

# **Technical Information**

Experion LX Specification Fault Tolerant Ethernet



LX03-500-120 Release 120 February 2015, Version 1

## **Revision History**

Revision	Date	Description
1.0	February 2015	Release Publication

## **Table of Contents**

1. Pro	duct Introduction	<u>11</u> 4
1.1.	Experion LX System	
1.2.	Architecture Overview	
1.3.	Experion LX Fault Tolerant Ethernet Overview	<u>11</u> 4
2. Spe	ecifications	
2.1.	FTE Architecture Overview	
2.2.	Product Specifications	
2.3.	Topologies and Configuration Examples	
2.4.	Recommended FTE Switches	

## 1. Product Introduction

## 1.1. Experion LX System

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

## 1.2. Architecture Overview

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

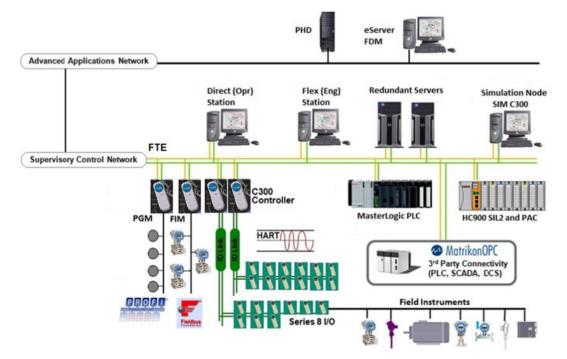


Figure 1 - Sample Experion LX Architecture

## 1.3. Experion LX Fault Tolerant Ethernet Overview

FTE is the control network for Experion family systems. FTE provides multiple communication paths between nodes, enabling an FTE network to tolerate all single faults and many multiple faults. FTE is dedicated to the control mission-providing not only fault tolerance but also the performance, determinism, and security required for industrial control applications.

FTE unites Honeywell's expertise in designing robust control networks with commercial Ethernet technology in a patented advanced networking solution. While FTE is not a general purpose Information Technology (IT) network due to its control mission, it leverages commercial Ethernet technology to lower the costs of the FTE network infrastructure, connections to IT networks, connections to 3<sup>rd</sup> party Ethernet devices, and on-going maintenance and support.

An FTE network is implemented through FTE nodes and appropriately configured switches. Normal Ethernet nodes can also connect to an FTE network and benefit from its highly available communications environment.

## 2. Specifications

## 2.1. FTE Architecture Overview

A Experion LX system has one or more clusters--a group of nodes associated with the same Experion LX Server, e.g., Level 1 nodes like controllers, and Level 2 nodes like Direct Stations and Experion LX Servers. FTE provides multiple communication paths through two parallel trees of switches and cables; an FTE node connects to each tree. FTE nodes form a fault-tolerant community whose members can communicate if at least one path exists between them. FTE nodes detect Ethernet nodes and use any available path to communicate with them also. FTE status can also be displayed by the FTE status Auxiliary Display in Experion LX system.

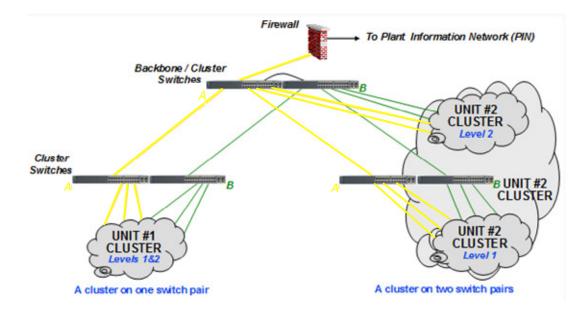


Figure 2 - Basic FTE Network Architecture

For reliable operation in high noise industrial environments, Honeywell recommends fiber optic cables and shielded copper cables. FTE network security is designed in, layer by layer, through switch configuration files, and best practice recommendations.

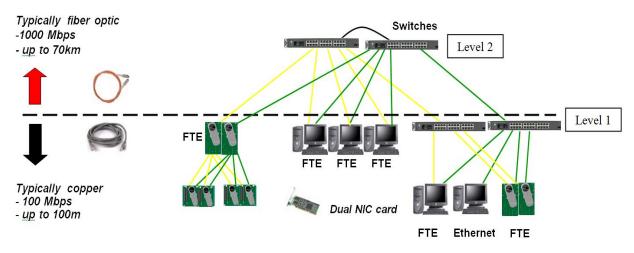


Figure 3 - FTE Network Equipment

## 2.2. Product Specifications

### 2.2.1. Network Capacity

The following Table specifies FTE Network capacity limits for Experion LX system.

Network Media	FTE	
Supervisory Networks per Experion LX Server:	1 redundant network serviced by 1 or more redundant or non-redundant Experion LX Servers up to the max FTE Nodes allowed per FTE Community	
Maximum Number of Nodes allowed:	330 FTE Nodes per FTE Community <sup>1</sup>	
Maximum Ethernet (non-FTE) Connections	100	
Transmission Rate	100 Mbits/sec	
Media Redundancy	Redundant only	
1. SCADA PLCs do not count as "Controllers" against this limit on FTE		

## 2.2.2. Ethernet Cables

Honeywell recommends fiber optic cables or shielded CAT5e copper cables, either ScTP (Screened Twisted Pair), which consists of multiple pairs with an overall shield, or STP (Shielded Twisted Pair), which consists of multiple pairs with individual shields plus an overall shield.

Experion LX nodes operate at 10 or 100Mbps. CAT5e cable provides operation up to 1Gbps. Shielded CAT6 cable, which provides operation up to 10Gbps, is also acceptable.

#### 2.2.3. Network Switches

Switches have ports for devices plus uplink ports. Switches can be interconnected using either device ports or uplink ports. Some uplink ports use SFP (Small Form Pluggable) modules, which provide several types of fiber optic connections.

For ease of installation, Honeywell provides several types of downloadable switch configuration files for implementing best security practices: all L1 devices, all L2 devices, or both L1 and L2 devices in a "split" configuration of separate L1 and L2 sections.

EA-SWHWX1 Specifications		
Model	HuaWei LS-S2326TP-EI-AC	
Number of Ports	(24) 10/100 BASE-TX ports (2) combo ports (10/100/1000 BASE-T or 100/1000 BASE-TX)	
Connector Type	RJ-45	
Power	100-240V AC (auto-ranging), 50-60 Hz	
Operating Temperature	-5℃ to 50℃ (23 to 122℃)	
Qualified Software Version in Experion LX System	Version 5.70 (S2300 V100R005C01)	

#### Switch with 24 Ports, 2 T Uplinks

For further information, see Huawei data sheet.

#### Switch with 24 Ports, 2 SFP/T Uplinks

EA-SWDLX1 Specifications	
Model	Dlink DES-3528
Number of Ports	<ul><li>(24) 10/100 BASE-TX ports</li><li>(2) 10/100/1000 BASE-T Stacking ports</li><li>(2) Combo SFP Slots</li></ul>
Connector Type	RJ-45
Power	100-240V AC (auto-ranging), 50-60 Hz
Operating Temperature	0 to 50 ℃ (32 to 122 ℉)
Qualified Software Version in Experion LX System	Version 2.60.017

For further information, see D-Link data sheet.

## 2.3. Topologies and Configuration Examples

The following examples illustrate typical component model numbers for an FTE network. They do not include COTS items like fiber optic cables, media converters, cables, and are not intended as the basis for placing an order.

#### Figure 4

Figure 4 Figure 4 shows the simplest FTE topology—one pair of switches, cabling to FTE and Ethernet nodes, and a crossover cable. All distances from nodes to switches are less than 100 meters, so copper equipment and cabling can be used.

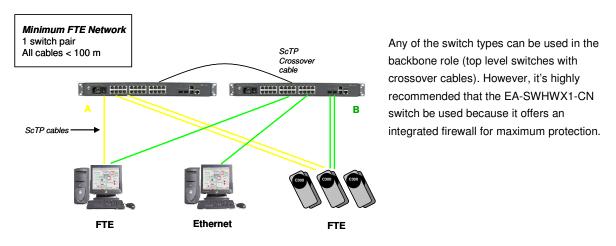


Figure 4 - Minimum FTE Network

Figure 5 shows an FTE network with three pairs of switches. One node and one pair of switches are over 100m from the backbone switches, so they are connected using multi-mode fiber optic cables and 100 Mbps media converters. Otherwise, copper equipment and cabling are used. The 100 Mbps switches are sufficient for this system but it is also acceptable to use 1000 Mbps SFP modules.

Media converters may be a more economical solution than SFPs, depending on the distances involved and other site factors. There are many media converters on the market for different speeds, distances, and cable types. Media

converters may be selected on a project basis; no certification is required since they do not affect FTE or Experion LX functions.

#### **Currently Supported Combination of Backbone Switches**

Both HuaWei LS-S2326TP-EI-AC and Dlink DES-3528 can be used as L1 or L2 network switch, but it's recommended to use same brand for both L1 and L2 networks.

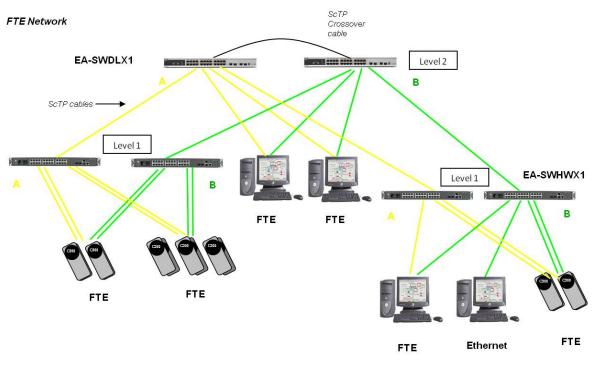


Figure 5 - FTE Network

## 2.4. Recommended FTE Switches

The following switches have been tested and qualified by Honeywell to operate in an Experion LX system. Non-qualified switches should not be used and could result in degraded performance or loss of communication.

Description	
Huawei LS-S2326TP-EI-AC	
Dlink DES-3528	

Experion<sup>™</sup> and Experion LX<sup>™</sup> are trademarks of Honeywell International Inc..

All other products and brand names shown are trademarks of their respective owners.

This document contains Honeywell proprietary information. It is published for the sole usage of Honeywell Process Solutions' customers and prospective customers worldwide. Information contained herein is to be used solely for the purpose submitted, and no part of this document or its contents shall be reproduced, published, or disclosed to a third party without the express permission of Honeywell International Inc.

While this information is presented in good faith and believed to be accurate, Honeywell disclaims the implied warranties of merchantability and fitness for a particular purpose and makes no express warranties except as may be stated in its written agreement with and for its customer.

In no event is Honeywell liable to anyone for any indirect, special or consequential damages. The information and specifications in this document are subject to change without notice.

#### Sales and Service

For application assistance, current specifications, pricing, or name of the nearest Authorized Distributor, contact one of the offices below.

## **ASIA PACIFIC**

Honeywell Process Solutions, (TAC) <u>hfs-tac-</u> <u>support@honeywell.com</u>

#### Australia

Honeywell Limited Phone: +(61) 7-3846 1255 FAX: +(61) 7-3840 6481 Toll Free 1300-36-39-36 Toll Free Fax: 1300-36-04-70

#### China – PRC - Shanghai

Honeywell China Inc. Phone: (86-21) 5257-4568 Fax: (86-21) 6237-2826

#### Singapore

Honeywell Pte Ltd. Phone: +(65) 6580 3278 Fax: +(65) 6445-3033

South Korea Honeywell Korea Co Ltd Phone: +(822) 799 6114 Fax: +(822) 792 9015

## EMEA

Honeywell Process Solutions, Phone: + 80012026455 or +44 (0)1344 656000

Email: (Sales) <u>FP-Sales-Apps@Honeywell.com</u> or (TAC) <u>hfs-tac-support@honeywell.com</u>

## AMERICA'S

Honeywell Process Solutions, Phone: (TAC) 1-800-423-9883 or 215/641-3610 (Sales) 1-800-343-0228

Email: (Sales) FP-Sales-Apps@Honeywell.com or (TAC) hfs-tac-support@honeywell.com

Specifications are subject to change without notice.

For more information To learn more about SmartLine Transmitters, visit <u>www.honeywellprocess.com</u> Or contact your Honeywell Account Manager

Process Solutions Honeywell 1250 W Sam Houston Pkwy S Houston, TX 77042

Honeywell Control Systems Ltd Honeywell House, Skimped Hill Lane Bracknell, England, RG12 1EB

Shanghai City Centre, 100 Jungi Road Shanghai, China 20061



# Honeywell

LX03-500-120, Ver.1 February 2015 ©2015 Honeywell International Inc.