Experion LX R500 Reference Guide

July 2017, Version 0.1

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Revision History

Revision	Date	Description
0.1	July 2017	Release version

EXPERION LX INTRODUCTION

Experion LX is a new Field Products DCS/SCADA platform, purpose built to be sold and delivered through Honeywell Field products Channel and System Integrator Partners. It is based on Honeywell's reliable DCS platform and Experion PKS with 1000's of installations installed globally. The offering consists of new series 8 Controller and I/O hardware platform and the Experion LX software base offering and software options. The series 8 controller is based on the tried and true EPKS C300 controller.

The product is targeted at small to mid-tier DCS/SCADA customer, so you may be thinking small to medium sized applications, but this has truly a large DCS & SCADA scalability. The system supports up to 10,000 process points, 50,000 SCADA points, 5 DSA connections, Direct station, Quick Builder, Display Builder, OPC client Interface, Modbus Interface, Recipe Manager, Control Solver, Profit Loop, HC900, RTU 2020 and ControlEdge PLC interface, Experion LX Alarm groups and much more.

PURPOSE

The Experion LX Reference Guide is for Honeywell internal use only. This document is designed to assist the Honeywell teams train the channels partners and to be used as a reference guide for user in selecting the proper Experion LX models to order for a particular automation project. It is designed to be used along with the Experion LX Estimation Tool when planning an Experion LX project.

Throughout this document, model numbers and limited specification type information are provided in order to clarify selections that are being made. For a full listing of model numbers and specifications, please refer to the Experion LX Model Selection Guides (MSG) and Product Specifications.

Always consult latest specification, MSGs and Experion LX Estimation tool available at **Experion LX Bulltin Board**.

ORDER AND UPGRADE INFORMATION

Experion LX Estimating Tool

Honeywell provides an offline estimation tool to help our Channel Partners develop response to RFQ and proposals. This tool helps the application engineer to select the most cost-effective set of model numbers to order to meet the requirements of the application. This tool also enforces certain system capacity, topology and performance rules in order to assure that a valid and complete system topology is being ordered.

This tool is called the "Experion LX Estimation Tool" and is available on Honeywell CHAMP **(**Link**)** and on Honeywell internal Bulletin Board Page under Pricebook/Guide section **(**Link**).** Note that changes are frequently made; prior to building a configuration, always check the Honeywell Preferred Extranet to assure that you have the latest version.

Orders for New Systems

Orders for new Experion LX systems will be processed via the Field Products supply chain headquartered in Juarez Mexico. All Experion LX orders are to be entered using SAP Order Entry or Webchannel.

Experion LX orders require the licensing of software. Therefore it is imperative that the order contain the Customer ID number for the end-user customer as registered in the Honeywell Siebel database. This is required for a software license to be properly executed. Failure to provide the Customer ID number will result in your order being rejected.

Orders for Expansion and Upgrade

Expansion and/or upgrade orders for Experion LX systems will be processed via the Field Products supply chain headquartered in Juarez Mexico. All Experion LX orders are to be entered using SAP Order Entry or Webchannel.

Experion LX R500 supports off-process migration from older Experion LX releases. Starting Experion LX R500, Honeywell is introducing an upgrade fee based on 'Experion LX Upgrade Units'. The number of upgrade units will be calculated based on few key factors like number of IO points, number of stations and redundancy. Appropriate upgrade unit model number is used based on the current release. Other accessories like Media kit(s), SQL and operating system etc. will also be required. The LX R500 configurator tool is adjusted with this change and must be used for upgrades from LX R120 and R110.

Separate orders are must for expansion cum upgrade type orders. Experion LX Estimation tool provides this requisite BOM with separate BOM for upgrade and expansions respectively.

Delivery Lead Time

Delivery lead times will be communicated to the System Integrator upon receipt of completed order.

HONEYWELL INTERNAL USE EXPERION SOFTWARE

Experion software is available on **Aspera**. For information on Aspera check this link: **Aspera Overview**.

For demo license for internal use, please contact the product manager Shivendra.mishra@honeywell.com

PRICING

Experion LX Estimation tool provides an indicative list price based on global USD list price for Experion LX. For accurate List Prices, Siebel provides country specific list prices available for all quotes. Local prices must be referred for the customer proposal and estimation purposes.

List price for a customer

If you require a Price List for a Customer, please refer Experion PMC price book on the **hpsvault** or **CHAMP** for (Model Selection Guide) MSGs and send an email to the HPS Pricing HelpDesk to ensure that you use latest MSG and the appropriate legal disclaimer is included.

ELECTRONIC DOCUMENTATION

Electronic documentation distribution improves access and accuracy, and reduces wastage. Experion LX R500 includes regular documentation updates between major releases, improving the accuracy of documentation. Printed documentation is no longer shipped and instead is provided as PDF collections. In addition, individual PDF documents can be viewed and downloaded from the Honeywell Process Solutions website (www.honeywellprocess.com).The PDF collection DVD (containing PDF collections) is included in the Experion LX R500 media set (LX-DME500). There is no separate model number for electronic documentation.

Printing of documentation

Individual PDF files from the Honeywell Process Solutions website, or from the PDF collections, can be printed and supplied to customers in paper format, if required, using a local print facility.

Honeywell internal users including TSCs, Sales, CMMs, CBMs etc are strongly recommended to have PDF collection DVD (including a very impressive search tool!) with them and use time to time to support customers. Please write to the product manager Shivendra.mishra@honeywell.com if you need your personal copy of PDF collection DVD.

APPROVALS AND RQUP PROCESS

Quotations of all Experion projects require DRF approval. If your quotation includes only released products, then no further approval is needed to quote.

If you need to quote an unreleased product that appears on the approved roadmap, or a released solution that is part of extended RQUP, it is required that an RQUP (Request to Quote Unreleased Product) is approved by the PMC Modsys Business Team prior to submitting a proposal. The RQUP process and forms can be found at http://go.honeywell.com/rqup**.** The Business Team Leader is Steven Wheatman who can answer any questions that may arise.

SUPPORT CONSIDERATIONS

Recommended Spare Parts-

Experion LX controller and I/O spare parts are covered by standard product model numbers. There are no special model numbers for spare parts.

The following are recommended spares for an Experion LX system:

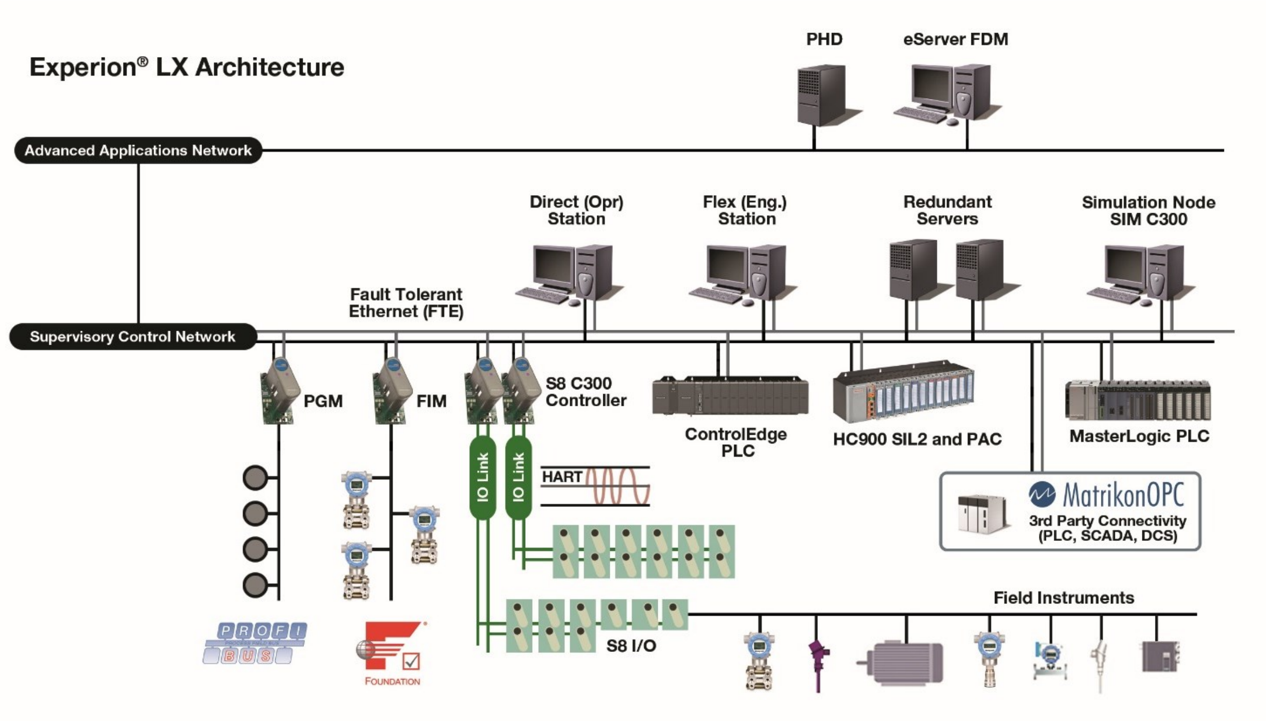
- At least one C300 controller and C300 IOTA. Multiple spares are recommended depending on number of controllers.
- At least one set of IO Link cables, in the longest length used on the system. Other lengths may also be needed depending on specific needs.
- One or more of each Series 8 module type and IOTA type used on the system. Multiple spares are recommended depending on the number of I/O modules of each type.
- One or more power supplies. Multiple spares are recommended depending on number of power supplies in use.

EXPERION LX ARCHITECTURAL OVERVIEW

Experion LX is a purpose-built, system integrator-friendly automation system that leverages key proven Experion PKS technologies.

Experion LX helps process manufacturers increase profitability and productivity through a modern and reliable automation system with no single point of failure. It offers the best of both global and local resources, utilizing the global expertise of Honeywell and the local support of System Integrators.

The Experion LX is an extremely scalable system that can support small single reactor processes through large and complex control system challenges. Figure 1 is a representation of many of the possible nodes that can be utilized in an Experion LX architecture. Note that the architecture is highly scalable and not all nodes are necessary or required.


Experion® LX Architecture
PHD
eServer FDM
Advanced Applications Network
Direct (Opr) Station
Flex (Eng.) Station
Redundant Servers
Simulation Node SIM C300
Fault Tolerant Ethernet (FTE)
Supervisory Control Network
PGM
FIM
S8 C300 Controller
ControlEdge PLC
HC900 SIL2 and PAC
MasterLogic PLC
IO Link
IO Link
HART
MatrikonOPC
3rd Party Connectivity (PLC, SCADA, DCS)
Field Instruments
S8 I/O
PROFI BUS
FOUNDATION

Sizing Rules

There are limited configuration rules in this document. These rules should not be the guidelines for sizing a system. Please consult the appropriate Specification documents or estimation tools for additional information.

Environmental Considerations

Series 8 I/O in Experion LX is suitable for G2-corrosive storage/field environments without optional conformal coating and G3-corrosive environments with the optional coating. Other environmental limits are covered in Series 8 IO specification document.

To provide maximum reliability in harsh and corrosive environments, an optional conformal coating solution is offered. Conformal coating provides a protective layer to safeguard against harsh environments. Refer to the Controller Specification and the Series 8 I/O Specification, for all specification details. The Experion LX Estimation Tool supports coated models and allows the user to select coated or uncoated as a project option.

Third Party Software

Please refer to the Software Change Notice (SCN) for a list of third party software applications that have been tested on Engineering Stations and Direct Stations, along with application conditions.

Microsoft Operating System

Experion LX R500 uses Long Term Service Branch (LTSB) based Windows 10 operating system and Windows Server 2016 operating systems. Due to restriction from Microsoft, the Windows 10 Enterprise LTSB version is not available pre-installed with computer machines from PC vendors. This implies the Windows 10 Enterprise LTSB OS for LX R500 needs to be separately purchased by Honeywell Partners/Integrators either through

- Any Microsoft partner who are authorized to sell Windows 10 Enterprise 2016 LTSB under Microsoft's Volume Licensing agreement, or
- Honeywell using the model number specified in below table

Model Number	Model Description
MS-OSLW10	Windows 10 Enterprise 2016 LTSB

Note that the above operating system are sold for use with Embedded systems only such as Experion LX. An embedded system computer is sold with a Windows Embedded operating system that is designed to work with an Embedded Application. An Embedded Application in this case is Experion and associated applications. The Embedded operating system can't be used as a general purpose operating system for tasks that have nothing to do with the Embedded Application. Additional terms and conditions that explain the appropriate use of the operating system will be supplied when the above model numbers are purchased. Windows Server 2016 OS has no such restriction and partners may continue purchasing this separately or pre-installed with the server grade machine.

Microsoft Client Access Licenses

Model Number	Model Description
EP-S08CAL [1]	MS Windows Server 5 Device Client Access License
MZ-SQLCL4 [2]	Microsoft SQL Runtime CAL

1. Windows Server Client Access Licenses (CALs) are only required when using server grade computers as engineering stations. Windows Server CALs are typically included with a new server when supplied with the Windows Server OS. The Experion LX Estimation tool will suggest how many CALs are required for systems, though it will be the responsibility of the System Integrator to ensure that all CALs are included.
2. Experion LX R500 uses SQL 2014. SQL Server is bundled with the Experion LX software. We are required to add the appropriate number of SQL Server Client Access Licenses with each system. The Experion LX Estimation tool will automatically add these to the order. The quantity of SQL Server licenses (MZ-SQLCL4) is based on the number of computers used in the system. For example, a system with redundant engineering stations and five (5) direct stations will require a total of seven (7) SQL CALs.

Each computer that accesses a computer running Windows Server 2016 must have a Client Access License (CAL). CALs can be deployed in two ways (Microsoft terminology):

- "Per Server" –the license is added to the server for any client to use, and the server must have one license for each client that accesses the server.
- "Per Device or Per User" –the client that accesses the server provides the license. Each client must have the appropriate client access license(s), for example a Windows Server 2008 CAL and a SQL

Server CAL. Windows Server 2008 provides both “Device CALs” and “User CALs”; Experion LX systems need only Device CALs.

The license deployment type is chosen when installing the Windows Server 2016 operating system. The user has one option to change from the “Per Server” scheme to the “Per Device or Per User” scheme after the initial installation. The CALs listed in the table above can be deployed either way. However the “Per Device or Per User” option is in almost all cases the most cost effective and is the recommended license deployment type.

A Device CAL is required for each Direct Station connecting to an Engineering Station running Windows Server 2016. Device CALs are not required if the Engineering Station is running Windows 10.

As an example, if a system has redundant engineering stations running Windows Server 2008 and 16 Direct Stations, a total of 18 Device CALs are required. Since Device CALs are sold in increments of 5 CALs, a total of 20 Device CALs will be required for the system.

Computer Requirements

Minimum requirements for Engineering Stations and Direct Stations are found in the Experion LX HMI specification document that has Engineering Station and Direct Station specifications.

Terminal Servers

The new terminal server for Experion is from Systech, a 3rd party vendor. Buyers can order the supported terminal server by placing order to www.systech.com directly.

SERVER DATABASE

Base Software

Every Experion LX system requires an Engineering Station (or Server) and base software at a minimum (LX-DBASE1). For redundant Engineering Stations, do not order multiple base software packages.

Model Number	Model Description
LX-DBASE1	Experion LX Database Base Software

Experion LX Base Software (LX-DBASE1) is supplied with the following components/ features as standard:

Software Component	Quantity	Description
Experion LX SCADA Point	100	Used for connecting to SCADA interfaces like PLCs, RTUs, or for using the OPC Client Interface. A maximum of 50,000 SCADA Points can be configured per system.
Experion LX Process Point	100	Used for points in the C300 controller. A maximum of 10,000 Process Points can be configured per system.
CDA sub systems interface	1	Interface to CDA (Control Data Access) compliant controllers like S8 C300
Control Builder	1	Controller configuration software for C300
Quick Builder	1	SCADA (non-C300) configuration software
Display Builder	1	Used to configure HMI displays for Experion Station
Enterprise Model Builder	1	For Enterprise Model Builder Database (EMDB)
Development System	1	Removing this option would create a run-time only license.
C300 Control Solver – 50ms	50	Per controller license for control execution at 50 msec
Experion LX Server	1	Internal use license for identification of system type
Direct Station	1	Similar to Console Station in Experion PKS. To connect directly with C300 controller in case the Engineering station / Server is unavailable
Direct Station Extension	1	Required for Multiple Display Support but will not be printed.
Multiple Display Support	1	Will be available on each Direct Station.
Flex Station	2	Required for Engineering Station. Set to (2) for supporting redundant Engineering Stations.
Peer Control Data Interface (PCDI)	127	Controller connectivity to third party devices is common expectation in base software package.
Network Server	1	Used for Microsoft Excel data Exchange.
Microsoft Excel Data Exchange users	1	Used for reporting and data access, per user

Feature / Interfaces (licensed per Server)	Enabled (Y/N)	Used for
Control Builder Template Support	Yes	Enables increased engineering productivity, similar tools offered by local competitors
Bulk Build Support	Yes	Bulk Build Support is Control Builder functionality that provides support for rapid replication for tagged objects: CMs, SCMs, IOMs, and FIMs and their contained component objects. Bulk Build support is licensed per server, the enabled and the number of instances does not matter
Procedural Operations	Yes	For execution of procedures in continuous processes
ProfitLoop	Yes	
Safety Manager / FSC SCADA Interface	Yes	Standard SCADA Honeywell interface
Modbus (RTU, Plus, ASCII & TCP) Interface	Yes	Common third party interface
OPC Display Client	Yes	Allows the user to insert OPC Data onto a display without the need to build points
OPC Client Interface	Yes	Allows OPC Data Access Server information to be mapped into Experion LX SCADA points.
Redirection Manager	Yes	Provides OPC server redundancy to OPC apps that are not natively redundant
Masterlogic Integration	Yes	
Honeywell Universal Modbus Driver for HC900	Yes	Support bundling of HC900 and HC900 SIL2 with LX
DNP3 Interface	Yes	
Experion LX Cross Reference Report	Yes	Support Cross reference report
Experion LX Alarm Groups	Yes	To support Alarm groups
Honeywell HC900 Universal Modbus History Backfill	Yes	Enables uploading the plant history data from HC900 controller into the Experion Server
DSA enabling License	Yes	Enables eServer retrieving data via DSA from Experion LX (DSA Publish is licensed option)
Display versioning control	Yes	HMI Web Display Builder version control system with a ‘check-in, check-out’ work flow
Recipe Management	Yes	Provides facilities to create recipes and download them to nominated process units.
Batch Report	Yes	For Batch reporting
User Scan task	Yes	Generally used with Application Development Toolkit and is required for the Cyclic Task Algorithm

Database Size Expansions

If additional points beyond what is in the base software package are required, the following model numbers can be used to increase the Process Point and SCADA Point counts. A total of 10,000 Process Points and 50,000 SCADA Points are supported per Experion LX cluster.

Model Number	Model Description
Process Point Adders	
LX-DPR100	Experion LX 100 Process Points Adder to Database Size
LX-DPR01K	Experion LX 1,000 Process Points Adder to Database Size
LX-DPR02K	Experion LX 2,000 Process Points Adder to Database Size
LX-DPR05K	Experion LX 5,000 Process Points Adder to Database Size
LX-DPR10K	Experion LX 10,000 Process Points Adder to Database Size
SCADA Point Adders	
LX-DSC100	Experion LX 100 SCADA Points Adder to Database Size
LX-DSC01K	Experion LX 1,000 SCADA Points Adder to Database Size
LX-DSC02K	Experion LX 2,000 SCADA Points Adder to Database Size
LX-DSC05K	Experion LX 5,000 SCADA Points Adder to Database Size
LX-DSC08K	Experion LX 8,000 SCADA Points Adder to Database Size
LX-DSC10K	Experion LX 10,000 SCADA Points Adder to Database Size
LX-DSC25K	Experion LX 25,000 SCADA Points Adder to Database Size
LX-DSC50K	Experion LX 50,000 SCADA Points Adder to Database Size

Point Count Example 1:
The customer requires 2,100 process points implemented in C300 controllers. Additionally, the non-redundant engineering station will interface with several PLCs that will contain an additional 5,300 points. To accomplish this, you will order the Database Base Software (LX-DBASE1) and a complement of adders for Process points:

Model Number	Qty.	Note
LX-DPR02K	1	Round down((2,100 – 100)/2,000) [1]
LX-DPR01K	0	Round down((2,100- 100- LX -DPR02K*2,000)/1,000)
LX-DPR100	0	Round up((2,100- 100- LX -DPR02K*2,000- LX -DPR01K*1,000)/100)
LX-DSC05K	1	Round down((5,300-100) /5,000) [2]
LX-DSC02K	0	Round own((5,300-100- LX -DSC05K * 5,000) /2,000)
LX-DSC01K	0	Round down((5,300-100- LX -DSC05K * 5,000- LX -DSC02K*2,000) /1,000)
LX-DSC100	2	Round up((5,300-100- LX -DSC05K * 5,000- LX -DSC02K*2,000- LX -DSC01K *1,000) /100)

[1] 100 free process point included in base software

[2] 100 free SCADA point included in base software

Server / Engineering Station Redundancy

Server / Engineering Station redundancy allows two Servers / Engineering stations to operate one system. Two computers are used in a primary / backup scheme; this configuration delivers very high reliability, with the backup automatically taking over for the primary PC in the event of a failure. Redundant Engineering Stations also allow maintenance to be performed on either Station without losing the ability to historize any points.

Redundancy software follows the same methodology as selecting the database size from the previous step. Start by selecting the base software, LX-RBASE1. This option includes station redundancy. It does not include an additional station connection license.

Model Number	Model Description
LX-RBASE1	Experion LX Redundancy Base Software

Next, choose the equivalent point adders for redundancy that were chosen for the database. The point count has to exactly match that of the database point count.

Model Number	Model Description
Process Point Redundancy Adders	
LX-RPR100	Experion LX 100 Process Points Redundancy Adder
LX-RPR01K	Experion LX 1,000 Process Points Redundancy Adder
LX-RPR02K	Experion LX 2,000 Process Points Redundancy Adder
LX-RPR05K	Experion LX 5,000 Process Points Redundancy Adder
LX-RPR10K	Experion LX 10,000 Process Points Redundancy Adder
SCADA Point Redundancy Adders	
LX-RSC100	Experion LX 100 SCADA Points Redundancy Adder
LX-RSC01K	Experion LX 1,000 SCADA Points Redundancy Adder
LX-RSC02K	Experion LX 2,000 SCADA Points Redundancy Adder
LX-RSC05K	Experion LX 5,000 SCADA Points Redundancy Adder
LX-RSC08K	Experion LX 8,000 SCADA Points Redundancy Adder
LX-RSC10K	Experion LX 10,000 SCADA Points Redundancy Adder
LX-RSC25K	Experion LX 25,000 SCADA Points Redundancy Adder
LX-RSC50K	Experion LX 50,000 SCADA Points Redundancy Adder

Point Count Example 2:

The customer requires 3,320 process points implemented in C300 controllers. Additionally, the redundant engineering station will interface with several PLCs that will contain an additional 8,300 points. To accomplish this, you will order the Redundancy Database Base Software (LX-RBASE1) and a complement of adders for Process points:

Model Number	Qty.	Note
LX-DPR02K	1	Round down((3,320- 100)/2,000)[1]
LX -DPR01K	1	Round down((3,320- 100- LX -DPR02K*2,000)/1,000)
LX -DPR100	3	Round up((3,320- 100- LX -DPR02K*2,000- LX -DPR01K*1,000)/100)
LX -RPR02K	1	= LX -DPR02K
LX -RPR01K	1	= LX -DPR01K

Model Number	Qty.	Note
LX -RPR100	3	= LX -DPR100
LX -DSC05K	1	Round down((8,300-100) /5,000)[2]
LX -DSC02K	1	Round own((8,300-100- LX -DSC05K * 5,000) /2,000)
LX -DSC01K	1	Round down((8,300-100- LX -DSC05K * 5,000- LX -DSC02K*2,000) /1,000)
LX -DSC100	2	Round up((8,300-100- LX -DSC05K * 5,000- LX -DSC02K*2,000- LX -DSC01K *1,000) /100)
LX -RSC05K	1	= LX -DSC05K
LX -RSC02K	1	= LX -DSC02K
LX -RSC01K	1	= LX -DSC01K
LX -RSC100	2	= LX -DSC100

1 100 free process point included in base software
2 100 free SCADA point included in base software

Distributed System Architecture Licenses

Distributed System Architecture (DSA) allows multiple Experion LX clusters to be robustly integrated with minimal engineering effort. It allows points from different clusters to be easily incorporated into alarm summary, history trends, events and reports. An Experion LX DSA system consists of two or more Servers / Engineering Stations (or redundant pairs) connected via a communications network. DSA provides global access to all point data in the Distributed System.

Each Server/ Engineering Station cluster is enabled to publish data in a DSA design. Order one of LX-XRESR1 for an Engineering Station or redundant pair that needs to subscribe to data. This option allows systems with up to five (5) clusters to be configured. Consult the LX HMI Specification for additional information on DSA.

Model Number	Model Description
LX-XRESR1	DSA Remote Server Enabler

DSA Interoperability:
Experion LX can publish data to EPKS system, and cannot subscribe data from EPKS system. Experion LX can subscribe data from other Experion HS/LS system, and can publish data to Experion HS/LS system. Please refer Experion LX R500 HMI Specification document for more details.

MEDIA KIT

Starting Experion LX R500, a single media kit replaces all the different media kit types offered with previous LX releases for different needs like redundancy, demo, migration etc.

Model Number	Model Description
LX-DME500	Experion LX Media Kit – Standard

The R500 media kit doesn't include hardware security key (dongle). The Hardware security key is required only for select countries and this can be purchased separately using following models.

Model Number	Model Description
EP-DONUSB	Experion USB Protection Device
EP-DONENB	Experion Software Protection Dongle Enabler

Dongle Ordering Examples:

For redundant system, add below line items in final order for the below specified countries/regions:
1* EP-DONENB
2* EP-DONUSB

For non-redundant system, add below line items in final order for the below specified countries/regions:
1*EP-DONENB
1*EP-DONUSB

Expansion orders- Should not include these dongle items as they would continue to use the original dongle.

New Experion LX system- The dongle items are only required for a country/region listed below

Upgrade of existing LX system to future release- Will continue to be supported with dongles, fresh dongle items need to be ordered

Dongle Replacement Request- Please contact the product manager

List of countries where dongle continues to be ordered for LX systems-
Korea / Taiwan / Indonesia / Thailand / Vietnam

EXPERION LX STATIONS

Experion LX Direct Station

The Experion LX Direct Station is the Human Machine Interface (HMI) used for operations, monitoring and engineering. Direct Stations can be implemented as desktop models or in custom furniture and support up to four monitors. Both Direct Stations and Engineering Stations can host the Experion LX Engineering Tools.

Direct Stations communicate directly with the Experion LX Control Execution environment. This provides a high-availability operation platform and does not rely on the Engineering Station for displaying process data on HMI displays. This station is designed specifically for processes that run continuously and require operations personnel to maintain a constant view of the process.

Model Number	Model Description
LX-STAD01	Experion LX Direct Station
Note- One (1) Direct Station license is delivered with the base software license. A total of 20 Direct Stations are supported per Experion LX cluster.	

Experion LX Flex Station

The Experion LX Flex Station is a versatile operator interface that uses a client-server relationship to present process data to the operator. It is suitable for full-time operations in a large percentage of applications and can also be used as engineering or wireless Stations.

The Experion LX Flex Station operator interface license provides a variety of connection methods:

- **Static -** provides a permanent, dedicated connection with the server, recommended for fulltime operations. Choose the number of connections required.
- **Rotary -** provides a concurrent-use connection to the server. Choose the number of connections that require connecting at the same time.

Model Number	Model Description
LX-HSTA01	Experion LX Flex Station
Note- Two (2) Flex Station connection license is delivered with the base software license. A total of 10 Flex Stations are supported per Experion LX cluster.	

Multi Window Support Option for Experion Station - Flex

The license in the table below is an option for ES-F and can be implemented as Multiple Static Stations or as Multiple Windows.

Experion LX Direct Station licenses include the “multi-window” mode, but do not support the “multi-Station” mode.

Model Number	Model Description
LX-SMWIN1	Multi-window Support for Experion LX Flex Station, per computer platform *(Maximum sixteen(16) windows concurrently open or four (4) static stations)*

Multiple Static Stations allows up to four Stations (connections) on a single Experion Station computer while only consuming one Station license.

As an alternative, Multiple Windows can be implemented which allows up to 16 windows running in SafeView to be concurrently open within display guidelines.

Regardless of which alternative is implemented, only one "licensed" station connection is deducted from the available "licensed" station connections.

The total number of Server connections (licensed and multi-Station connections) is still restricted per the specification, regardless of the number of computers they are running on. This option is not valid for Rotary (casual use) connected Flex Stations.

Example 1:
Scenario: A customer wants 4 (Flex) Station computers, 2 of which will be dual monitor and 2 single monitor. The customer wants to run the 2 dual monitor computers in a “multi-station” mode.
Solution: The most cost effective way to license this configuration would be for the customer to purchase 4 Flex Station connections and 2 Multiple Window options. The Multiple Window options will be used for the “extra” screen on the dual screen computers. A Station connection will be consumed on each of the computers. So, the total number of licensed Station connections consumed would be 4 (1 for each computer) with the total number of connections used on the server being 6 (2 on each of the dual screen computers and 1 each on the single screen computers.)

Example 2:
Scenario: A customer wants 3 (Flex) Station computers, 1 of which will have a quad screen, another a dual screen, and the other a single monitor. The customer wants to run the quad screen computer in a “multi-window” mode and the dual screen computer in a “multi-station” mode.
Solution: The most cost effective way to license this configuration would be for the customer to purchase 3 Flex Station connections and 2 Multiple Window options. The Multiple Window options will be used for the “extra” screens on the quad and dual monitor computers. A station connection will be consumed on each of the computers. So, the total number of licensed Station connections consumed would be 3 (1 for each computer) with the total number of connections used on the server being 4 (1 for the quad screen computer as it is operating in Multi-Window mode, 2 for the dual screen computer as it is running in Multi-Station mode and one other for the single screen computer.

Direct Station license includes the “multi-window” mode, but do not support the “multi-Station” mode.

Experion LX Station Pan and Zoom Displays

Experion Station Pan and Zoom displays enables navigation of displays that are larger than a standard display size, enabling navigation of larger scale, comprehensive information graphics and intuitive zoom-in and zoom-out functionality. This functionality will suit any plant type and will also be extremely useful for sites with geographically dispersed assets, Fire and Gas displays, detectors overlaid on plant layout, ESD / Cause and Effect displays, Logic displays that are too big for one display, and Equipment details in process displays, e.g. Pump status, vibration Monitoring etc.

Model Number	Description
LX-PZE000	Station Pan and Zoom, Per Server
Note: Order 1 per (redundant) Server requiring this. Required for all Experion servers that need to view these display types.	

ENGINEERING STATION SOFTWARE, ALARM OPTIONS AND STANDARD TOOLS

Experion LX includes application options to accomplish customer requirements. Select any optional applications from the following table:

Model Number	Model Description
LX-AESHED	**Point Control Scheduler** This option allows points and point parameters to be set at user configurable schedules.
LX-SVALDS	**Alarm DSA Report** Report that includes alarm details from other Engineering Stations in a DSA environment. Enables analysis of alarms that occurred during a specified time span on remote points.
LX-SVALGP	**Alarm Shelving** The shelving alarming is used to suppress alarms on instruments that have an issue or where the process has changed, which is based on decisions by the operator
LX-ACVAGE	Alarm Pager
LX-DASENB	**Dynamic Alarm Suppression** Enables a user to reduce alarm floods or the number of standing alarms by removing an alarm or group of alarms from the summary when an initiating alarm has occurred.
LX-ALMTND	Alarm Tracker
LX-QKBLDR [1]	**Quick Builder – SCADA database builder** Used to create and modify a configuration database, which defines how system items, such as SCADA controllers and points are set up. This model number is used to increase the number of instances that are licensed per Experion LX system.
LX-DSBLDR [1]	**Experion LX HMI Display Builder** HMIWeb Display Builder is a specialized drawing application that enables you to create your own custom displays for Stations. This model number is used to increase the number of instances that are licensed per Experion LX system.
LX-COBLDR [1]	**Experion LX Control Builder** Control Builder is used to configure Experion LX's controllers, which can handle all possible control requirements – whether for continuous processes, batch processes, discrete operations, or machine control needs. This model number is used to increase the number of instances that are licensed per Experion LX system.
Note 1 – One (1) instance is included with base software package, LX-DBASE1.	

APPLICATION DEVELOPMENT TOOLS AND APPLICATION ENABLERS

Model Number	Model Description
LX-AEAPD1	**Application Development Toolkit** Custom applications can be written to interface to Experion. Select LX-AEAPD1 if customer requirements include the need to create custom applications. This option includes the Network Server component, ODBC Data Exchange, ODBC Driver, and Server Automation object. Select once per Server or redundant Server pair
LX-CADL02	**CAB Developer** The CAB Developer license allows users to use Control Builder and CAB tools to create CAB blocks for the C300 controller. Each computer used to develop or edit CAB programs requires a CAB Developer license. CAB Developer requires Control Builder. Control Builder must be installed on the computer node where CAB Developer is installed and the node must have access to the Experion Server. The CAB Developer limit corresponds with the CB limit. Concurrent sessions of CAB Developer require concurrent licenses of Control Builder. The C300 control solver license includes the ability to load and execute CAB function blocks.
LX-BKCF00	**Experion LX Enhanced Bulk Build Tool** Enhanced bulk build and bulk edit is a feature that gives great ability to create offline templates for creating control strategies quickly. It offers several modes, including IO assignment, function block replacement, and exports to Microsoft Excel or Access for easy data manipulation. It is licensed on a per-Control Builder instance. For example, if your system has two Control Builder instances and both require use of Enhanced Bulk Configuration Tools, order two of TC-BKCF00.
LX-ESIG01	**Electronic Signature Option** Electronic Signature introduces enhanced capabilities to support the Pharmaceutical industry and its unique requirements related to regulations such as 21 CFR Part 11. However, it is also useful to any user requiring the ability to trace all operator actions. The electronic signature option allows for operator actions, such as acknowledging a message or controlling a point, to require one or more electronic signatures to complete the action. LX-ESIG01 provides the following functions: • Electronic Signatures on CEE generated operator messages • Electronic Signatures on SCADA points • Electronic signatures on Process points • Electronic Signatures on Point Scheduler • Ability to securely enable and disable Electronic Signatures by area If there is a requirement to complete Electronic Signatures across a DSA network, the Electronic Signature Option must be enabled on both the Publisher and the Subscriber.
LX-DEQ100	**100 Equipment Point Adders to Database Size** Includes redundant points if the server is redundant. Provide simplified engineering and operational efficiency for repeated assets. Equipment can be configured with minimal engineering effort, while the associated displays are generated automatically, reducing the engineering effort and allowing this task to be completed by people with less specialized training. Other points and hardware items built as part of the equipment still contribute to their own relevant capacity constraints. Refer ‘Point Count Example’ Annexure

Model Number	Model Description
LX-SVPWFB	**Power Function Blocks** A library of custom algorithms that significantly decrease the amount of effort needed to design common power generation control strategies. Power Function Blocks are licensed once per Engineering Station or Redundant Engineering Station pair.
LX-SMCS30	**C300 Controller Simulation Environment** A version of the Control Execution Environment that can be used to simulate and test the proper functioning of a control strategy. Simulation environments are sold per controller. If five (5) simulated controllers are required, then five (5) of LX-SMCS30 are ordered.
LX-ADSP01	**Advanced HMIWeb Solution Pack** Included with each Experion LX R500 media set is the standard HMIWeb Solution Pack, which can be used free of charge. HMI web advanced Solution pack must be ordered once per (redundant) server when viewing displays that include advanced HMIWeb SP components.

SCADA INTERFACE OPTIONS

Model Number	Model Description
LX-IDNPHB	**DNP3 History backfill functionality** Makes use of the time stamped values reported by the RTU after recovery from a communications failure to backfill data into Experion history. This functionality depends on the ability of the DNP3 controller to report time stamped values. The DNP3 interface is already included in LX database software. Experion DNP3 History backfill functionality has been qualified for the following devices: • Honeywell RTU 2020 • Foxboro SCADA RTU50 • Kingfisher CP21
LX-I60870	**IEC 60870 Protocol SCADA Interface** The IEC-60870 interface makes use of the IEC 60870-5-101 and 60870-5-104 protocols for connecting Experion to an RTU (Remote Terminal Unit). IEC 60870-5-101 is a protocol based on RS-232 while IEC 60870-5-104 is based on Ethernet. The Experion Server provides a software framework called the “point server” to integrate new devices with the Experion Server.
LX-I61850	**IEC 61850 Protocol SCADA Interface** Enables support for IEC-61850 Protocol SCADA interface regularly used for Power, T&D Applications
LX-IHWMLS	Honeywell Master Logic Integration
LX-IADDVM	**DVM Integration** Enables integration using Point Server technology with Honeywell Digital Video Manager. Ordered once per Experion LX (or redundant) server to enable integration with DVM
LX-IEMB00	Enron Modbus Interface
LX-IEMBOE	Enron Modbus EFM Functionality, can only be ordered with LX-IMB00, Enron Modbus interface

OPC AND DATA EXCHANGE OPTIONS

<table>
<tr><th>Model Number</th><th>Model Description</th></tr>
<tr><td>LX-OPCINT</td><td>
OPC Integrator SAI
OPC Integrator is a robust, easily configurable and efficient means of transferring data between OPC Data Access Servers. It acts as an OPC data client to two OPC data servers to facilitate the transfer of data between them.

The OPC Integrator is sold on a per Server Application Instance or SAI basis. An SAI is defined as an OPC Data Access Server Application whose data is being subscribed to by OPC Integrator on a given machine. This OPC Data Access Server may be on the same or different physical machine as the Experion LX Engineering Station. If the same OPC Data Access Server resides on two different physical machines and OPC Integrator is subscribing to data on both machines, this would be classified as two SAIs.

If multiple transfer groups are connecting to the same physical machine and OPC Data Access Server, then this is classified as only one SAI.
Enabled with the Experion LX Engineering Station is a free OPC Integrator SAI to the Experion LX OPC Data Access Server on the local machine. This OPC Integrator SAI allows for the transportation of data on the local Experion LX OPC Data Access server i.e. where the source and destination of an OPC Integrator transfer group uses the Experion LX OPC Data Access Server progID with an IP address of localhost. All other OPC Integrator connections, other than the one just mentioned are licensed.
Example 1
<table>
<tr><th>Transfer Group</th><th>Source Prog ID</th><th>Source IP</th><th>Dest Prog ID</th><th>Dest IP</th></tr>
<tr><td>Transfer Group A</td><td>Experion LX</td><td>Localhost</td><td>Experion LX</td><td>Localhost</td></tr>
</table>
No licensed OPC Integrator connections would be required in this example as the OPC Integrator Local Transport Enabler would be used which is supplied with all Experion LX Systems.
Example 2
<table>
<tr><th>Transfer Group</th><th>Source Prog ID</th><th>Source IP</th><th>Dest Prog ID</th><th>Dest IP</th></tr>
<tr><td>Transfer Group A</td><td>Vendor A</td><td>Localhost</td><td>Vendor A</td><td>192.168.0.1</td></tr>
<tr><td>Transfer Group B</td><td>Vendor A</td><td>Localhost</td><td>Vendor B</td><td>192.168.0.1</td></tr>
</table>
There would be a total of three Server Application Instances in this example,

Vendor A running on Localhost
Vendor A running on 192.168.0.1
Vendor B running on 192.168.0.1

</td></tr>
</table>

<table>
<tr><th>Model Number</th><th>Model Description</th></tr>
<tr><td>LX-OPCDA1</td><td>OPC Data Access Server
The OPC Data Access Server allows OPC Data Access Clients to view Experion LX Point data for control, historization, etc. OPC Data Access Server can also be used in combination with OPC Integrator for the read and write of data to another OPC Data Access Server.

The OPC Data Access Server is sold on a per Client Application Instance or CAI basis. Each OPC Client Application running on a physical node connecting into the Server consumes one 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.</td></tr>
<tr><td>LX-OPCHDA</td><td>Experion LX OPC Historical Data Access CAI
The OPC History Data Access Server is designed to expose Experion LX History in an open manner to OPC Clients that require this information.

The OPC History Data Access Server is sold on a per Client Application Instance or CAI basis. Each OPC Client Application running on a physical node connecting into the Server consumes one 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.</td></tr>
<tr><td>LX-OPCSAE</td><td>OPC Alarm & Event Server CAI
The OPC Alarm & Event Server is designed to expose Experion LX Alarm & Event data in an open manner to OPC Clients that require this information.

The OPC Alarm & Event Server is sold on a per Client Application Instance or CAI basis. Each OPC Client Application running on a physical node connecting into the Server consumes one 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.</td></tr>
<tr><td>LX-OPCADV</td><td>OPC Advanced Client
The OPC Advanced Client allows OPC Server information to be mapped into Experion OPC Advanced points, which allows you to have more than eight scanned parameters and user-defined names, and supports seamless integration of Alarm & Event Data from an OPC Alarm & Event Server into Experion Alarm Summary. As a whole, the OPC Advanced Client provides a unique capability to integrate complex data structures and their corresponding alarms within Experion.

This option has to be selected once per Engineering Station or redundant Engineering Station pair to integrate with any number of OPC Servers.</td></tr>
<tr><td>LX-XLDE01</td><td>Microsoft Excel Data Exchange, per user
Excel Data Exchange is licensed on a per user basis and requires ordering multiple quantities if multiple users require access. In general, a “user” is a third party application. The table below shows how the users should be calculated.

<table><tr><th>Requirement</th><th>Number of users</th></tr><tr><td>Live data into Microsoft Excel</td><td>One user per computer that needs to run Excel that acquires data from the Experion LX database</td></tr></table></td></tr>
</table>

<table>
<tr><th>Model Number</th><th colspan="2">Model Description</th></tr>
<tr><td rowspan="2"></td><td>Snapshot/historical data Microsoft Excel</td><td>One user per computer that needs to run Excel that acquires data from the Experion LX database</td></tr>
<tr><td>Integrated Excel reporting</td><td>One user, as the copy of Excel runs only on the server</td></tr>
</table>

QUALIFICATION AND VERSION CONTROL SYSTEM

QVCS support licensing is directly related to the Server Process Point count (the additional licenses chosen, not what's included in the base). The user must choose a base option first, and then the appropriate option identical to the Process Point count.

<table>
<tr><th>Model Number</th><th>Description</th></tr>
<tr><td>LX-QVC0BS</td><td>Qualification and Version Control System Base Software</td></tr>
<tr><td>LX-QVC100</td><td>100 Point QVCS</td></tr>
<tr><td>LX-QVC01K</td><td>1000 Point QVCS</td></tr>
<tr><td>LX-QVC02K</td><td>2000 Point QVCS</td></tr>
<tr><td>LX-QVC05K</td><td>5000 Point QVCS</td></tr>
<tr><td>LX-QVC10K</td><td>10000 Point QVCS</td></tr>
<tr><td colspan="2">Note 1: If there is a requirement to complete Electronic Signatures across a DSA network, the Electronic Signature Option must be enabled on both the Publisher and the Subscriber.</td></tr>
</table>

For example, assume your Process Point Database size is 2300 points (A quantity of one (1) LX-DPR02K (2000 Process Point Adder to Database) and a quantity of three (3) LX-DPR100 (100 Process Point Adder to Database)). To provide QVCS support, you will need a quantity of one (1) TC-QVC0BS, a quantity of one (1) LX-QVC02K and a quantity of three (3) LX-QVC100.

FIELDBUS INTEGRATION CONSIDERATIONS

Fieldbus Integration Guidelines – The Experion Fieldbus Interface Module (FIM) features high system capacity, complete flexibility, optional module redundancy and ease of engineering. The capability to read DD files provided by fieldbus device manufacturers and build library templates from these files is an integrated feature of the system. Interconnection of FF and C300 function blocks allows mixing and matching of control strategies and fully supports "control in the field."

See the Controller Specifications and the Foundation Fieldbus Specifications for detailed specifications and configuration limits.

Other useful information and tools can be obtained from the Foundation website http://www.fieldbus.org/

Device Testing. The capability to add Fieldbus devices to the Experion library is integrated into Control Builder. Devices must be registered with the Fieldbus Foundation at level ITK 4.0 or higher. At customer or vendor request, the Honeywell Fieldbus Interoperability Lab will test devices with the Experion Fieldbus solution. Device Descriptor files for devices tested are posted on our public website at www.honeywellprocess.com

Communication Usage Licenses

Communication Usage Licenses are subjected to licensing. The license always applies to the Server. Licenses cannot be transferred between servers. There are two types of licenses, as indicated per model number:
A – a fixed number of instances can be loaded to the system, regardless of controller assignment,
B – the function block library or feature is enabled, the number of instances of a function block does not matter.
Choose the quantities of the model numbers below necessary to provide the usage license for the hardware selected. For example, if your configuration requires six FIMs, select a quantity of one (1) LX-FFLX01 and one (1) LX-FFLX05. Note that FIM count applies to total number of non-redundant FIMs plus redundant FIM pairs per Server.

Model Number	Model Description
LX-FFLX01	Fieldbus Usage License, 1 FIM
LX-FFLX05	Fieldbus Usage License, 5 FIMs

Fieldbus Usage License is only supported in High Capacity system configuration

C300 ETHERNET/IP INTERFACE

The C300 Ethernet/IP interface allows the C300 to communicate directly with Ethernet/IP devices through a Level 2 connection to an Ethernet/IP network. It is licensed option per controller. For example, if a system has 10 C300s, and only 5 C300s need to communicate with Ethernet/IP devices, order 5 of LX-EPLX01.

Model Number	Model Description
LX-EPLX01	Ethernet/IP, 1 controller license

Ethernet/IP interface is only supported in High Capacity system configuration

EXPERION BATCH MANAGER (EBM)

EBM is licensed per Experion server. License instances can be distributed between any CEE assigned to the Experion server. Multiple servers are supported, limited by the license instances on each server.

The license mechanism monitors the sum of the S88 procedural elements: Procedure, Unit Procedure and Operation that are concurrently executing. This number is only evaluated when a batch is executing (i.e. created and not in pre execution or post execution) and a system alarm is raised if it is exceeded. A user is never prevented from creating or starting a batch because a license limit has been exceeded. Summary displays are not licensed and are available with the base Experion software.

Recipes

Instance Based Recipes

Instance based recipe or RCM is fully supported with Experion LX. However starting Experion LX R120, instance based recipe or RCM is not offered as a separate licensed item. Instead equal number of Class Based Recipe instances (described in the next section) needs to be purchased. For example, for 50 RCM instances, consider 2x LX-CBR025 (i.e. 50 CBR instances). Also using LX-CBRxxx model, a mix of class based recipes and RCM’s is allowed. In such case, model number LX-CBRNNN must be ordered where NNN is the sum of the class based recipes instances and the RCM’s required. The number of licensed instances is cumulative so for example ordering 2 x LX-CBR025 gives a license limit of 50 instances.

Class Based Recipes

Model Number	Model Description
LX-CBR010	Class Based Recipe Running 10 Instances
LX-CBR025	Class Based Recipe Running 25 Instances
LX-CBR100	Class Based Recipe Running 100 Instances
LX-CBR300	Class Based Recipe Running 300 Instances

A procedural element loaded to a CEE such as a Master Recipe at any level according to S88 consumes a single process point license. A batch created from a loaded Master Recipe or RCM appears in the summary displays but consumes no additional point licenses. EBM instances are only used when a procedural element is executing.

EXPERION LX ESERVER

Experion LX eServer provides a cost effective portal for users that should not be interfacing directly with the control system. The Honeywell eServer uses DSA to communicate to one (or many) on-process Experion server to provide a robust, high-performance data concentration to its casual users.

Model Number	Model Description
LX-EBASE1	eServer Base Package

The eServer Base package includes:

- Standard Access for an unlimited number of Users
- IIS Web Services
- Static Station (for administration of eServer)
- The maximum number of supported DSA Connection licenses
- Display Builder

The Experion LX eServer Base Package (LX-EBASE1) provides the services to run a fully operational eServer. Included is eServer Standard Access, allowing an unlimited number of web browsers (with no client application downloads required!) to view static snapshots of process graphic displays. The following options are available for eServer:

Premium Access Users

Experion LX eServer Premium Access is available optionally with Experion LX eServer, providing a dynamic solution that displays live, updating Experion custom graphics and trends. Users access Premium Access by downloading a small executable from the eServer home page, prior to using Premium Access for the first time. This executable runs locally on the user's computer but does not require to be installed on their computer.

Model Number	Model Description
LX-ETPREM1	eServer Premium Access, per User
Note 1 –An eServer supports a maximum of 38 Premium Access connections. This option includes user interactivity and real-time updating (i.e., pages don't have to be reloaded to view any changes). It operates in Internet Explorer.	

Media Kit for eServer
Experion LX eServer Installation Media is included in Experion LX Installation Media Kit, which needs to be ordered with LX-EBASE1

Model Number	Model Description
LX-DME500	Experion LX R500 Media Kit, Standard

Note: Experion LX eServer software needs to be ordered separately from Experion LX system software.

EXPERION VIRTUALIZATION SOLUTIONS

Virtualization Client Access Licenses

As Honeywell did with physical hardware, Honeywell provides value add additions to the virtualization layer. For this additional value that Honeywell is adding, a Client Access License is required for the use of Experion Software in a virtualized environment. Some of the things that Honeywell provides with these CALs include,

- Extensive certification and approval process for our applications to ensure that they work correctly virtualized
- Testing and guidance around VMware patches (done in a similar fashion to what HPS does with Windows patches)
- Development of solutions such as the Backup Control Center solution that solves new industry problems leveraging virtualization.
- Implementation and Planning Guide that provides the best practices for installing and configuring your virtual environment.
- Supply, support the complete virtual environment including the Hardware, Hypervisor, OS and Honeywell Software.

Model Number	Model Description
LX-EPCVMS	Experion LX Virtualization Server CAL
LX-EPCVMC	Experion LX Virtualization Client CAL

Notes

1. Experion LX Virtualization Server CAL applies to the following nodes,
   • Experion LX Server
   • SIM-C300
2. There is also a Virtualization Server CAL that applies to FDM. This can be found in the FDM Pricebook. For reference this applies to the following FDM nodes
   • FDM Server
   • FDM Gateway
3. Experion LX Virtualization Client CAL applies to the following nodes,
   • Flex Station
   • Direct Station
4. There is also a Virtualization Client CAL that applies to FDM. This can be found in the FDM Pricebook. For reference this applies to the following FDM nodes
   • FDM RCI
   • FDM Client
5. The above CALs need to be purchased for each running on process L2 virtual machine that contains the nodes mentioned. Definition of on process in this case is where
   “Experion or FDM is connected to any external system, Honeywell or third party, where that connection is used to access real-time or historical data. Data in the system is live process or instrument information.”
6. If both FDM and Experion Station are running on the same virtual machine, only one CAL of either type needs to be purchased
7. CALs are NOT required for the above nodes at Level 3 and above if they don't conform to the definition outlined in Note 5
8. Any of the nodes listed above, if they are shutdown do not require CALs i.e. in the case of a VM that has been copied for backup purposes.
9. While CALs do not need to be purchased for off process systems, at least one CAL of either type is still required in order to enable virtualization capabilities.

In addition to Virtualization Client Access Licenses, please refer to Honeywell virtualization wiki website for the latest specifications for hardware and software components that support Experion virtualization solution and detailed estimation guidance.

Experion Virtualization Estimation Tool provides configuration of Experion LX based Virtual System and HPS Virtualization Specification is the master document for all you need on Virtualization.

Please refer to the latest issue of Experion LX Model Selection Guide (MSG) files for the virtualization software components that can be ordered from Honeywell.

Please review the estimate with a specialist Sales consultant or project personnel or Experion LX product manager Shivendra.mishra@honeywell.com

MIGRATION PATHS AND UPGRADE OPTIONS

Experion LX offers off-line migration path from previous Experion LX releases. Below list covers various upgrade units that are required for upgrading any previous LX release to LX R50x. These upgrade units are required in appropriate quantities along with necessary Experion Media kit(s) [depending on number of migration steps], Operating System and Microsoft SQL licenses. Please contact your Honeywell account manager for more details.

Model Number	Description	Used for
LX-UPANR1	Experion LX Upgrade Unit – Release minus 1	Upgrades from Experion LX R120 to R50x
LX-UPANR2	Experion LX Upgrade Unit – Release minus 2	Upgrades from Experion LX R110 to R50x

Note 1 – Upgrade units based fee structure is introduced with Experion LX R500 onwards. Upgrade to LX R120 and previous releases don't require upgrade units.

Note 2 – Experion LX R10x systems require two step migration path, first from LX R10x to R11x system and then R11x to R50x using upgrade unit fee structure.

Calculation for number of upgrade units

The number of **Upgrade Units for an Experion LX upgrade to R500 = A + B + C + D** , where:

A	Base System S/W - each System has base system software, and this forms the minimum number of units needed for an upgrade order.	= 65 units
B	Factor to represent number of Process+SCADA Points in System - this does not include the free 100 Process & SCADA points each that are provided with the Experion LX base software.	= (Number of Process + Scada points) * 3 / 100. If redundant, multiply by 2.
C	Factor to represent number of Flex Stations (ES-F) in System - this excludes free 2x Flex Stations that is bundled in Experion LX	= Number of Flex Station * 15
D	Factor to represent number of Direct Stations- this excludes free 1x Direct Station that is bundled in Experion LX	= Number of Direct Stations * 30

Experion LX base software includes 100 Process, 100 SCADA points, 2xFlex Station and 1xDirect Station

The number of **Upgrade Units for an Experion LX eServer upgrade to R500 = A + B**, where:

A	Base System S/W - each eServer system has the base system software, and this forms the minimum number of units needed for an eServer upgrade order.	= 25 units
B	Factor to represent the number of Premium Access Connections	= Number of Premium Access Connections * 10

Experion LX R120 is the first release supporting eServer.

The LX R500 configurator has been updated with upgrade unit calculations. Here are some examples.

Example 1- Upgrade to Experion LX R500 system from Experion LX R110 system with 2100 Process and 600 SCADA points, 3xFlex Stations, 2xDirect Stations and Server redundancy
Solution:
A- 65 units
B- (2000+500)* 3/100= 75= 75 * 2 (Redundant system)= 150 units
C- 1* 15= 15 units
D- 1* 30= 30 units
Total (65+150+15+30)= 260 upgrade units= **260 qty of LX-UPANR2** (upgrade from LX R110)

Example 2- Upgrade to Experion LX R500 system from Experion LX R120 non-redundant system, **eServer** base system and 3x Premium access license, 1200 Process and 500 SCADA points, 4xFlex Stations and 1xDirect Station
Solution:
LX Server system-
A- 65 units
B- (1100+400)* 3/100= 45 units
C- 2* 15= 30 units
D- 0* 30= 0 units
Total (65+45+30+0)= 140 upgrade units= **140 qty of LX-UPANR1** (upgrade from LX R120)
LX eServer system-
A- 25 units
B- 3* 10= 30 units
Total (25+30)= 55 upgrade units= **55 qty of LX-UPANR1** (upgrade from LX R120)

Total upgrade units needed for the project (LX Server and eServer combined)= **140+55= 195 qty of LX-UPANR1**

SERIES 8 I/O MODULES

Series 8 is designed to meet critical process control needs. All Series 8 components have a unique look and feel. This new look allows for highly compact and customized installations.

The unique features of Series 8 I/O include:

- I/O Module and field terminations are combined in the same area. The I/O module is plugged into the I/O termination assembly (IOTA). This eliminates the need for a separate chassis to hold the electronics assemblies.
- Redundancy is accomplished directly on the IOTA without any external cabling or redundancy control devices but simply adding a second IOM to an IOTA. The only exception is the C300 controller, where a redundancy cable physically connects two C300 Controllers in a redundant configuration.
- Two level "detachable" terminals for landing the field wiring in the enclosure.
- Field power is supplied through the IOTA with no need for extra power supplies and the associated craft wired marshalling.

One of the unique features of Series 8 components is the look of the modules themselves. This new look has features to help facilitate the effective use of control hardware in a systems environment.

These features include:

- Vertical mounting of components to facilitate effective wiring. Vertical mounting allows for more effective wiring since most field wiring applications require entry from the top or bottom of the systems cabinet.
- Information "circle" that allows for a quick visual cue to draw the Maintenance Technician's eye to important status information.
- "Tilted" design allows for effective heat management within a cabinet enclosure. As Series 8 allows for very compact cabinet configurations, an effective heat management system is critical for high system availability.

C300 CONTROLLER AND SERIES 8 I/O MODELS

All C300 controller, Series 8 IOM and IOTA are available in Coated and Uncoated variants. The term 'Coated' stands for hardware with conformal coating material applied to electronic circuitry for protection against moisture, dust, chemicals, and temperature extremes. Coated IOM and IOTA are recommended when electronics must withstand harsh environments and need to have added protection.

As a quick reference, all the Series 8 Honeywell models starting with 8C denotes 'with Conformal Coating' and the models starting with '8U' denotes non-conformal coated hardware.

C300 Controller

Model Number	Description
8C-PCNT02	Series 8 C300 Controller, Coated
8C-TCNTA1	Series 8 C300 Controller I/O Termination Assembly(IOTA), Coated
51305980-836	Cable, Redundant C300 Controller

Coated Type S8 IOs

I/O Module (Coated)	IOTA (Coated)	Description	Circuits	Size (in “)	Red.
8C-PAIH54		High-level AI HART, Differential	16		√
	8C-TAIDA1	AI IOTA		9	
	8C-TAIDB1	AI IOTA Redundant		12	√
8C-PAIHA1		High-level AI HART, Single-ended	16		√
8C-PAINA1		High-level AI w/o HART, Single-ended	16		√
	8C-TAIXA1	AI IOTA		6	
	8C-TAIXB1	AI IOTA Redundant		12	√
8C-PAIMA1		Low-level AI – RTD & TC	16		
	8C-TAIMA1	Low-level AI IOTA		9	
8C-PAOHA1		Analog Output HART	16		√
8C-PAONA1		Analog Output w/o HART	16		√
	8C-TAOXA1	AO IOTA		6	
	8C-TAOXB1	AO IOTA Redundant		12	√
8C-PDILA1		Digital Input 24V	32		√
8C-PDISA1		Digital Input Sequence of Events	32		√
8C-PDIPA1		Digital Input 24V Pulse Accumulation	32		√
	8C-TDILA1	DI 24V IOTA		9	
	8C-TDILB1	DI 24V IOTA Redundant		12	√
8C-PDODA1		DO 24V Bussed Out	32		√
	8C-TDODA1	DO 24V Bussed IOTA		9	
	8C-TDODB1	DO 24V Bussed IOTA Redundant		12	√
	8C-SDOX01	DO Relay Extension [1]		15	√
Note 1- DO Relay Extension board is used along with DO IO module+ IOTA (Redundant or non-redundant)					

Interfaces Modules

Profibus Interface and IOTAs	
8C-IP0102	Profibus Gateway Module
8C-TPOXA1	Profibus Gateway Module IOTA
Foundation Fieldbus Interface	
S8-KFB4A1	Series 8 FIM4 Kit, Redundant
S8-KFB4B1	Series 8 FIM4 Kit, Non-Redundant
51307038-100	Power Control Module Assembly
FOE Interface	
8937-HN	Fiber Optic Extender Module

DEMONSTRATION HARDWARE AND SOFTWARE

The demonstration kit consists of the series 8 controller and I/O hardware kit and the Experion LX demonstration software set. A complete demonstration software order requires ordering of all of the following models in the indicated quantities. The demonstration software is a full Experion System but limited 5 hour runtime. It does not require a license dongle and the Demonstration systems are not for sale to end users.

Experion LX Demo Software- Must order below items in specified quantity		
Model Number	**Description**	**Quantity**
LX-DEMOSW	Experion LX Demo Software License	1
LX-DME500	Experion LX R500 Media Kit- Standard	1
MZ-SQLCL4	Microsoft SQL runtime CAL	3
Experion LX Hardware Demo		
HTK-EPLX-UA-120-01	Series 8 Controller and I/O Demo Kit [1]	1
Note 1 – Model number shall be updated shortly with Experion LX R500		

Notes:
1) All Software orders require a Siebel number for order entry
2) Demo Software and Hardware Kit are for sales purposes and are not available for resale to an End User
3) Demo Software has a 5 hour run-time; no dongle required
4) Development System Software is for use by System Integrators
5) Contains a Redundant C300 controller, HLAI HART, AO HART, DI and DO Modules and IOTAs

For reference the demonstration software system includes the following feature set:

Model Number	Model Description	Quantity
LX-DBASE1	Experion LX Base Software	1
LX-RBASE1	Experion LX Redundancy Base Adder	1
LX-DSC01K	Experion LX SCADA Point adder, 1000 Pt	3
LX-DPR01K	Experion LX Process Point adder, 1000 Pt	3
LX-RPR01K	Experion LX Red Process Adder 1000 Point	3
LX-RSC01K	Experion LX Red SCADA Adder 1000 Point	3
LX-CBR025	Class Based Recipe Running 25 Instances	1
LX-BKCF00	Enhanced Bulk Configuration Tools for Control Builder	1
LX-SMCS30	Experion LX C300 Simulation Environment	5
LX-OPCDA1	Experion LX OPC DA Server	1
LX-OPCHDA	Experion LX OPC HAD HDA Server	1
LX-OPCINT	Experion LX OPC Integrator	1
LX-OPCSAE	Experion LX OPC A&E Server	1
LX-OPCADV	Experion LX OPC Advance Client	1
LX-SVALGP	Experion LX ALARM Shelving	1
LX-SVALDS	Experion LX Alarm DSA Report	1

LX-XRESR1	Experion LX DSA SERVER ENABLER	1
LX-AESHED	Experion LX Point Control Scheduler	1
LX-XLDE01	Experion LX Excel Data Exchange	1
LX-SVPWFB	Experion LX Power Function Blocks	1
LX-IDNPHB	Experion LX DNP3 History Backfill	1
LX-I61850	Experion LX IEC 61850 Interface License	1
LX-I60870	Experion LX IEC 60870 Interface License	1
LX-PZE000	Station Pan and Zoom, Per Server	1
LX-ALMTND	Alarm Tracker	1
LX-DASENB	Dynamic Alarm Suppression	1
LX-DEQ100	100 Equipment Point Adders to Database Size	1
LX-ADSP01	Advanced HMIWeb Solution Pack	1
LX-FFLX05	Fieldbus Usage License, 5 FIM	1
LX-IHWMLS	Experion LX Masterlogic Integration	1
LX-EPCVMS	LX Virtualization Server CAL	1
LX-EPCVMC	LX Virtualization Client CAL	1
LX-ESIG01	Electronic Signature Option	1
LX-QVC0BS	QVCS Base SW	1
LX-QVC100	100 Point QVCS	1
LX-EPLX01	Ethernet/IP, 1 controller license	3
LX-SMWIN1	Multi-window Support	1

DEVELOPMENT SOFTWARE

The Development Software package is for use by System Integrators who will be building and delivering the systems. A complete Development Software order requires ordering of all of the following models in the quantities indicated.

The Development system is a full system with all options turned on and a run time of one year. This will be provided to SIs as their development system and is not for resell to customers. This will not show up on our price list but will be an internal item that will be authorized by our channel team once the contract is in place with the channel partner. Contracts with SIs are an annual agreement, if not renewed then the development software is deactivated.

Experion LX Development Software- Must order below items in specified quantity		
Model Number	**Description**	**Quantity**
LX-DEVPSW	Experion LX Development Software License	1
LX-DME500	Experion LX R500 Media Kit- Standard	1
MZ-SQLCL4	Microsoft SQL runtime CAL	3

For reference the Development software system runs on a Server and includes a Base Software with 10,000 Process pts and 50,000 SCADA pts licenses and the following feature set:

Model Number	Model Description	Quantity
LX-STAD01	Experion LX Direct Station	1
LX-DSBLDR	Experion LX Display Builder	1 (2 total including 1 in base sw)
LX-QKBLDR	Experion LX Quick Builder	1 (2 total including 1 in base sw)
LX-COBLDR	Experion LX Control Builder	1 (2 total including 1 in base sw)
LX-SMCS30	Experion LX C300 Simulation Environment	32
LX-AESHED	Experion LX Point Control Scheduler	1
LX-XLDE01	Experion LX Excel Data Exchange	1
LX-SVPWFB	Experion LX Power Function Blocks	1
LX-XRESR1	Experion LX DSA SERVER ENABLER	5
LX-CBR300	Class Based Recipe Running 300 Instances	1
LX-OPCINT	Experion LX OPC Integrator	15
LX-OPCDA1	Experion LX OPC DA Server	127
LX-OPCSAE	Experion LX OPC A&E Server	15
LX-OPCHDA	Experion LX OPC HDA Server	127
LX-SVALGP	Experion LX Alarm Shelving	1
LX-SVALDS	Experion LX Alarm DSA Report	1
LX-I61850	Experion LX IEC 61850 Interface License	1
I61850-802FEE	IEC61850 802 LITE ROYALTY FEE	1
LX-I60870	Experion LX IEC 60870 Interface License	1
LX-OPCADV	Experion LX OPC Advance Client	2
LX-IDNPHB	Experion LX DNP3 History Backfill	1
LX-SVALGP	Experion LX ALARM Shelving	1
LX-BKCF00	Enhanced Bulk Configuration Tools for Control Builder	1
LX-PZE000	Station Pan and Zoom, Per Server	1
LX-ALMTND	Alarm Tracker	1
LX-DASENB	Dynamic Alarm Suppression	1
LX-DEQ100	100 Equipment Point Adders to Database Size	1
LX-ADSP01	Advanced HMIWeb Solution Pack	1
LX-FFLX05	Fieldbus Usage License, 5 FIMs	1
LX-IHWMLS	Experion LX Masterlogic Integration	1
LX-EPCVMS	LX Virtualization Server CAL	1
LX-EPCVMC	LX Virtualization Client CAL	1
LX-ESIG01	Electronic Signature Option	1
LX-QVC0BS	QVCS Base SW	1
LX-QVC100	100 Point QVCS	1
LX-EPLX01	Ethernet/IP, 1 controller license	3
LX-SMWIN1	Multi-window Support	1
LX-IADDVM	DVM Integration	1
LX-IEMB00	Enron Modbus	1
LX-IEMBOE	Enron Modbus Interface	1
LX-ACVAGE	Alarm Pager	1

ANNEXURE 1- EXPERION BATCH MANAGER

Experion Batch Manager (EBM) is the name given to a combination of Experion features applied to batch processes. The same features can be used for the execution of procedures in continuous processes and is called Procedural Operations. Customers use different terminologies between these segments and so different names are required. For further detail on EBM terminology refer to the EBM User Guide or Specification.

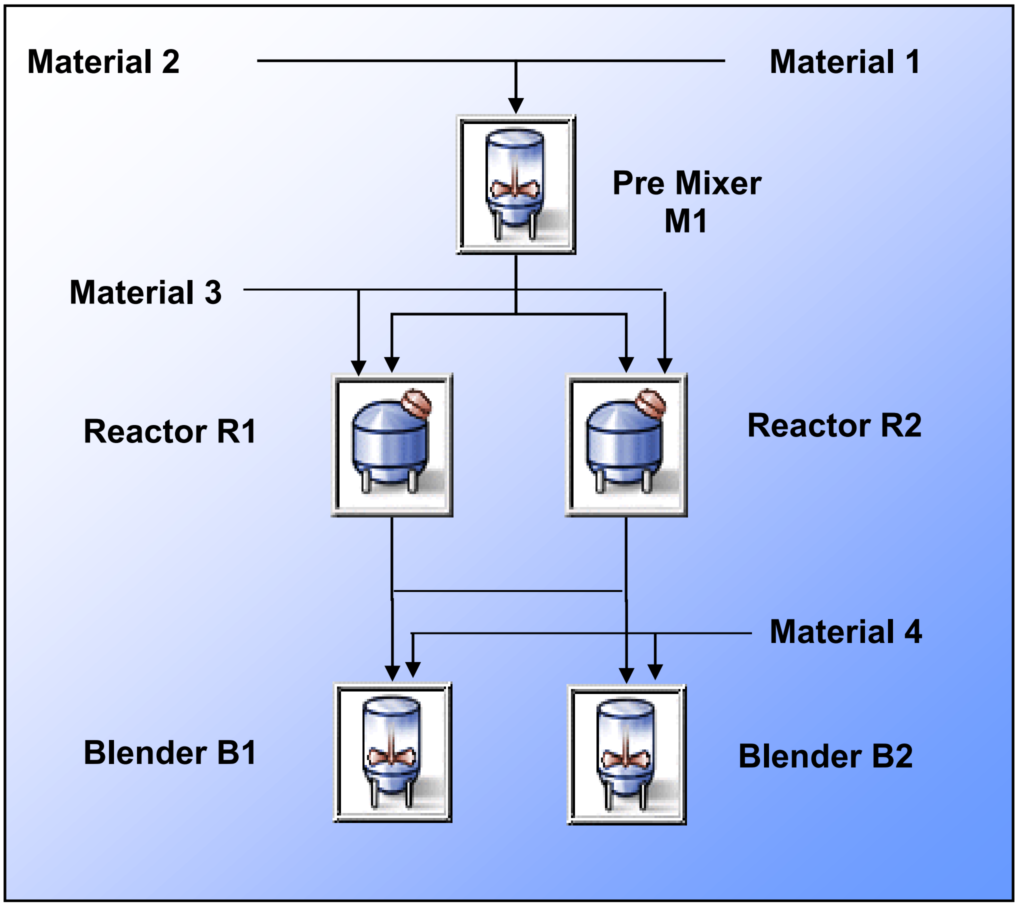
S88 is the ISA standard for structure and terminology in batch processes and products. It is universally used by end users, vendors and consultants in designing and licensing batch systems. Some knowledge of S88 is useful when estimating Batch Manager.

Minimum system configuration for EBM consists of:

1 x Experion Process Server
1 x CEE controller with Series 8 C300
1 x Control Builder license

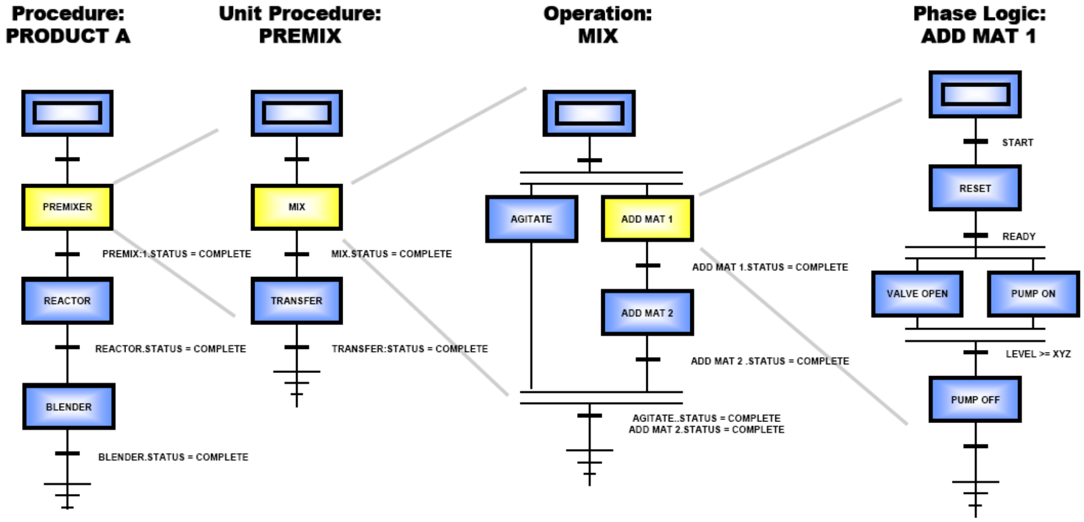
Two sets of batch types are available in Experion for instance based and class based recipes respectively. For plants with multiple sets of identical equipment customers with new Experion systems are likely to use class based recipes to reduce configuration and maintenance effort.

Typical Batch Plant



S88 defines this as a Process Cell which is made up of Units M1, R1, R2, B1 and B2. Materials 1 and 2 are mixed in M1 then transferred to R1 or R2 where material 3 is added and a reaction takes place. The product is then transferred to B1 or B2 where material 4 is added. The final product is transferred to storage.

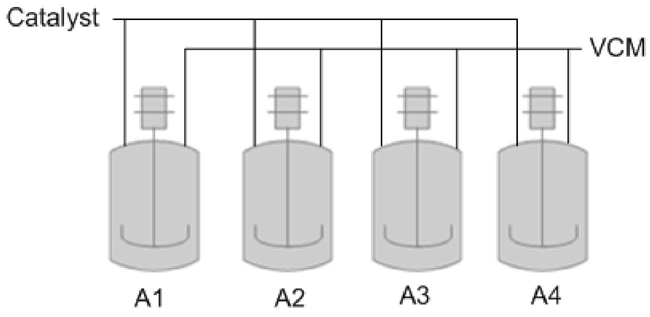
S88 structures recipes into 4 hierarchical layers, Procedure, Unit Procedure, Operation and Phase. A Procedure for this example would consist of 3 Unit Procedures one for each of Mixer, Reactor and Blender. Each unit procedure may be made up of a number of Operations in the case of the pre-mixer these are Mix and Transfer. Each Operation is made up of a number of Phases for the Mix operation these are Agitate, Add Mat 1 and Add Mat 2. Each product produced will have a different recipe. For this example there are say 5 different products.


Procedure:
PRODUCT A
Unit Procedure:
PREMIX
Operation:
MIX
Phase Logic:
ADD MAT 1
PREMIXER
PREMIX:1.STATUS = COMPLETE
REACTOR
REACTOR.STATUS = COMPLETE
BLENDER
BLENDER.STATUS = COMPLETE
MIX
MIX.STATUS = COMPLETE
TRANSFER
TRANSFER:STATUS = COMPLETE
AGITATE
ADD MAT 1
ADD MAT 1.STATUS = COMPLETE
ADD MAT 2
ADD MAT 2 .STATUS = COMPLETE
AGITATE..STATUS = COMPLETE
ADD MAT 2.STATUS = COMPLETE
START
RESET
READY
VALVE OPEN
PUMP ON
LEVEL >= XYZ
PUMP OFF

Example 1 - Using Instance Based Recipes

Before Experion LX R120, EBM systems used Recipe Control Modules (RCM's) and SCM's for all batch functions. An RCM executes in a CEE and is permanently configured in the CEE.

Here is a simplified Batch Plant for 4 PVC Autoclaves making 5 different recipes grades 1101 to 1105:

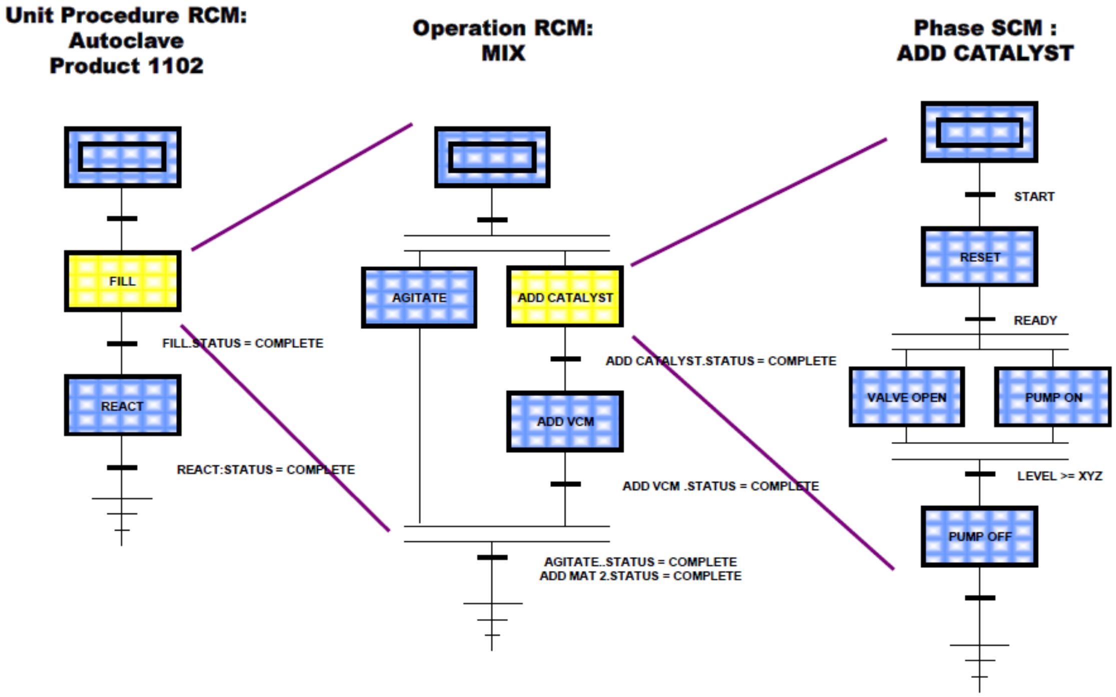

Catalyst
VCM
A1
A2
A3
A4

Example 1 Batch Manager Layout

In S88 terms this plant has 4 batch units: A1 to A4, phases shared between autoclaves for Catalyst/VCM and phases dedicated to each autoclave for heating and agitator.

Unit	A1	A2	A3	A4
Shared Phase	Catalyst			
Shared Phase	VCM			
Dedicated Phases	Heated	Heated	Heated	Heated
Dedicated Phases	Agitator	Agitator	Agitator	Agitator

For each product a unit procedure RCM is configured made up of 2 operation RCM’s (Fill and React) which are in turn made up of phases. In Experion each phase is an SCM. The diagram below shows the unit procedure RCM for recipe 1101. This would again be repeated for 4 autoclaves and the recipes 1101 to 1105 so a total of 20 unit procedures are configured


Unit Procedure RCM:
Autoclave
Product 1102
Operation RCM:
MIX
Phase SCM :
ADD CATALYST
FILL
FILL.STATUS = COMPLETE
REACT
REACT:STATUS = COMPLETE
AGITATE
ADD CATALYST
ADD CATALYST.STATUS = COMPLETE
ADD VCM
ADD VCM .STATUS = COMPLETE
AGITATE..STATUS = COMPLETE
ADD MAT 2.STATUS = COMPLETE
START
RESET
READY
VALVE OPEN
PUMP ON
LEVEL >= XYZ
PUMP OFF

Estimating Example 1 Licenses

	Step	Example Configuration
1	Estimate Experion hardware based on customer requirement for servers, stations and controllers including the number of process points.	Minimum 1 x Experion Process Server, 1 x Experion Station, 1 x CEE plus associated licenses. Estimated 1000 total number of process points based on I/O.
2	Estimate the number of S88 Units the customer has. One UCM will be required for each Unit. Input from the customer or Honeywell project group may be required to do this.	4 units require 4 x UCM’s. Consumes 4 licensed process points from step 1.
3	Estimate the number of Phases (SCM’s) required. Input from the customer or Honeywell project group will be required to do this	Catalyst x 1 VCM x 1 Heating x 4 Agitator x 4 10 SCM’s consuming 10 process points from step 1. If this information is not available for license estimating purposes allow 10 SCM’s per Unit.
4	Establish the number of recipes the customer will need and how many units are involved in each recipe	5 recipes 1101 to 1104 where each recipe will have at least 1 x RCM for the Unit Procedure and 2 x RCM’s for Operations. The number of operations will depend on the customer’s process and preferences.

		For license estimating purposes allow 2 Operations for each Unit Procedure. 5 products x (1 unit procedure + 2 operations) = 15 RCM’s x 4 units = 60 RCM’s consuming 60 process points from step 1. If this information is not available roughly estimate the number of RCM as: (number of units x 3 x number of recipes) = 60 in the example.
5	Validate the number of process points in step 1 is sufficient allowing for any spare requirement from the customer.	Process points for batch required in steps 2 to 4: 4 UCM 10 SCM 60 RCM Total 74 additional process points. Order an additional 100 process point adder license LX-DPR100.
6	Establish how many recipes will be running concurrently. From this estimate how many RCM’s will be executing concurrently.	If the plant is fully loaded 4 recipes may be running concurrently, one batch in each Unit. Each batch will be executing 1 x Unit Procedure and 1 x Operation. The number of concurrent executing RCM’s is (4 units x (1 Unit Procedure + 1 x Operation)) = 8 running RCM’s. Order 1 x LX-RCM010 for 10 running RCM’s. If this information is not available as a rough estimate allow 3 running RCM for each unit.
7	Review the estimate with a specialist Sales consultant or project personnel. For a current list of contacts refer to the contacts page of the **Batch Knowledge community wiki**	

Example 1 - using Class Based Recipes

In example 1 one batch requires only one unit and there are 5 products. This means 5 unit procedure RCM’s have to be configured and maintained for each unit, one for each product. This also means that a batch has to be complete before the next can be started possibly causing operational delays. These problems increase when plant configuration means one batch requires multiple units and are resolved by the use of Class Based Recipes.

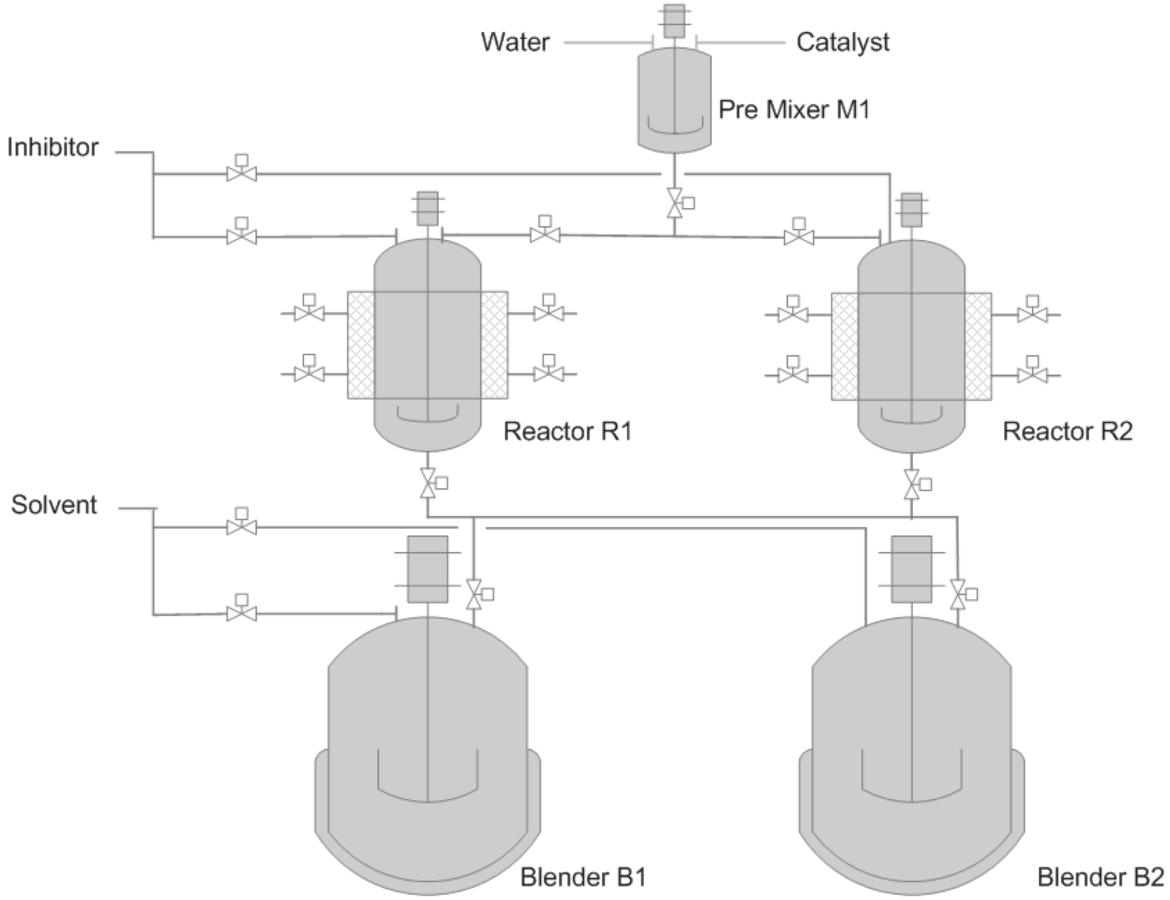
Class Based Recipes use the same S88 structure but do not normally use static RCM’s. Instead of an RCM a Master Recipe (MR) is configured for each product in the example 1. A MR is configured in a CEE and resides permanently in that CEE. When a batch is set up by the operator in the batch summary or other display a Control Recipe (CR) is created from the MR in the same CEE. The operator can select the Autoclave they wants to use (A1 to A4) and assigns it to the batch/CR they have created. They can queue up as many batches as he wants at the start of a day or shift limited only by the CEE resources. The control recipe is transient and resides in the CEE only until the batch is removed from the batch summary display.

Estimating Example 1 - Licenses Class Based Recipes

	Step	Example Configuration
1	Estimate Experion hardware based on customer requirement for servers, stations and controllers including the number of process points.	Minimum 1 x Experion Process Server, 1 x Experion Station, 1 x CEE plus associated licenses. Estimated 1000 total number of process points based on I/O.
2	Estimate the number of S88 Units the customer has. One UCM will be required for each Unit. Input from the customer or Honeywell project group may be required to do this.	A unit instance is derived from a unit class, here is only one unit class Autoclave. Ensure there are sufficient process points in step 1 for the unit instances. Input from the customer or Honeywell project group may be required to do this 4 units require 4 x autoclave unit instances. Consumes 4 licensed process points from step 1.
3	Estimate the number of Phases (SCM's) required. Input from the customer or Honeywell project group will be required to do this	Catalyst x 1 VCM x 1 Heating x 4 Agitator x 4 10 SCM's consuming 10 process points from step 1. If this information is not available for license estimating purposes allow 10 SCM's per Unit.
4	Establish the number of recipes the customer will need and how many units are involved in each recipe	5 recipes each will have a MR consisting of 1 x unit procedure and 2 x operations. The number of operations will depend on the customer's process and preferences. For license estimating purposes allow 2 Operations for each Unit Procedure. products x (1 unit procedures + 2 operations) = 15 this consumes 15 process points from step 1. Note reduction from 60 using instance based recipes. If this information is not available roughly estimate the number of points for recipes: (number of units x 3 x number of recipes) = 15 in the example.
5	Validate the number of process points in step 1 is sufficient allowing for any spare requirement from the customer.	Process points for batch required in steps 2 to 4: 4 unit instances 10 SCM 15 recipes Total 29 additional process points. Note reduction from 74 using instance based recipes. Order an additional 100 process point adder license LX-DPR100.
6	Establish how many recipes will be running concurrently. From this estimate how many RCM's will be executing concurrently.	If the plant is fully loaded 4 recipes may be running concurrently, one batch in each Unit. Each batch will be executing 1 x Unit Procedure 1 x Operation. The number of executing recipes is 4 units x (1 Unit Procedure + 1 x Operation) = 8 running instances. Order 1 x LX-CBR010 for 10 license instances with CBR. If this information is not available as a rough estimate allow 3 running RCM for each unit.
7	Review the estimate with a specialist Sales consultant or project personnel. For a	

	current list of contacts refer to the contacts page of the **Batch Knowledge community wiki**	

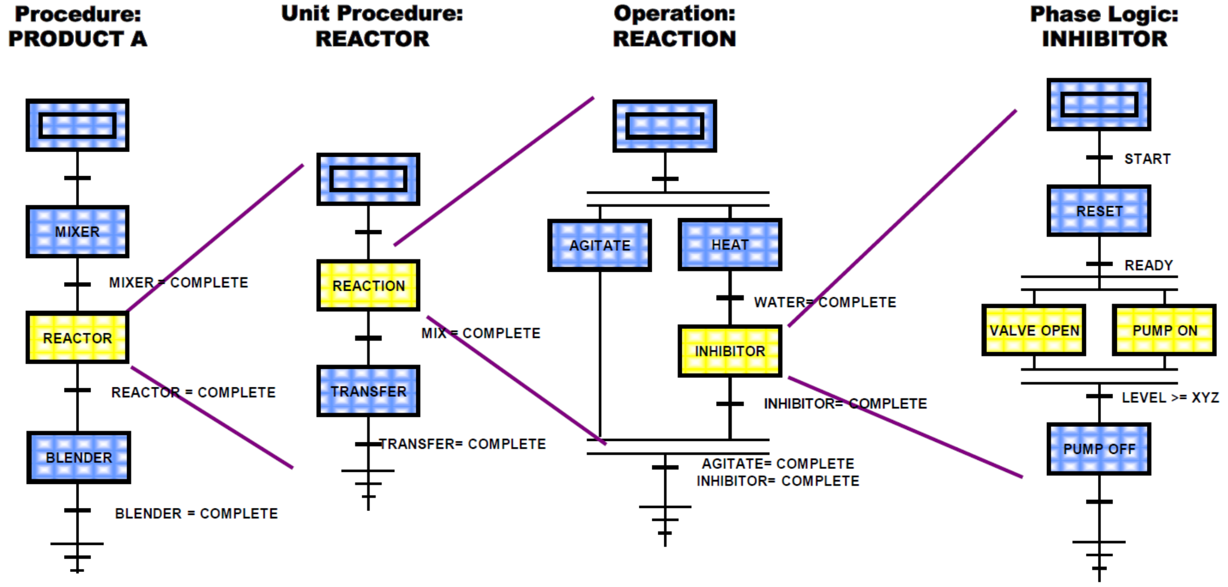
Example 2 - using Class Based Recipes



Example 2 is a resin plant made up of Units M1, R1, R2, B1 and B2. Catalyst and water are mixed in M1 then transferred to R1 or R2 where heating takes place. When a reaction has taken place inhibitor is added. The product is then transferred to B1 or B2 where Solvent is added. The final product is transferred to storage. This example is complex to automate using RCM's and class based recipes offer significant benefits. S88 structures recipes in example 2 into 4 hierarchical layers (one more than the PVC example); Procedure, Unit Procedure, Operation and Phase. A Procedure for this example would consist of 3 Unit Procedures one each for Mixer, Reactor and Blender. Each unit procedure may be made up of a number of Operations. In the case of the Reactor these are Reaction and Transfer. Each Operation is made up of a number of Phases for the Mix operation these are Agitate, Heat and Inhibitor. Each product may have a different master recipe. For this example there are 8 different products 1210 to 1208. There are 3 equipment unit classes Mixer, Reactor and Blender. There is a single instance of the Mixer Class M1, 2 instances of Reactor R1 and R2, Blender B1 and B2.
The following phases are configured as "functions" which normally correspond to a phase. The same phase can be shared between equipment for example Inhibitor and Solvent. Functions are mapped to specific tags for the unit instance that is selected by the operator when the batch is executing.

	Unit Class Mixer	Unit Class Reactor		Unit class Blender	
Function (Phase)	M1	R1	R2	B1	B2
Water	X				
Catalyst	X				
Inhibitor		X			
Solvent				X	
Agitator	X	X	X	X	X
XferOut	X	X	X	X	X
Heat		X	X		

A master recipe is configured by linking functions together to build Procedures, Unit Procedures, and Operations. At batch creation the operator selects the unit to use, starts the batch and the recipe uses the tags mapped to the unit selected. This reduces the number of recipes which have to be built and maintained compared with RCM recipes.


Procedure:
PRODUCT A
Unit Procedure:
REACTOR
Operation:
REACTION
Phase Logic:
INHIBITOR
MIXER
MIXER = COMPLETE
REACTOR
REACTOR = COMPLETE
BLENDER
BLENDER = COMPLETE
REACTION
MIX = COMPLETE
TRANSFER
TRANSFER= COMPLETE
AGITATE
HEAT
WATER= COMPLETE
INHIBITOR
INHIBITOR= COMPLETE
AGITATE= COMPLETE
INHIBITOR= COMPLETE
START
RESET
READY
VALVE OPEN
PUMP ON
LEVEL >= XYZ
PUMP OFF

In this example the class based master recipe for Product A consists of 1 x Procedure, 3 x Unit Procedures, 2 x Operations and the phases shown. The Operator can select either reactor or blender based on plant priorities.

Estimating Example 2 - Licenses Class Based Recipes

	Step	Example Configuration
1	Estimate Experion hardware based on customer requirement for servers, stations and controllers including the number of process points.	Minimum 1 x Experion Process Server, 1 x Experion Station, 1 x CEE plus associated licenses. Estimated 1000 total number of process points based on I/O.
2	Estimate the number of S88 Units the customer has. One unit instance will be required for each Unit. Input from the customer or Honeywell project group may be required to do this.	5 unit instances require: 1 x Mixer 2 x Reactor Class 2 x Blender Class Consumes 5 licensed process points from step 1.
3	Estimate the number of Phases (SCM's) required. Input from the customer or Honeywell project group will be required to do this.	16 Phases indicated by X in table above 16 SCM's consuming 16 process points from step 1. If this information is not available for license estimating purposes allow 10 SCM's per Unit.
4	Establish the number of recipes the customer will need and how many units are involved in each recipe	8 product recipes where each recipe will have at least 1 x Procedure, 3 x Unit Procedures (Mixer/Reactor/Blender). The number of operations will depend on the customer's process and preferences, Example 2 shows 2 x Operations for the reactor Unit Procedure and none for the Mixer or Blender. 1 Procedure 3 Unit Procedures 2 Operations Each of the 8 recipes has 6 procedural elements each consuming 1 licensed process points from step 1. This consumes 6 x 8 = 48 process points from step1. If this information is not available roughly estimate the number points consumes as: (number of units x 2 x number of recipes) = 80 in the example
5	Validate the number of process points in step 1 is sufficient allowing for any spare requirement from the customer.	Process points for batch required in steps 2 to 4 : 5 unit instances 16 SCM's 48 for recipes Total 69 additional process points. Order an additional 100 process point adder license LX-DPR100.
6	Establish how many recipes will be running concurrently. From this estimate how many procedural elements will be executing concurrently.	If the plant is fully loaded 5 recipes may be running concurrently (one batch in each Unit). Each batch will be executing 1 x Procedure 1 x Unit Procedure 1 x Operation The number of licensed instances is 5 units x (1 x Procedure + 1 x Unit Procedure + 1 x Operation) = 15 running instances. Order 2 x LX-CBR010 for 20 license instances with CBR.

		If this information is not available as a rough estimate allow 3 running procedural elements for each unit.
7	Review the estimate with a specialist Sales consultant or project personnel.	

Comparing Class Based & Instance Based Recipes

	Instance Based	Class Based
Summary Display Support	Yes	Yes
S88 Layered Recipes	Yes	Yes
Fixed Equipment References	Yes	Not Recommended
Class Based References	No	Yes
Data Block Support	Yes	Yes

Recipe Builder

Recipe Builder provides a subset of the functionality available in Control Builder for the building of recipes only. For license purposes Recipe Builder is treated as an instance of Control Builder. Recipe builder can be started without starting the configuration studio first.

Like control Builder, Recipe Builder can be installed on any client PC with the appropriate specification. There is no specific license for Recipe Builder. Order sufficient Control Builder Client Licenses LX-COBLDR for the sum of Control Builder and Recipe Builder stations required.

ANNEXURE 2- EXPERION VIRTUALIZATION SOLUTION

Virtualization emulates the various layers of a typical computing environment. Through a process of abstraction, it removes many of the limitations experienced when dealing directly with these layers.

In the context of process control systems, many of today's manufacturers require separate servers to support different applications. Virtualization allows a single server to simultaneously run multiple operating systems and applications. It does this while insulating these virtual machines from the underlying hardware and also from each other. Virtualization also encapsulates these virtual machines in a single set of files that can be moved to different locations or duplicated, thereby allowing new machines to be generated with ease.

By combining virtualization with Experion LX, Honeywell users can optimize their industrial control applications. Virtualization enables plants to:

- Reduce PC hardware requirements
- Reduce the frequency and impact of operating system and hardware changes
- Simplify overall system management
- Improve availability, reliability and disaster recovery

The Virtualization Infrastructure is the software that virtualizes the physical hardware and presents to one or more Experion Nodes a "virtual machine" that each has a standardized set of virtual devices, referred to as virtual hardware.

In addition to providing all of the above benefits when Experion applications are run virtualized, Honeywell also provides a Backup Control Center solution based around VMware's Site Recovery Manager Solution that provides a highly flexible disaster recovery solution for control centers.

Note that the information below is correct at the time of writing; however the virtualization wiki is the primary reference for this information. This content will no longer be actively maintained. If this information at any point contradicts the wiki, the wiki should be considered correct. Text in blue below will take you to the key wiki pages Virtualization Wiki can be found at https://acswiki.honeywell.com/display/acsHPSkcVirtual/Home

Software
The Virtualization Infrastructure software that Honeywell HPS ships is VMware's vSphere 6.x. HPS supplies 3 different types of VMware Hypervisor product along with Site Recovery Manager for our BCC Solution. Click on the hyperlinks below for further information.

vSphere Essentials Plus

- This package will s upport the vast majority of virtualization projects.
- Sold with support for up to 3 physical computers
- Default choice

vSphere Standard

- Designed for larger solutions that require more than 3 hosts
- Required for our Backup Control Center Solution
- Sold on a per CPU socket basis.
- Must be sold with vCenter Standard

Site Recovery Manager
Used for Experion's Backup Control Center solutions

More details can be found at- Software:
https://acswiki.honeywell.com/display/acsHPSkcVirtual/Estimating+VMware+Licensing+Requirements
Hardware:
https://acswiki.honeywell.com/display/acsHPSkcVirtual/Virtualization+Hardware+Components+Overview

ANNEXURE 3- EQUIPMENT POINT COUNT EXAMPLE

Point Count Example 1:
The customer requires 1,125 points implemented in C200/C200E controllers. Additionally, the server will interface with several PLCs that will contain an additional 5,300 points. To accomplish this, you will order the Database Base Software (EP-DBASE1) and a complement of adders for Process points and SCADA points. Specifically, a quantity of one (1) EP-DPR01K and a quantity of one (1) EP-DPR100 (the Database Base Software includes 50 Process points that will cover the remaining 25 points in the C200/C200E controllers) will cover the necessary Process points. A quantity of one (1) EP-DSC05K and a quantity of three (3) EP-DSC100 will cover the necessary SCADA points.

Point Count Example 2: (using Equipment)
The customer has 150 wellheads all using the same Equipment template called 'Wellhead1'. Each wellhead uses 50 SCADA points therefore the template 'Wellhead1' includes 50 SCADA points. When built, 150 Wellheads will consume 150 Equipment Points and 7,500 SCADA points. To accomplish this with a redundant server, (see redundancy license details below), you will order the Database Base Software (EP-DBASE1), and the Redundancy Base Software (EP-RBASE1), plus:

- SCADA points: one (1) by EP-DSC05K, one (1) by EP-DSC02K, five (5) by EP-DSC100, (total of 7,500 points: May be more efficient to order 10,000 points instead);
- SCADA point redundancy: one (1) by EP-RSC05K, one (1) by EP-RSC02K, five (5) by EP-RSC100;
- Equipment points: two (2) by EP-DEQ100

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