

# Experion LX Server Specification



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## Revision History

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## 1. Product Introduction

### 1.1. Experion LX™

As a member of Honeywell's Experion family, Experion LX is specifically designed to meet the customer needs in mid-tier markets (Chemicals, Industrial Power, F&B, Bio-fuels, ...), through integrating state-of-the-art technology from the award-winning Experion Process Knowledge System (PKS) with innovative design of Series 8 I/O modules and cabinets, validated wider range of COTS options, easier engineering and maintenance capabilities, and integrator-friendly programs and tools. Experion LX is the perfect platform for process, asset and business management, and enables customers to increase their profitability and productivity and accessibility to local support without sacrificing quality and reliability in an increasingly competitive environment.

### 1.2. Architecture Overview

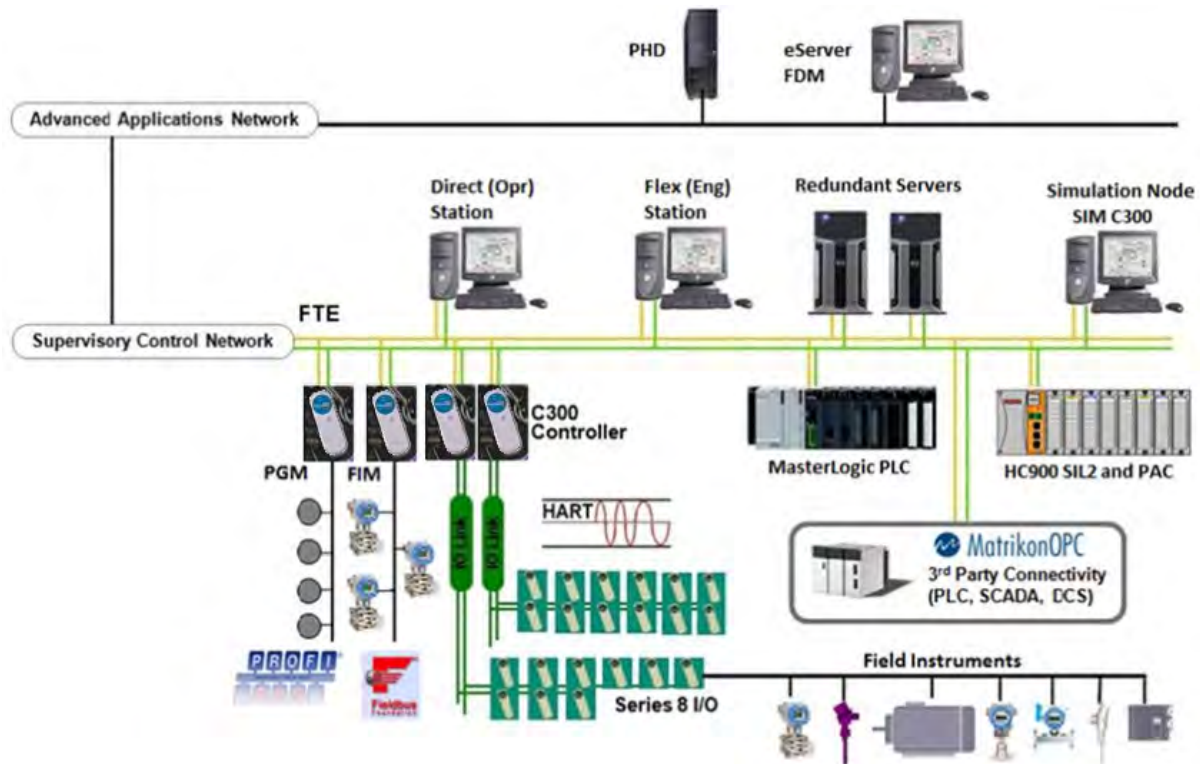


Figure 1 - Sample Experion LX architecture

The Experion LX platform comprises many different integrated hardware and software solutions depending upon the needs of the application. This pictured architecture is a representation of many of the possible nodes that can be used in the Experion LX architecture. Note that the architecture is highly scalable and not all nodes are necessary or required.

### 1.3. Experion LX Server Overview

The Experion LX Server or redundant LX Server combination functions as a system-wide historian and global database. The Experion LX Server also supports communication to SCADA point sources, DSA point sources, OPC clients and LX Servers and holds the system event journal, system configuration files, custom applications and server scripts. The LX Server is the source for data, alarms, events, etc. for the client-connected applications. One or more Experion LX Servers are required for an Experion LX system.

## 1.4. Database Sizing

### 1.4.1. System Capacity

Functional Area	Capacity Description	R110 Standard Capacity system	R110 High Capacity	Comments
System Size	Max LX Server Clusters per System	1	1	<ul style="list-style-type: none"> <li>The maximum number of Experion LX Servers that can be defined in one system supported by the System Status Display, and connected via DSA</li> </ul>
DSA	Max DSA connections per LX Server	5	5	<ul style="list-style-type: none"> <li>Maximum number of other Servers that can be connected via DSA, local to this system and/or to remote system Servers</li> </ul>
	DSA Data Publish	1500 PPS	1500 PPS	<ul style="list-style-type: none"> <li>Maximum number of parameters/sec to all remote servers</li> </ul>
Server Point Counts	Max Total Server Points	9000 (4K SCADA+ 5K Process )	118,000 (8K SCADA+10K Process + 100,000)	<ul style="list-style-type: none"> <li>The maximum number of points in a system. A Experion LX system contains 1 LX Server cluster.</li> <li>This number is calculated by adding up SCADA points, DSA points and CDA points listed below.</li> </ul>
	Max SCADA Points	4000	8,000	<ul style="list-style-type: none"> <li>Any points that are used to display data retrieved from SCADA Interfaces are classified as SCADA points. Examples of these devices include the PLC Interfaces, DNP3 Protocol Interface, etc.</li> </ul>
	Max DSA Points	0	100,000	<ul style="list-style-type: none"> <li>DSA Points are created whenever a point that belongs to another server is accessed using DSA.</li> <li>DSA Points are not licensed on the Server that is subscribing to the points.</li> </ul>
	Max Process Points	5000	10,000	<ul style="list-style-type: none"> <li>Any device that uses the Control Data Access (CDA) interface consumes process points (C300 Controllers).</li> </ul>

Functional Area	Capacity Description	R110 Standard Capacity system	R110 High Capacity		Comments
	PSA (Point LX Server) Points				<ul style="list-style-type: none"> <li>The PSA point count is an aggregation of points from point server interfaces such as SPS/Adv OPC /BMA/etc. Each interface may have its own limits but the overall PSA count will count against the total point count limit for a server</li> </ul>
System Point Counts	Total of all point types per DSA connected system	9000	118,000		<ul style="list-style-type: none"> <li>The maximum number of points in a system.</li> </ul>
SCADA	RTU/Controller configuration range	50	50		<ul style="list-style-type: none"> <li>Supported range that RTU's can be assigned to. (Note: Performance of large numbers of RTU's will be based other system, channel, and controller limitations).</li> </ul>
SCADA channels	SCADA channels	20	20		
Direct stations	Max Direct Stations per Cluster	10	15		<ul style="list-style-type: none"> <li>Maximum number of Direct station supported in Experion LX R110</li> </ul>
<p>Points have a composite data structure that can represent several field values. For example, you only need one analog point for a control loop that maintains the temperature of an oven because the point's data structure can include the process variable (PV), output variable (OP), set point (SP) and mode (MD).</p>					

### 1.4.2. Alarm, Event, Alert and Message Lists

Items	Specifications	Comments
Maximum number of active alarms and alerts	4,000	Alarms and alerts occupy the same storage space so there can be a maximum of 4,000 active alarms and alerts in the Alarm and Alert summaries.
Maximum number of active messages	1,000	Number of messages that appear in the Message summary.
Maximum number of SOE messages	32,767	Number of SOE messages that can appear in the SOE summary.
Maximum number of events in online event file	1.2 million	<ul style="list-style-type: none"> <li>All alarms, login actions, operator actions, and configuration changes are logged in the online event file.</li> <li>Up to two events are generated for every alarm, including one event for entering the alarm condition and one for return to normal.</li> </ul>

### 1.4.3. Other Database Sizing Specifications

Items	Specifications	Comments
Printer connections	20	This is the total number of printers that can be configured as either report or alarm devices.
Trend sets	3,000	
Trend pens per set	32	
Trend periods	1, 5, 20 minutes 1, 2, 4, 8, 12 hours 1, 2, 5 days 1, 2, 4 weeks 3, 6 months 1 year	
Operating groups	16,000	
Points per group	8	
Reports	1,000	
Operators	1,000	This is the default limit. The quantity can be increased to 32,000, if required.
Number of recipes	500	
Number of messages	1000	
Number of point control scheduler	1000	

## 1.5. Enterprise Model Sizing

### 1.5.1. Assets

Description	Standard Capacity System	High Capacity System	Comments
Assets	1000	1000	The asset model represents the organization of items in the enterprise, for example, process units, individual pieces of equipment or facilities, etc. The relationship or hierarchy between assets and entities forms the asset model. The primary relationship in the asset model is that of asset containment, where one asset contains another.
Assignable assets	500	1000	Assignable assets provide a way to assign assets to an operator's scope of responsibility. An assigned asset includes all asset children of the assigned asset including any points associated with those assets or any alarm groups that have been designated by that asset for scope of responsibility purposes. The number of assignable assets is a subset of the total number of assets.
Nesting depth for asset hierarchies	10	10	
Children per asset	No limit	No limit	

### 1.5.2. Alarm Groups

Description	Standard Capacity System	High Capacity System	Comments
Alarm groups	500	1000	Alarm Groups present alarm state/status for a disparate group of points and assets that are not represented by a single asset in the asset model.
Children per alarm group	500	500	
Nesting depth for alarm group hierarchies	5	5	



## 1.6. History Sizing

### 1.6.1. Collection Rates

Items	Specifications	Comments
Standard history	<ul style="list-style-type: none"> <li>Predefined collection rates of 1, 2, 5, 10 and 30 minutes</li> <li>3 additional user defined collection rates can be defined.</li> </ul>	<ul style="list-style-type: none"> <li>When you configure a point parameter for standard history collection, Experion LX also collects 4 different standard history averages, based on the standard history snapshot rate that you choose for standard history collection.</li> <li>The default standard history snapshot rate is 1 minute and the collection rates for averages are 6-minute, 1-hour, 8-hour and 24-hour averages.</li> <li>The averages are calculated using the 1-minute base interval. That is, 6-minute averages are calculated on six 1-minute values. If you change the 1-minute base interval the averages are still calculated from the base interval. For example, if you change the base interval to 30 seconds, 6-minute averages are calculated on twelve 30-second values.</li> </ul>
Fast history	<ul style="list-style-type: none"> <li>Predefined collection rates of 5, 10, 15, 20 and 30 seconds.</li> <li>3 additional user defined collection rates can be defined.</li> </ul>	<ul style="list-style-type: none"> <li>A maximum of 8 collection rates can be defined choosing from the default intervals on the left</li> <li>Additional rates can be defined; however they must be in multiples of the base rates.</li> <li>The 5 second base rate can be configured to 1 second.</li> </ul>
Extended history	<ul style="list-style-type: none"> <li>1-hour snapshot</li> <li>8-hour snapshot</li> <li>24-hour snapshot</li> </ul>	<ul style="list-style-type: none"> <li>When a point is configured for extended history collection, all of these intervals are stored.</li> </ul>
Exception history	<ul style="list-style-type: none"> <li>5, 10, 15, 30, and 60 seconds</li> <li>5, 10, 15, 30, and 60 minutes</li> <li>2, 4, 6, 8, 12, and 24 hours</li> </ul>	<ul style="list-style-type: none"> <li>Whereas standard, fast, and extended history collect and store point parameter values periodically, exception history collects values at the rate configured for that point parameter but only stores them if the value or quality of that point parameter has changed since it was last stored.</li> <li>Note that exception history only collects and stores string values.</li> </ul>
To support daylight savings and time zones, all collected data is historized in Universal Time Coordinated (UTC) time.		

### 1.6.2. Default History Files Sizes

Items		Specifications		Comments
		Time	Samples	
Standard history	1-minute snapshot	24 hours	1,442	
	6-minute average	7 days	1,682	The averages are calculated using the 1-minute base interval. That is, 6-minute averages are calculated on six 1-minute values.
	1-hour average	7 days	170	The averages are calculated using the 1-minute base interval.
	8-hour average	3 months	281	The averages are calculated using the 1-minute base interval.
	24-hour average	1 year	368	The averages are calculated using the 1-minute base interval.
Fast history	1-second or 5-seconds	2 hours or 12 hours	8,652	
Extended history	1-hour snapshot	7 days	170	
	8-hour snapshot	3 months	281	
	24-hour snapshot	1 year	368	
The number of samples in each history file can theoretically be increased to 100,000 samples. If the size of the history file is increased beyond the default qualified size, care should be taken not to exceed the maximum history file size constraints. (See section 2.3.4). History archiving is available to store the history files for later retrieval. Experion LX history data is seamlessly available for use across every Experion LX Station for trend displays, reports, custom displays, applications, spreadsheets and ODBC compliant databases.				

### 1.6.3. Maximum Parameters Assigned to History

Items	Specifications	Comments						
Standard history	2,000	This is the default limit that Experion LX is shipped with. It can be changed by a database initialization up to a maximum of 50,000. Double, Float, Integer and Time data can be stored.						
Fast history	500	This is the default limit that Experion LX is shipped with. It can be changed by a database initialization up to the following maximums. <table border="0" style="margin-left: 20px;"> <tr> <td><u>Fast History Collection Rate</u></td> <td><u>Maximum Parameters</u></td> </tr> <tr> <td>1 second</td> <td>1000</td> </tr> <tr> <td>5 seconds</td> <td>2000</td> </tr> </table> Double, Float, Integer and Time data can be stored.	<u>Fast History Collection Rate</u>	<u>Maximum Parameters</u>	1 second	1000	5 seconds	2000
<u>Fast History Collection Rate</u>	<u>Maximum Parameters</u>							
1 second	1000							
5 seconds	2000							
Extended history	2,000	This is the default limit that Experion LX is shipped with. It can be changed by a database initialization up to a maximum of 10,000. Double, Float, Integer and Time data can be stored.						
Exception history	500	This is the default limit that Experion LX is shipped with. It can be changed by a database initialization up to a maximum of 1000. String maximum of 255 characters can be stored. A maximum of 100 exception history parameters can be stored per second.						
The ability to collect history at the configured rate depends upon throughput of underlying process control network, see table 2.4, LX Server Data Access Acquisition Performance.								

### 1.6.4. Calculating History Space Requirements

Items	Specifications	Comments
Maximum history file size	500 MB	<ul style="list-style-type: none"> <li>Each type of history sample is stored in a separate history file. For example, there are five history files for standard history, one each for: 1-minute snapshot, 6-minute average, and so on.</li> <li>An individual history file should not exceed this size.</li> </ul>
Formula for calculating number of samples for a given history file size	<p>If collecting P parameters for a particular history rate with a history file size of S bytes then:</p> <p>Number of samples = <math>(S/2)/((P*6)+8)-1</math></p>	<p><b>Example:</b></p> <p>Standard history one minute (history 1) file size is 432623072 bytes</p> <p>Number of parameters assigned to standard history is 50000</p> <p>Number of samples = <math>(432623072)/((50000*6)+8)-1=721</math> records</p> <p>For efficiency reasons the history file size should be configured to be as close to 500M as possible. The sysbld utility is used to modify the number of parameters assigned and the number of samples collected for each type of history.</p>

### 1.7. LX Server Data Acquisition Performance

Items	Standard Capacity System	High capacity system	Comments
<b>Experion LX Controllers</b>			
Maximum CDA throughput from all Controllers – C300 (PPS – Parameters Per Second)	4,700	4,700	
Maximum number of CDA subscribed parameters from all controllers on FTE	8,000	25,000	This is the number of parameters that can be actively subscribed by an Experion LX Server at any one time. The Server adds and removes items from the subscription list based on demand.
<b>DSA</b>			
Maximum pps from each configured DSA subscribing LX Server	0	1,000	This information is duplicated in section 3.2, DSA.
<b>SCADA</b>			
Maximum pps from all configured SCADA devices	Limited by device		
<b>OPC</b>			
Maximum OPC pps from all configured OPC Servers	See section 3.2 , OPC		

### 1.8. Notification Performance

Items	Specifications	Comments
<b>Alarm and Event Notifications</b>		
Maximum number of events (burst condition) <sup>1</sup>	1,500 events	The Experion LX Server alarm system will handle an event burst of up to 1,500 events, with a minimum time between consecutive bursts. An "event burst" is defined as a group of events greater than 40/sec, received from all connected event servers in a period of less than 3 seconds.
Formula to calculate the time period required between consecutive bursts, to allow for event processing	$\Delta T = BS / (60 - ER)$ <p>Where:  <math>\Delta T</math> = # of seconds required between bursts                      BS = Burst Size (number of events in the burst)                      ER = Event Rate between bursts</p>	Examples: <ul style="list-style-type: none"> <li>• 1,500 event burst and no events between bursts: <math>\Delta T = 1,500 / 60 = 25</math> seconds</li> <li>• 500 event burst with 30 events/sec between: <math>\Delta T = 500 / 30 = 17</math> seconds</li> </ul>
Maximum number of sustained events/second <sup>1</sup>	10,000/hour, with peaks of up to 40/sec	
Maximum number of sustained alarms/second <sup>1</sup>	30/sec	
Maximum duration of events in online events file	12 weeks	
Maximum number of events in online events files	1.2 million	Event archiving can be used to access older events. Approximately 60 MB of hard disk space is required for every 100,000 events archived
<b>Alerts and Notifications</b>		
Maximum number of alerts/second	1	
Maximum burst of alerts	100	These totals are still subject to the overall maximum number of events per second and maximum burst of events limit that the Experion LX Servers can support.
Note 1 – The Experion LX Server includes the option to support OPC alarms and events in addition to native Experion LX notifications. When the Experion LX Server is configured to receive alarms and events from an OPC alarm and event server, the notification limits noted in this table are applicable to the combined set of events received from all connected event sources.		

## 1.9. Supervisory Control and Data Acquisition (SCADA)

### 1.9.1. Real Time Database SCADA Point Structures

Point Structure <sup>1</sup>	Standard Parameter		
Analog <sup>2</sup>	Control Deadband	Scan Status	SP Low Limit
	Process Variable	OP High Limit	0% & 100% Range
	Setpoint	Scan Period	Operator Control Level
	Normal Mode	Scan Address	OP Low Limit
	Output	Control Timeout	PV Clamp Flag
	Mode	Alarm Permit Flag	Engineering Units
	SP High Limit	Alarm Status	Drift Deadband
	Up to 4 user definable inputs	Up to 8 Alarm types <sup>3</sup>	Alarm Deadband
	Point Name	Alarm Status	Associated Display
Point Description	PV Last Processed Time <sup>4</sup>		
Status <sup>5</sup>	Output Width	Output	Output Pulse Width
	Process Variable	Scan Status	Re-Alarm Status
	Control Timeout	Normal Mode	Associated Display
	Mode	Scan Period	Alarm Permit Flag
	PV Last Processed Time <sup>3</sup>	Scan Address	Input Width
	Point Name	Alarm Priority	Control Failure Alarm Priority
	Point Description	Operator Control Level	
Accumulator <sup>6</sup>	Output Width	Scan Status	Output Pulse Width
	Process Variable	Normal Mode	Re-Alarm Status
	Control Timeout	Scan Period	Associated Display
	Output	Scan Address	Input Width
	Operator Control Level	Mode	Alarm Priority
	Control Deadband	Alarm Permit Flag	PV Last Processed Time <sup>2</sup>
	Process Variable	Control Failure Alarm Priority	SP Low Limit
	Setpoint	Scan Status	0% & 100% Range
Normal Mode	OP High Limit	Operator Control Level	

Note 1 – For each of the point types it is possible to add user-defined parameters to the existing pre-built parameters. This enables tags to be extended to contain free format values, constant values, or values used by applications and scripts to store calculated or derived plant information. User-defined parameters can be assigned to history collection.

Experion LX supports additional data processing through the use of standard algorithms that may be attached to an analog, status or accumulator point. Functions provided by these algorithms include:

- o Arithmetic calculations
- o Boolean calculation
- o Maximum/minimum value
- o Integration
- o Run hours totalization
- o Group alarm inhibit
- o Report request
- o Application program request

Note 2 – Used for continuous values.

Note 3 – Supported alarms include: PV Hi, PV Lo, PV HiHi, PV LoLo, Deviation Hi, Deviation Lo, Transmitter Hi, Transmitter Lo, Rate of Change, Control Fail, and Control Timeout. Each of the configured alarms can be assigned a priority ranging from Journal, Low, High to Urgent. An alarm sub-priority (0 to 15) can also be assigned to further differentiate alarms.

Note 4 – Each time the PV is polled from the RTU, Experion LX will track and maintain the time/date of when the value last changed, or more specifically, was last processed. If the Analog point in Experion LX has a drift deadband of 1%, then the last processed time is not updated until the PV moves by >1%. Similarly, if the drift deadband is 0%, then the last processed time is not updated until the PV moves slightly.

Note 5 – Used for digital values. The PV of a status point can range from a single bit to a three bit digital input, allowing up to eight possible states.

Note 6 – Used for totalizer values. Data associated with pulsed inputs are stored in the system in an accumulator point type that will provide automatic tracking of instrument rollover.

## 1.10. Server Scripting

### 1.10.1. General Server Scripting Specification

Items	Specifications	Comments
<b>Description</b>		
<p>Server scripting extends the behavior of the server-resident subsystems and its run time objects. Examples of server objects are points and parameters, reports, assets and tasks (application programs). Scripts can run by the server either periodically or when a specified event occurs. Standard displays support the monitoring of the status of running scripts.</p>		
<b>General Specifications</b>		
Maximum script size	Short scripts only (typically less than 50 lines)	<ul style="list-style-type: none"> <li>Server scripting has been optimized for relatively short scripts and is not designed for implementing control strategies. If a task is computationally intensive, or requires extensive file handling, custom applications can be used instead of scripts – see section 3.6 “Application Development Toolkit”. Some tasks qualify for both categories, and the rules are flexible when deciding what tasks can and cannot be performed by server scripts, see the following section.</li> <li>Where possible, existing server functionality should be used in preference to writing server scripts. Standard server functionality optimizes the task implementation.</li> </ul>

### 1.10.2. Server Scripting versus Custom Applications

Tasks	Server Scripting	Custom Application
Extend server functionality via information transfer	Yes	Yes
Relatively short processing (< 50 lines of code)	Yes	Yes
Used to provide linkage to other applications via automation servers	Yes	Yes
Code is interpreted at run-time.	Yes	No
Code is compiled and optimized at build time.	No	Yes
Computationally intensive	No	Yes
Optimized for supervisory control	No	Yes
Iterative code	No	Yes
Relatively complex user interface requirements	No	Yes
Extensive file handling	No	Yes
Script (program) state preserved on failover	No	No
Language	VBScript	Visual Basic, C++, etc.

## 2. Option Specifications

### 2.1. Server Redundancy

Items	Specifications	Comments
<b>Description</b>		
Server redundancy provides a high availability platform by enabling a pair of similarly configured Servers to support each other in a primary/backup fashion.		
<b>Details</b>		
Redundancy fail-over conditions	Should the primary Server fail, a fully functioning backup assumes the primary role.	Primary refers to the specific Server that is actively acquiring data from the controllers/RTUs and serving data to the clients. The primary Server propagates all database transactions to the backup to enable both databases to remain synchronized.

### 2.2. Distributed Systems Architecture (DSA)

#### 2.2.1. General DSA Specifications and Performance

Items	Standard Capacity System	High capacity system	Comments
<b>Description</b>			
Distributed System Architecture (DSA) is an option that enables multiple Experion LX Servers to share data, alarms, alerts, messages and history without the need for duplicate configuration on any Server.			
Maximum number of DSA connected servers	5	5	This is the total number of Experion LX Servers on the network. They do not all need to be connected to each other via DSA or be in the same Enterprise Model system. Note the increased limit for Central Control Room topologies below
<b>DSA Data Publish</b>			
Maximum number of parameters/s to all remote servers <sup>1</sup>	1500	1500	
Maximum number of remote servers for publishing to	5	5	
<b>DSA Data Subscription</b>			
Maximum number of parameters/s from each remote server <sup>1</sup>	0	1000	
Maximum number of remote servers that this server can subscribe to	0	5	
Total number of parameters/s from all remote servers	0	5000	



<b>DSA Request Response</b>			
(Device read) Maximum number of list reads from DSA Server per second	1	1	
(Device read) Maximum number of items/list supported <sup>1,2</sup>	1000	1000	
(Device read) Sustained read rate (items/second) <sup>1,2</sup>	250	250	
<p>Note 1 – Ability to deliver published data rate depends upon throughput of underlying process control network.. Refer to the documentation associated with the process control network for more information.</p> <p>Note 2 – Device reads should be used with caution. It is possible to overload the underlying process control network if too many device reads are done.</p> <p>Note 3 – These values are based upon the standard history configuration settings</p>			

### 2.2.2. DSA Central Control Room

<b>DSA Central Control Room Topology <sup>1</sup></b>		
	<b>Standard Capacity System</b>	<b>High capacity system</b>
Maximum number of remote servers that this server can subscribe to	0	5
<p>Note 1 – The DSA Central Control Room (CCR) topology is a topology where an Experion LX Server is a subscriber to a large number of remote DSA servers. The key features of this topology are:</p> <ul style="list-style-type: none"> <li>• The CCR server is not process connected</li> <li>• The CCR server can be redundant</li> <li>• The CCR server has its own EMDb. All remote servers are external servers in CCR server EMDb.</li> <li>• The remote servers must obey the standard DSA limits (including the maximum number of remote servers that this server can subscribe/publish to)</li> <li>• The CCR server must obey the standard DSA limits (except for the maximum number of remote servers that this server can subscribe to)</li> </ul>		

### 2.2.3. DSA Interoperability

DSA support is between Experion LX systems only.

## 2.3. OPC

### 2.3.1. OPC Client Interface (SCADA Client)

Items	Specifications	Comments
<b>Description</b>		
The OPC Client Interface is designed primarily for robust integration of low complexity subsystems such as Programmable Logic Controllers (PLCs) and Remote Terminal Units (RTUs). It provides an open method for connecting a wide range of devices for supervisory monitoring, alarming and control.		
<b>General OPC Client Interface Specifications</b>		
Maximum number of third-party OPC DA servers supported by the Experion LX OPC DA Client	5	
OPC DA versions supported	1.0a and 2.05a	
Supports redundant OPC DA Servers	Yes	The OPC Client Interface natively supports the concept of preferred and secondary servers. However, it only supports passive redundancy, requiring the interface to rebuild the items and groups on the secondary in the event of a primary failure. This will give acceptable performance for a moderate number of items.
Time-stamping	Within the Experion LX Server	Time-stamping of the data occurs within the Experion LX Server once the data has been successfully read into the SCADA database
Alarming	Yes	Alarms are generated based on limits defined within the Experion LX Server.
Scannable parameters per point	8 – Analog 3 – Digital 1 – Accumulator	<ul style="list-style-type: none"> <li>A scannable parameter is a parameter that is able to source data from an OPC Item versus an internal register.</li> <li>These are the standard quantities of scannable parameters found on all SCADA analog, digital and accumulator points.</li> </ul>
<b>OPC Groups and Items</b>		
Maximum number of OPC controllers	50	This is the maximum number of SCADA controllers/RTUs that can be built across all channels on an Experion LX Server.
Maximum number of items per OPC controller	960	This is the total number of OPC Items that can be built against a given controller. There will be a varying number of items consumed with each point, up to 8 for an analog point.
Maximum number of OPC groups supported	500	<p>An OPC client controller manages groups as follows:</p> <ul style="list-style-type: none"> <li>A group is created for each scan period used by the point parameters (items) defined on the controller. All point parameters that have the same scan period are placed in the same group. Note that if a scan period of 0 is used, the item is placed in a group with an update rate equal to the slowest scan rate of the system.</li> <li>All points defined on the controller have the same OPC deadband. Note that the OPC deadband is not the same as the alarm and control deadbands that can be specified for analog points.</li> </ul>
Maximum number of items per scan period per controller	960	As above.
Rate at which items can be added to groups	1,000/second	The rate at which items can be added to groups depends upon the design of the OPC Server and the throughput of the process control network with which it connects.
OPC group update rates	1 second and above	The group rates supported match the Experion LX scan rates

Items	Specifications	Comments
supported		supported.
<b>OPC Client Callback Support</b>		
Sustained callback rate from all OPC servers (values per second)	1,000	
<b>OPC client write support</b>		
Number of item writes by OPC client interface per second (per channel)	1	
Maximum no. of items per list supported (write)	10	
Sustained write rate (items/second)	1	

### 2.3.3. OPC Display Data Client

Items	Specifications	Comments
<b>Description</b>		
Primarily targeted as a convenient method of getting OPC Data into displays. Designed for situations where you need to bring data into the Experion LX displays via OPC and no additional processing needs to be done on the server e.g. no need for alarming, historization, point detail, group, etc. The Experion LX OPC Display Data Client is bundled with the Experion LX base software.		
<b>General OPC Display Data Client Specifications</b>		
Maximum number of third-party OPC servers supported	5	
OPC versions supported	2.05a	
<b>OPC Performance and Throughput</b>		
Maximum number of OPC groups supported	See Comment	The OPC Display Data Client manages groups as follows: a group is created for each subscription rate used by local and remote clients. That is, all point parameters that have the same subscription rate are placed in the same group. When an item is no longer being subscribed to, it will be removed from its current group.
Maximum number of data values per display	40	The performance of third-party OPC Servers can vary significantly. For very slow OPC Servers it is possible that the maximum number of OPC display data client values per display may be less than this.
Maximum number of data values per OPC server	1,000	
Display rates supported	1 second and above	This value depends upon the design of the third-party OPC server and the throughput of the process control network with which it connects.
<b>OPC client callback support</b>		
Sustained callback rate from all OPC servers (values per second)	100	The performance of third-party OPC servers can vary significantly. For very slow OPC servers it is possible that the maximum number of OPC display data client values per display may be less than this.

### 2.3.4. OPC Data Access Server

Items	Specifications	Comments
<b>Description</b>		
The Experion LX OPC Data Access Server provides OPC Data Access Clients with the capability to view Experion LX point data for the purposes of control and plant-wide historization.		
<b>General OPC Data Access Server Specifications</b>		
Maximum number of OPC Data Access Client Application Instances (CAIs)	20	Each OPC Client Application running on a physical node connecting into the server consumes one Client Application Instance (CAI) for each application. The applications can open multiple physical connections and this still only counts as one CAI for each application. If the same application is running on multiple nodes, one CAI is consumed for each node.
Maximum number of concurrent OPC DA connections across all OPC clients	50	
OPC DA versions supported	1.0 and 2.05a	
Redundancy supported	Yes	Redirection Manager should be used for connecting clients that do not support redundancy to the redundant Experion LX servers. For clients that do support redundancy, use of Redirection Manager is still advised as it has been designed with Experion LX's redundancy scheme in mind.
<b>OPC Groups and Items</b>		
Maximum number of OPC groups supported	300	
Maximum number of items per group supported	7,000	
Rate at which items can be added to groups	1,000/second	Assumes the parameters are already primed. The rate at which items can be added to groups depends upon the throughput of underlying process control network.
Total number of items supported across all groups	50,000 <sup>1</sup>	
Group update rates supported	1 second and above	
<b>OPC Client Callback Support</b>		
Sustained callback rate from OPC server (items per second) to all OPC clients	2,000 <sup>1</sup>	
<b>OPC Client Read Support</b>		
(Cache read) Maximum number of list reads from OPC server per second	1	
(Cache read) Maximum number of items/list supported	2,000 <sup>1</sup>	Assumes that the data is already subscribed to and is therefore in the Experion LX cache.
(Device read) Maximum number of list reads from OPC server per second	1	
(Device read) Maximum number of items/list supported	2,000 <sup>1, 2</sup>	
(Device read) Sustained read rate (items/second)	500 <sup>1, 2</sup>	

*Continued.*

<b>OPC Client Write Support</b>		
Number of list writes to OPC server per second	1	
Maximum no. of items per list supported (write)	2,000 <sup>3</sup>	
Sustained write rate (items/second)	500 <sup>3</sup>	
<p>Note 1 – Ability to deliver published data rate depends upon throughput of underlying process control network. . Refer to the documentation associated with the process control network for more information.</p> <p>Note 2 – Device reads should be used with caution. It is possible to overload the underlying process control network if too many device reads are performed.</p> <p>Note 3 – The ability to deliver write data rate depends upon the throughput of underlying process control network.</p>		

### 2.3.5. OPC Alarm and Event Server

Items	Specifications	Comments
<b>Description</b>		
The OPC Alarm and Event Server is a simple and convenient mechanism for publishing Experion LX alarms and events to client applications. It provides a rich range of different Experion LX alarm and event data in an efficient manner, using the latest version of OPC specification.		
<b>General OPC Alarm and Event Server Specifications</b>		
Maximum number of Alarm & Event Client Application Instances	15	Each OPC Client Application running on a physical node connecting into the Server consumes one Client Application Instance (CAI) for each application. The applications can open multiple physical connections and this still only counts as one CAI for each application. If the same application is running on multiple nodes, one CAI is consumed for each node.
OPC A&E versions supported	1.1	
Redundancy supported	Yes	Redirection Manager should be used for connecting clients that do not support redundancy to the redundant Experion LX servers. For clients that do support redundancy, use of Redirection Manager is still advised as it has been designed with Experion LX's redundancy scheme in mind.
Event types supported <sup>1</sup>	Condition, tracking and simple	<p>Condition-related events are associated with OPC conditions (e.g. Acked, UnAcked, Disabled etc.). An example is the tag FIC101 transitioning into the LevelAlarm condition and HighAlarm sub-condition.</p> <p>Tracking-related events are not associated with conditions, but represent occurrences which involve the interaction of an OPC Client with a "target" object within the OPC Event Server. An example of such an event is a control change in which the operator, (the OPC Client), changes the set point of tag FIC101 (the "target").</p> <p>Simple events are all events other than the above. An example of a simple event is a component failure within the system/device represented by the OPC Event Server.</p>
Experion LX alarm and event types published	Alarms, alerts, messages, events, SOE, operator changes	
<b>OPC Performance and Throughput</b>		
Maximum notification rate to one OPC A&E client	15,000/hour	The maximum notification rate is the total number of notifications received by the server from all sources. The maximum A&E notification rate is dependent on the total number of notifications being received by the server from all sources.
Maximum notification rate to all OPC A&E clients	10,000/hour	As above.
<p>Note 1– Because of the many different interpretations of the OPC A&amp;E standard by third-party vendors, integration issues with OPC condition events in areas such as alarm acknowledgement and duplicate alarm identification may exist. Contact Honeywell for planning assistance when integrating a third-party OPC A&amp;E Client that utilizes OPC condition events with Experion LX.</p> <p>The risks with OPC simple and tracking events are lower than for OPC condition events. However, because of different interpretations of the OPC AE standard, integration issues may still be found. Thorough testing should be performed between the Experion LX OPC A&amp;E Server and third party client to ensure correct operation.</p>		

### 2.3.6. OPC Historical Data Access Server

Items	Specifications	Comments
<b>Description</b>		
The OPC History Data Access Server presents Experion LX history data in an open manner to client applications. Whether archived or online, the Experion LX OPC history data is able to retrieve and publish data timely and efficiently. A range of aggregate functions are provided to reduce the processing load on the client.		
<b>General OPC Historical Data Access Server Specifications</b>		
Maximum number of History Data Access Client Application Instances	20	Each OPC Client Application running on a physical node connecting into the server consumes one Client Application Instance (CAI) for each application. The applications can open multiple physical connections and this still only counts as one CAI for each application. If the same application is running on multiple nodes, one CAI is consumed for each node.
Maximum number of concurrent OPC HDA connections across all OPC clients	40	
OPC HDA version supported	1.2	
Redundancy supported	Yes	Redirection Manager should be used for connecting clients that do not support redundancy to the redundant Experion LX servers. For clients that do support redundancy, use of Redirection Manager is still advised as it has been designed with Experion LX's redundancy scheme in mind.
Supported aggregates	Interpolated, average, minimum and maximum	
<b>Performance and Throughput</b>		
ReadRaw (average values per second)	3500 <sup>1,2</sup>	
AdviseRaw (average values per second)	1200 <sup>1,2</sup>	
ReadProcessed (average values per second)	500 <sup>1,2,3</sup>	
<p>Note 1 – A minimum of 10 point.parameters per call are required to achieve this performance.</p> <p>Note 2 – The specification for value/second is across all clients.</p> <p>Note 3 – ReadProcessed performance is for interpolation aggregate.</p>		

### 2.3.7. OPC Integrator

Items	Specifications	Comments
<b>Description</b>		
<p>OPC Integrator allows bi-directional data transfer between two or more OPC Data Access Servers for the purposes of supervisory monitoring, alarming and control. As a fully integrated part of Experion LX, it provides integrated diagnostic, configuration and operational experiences that are consistent with other Experion LX operations. Additionally OPC Integrator leverages Experion LX's advanced redundancy features for improved reliability.</p>		
<b>General OPC Integrator Specifications</b>		
OPC DA versions supported	2.05a	
Maximum number of OPC Integrator transfer groups supported	Unlimited	A typical large system consists of approximately 40 groups.
Maximum number of items per group	Unlimited	Typical large systems will contain approximately 1000 items per group.
Transfer rates supported	500ms and above	<ul style="list-style-type: none"> <li>Typically set between 1 and 10 seconds.</li> <li>Ability of OPC Integrator to support a given transfer rate depends on the underlying OPC Data Access Server that it is connected to.</li> <li>Setting this number too low can impact performance.</li> </ul>
Rate at which items can be added to groups	1,000/second	Assumes the parameters are already primed. The rate at which items can be added to groups depends upon the design of the third-party OPC server and the throughput of the process control network it connects to.

## 2.4. Interfaces

Interface Software <sup>1</sup>	Connection Type
DNP3 Protocol Interface	Open Standard Serial and Ethernet (TCP/IP & UDP/IP)
Modbus (RTU, Plus, ASCII, & TCP) Interface	Serial, Modbus+, ASCII and Ethernet
<p>Note 1 – The Honeywell Safety Manager and MasterLogic PLC Serial and Ethernet Integration is standard included with the Experion LX base software.</p>	

## 2.5. Microsoft Excel Data Exchange

Item	Specification
<b>Description</b>	
<p>Enables capture of real-time point parameter and history information, and displays the data in a Microsoft Excel spreadsheet, using cell formulas or the Microsoft Excel Data Exchange Wizard.</p>	
<b>Details</b>	
Access to real-time point parameter values	Read or Read/write access (configurable)
Access to historical point parameter values	Read only
Access to database files (user tables)	Read or Read/write access (configurable)



## 2.6. Application Enablers

### 2.6.1. Point Control Scheduler

Item	Specification
<b>Description</b>	
The Scheduler option allows point supervisory control to be automatically scheduled to occur at a specified time. This may occur on a "one-shot" basis, daily, workday, weekend, holiday, or a day of the week.	
<b>Details</b>	
Maximum number of point control schedules	1,000

### 2.6.2. Recipe Management

Items	Specifications	Comments
<b>Description</b>		
Recipe Management provides facilities to create recipes and download them to nominated process units. Each recipe may have up to 30 items and recipes can be chained together to form larger recipes, if required. Recipe items may be used to set ingredient targets, set alarm limits, set timers and place equipment into correct operating state. Items may be individually enabled for scaling.		
<b>Details</b>		
Maximum number of recipes	500	This is the default limit. This number can be increased to 32,000 if required.

### 2.6.3. Batch Reporting

Items	Specifications	Comments
<b>Description</b>		
Batch reporting enables integrated reporting of batches or lots of a production process run, to be compiled and archived automatically by the Experion LX server. This feature is standard included in the Experion LX base software.		
<b>Details</b>		
Maximum number of history samples per batch report	65,000	A batch report can collect one type of history sample (such as 5-second samples or 1-hour averages) for up to 50 points.

### 3. Hardware and Software Requirements

#### 3.1. Experion LX Server Computer Requirements

A computer must meet the following specifications to be used as a Experion LX Server. These guidelines are intended to provide a minimum baseline. Honeywell computer platforms will meet these specifications and carry full support as a qualified offering. For installation information on computer platforms, including physical, electrical, corrosion, and other environmental requirements, please consult Honeywell installation guides or Dell documents.

Server System Performance Sizing Chart	
System Configuration	System "Type"
Systems with up to: <ul style="list-style-type: none"> <li>4000 SCADA points</li> <li>5000 Process Points</li> <li>10 Direct Stations</li> <li>Redundancy</li> </ul>	Standard Capacity
Systems with up to: <ul style="list-style-type: none"> <li>8000 SCADA points</li> <li>10000 Process Points</li> <li>5 DSA Connected Servers</li> <li>15 Direct Stations</li> <li>Redundancy</li> </ul>	High Capacity-T110 II Server PC
Systems with maximums specified in the Server Spec	High Capacity-R710 Server PC

##### 3.1.1. Server Hardware Requirements

System Configuration	Standard Capacity	High Capacity – T110 II	High Capacity – R710
Processor	3 GHz or Faster	Intel Xeon X3440 Xeon CPU, 2.53GHz, 8M Cache	Xeon X5560 Processor 2.8GHz Turbo HT (or better) Quad Core.
RAM	3 GB	3 GB	4 GB
Networking	100 Mbps Ethernet or FTE	100 Mbps Ethernet	100 Mbps Ethernet
Video Resolution	1024 x 768 65K colors	1024 x 768 65K colors	1024 x 768 65K colors
Video RAM	8 MB	8 MB	16 MB
Operating System	Window 7 Professional or Windows 2008 Server (32-bit)		
Browser type	Microsoft Internet Explorer 7		
Hard Drive	160 GB	250 GB	160 GB
Example Hardware for LX Server	Dell Optiplex 3010 HP Compaq Pro 6305	Dell PowerEdge T110 II Dell PowerEdge T610	Dell PowerEdge R710 (4GB Server RAID5 2U rack, 2GB)
Display Card	ASUS Display Card HD6670-2GD3		
Note 1 – The systems listed here are examples of platforms that will meet or exceed the recommended specifications.			

### 3.1.2. Server Hardware Requirements

Network	Comments
Fault Tolerant Ethernet <sup>1</sup>	Honeywell's patented Fault Tolerant Ethernet (FTE) network uses off-the-shelf networking hardware to allow Ethernet to provide "DCS network" functionality. FTE provides a robust and high availability network infrastructure for communicating to Experion LX Direct Stations, C300 controllers, etc.
Network Interface Cards	Broadcom 5720 or Intel 82576
Switches	Huawei LS-S2326TP-EI-AC, Dlink DES-3528, IEI RES-3242GC
<p>Note 1 - The FTE solution employs a single logical network over redundant media. By providing more communication paths between nodes, FTE also tolerates more faults, including all single faults and many multiple faults. In addition, FTE is transparent to higher-level applications, which benefit from the high network availability that FTE provides, without requiring any additional software configuration. Normal Ethernet nodes (non-FTE) can also connect to an FTE network and benefit from a more available communications environment than conventional Ethernet redundancy schemes offer.</p>	

## 4. Model Numbers

### 4.1. Server Database

Model Number	Description
LX-DBASE1 <sup>1</sup>	Experion LX Base Software
LX-DPR100 LX-DPR01K LX-DPR02K LX-DPR05K LX-DPR10K	100 PROCESS PTS, Non-Redundant 1,000 PROCESS PTS, Non-Redundant 2,000 PROCESS PTS, Non-Redundant 5,000 PROCESS PTS, Non-Redundant 10,000 PROCESS PTS, Non-Redundant
LX-DSC100 LX-DSC01K LX-DSC02K LX-DSC05K LX-DSC08K	100 SCADA PTS, Non-Redundant 1,000 SCADA PTS, Non-Redundant 2,000 SCADA PTS, Non-Redundant 5,000 SCADA PTS, Non-Redundant 8,000 SCADA PTS, Non-Redundant
<p>Note 1 – Every Experion LX Server requires base software at a minimum. The base software includes the following items: 1 Experion LX Direct Station, 2 Experion LX Flex Station, 1 Display Builder Client, 100 SCADA points, 100 Process points, 1 Quick Builder License, Redirection Manager, OPC Display Data Client, Honeywell Safety Manager Integration, Batch Reporting, 1 Display Builder License, 1 Control Builder Client License (enables the configuration of control strategies for CDA devices such as the C300), Control Builder Template Support, CDA Subsystems Interface, Simplified Enterprise Model Builder, Modbus (RTU/PLUS/ASCII/TCP) Interface, Experion LX Recipe Manager, 5 Microsoft Excel Data Exchange Licenses, DSA Publish, Multiple Display Support, 127 PCDI, History Collection/Archiving, Events Collection/Archiving, Chart Monitoring, Reporting, Alarm Event Report, Alarm Duration Report, Alarm Metrics, Excel Report, C300 Control Solver -50ms, DNP3 Interface and OPC Client Interface Licenses. The base license also includes other options and interfaces as listed in the Experion LX Server License Specification.</p>	

### 4.2. Server Redundancy

Model Number	Description
LX-RBASE1	Redundancy Base Adder
LX-RPR100 LX-RPR01K LX-RPR02K LX-RPR05K LX-RPR10K	100 PROCESS PTS, Redundancy Adder 1,000 PROCESS PTS, Redundancy Adder 2,000 PROCESS PTS, Redundancy Adder 5,000 PROCESS PTS, Redundancy Adder 10,000 PROCESS PTS, Redundancy Adder
LX-RSC100 LX-RSC01K LX-RSC02K LX-RSC05K LX-RSC08K	100 SCADA PTS, Redundancy Adder 1,000 SCADA PTS, Redundancy Adder 2,000 SCADA PTS, Redundancy Adder 5,000 SCADA PTS, Redundancy Adder 8,000 SCADA PTS, Redundancy Adder

### 4.3. Experion LX Media Kits, Stations and CALs

Model Number	Description
LX-NME110	Experion LX R110 Media Kit, Standard
LX-RME110	Experion LX R110 Media Kit, Redundant
LX-STAD01	Experion LX Direct Station
MZ-SQLCL4	Microsoft SQL Runtime CAL
EP-S08CAL	Windows Server 5 Device CAL
<p>Note 1 – The Experion LX Media Kit includes all of the associated media for the Experion LX software and additional software options. .</p>	

#### 4.4. Distributed System Architecture

Model Number	Description
LX-XRESR1	DSA Subscribe (DSA Server Enabler)
Note 1 – Each Experion LX Server is enabled to publish data in a DSA design. CV-XRESR1 is required once for an Server or redundant Server pair that needs to subscribe to data. One DSA Subscribe license is required to subscribe to up to the maximum number of 14 Servers.	

#### 4.5. OPC

Model Number	Description
LX-OPCINT	OPC Integrator
LX-OPCDA1	OPC Data Access Server
LX-OPCHDA	Experion LX OPC Historical Data Access Server
LX-OPCSAE	OPC Alarm & Event Server
LX-OPCADV	OPC Advanced Client

#### 4.6. Experion LX Software Options

Model Number	Description
LX-SMCS30	C300 Simulation Environment
LX-XLDE01	Microsoft Excel Data Exchange
LX-AESHED	Experion LX Point Control Scheduler
LX-RCM010	Batch Manager, 10 RCM
LX-RCM025	Batch Manager, 25 RCM
LX-RCM100	Batch Manager, 100 RCM
LX-RCM300	Batch Manager, 300 RCM
LX-SVALGP	ALARM Shelving
LX-SVALDS	Alarm DSA Report
LX-SVPWFB	Power Function Blocks
LX-IDNPHB	DNP3 History Backfill
LX-I61850	IEC61850 Interface

#### 4.7. Engineering Tools

Model Number	Description
LX-COBLDR	Control Builder
LX-QKBLDR	Quick Builder – SCADA database builder
LX-DSBLDR	Display Builder 1
LX-BBD0BS	Bulk Build
Note 1 – Includes HMIWeb Display Builder and Display Builder. Control Builder, Quick Builder and Display Builder - one copy of each is included with the base software	

## 5. Glossary

Term or Acronym	Description
C300	A specific type of Honeywell Process Controller based on the series C form factor
CDA	Control Data Access is the Experion LX system communication infrastructure and data access interface schema that provides application integration with Experion LX system objects.
DCS	Distributed Control System
DSA	Distributed System Architecture
Experion LX Server	The node (optionally redundant) at the heart of Experion LX. The Server encompasses a wide range of subsystems including history collection, SCADA interfaces, alarm/event, etc.
FTE	Fault Tolerant Ethernet, the Experion LX control network
HMI	Human machine interface
HMIWeb	Human machine interface based on Web Technology
HTML	Hypertext Markup Language
MasterLogic	Honeywell PLC for fast logic applications supporting IEC programming languages
OPC	Series of standard specification for open connectivity in industrial automation originally based on Microsoft's OLE COM and DCOM technologies.
pps	Parameters per second
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition
Safety Manager (SM)	Honeywell's SIL3 Safety System
Uniformance PHD	Flexible environment for the collection, storage and analysis of process data. A Process History Database (PHD) database may be centrally configured and managed, gathering data from many systems including Honeywell Experion LX, Experion PKS and TotalPlant Solution (TPS), OPC Servers, and other third-party sources.

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