Honeywell Forge Process Safety Analyzer Cloud Historian

Installation and Configuration Guide

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About this document

This document describes the steps to install and configure Uniformance Cloud Historian Collector and its components specific to PSA.

Intended audience

This document is intended for Honeywell Project Engineers and Control Engineers who will configure Uniformance Cloud Historian Collector and its components specific to PSA. If you require any further assistance on configuring PSA, contact the technical support.

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Chapter 1  Introduction

1.1  Unifomance Cloud Historian

Unifomance Cloud Historian is used to deliver the real-time process data from the data lake, ERP and production data. Enterprise data can be analyzed instantly using tools and functions already in use at sites and plants. The Cloud Historian is hosted on Microsoft® Azure® cloud platform, with the Enterprise Historian based on a cloud native time series database, and the data lake based on Hadoop®, allowing users', data scientists to use their preferred tools. You can use the data store to correlate other types of data and compare it with process data across the enterprise.

Cloud Historian uses unique Cloud Historian Collectors which enable users to connect to various data sources and configure the data transfer to the cloud quickly. The software enables you to easily connect to any Honeywell Unifomance PHD or OPC-compatible historian.

Cloud Historian is built on the Honeywell Sentience Cloud Platform, which provides a standard platform for Honeywell applications and a common platform on which Honeywell partners can develop applications and services.

1.2  Cloud Historian Collectors

Cloud Historian collector software installed in a site is used to collect data from site based PHD systems or any plant historian (using ODBC or OPC connection) and transfer the data to the Cloud Historian. You can quickly install and configure Cloud Historian Collector software and stream data through a secure connection for all tags or a subset, to support an analytics task. You can assess the data from the cloud using Honeywell applications such as Process Safety Analyzer.

The Cloud Historian Collectors contain multiple components, and based on the requirements, you can install the components at client's location. The following explains the purpose of each component:

1.2.1  Cloud Historian Collector (L4 Collector)

This component is used to send data to Honeywell cloud stores. This requires direct internet access.

Note: If the Event source has a unique timestamp column, then Cloud Historian Collector (L4 collector) can be used instead of a DynAMo collector.

1.2.2  DynAMO Collector

This component is used to read data (Events & Time series) from ODBC & OPC sources and transfer it to Cloud historian collector.

1.2.3  Router (Repeater)

This component is used as a mediator between two different levels.

For example, if the Cloud Historian Collector is at Layer 4 (L4) and the DynAMO collector is at Layer 3 (L3), then the Router (Repeater) must be in the Layer 3.5 (L3.5) and act as a mediator between L4 and L3.

The following diagrams describes the Cloud Historian Collector components deployment scenario in PSA.
L3 to Cloud

L4 to Cloud
Chapter 2 Installation of Unif ormance Cloud Historian Collector and its components

This chapter describes the system requirements and the procedure to install Unif ormance Cloud Historian Collector. When you sign up for Honeywell’s cloud services, you will receive a welcome e-mail with the link to download the Cloud Historian Collector software. You can download the software and save it in your local machine.

This chapter consists of the following topics:

- Prerequisites to Install Cloud Historian Collector and its Components
- Installation of Cloud Historian Collector
- Installation of DynAMO (L2 Collector)
- Installation of Router (Repeater)

2.1 Prerequisites to Install Cloud Historian Collector and its Components

For information on the prerequisites, see the Prerequisites section in “Honeywell_Uniformance_Cloud_Historian_Online_Help_R150”

2.2 Hardware and Software requirements

- Your system must meet the following hardware and software requirements:

2.2.1 Hardware Requirements:

The following are the hardware requirements for Cloud Historian Collector, installed on a dedicated server, with a maximum of 25,000 tags (total across all connections) with an average collection rate of 30 seconds, spread across many connections:

<table>
<thead>
<tr>
<th>Hardware Requirements</th>
<th>Dual Core 1GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>8 GB</td>
</tr>
<tr>
<td>RAM</td>
<td>100 GB</td>
</tr>
</tbody>
</table>

The following are the hardware requirements for Cloud Historian Collector, installed on a dedicated server, which can support 200,000 tags or more with an average collection rate of 10 seconds, spread across 2-8 connections:

<table>
<thead>
<tr>
<th>Hardware Requirements</th>
<th>8 Core</th>
</tr>
</thead>
</table>
2.2.2 Software Requirements:

<table>
<thead>
<tr>
<th>Software Requirements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Server Operating System</strong></td>
<td>Microsoft® Windows® Server 2008 R2</td>
</tr>
<tr>
<td></td>
<td>Microsoft® Windows® Server 2012 R2</td>
</tr>
<tr>
<td></td>
<td>Microsoft® Windows® Server 2016</td>
</tr>
<tr>
<td><strong>Supported Browsers</strong></td>
<td>Internet Explorer- Version 11</td>
</tr>
<tr>
<td></td>
<td>Google Chrome- Version 62 and later</td>
</tr>
</tbody>
</table>

**Note**: For information on .NET Framework supported versions, see current release “Software Change Notice of Unifomance Cloud Historian”.

2.3 Installation of Cloud Historian Collector

To install the Cloud Historian Collector, perform the following:

1. In the welcome e-mail, click the link to download the Cloud Historian Collector software.
2. Save the Setup.exe file in your preferred location.
   The Unifomance Cloud Historian Collector - InstallShield Wizzard window appears.
4. Click Next.
   The License Agreement screen appears.
5. Read the license agreement terms carefully and select **I accept the terms in the license agreement**.

6. Click **Next**.
   The **Setup Type** screen appears.

7. Select the required setup type and click **Next**.
   The **Service Account Information** screen appears.
8. Type your service account credentials and click Next. This can be a domain account or a local account. The Customer and Site Information screen appears.

9. Type the Customer name and the Site name, and then click Next. The Database Service Information screen appears.

Customer name: the customer name as it appears in the welcome e-mail.
Site name: name of the site from which you want to upload data to the cloud.
10. Type a strong **Password** and confirm the Password, and then click **Next**.
    The installation completes. The password must minimum be of 8 characters in length and a combination of
    characters, numbers, and symbols.
    The **Ready to Install the Program** screen appears.

11. Click **Install**.

12. Once the installation is complete, click **Finish**.

13. Restart the computer.

**Note:** A restart is required, if PHD client is installed on the same machine, and to ensure that all its
components are registered correctly.

Once you complete the Cloud Historian Collector installation, you can download the L2 Collector from the Cloud Data
Connections screen. For information on how to install DynAMO (L2Collector), see [Installation of DynAMO (L2 Collector)](#).

### 2.4 Installation of DynAMO (L2 Collector)

To install the Collector, perform the following:

1. Select **Start** > **All Programs** > **Uniformance** and click **Uniformance Cloud Historian**.
   The **Cloud Historian** screen appears.

2. Login using the credentials provided in your welcome e-mail.

3. On the **Cloud Data Connections** screen, click **Add a connection**.
4. From the **Select and add a connection type** drop-down list, select **L2 Channel to Cloud Connector**.

5. Under **Create Channel** box, click **Download**. Download of the zipped folder that contains the setup files for L2 Collector and Router begins.

6. Navigate to the folder where the setup files are downloaded and unzip the setup files.

7. Navigate to the **EventCollector > CloudHistorianL2EventCollector > L2Collector > Collector_200.1** folder.

8. Right-click the setup.exe file and select Run as Administrator. The **DynAMO M&R Collector- InstallShield Wizard** window appears.
9. Click **Next**.
   The **License Agreement** screen appears.

10. Read the license agreement terms carefully and **select I accept the terms in the license agreement**.

11. Click **Next**.
12. The default paths selected in the **Installation Path** screen appear. Change the installation paths, if required.

![Installation Path Screen](image)

13. Click **Next**.

   The **Service Account Information** screen appears.

![Service Account Information Screen](image)

14. In the **Service Account Information** screen, provide the below inputs and click **Next**.

   The **DynAMO M&R Collector Details** screen appears.

   - **Domain\User Name**: User name of the runtime user account (used for running the Collector service). Use the format DOMAIN_NAME\USER_NAME. For DOMAIN_NAME, do not type the Fully Qualified Domain Name. For example, you must type OPS-L3\ADMIN instead of OPSL3.HISO.HONEYWELL.COM\ADMIN.

   - **Account Password**: Password of the runtime user account.
15. In the DynAMO M&R Collector Details screen, in the DynAMO M&R Collector Port Number box, type the port number to be used by the Collector service and click Next. The default port number is 9001. The Summary screen appears.

16. The Summary screen displays the list of features selected for installation. Review the list and click Next. The Ready to Install the Program screen appears.
17. Click **Install**.
   Once the Collector is installed successfully, a confirmation message appears.

18. Navigate to the **EventCollector > CloudHistorianL2EventCollector > L2Collector**, open **Collector_202.1** and right-click the **Collector** file and then click **Apply**.

19. Navigate to the **EventCollector > CloudHistorianL2EventCollector > L2Collector**, open **Collector_202.1_HF5** and right-click the **Collector** file and then click **Apply**.

20. Restart the computer.

Once you install the DynAMO Collector, you can configure the collector channels, for more information, see [Configure ODBC Channels](#).

### 2.5 Installation of Router (Repeater)

This is applicable only if you are creating a connection from L2 Channels to L4 Cloud Connector. Routers can be installed in Layer 3 or Layer 3.5 or in both layers, depending on the requirement. In that case, the L2 Collector transfers the collected event data to the Archiver through the Router.

To install the Router, perform the following:

1. Select **Start > All Programs > Uniformalance** and click **Uniformalance Cloud Historian**. The **Cloud Historian** screen appears.

2. Login using the credentials provided in your welcome e-mail.

3. On the **Cloud Data Connections** screen, click **Add a connection**.
4. From the **Select and add a connection type** drop-down list, select **L2 Channel to Cloud Connector**.

5. Under **Create Channel** box, click **Download**. Download of the zipped folder that contains the setup files for L2 Collector and Router begins.

6. Navigate to the folder where the setup files are downloaded and unzip the setup files.

7. Navigate to the **CloudHistorianEventRouter** folder and right-click the **setup.exe** file and then select **Run as Administrator**.
   The Uniformalnce CH EventRouter – InstallShield Wizard window appears.
8. Click **Next**.
   
   The **License Agreement** screen appears.

9. Read the license agreement terms carefully and **select I accept the terms in the license agreement**.
10. Click **Next**.

The **Setup Type** screen appears.

11. In the **Setup Type** screen, select **Complete** and click **Next**.

The **Service Account Information** screen appears.

12. In the **Service Account Information** screen, type the administrator credentials and click **Next**.

The **Archiver Server Information** screen appears.
13. In the **Archiver Server Information** screen, type the server name and click **Next**. The **Ready to Install the Program** screen appears.

14. Click **Install**. Once the Collector is installed successfully, a confirmation message appears.

Once you install the Router, you can configure the Router, for more information on configuring the router, see [Configure Router - IP Filtering](#)
Chapter 3 Configure Cloud Historian Collector and its Components

This chapter describes the configuration steps of the DynAMO Collector, and router.

This chapter consists of the following topic:

- Configure ODBC Channels
- Configure Router- IP Filtering

3.1 Configure ODBC Channels

You must configure ODBC channels to collect data from the data sources and send to the Layer 2 Collector. ODBC channels allow you to collect event data from an ODBC data source.

Prerequisites:

Before you configure ODBC channels, ensure the following:

- Your Windows user account must belong to DYNAMOUSER Windows group.
- You have installed the ODBC client application corresponding to the ODBC data source. If your ODBC data source is Honeywell Experion, you must install the Experion ODBC driver on your computer. For installation instructions, see installing Experion ODBC driver in the “DynAMo Metrics & Reporting Installation Guide”.
- If your event data is localized, set the Locale of your computer appropriately.
- If your ODBC source is Honeywell Experion database, ensure that the runtime user account (used to run the Collector service) has access to all the assets in Experion. It is recommended that you add this user account to one of the following user groups:
  - Product Administrators
  - Local Engineers
  - Local Supervisors
  - Local Operators
  - Local Ack View Only Users
- If your ODBC data source is Honeywell Experion database, the date-time format of the Collector computer must be same as the date-time format configured in the Experion database server. Otherwise, the standard rules files will not work.

To configure ODBC channels, perform the following:

1. Open DynAMo Metrics and Reporting Collector Configuration.
2. On the left pane, in the tree view, click the host name of the Collector.
3. In the toolbar, click the + icon and select ODBC from the drop-down list.
A new ODBC channel is created and listed in the left navigation pane as shown below:

4. Right-click the new channel, click Rename, type a name for the channel, and press Enter.
   The channel name must not start or end with a period, or contain spaces. Also, the name must not contain the following characters:

<table>
<thead>
<tr>
<th>Character</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>\</td>
<td>Backward Slash</td>
</tr>
<tr>
<td>/</td>
<td>Forward Slash</td>
</tr>
<tr>
<td>:</td>
<td>Colon</td>
</tr>
<tr>
<td>?</td>
<td>Question Mark</td>
</tr>
<tr>
<td>&lt;</td>
<td>Lesser Than</td>
</tr>
<tr>
<td>&gt;</td>
<td>Greater Than</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Channel name can be of maximum 80 characters long.

**Note:** You cannot rename a channel that is already enabled.

5. Click the **Settings** tab.

6. To connect to other ODBC sources, perform the following:
a. Below **Connection Properties**, click **Others**.

b. In the **ConnectionString** box, type the ODBC connection string for connecting to the target database.

**Attention:**

- The connection string must contain the DSN and user name required for connecting to the database.
- You can create a DSN using the Data sources (ODBC) tool in the Windows Control Panel.
- On 64-bit Windows, you must create DSN using the `C:\windows\syswow64\odbcad32.exe` application.
- Always use “System DSN” to connect to the event database.
- Ensure that the user account, that is used to run the DynAMo M&R Collector Service, has the privileges required to connect using the specified DSN.

c. In the **Password** box, type the password required to connect to the database using the specified connection string.
d. In the **Time Out** box, type the duration (seconds) for which the Collector must wait before trying to connect to the (source) database. If the connection could not be established within the specified time, the Collector aborts the connection attempt. Depending on your network bandwidth and the performance of your computer, specify an optimum timeout duration to avoid unnecessary timeout errors.

7. Click **Test Connection**.
   If the connection succeeds, a success message appears. If the connection fails, troubleshoot the problem, resolve it, and then try again.

8. Below **Data Collection Properties**, perform the following:
   a. In the **Field Separator** box, type the ASCII value of the custom text character for separating column data from one another before writing to the file or TCP port. The default value is 9 (ASCII value of <TAB>).
   b. In the **Message Separator** box, type the ASCII value of the custom text character for separating row data from one another before writing to the file or TCP port. The default value is \013\010 (ASCII value of <NEW LINE>).
   c. In the **Polling** box, type the interval (minutes) between successive data retrievals from the database. The default interval is 10 minutes.

**Attention:**

- The recommended value for the polling interval is 10 minutes or more. Some control systems write event messages to the database after a time lag of up to 10 minutes after event generation. In such cases, if you set the polling interval to less than 10 minutes, some event messages may not be missed and not collected.

- While collecting data from the data source, an ODBC channel always collects only the records that are older than 5 minutes. For example, if collection takes place at 12:05 am, then the ODBC channel collects only those events that are generated before 12:00 am.

   d. In the **Load Events From** box, type a start date and time for collecting historical event data. If your ODBC event data source contains historical event data, you can specify a past date and time. The M&R Collector collects all the event data available in your ODBC data source starting from the Resume Collection time. This is a one-time activity. In other words, the collection of historical event data happens only once, at the time of channel configuration.

9. To identify the source data specifying the tables and columns:
   a. Below **Query Settings**, select **Table/Views**.
b. In the **Table Name** column in the grid, type the name of the database table/view that contains the data you want to read.

c. In the **Time Column** column in the grid, type the name of the field in the source table/view that contains the time of insertion of each row.

d. (optional) If your source table contains multiple records with the same time stamp, select the **Index Field** check box. Then, in the **Index Field** column in the grid, type the name of the field in the source table/view that contains unique data for each record.

e. (optional) Does the **Time Column** you specified contains microsecond level time data.

   - If the **Time Column** does not contain the creation time of each record up to the microsecond level, select the **Microsecond Column** check box. Then, in the **Microsecond Field** column in the grid, type the name of the field in the source table/view that contains this information (the creation time of each record up to the microsecond-level).

   - If the **Time Column** contains the creation time of each record up to the microsecond level, select the **Is Microsecond in Date Time** check box.

f. Use the **Event ID Based** check box to define whether the Collector must pick and process the batches of event messages based on the date and time of receiving the messages or based on the Event ID of the last received message.

   Each event message contains a parameter named Event ID. For Honeywell Experion, this parameter holds a numeric value. The event messages generated by Experion have sequential Event IDs (that is, if an event message has the Event ID 4576, the next event message generated by the control system has the Event ID 4577).

   - If you select the **Event ID Based** check box, the Collector checks the Event ID of the last received event message. Then, the Collector queries the ODBC data source for new event messages whose Event IDs are greater than the last received event message.

   - If you do not select the **Event ID Based** check box, the Collector checks the date and time in the last received event message. Then, the Collector queries the ODBC data source for new event messages that were generated after that date. In this method of collection, there is a possibility of missing to collect some event messages. For example, the date and time of the last received message in a batch of event messages is 21 Aug 2018 10:00am. After the Collector processes this batch, a new alarm message is generated with a past-dated time stamp of 21-Aug-2018 9:00am. Since the time stamp of this alarm message is lesser than the time stamp of the last collected event message in the previous batch, this message is not collected as part of the next batch. As a result, this alarm message is missed and never collected.

g. In the **Table Column** column in the grid, type the names of all the columns that you want to read. Use comma to separate the column names. Include the name of the Time column, Index Field (if applicable), and Microsecond Field (if applicable) in this list.

**Attention:**
The database columns you specified for Time Column, Index Field, and Microsecond Field must be of a numeric type only.

If you have selected the Collect Shelving Comments check box, you must include the TransactionID column also in the list of columns that you want to read. This is the column where PSA stores the shelving comments. To read all columns in the table, type ".

To filter the retrieved records, below where, type the SQL query. For example, Area= 'P1'.

10. To specify the source data through an SQL query, perform the following:
   a. Below Query Type, click Query.
   b. In the SQL Statement box, type an SQL query that specifies the source table(s) and columns. Ensure that the query includes a source column that contains the creation time of each record in the table. Set the alias name of this column to Time column in the query. The new database connection is listed in the Server Connections list in the Control System Configuration dialog box.

11. If the Time column in your data source contains up to 6-digit long millisecond data, select the Is Microsecond in Date Time check box.

12. From the Select Archiver drop-down menu, select the target Archiver for this channel. All event data received through this channel are transferred to this Archiver.

Attention:

- The drop-down menu lists only the Archivers that you have already configured (as explained in the section Configuring the list of Archivers).
- The transfer of event data to the Archiver starts only after you configure (in the Archiver) the rules file and post-processing script file (if applicable) for the channel.

13. Click Save.

14. To start collecting events, click the Enable button on the top-right corner of the screen. The button label changes to Disable. To stop collecting events, click the same button again.

TIP: The “Enabled” status of a synchronization channel is independent of its parent (main) channel. In other words, enabling a main channel, does not automatically enable the synchronization channels under it.

3.2 Configure Connection between L2 Channel and Cloud Connector

For more information on how to configure connection between L2 Channel and Cloud Connector, see "Honeywell_Unciformance_Cloud_Historian_Online_Help_R150".
3.3 Configure Router- IP Filtering

After installing, configure the Router to allow or deny clients based on its IP or IP CIDR ranges.

**Note:** The same configuration is applicable for the Archiver service to restrict access to certain routers. This is a measure to control the access to the Archiver service/Router for an unintended client. However, the client authentication is the appropriate method to avoid unauthorized access.

To configure the Router, open the following Router Config file:

```
C:\ProgramFiles(x86)\Honeywell\Unifomance\ConnectedHistorianRouter\Honeywell.CloudHistorian.CloudConnector.Router.exe.Config
```

and edit as follows:

1. The following is a sample configuration which shows various options to provide IP ranges to filter:

   ```
   <IPFilter>
   <!--<HttpModule FilterName="Default" /-->>
   <Filters>
   <add Name="Default" DefaultBehavior="Deny">
   <allow hosts="127.0.0.1/8"/>
   <deny hosts="10.79.165.40" /><!-->
   <deny hosts="*"/>
   </add>

   <!-- A filter than only allows traffic from local network -->
   <!--<add Name="LocalOnly">
   <allow hosts="10.0.0.0/8,172.16.0.0/12,192.168.0.0/16,127.0.0.1/8" />
   <deny hosts="*" />
   </add>-->

   <!-- A filter than denies traffic from local network -->
   <!--<add Name="DenyLocal">
   <deny hosts="10.0.0.0/8,172.16.0.0/12,192.168.0.0/16,127.0.0.1/8" />
   <allow hosts="*" />
   </add>-->

   <!-- A filter than only allows traffic from loopback -->
   <add Name="LoopbackOnly">
   <allow hosts="127.0.0.1/8"/>
   <deny hosts="*"/>  
   </add>

   <!-- A filter than denies traffic from loopback -->
   <!--<add Name="DenyLoopback">
   <deny hosts="127.0.0.1/8"/>
   <allow hosts="*" />
   </add>-->
   </Filters>
   </IPFilter>

2. Provide the server details in which the Router is listening, and is used by the L2 Collector to connect:

   ```
   <services>
   ```
3. Provide the Archiver server details:

   <client>
   <endpoint address="net.tcp:// <Machine Name FQDN>:<Port>/EDPSService" bindingConfiguration="SSLEnabledTcpBinding" binding="netTcpBinding" contract="cloudHistorianArchiverEventService" />

   <endpoint address="net.tcp:// <Machine Name FQDN>:<Port>/EDCSService" bindingConfiguration="SSLEnabledTcpBinding" binding="netTcpBinding" contract="cloudHistorianArchiverConfigService" />
   </client>

4. Restart the Router service, to reflect the updated IP restrictions.