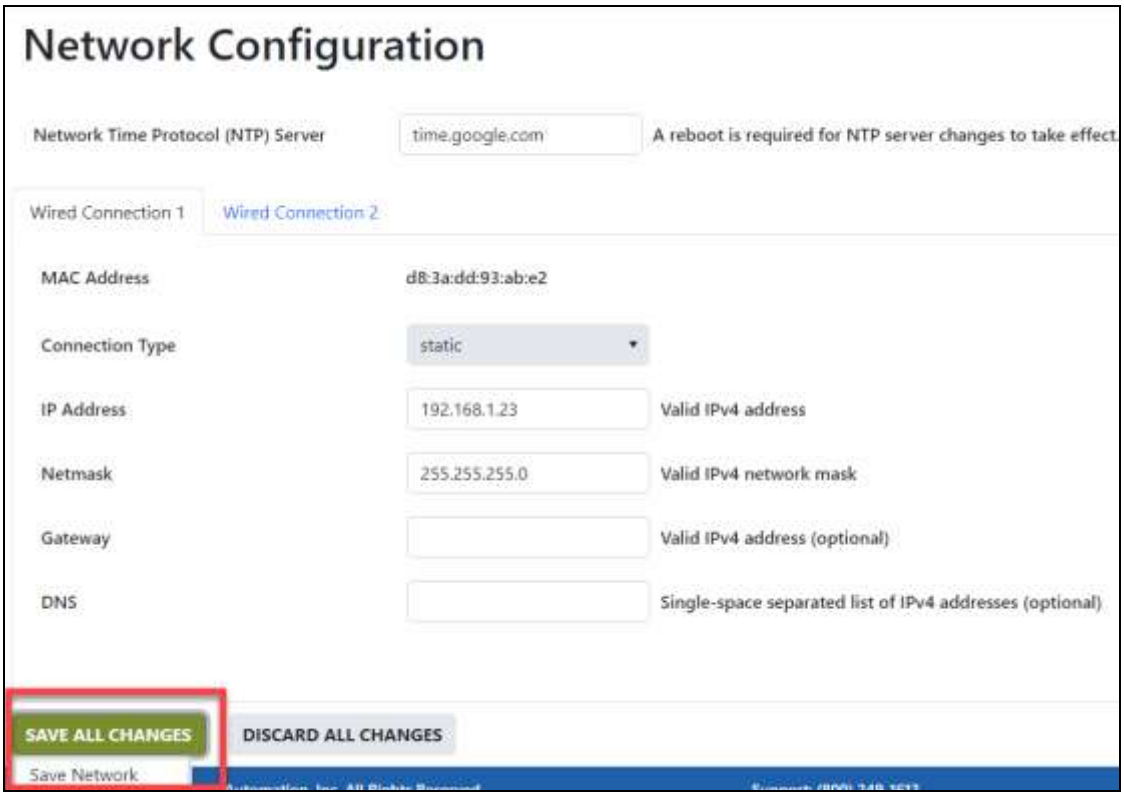
Default setting is set to DHCP. If DHCP fails, default IP address is 169.254.x.y

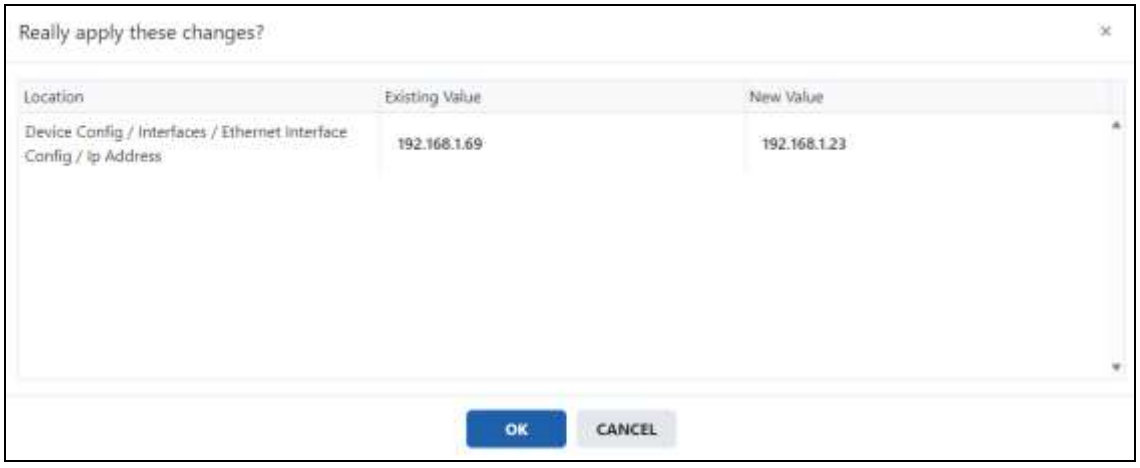
Device Settings

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.





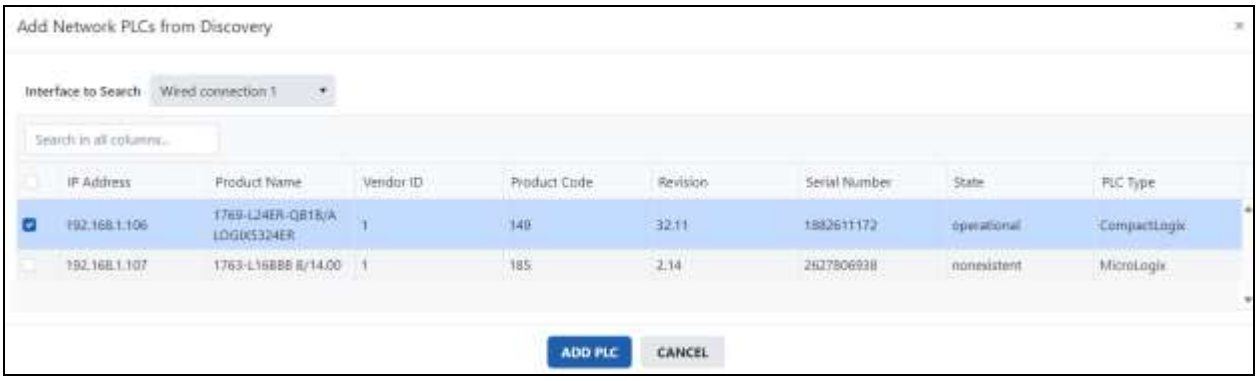
Protocol Settings

Allen-Bradley PLCs

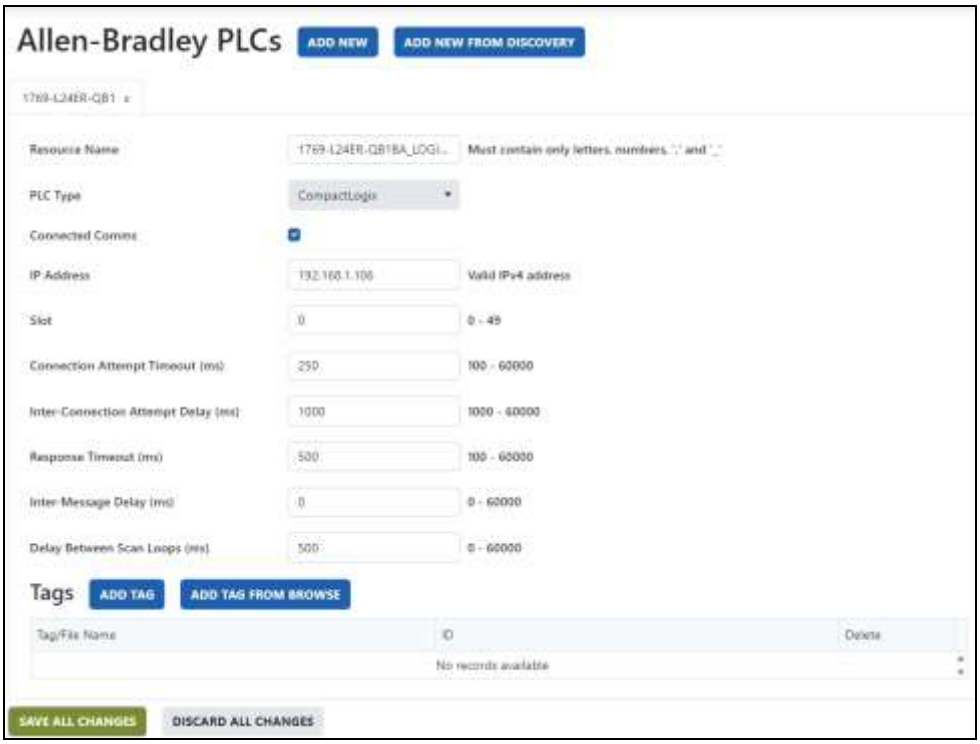
The Historian can automatically discover up to 10 Allen-Bradly PLCs.

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 refernace to the Historian.

2) **PLC Type:** Select the PLC type that matches the IP address you entered to connect with. The Unknow 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.

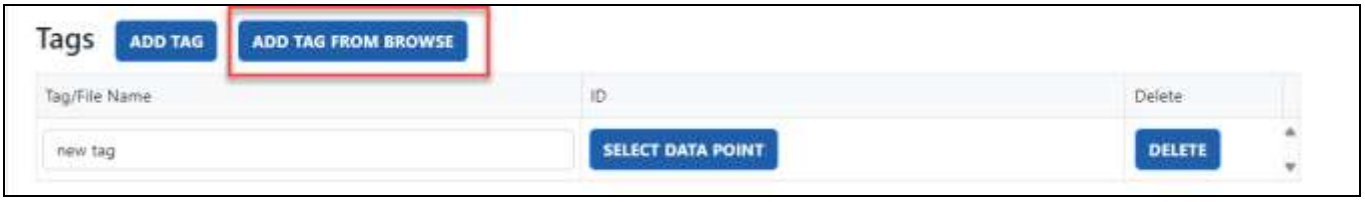
8) **Delay Between Scan Loops (ms):** Enter the length of time to delay between scan loops.

Tags

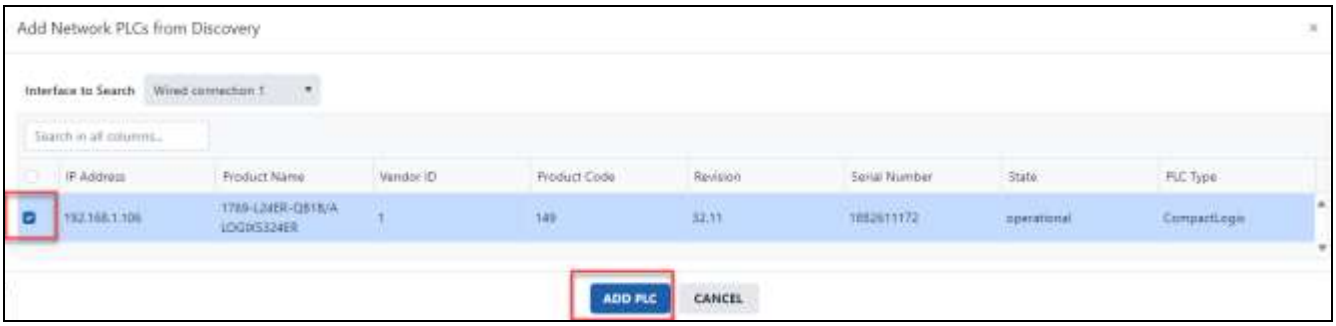
When **Add Tag** is selected, you enter in your Tag/File Name. Click the Select Data Point.

You can give the tag a more discriptive 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 referance 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.

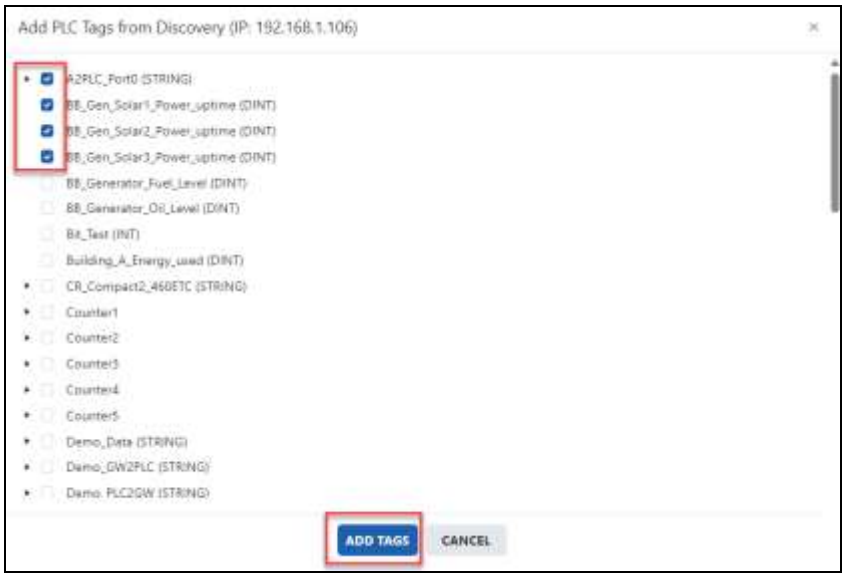
When **Add Tag From Browse** is selected, choose your PLC then click Add PLC.



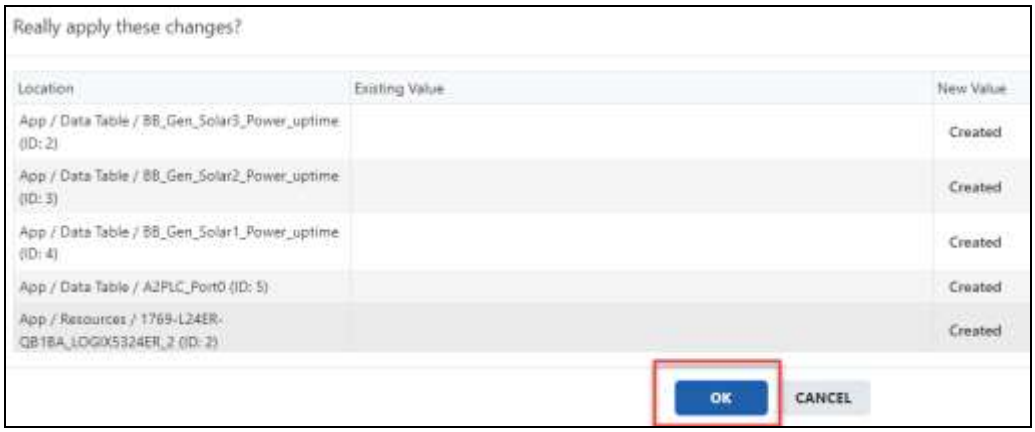
NOTE: Browsing File Names for Micrologix, SLC and PLC5 is not currently supported.

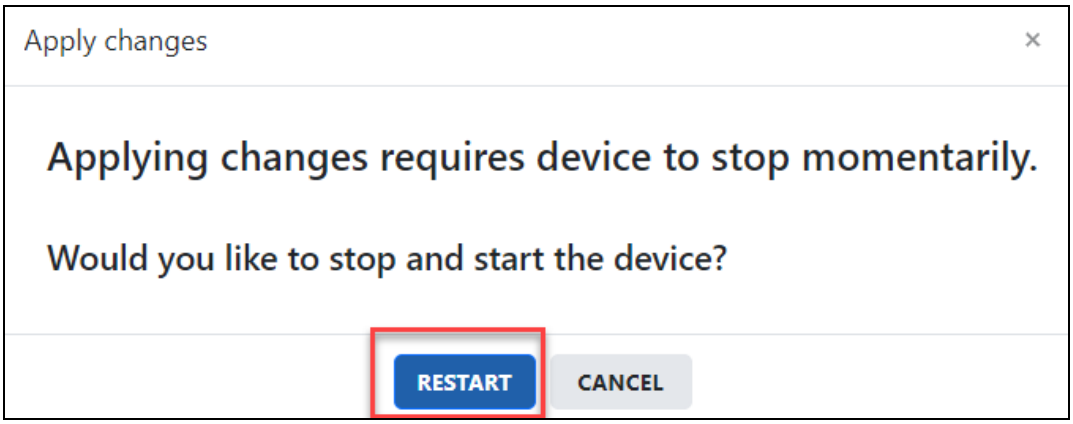


Once your tags are discovered, select which ones the Historian can monitor, click **Add Tags**.



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





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

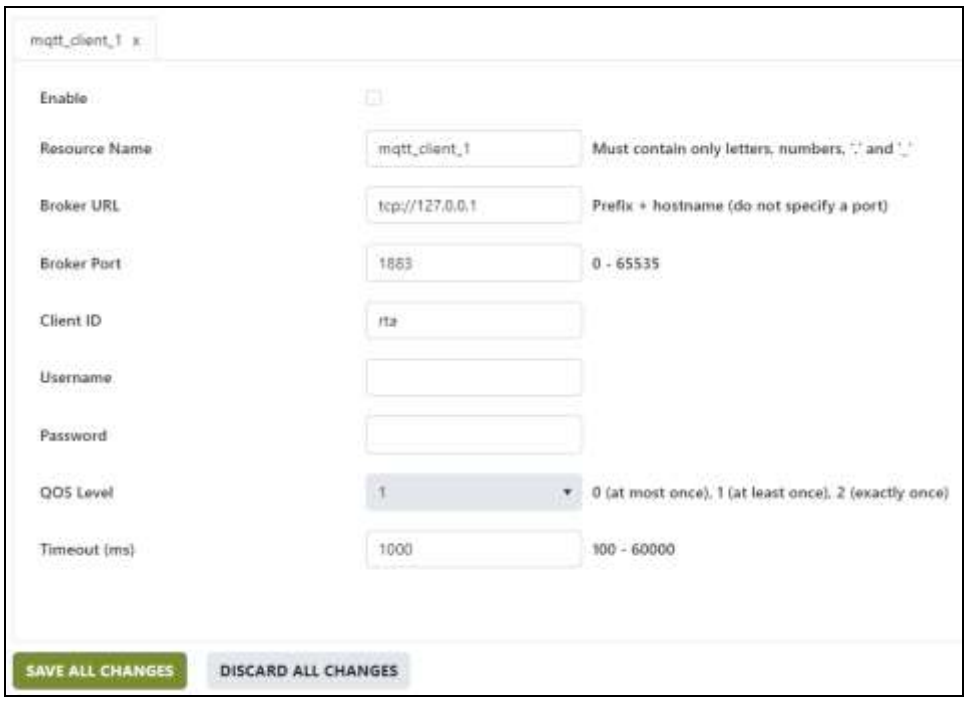
MQTT Clients

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.



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.

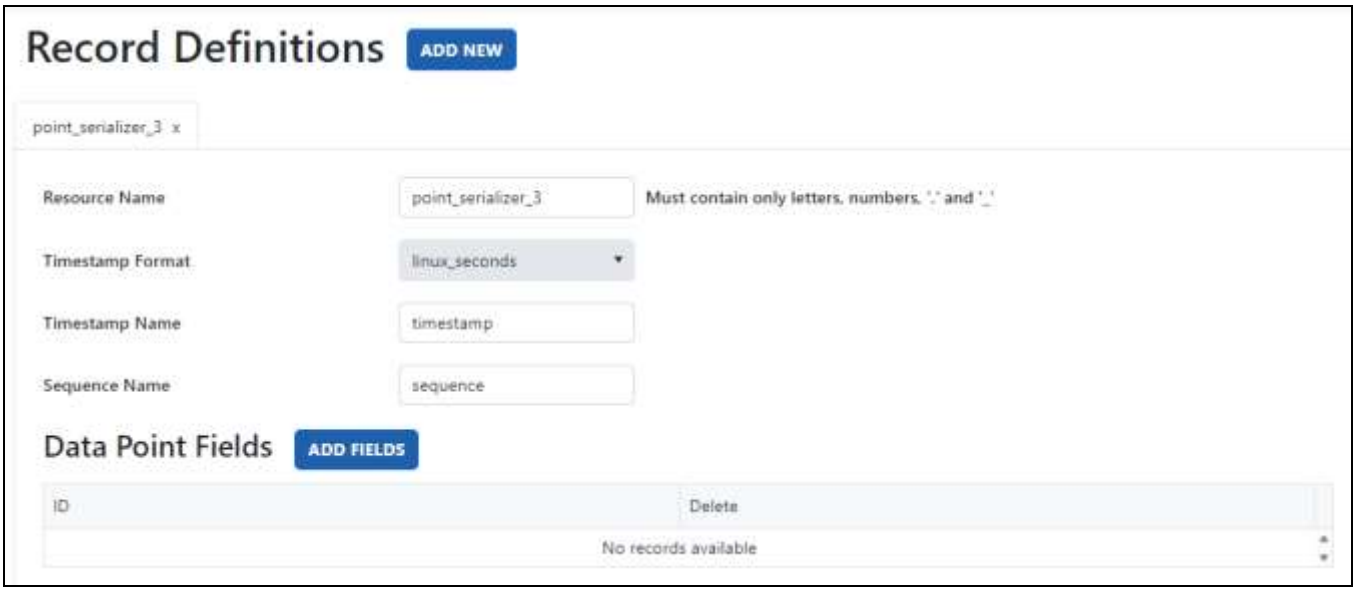
1) Resource Name: Enter the resource name to be used when referencing this Record Definition.

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

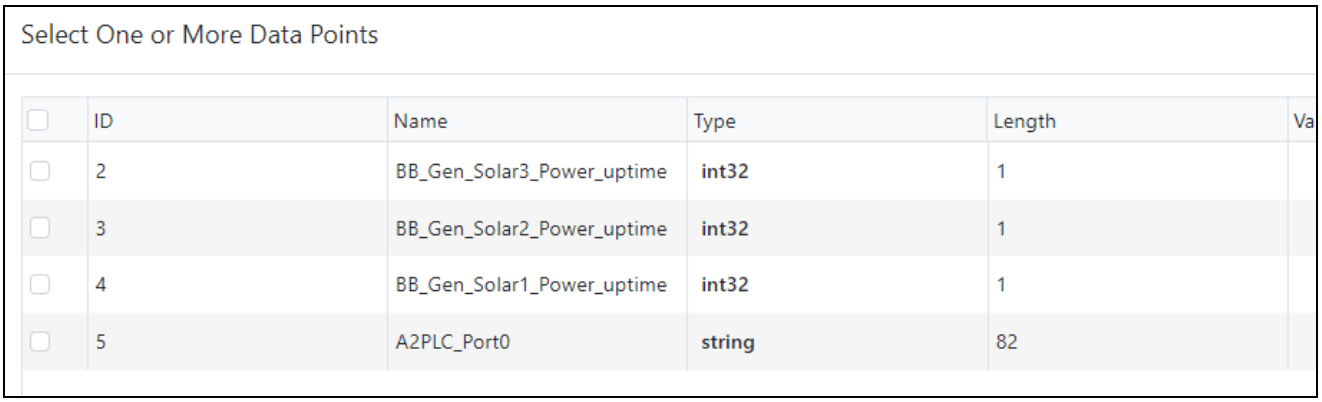
3) Timestamp Name: Enter the name/label for the timestamp in the MQTT JSON payload.

4) Sequence Name: Enter the name/label for the sequence number in the MQTT JSON payload.



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.



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.

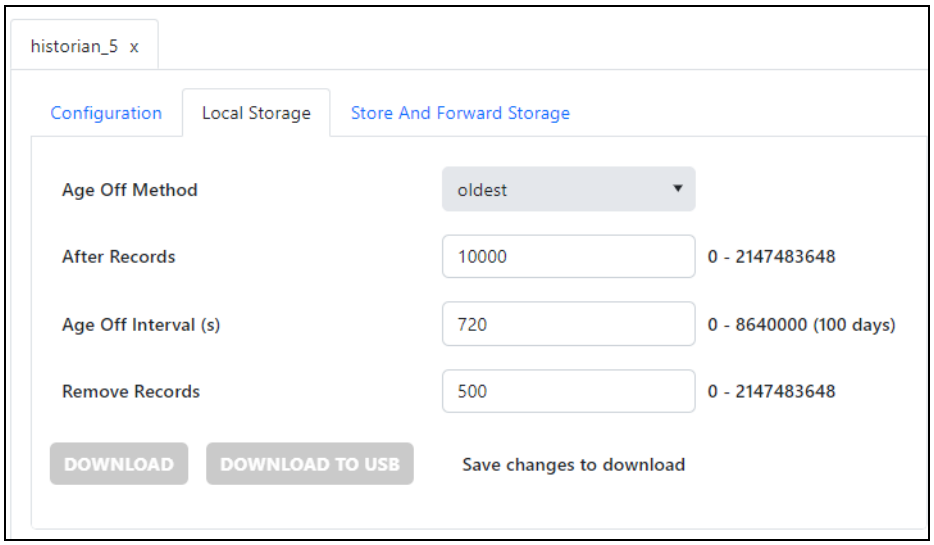
8) **Topic:** Enter the MQTT topic the record should be published to.

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.



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.

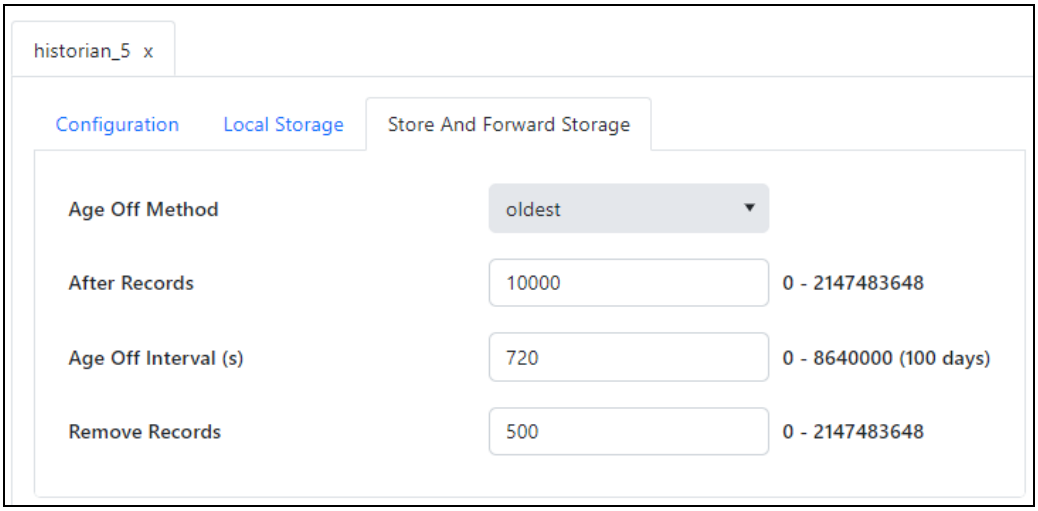
4) **Remove Records:** The number of records that will be aged off when hitting the age off interval or max number of records.

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.



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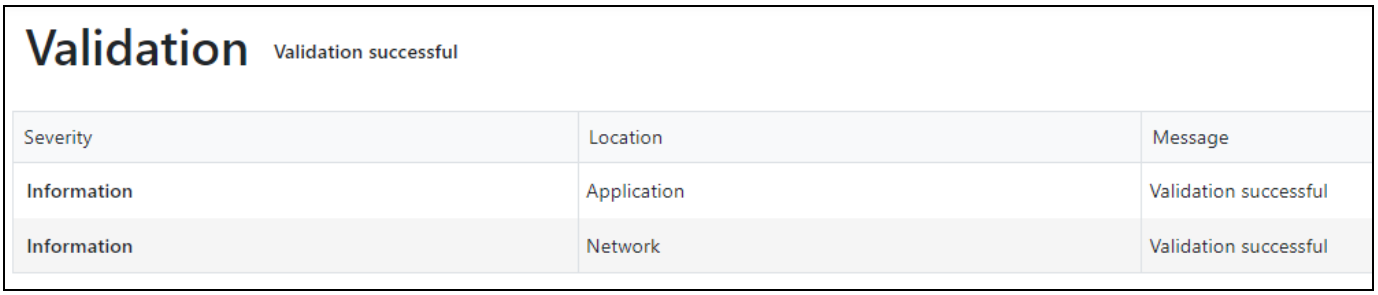
Utilities

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.



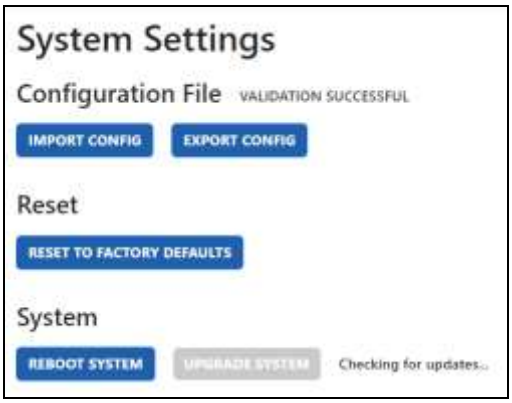
Logs

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.

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.