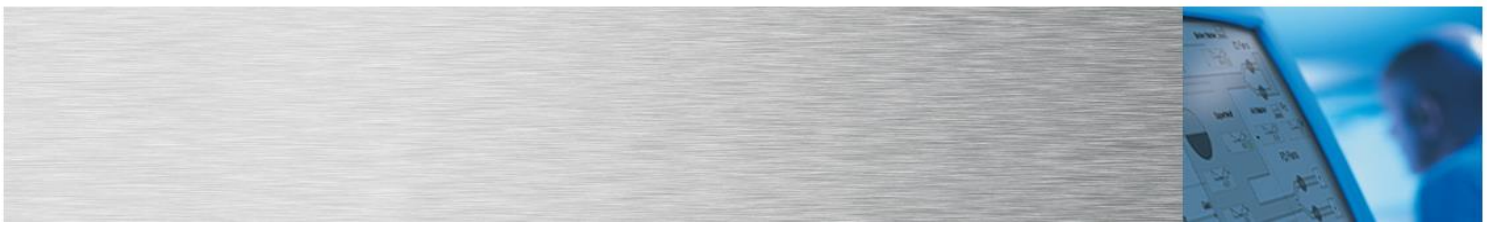
Enhanced High Performance Process Manager Specification

Technical Information

Honeywell



EHPM03-600
EUCN Release R686
EPKS Release R432
July 2016, Version 4

Revision History

Revision	Date	Description
1	2012/05/30	First Issue
2	2012/08/24	Section 4.2, Upgrade Kits, updated to include non-CE PM/APM to EHPM kits
3	2014/08/19	Added EPKS connect licensing information
4	2016/07/11	Updated EPKS connect licensing information

Table of Contents

1. Acronyms and Definitions

AM	Application Module
APM	Advanced Process Manager
APP	Application Processing Platform
CF9	Control Firewall (9 ports including the Uplink port)
EPNI2	Enhanced Process Network Interface (Version 2 for EUCN)
EPKS	Experion Process Control System
EHPM	Enhanced High Performance Process Manager
ENIM	Enhanced Network Interface Module
ENB	Enhanced Network Bridge
ES-T	Experion Station - TPS
EUCN	Enhanced Universal Control Network
FTE	Fault Tolerant Ethernet
GUS	Global Universal Station
HPM	High performance Process Manager
IEEE	Institute of Electrical and Electronics Engineers
LC	Lucent Connector (fiber optic connector with a 1.25mm ferrule)
LCN	Local Control Network
NIM	Network Interface Module
PKS	Process Knowledge Solution
PM	Process Manager
PU	Process Unit
SI	Serial Interface
TPN	TPS Process Network
TPS	TotalPlant Solution
UCN	Universal Control Network
US	Universal Station

2. Product Introduction

2.1. Enhanced High Performance Process Manager

The Enhanced High Performance Process Manager (EHPM) is Honeywell's modernized TotalPlant Solution (TPS) control and data acquisition device for industrial process applications and as such it is a part of the High Performance Process (HPM) manager family of controllers.

The High-Performance Process Manager represents an evolution of the highly successful Process Manager (PM), Advanced Process Manager (APM) and High Performance Process Manager (HPM). The EHPM uses dual 68040 processors to provide powerful and effective control on TPS Process Network (TPN). The added feature of EHPM is the ability to communicate over a Fault Tolerant Ethernet (FTE) based network called Enhanced Universal Control Network (EUCN).

Just as its predecessors, the EHPM offers highly flexible I/O functions for both data monitoring and control.

The EHPM is capable of:

- Performing data acquisition and control functions, including regulatory, logic, and sequential control functions, as well as peer-to-peer communications with other EUCN resident devices.
- Providing bi-directional communications to Modbus and Allen-Bradley compatible subsystems through a serial interface.
- Fully communicating with operators and engineers via Global User Stations (GUS), Universal Stations (US), Experion Station TPS (ES-T). Procedures and displays are identical to those used with other TPS controllers (PM/APM/HPM)
- Supporting higher level control strategies available on the TPN through the Application Module (AM), Application Processing Platform (APP) and host computers.
- Using the same I/O and wiring as the PM/APM/HPM, thereby providing cost-effective upward modernization for to existing PM/APM/HPM users

2.2. Architecture Overview

The EHPM is a part of the TPS/TPN product line connected to the Enhanced Network Interface Module (ENIM) as shown in Figure 1.

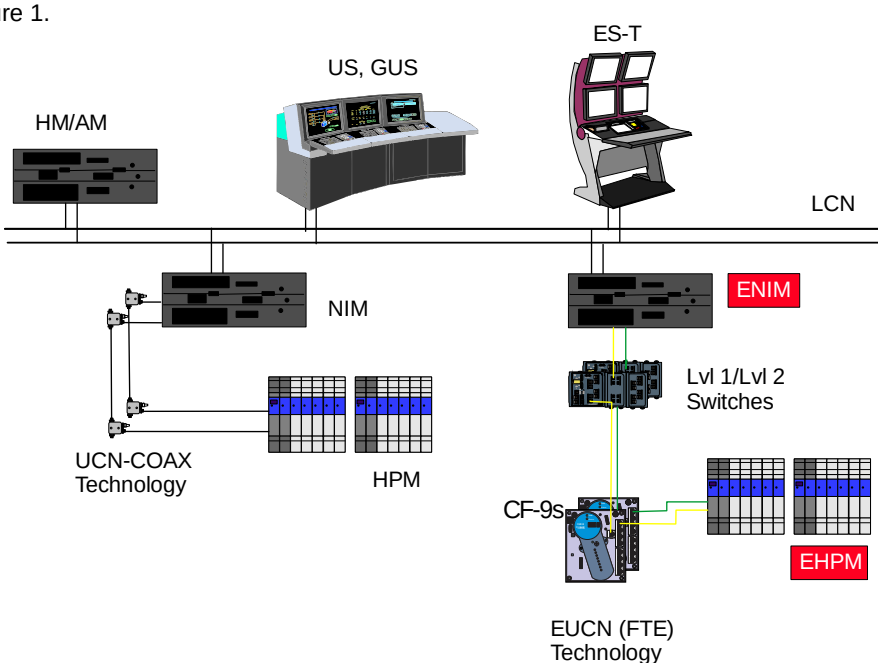


Figure 1: Simplified Architectural Overview of TPS/TPN

In the process of step-wise upgrade of the coax based Universal Control Network (UCN) to EUCN, the EHPM can also be connected to the Enhanced Network Bridge (ENB). The ENB supports operation of a hybrid logical UCN with connected to it coax and FTE based devices. ENB additionally enables the on-process migration from HPM to EHPM.

The EHPM is a part of the TPS/TPN product line connected to the ENB as shown in Figure 2.

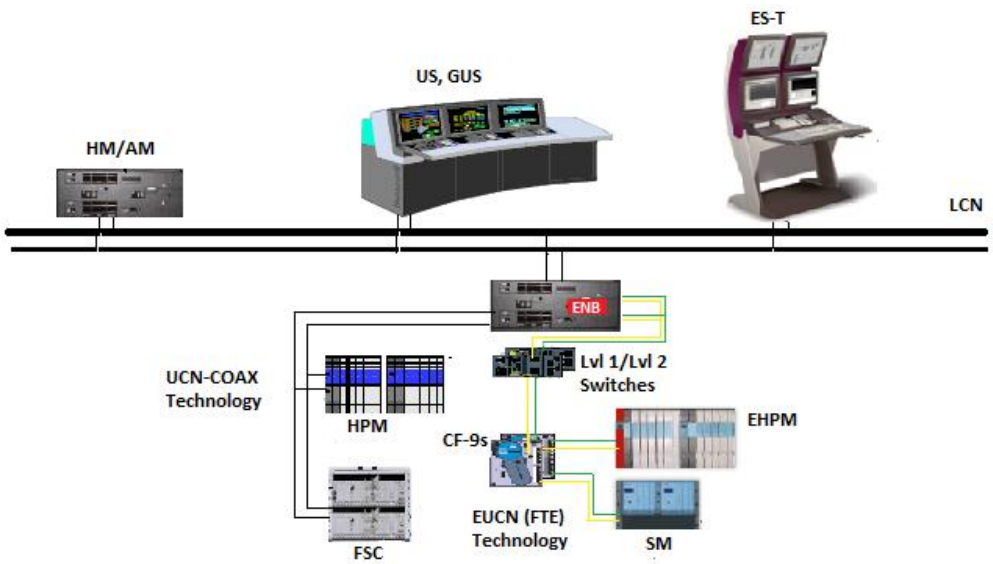


Figure 2: Simplified Architectural Overview of TPS/TPN with ENB Node

2.3. TPN/TPS System Software Requirements

EHPM controller can operate on a standalone TPN system

In order to properly handle network error messages there were some changes to TPN software. New Maintenance displays are developed for EHPM to aid in reliable network fault diagnosis. Thus there is a minimum release level of TPN/TPS software needed to use the EHPMs. That level of software is shown in the table below.

Honeywell Software System	Minimum Software Release Level
TPN	• R685 for ENIM connected EHPM's • R686 for ENB connected EHPM's
TPS	• R421

2.4. Requirements for EHPM Integration with Experion PKS

In addition to the independent operation within a standalone TPN system, the EHPM controller may be used with the Experion PKS system. What release of Experion PKS is required will depend on the level of integration and EHPM functionality desired.

With controller data presented on the ES-T HMIWeb displays using data flow from the TPN server to the LCN infrastructure the minimum required EPKS software release is:

Honeywell Software System	Minimum Software Release Level
EPKS	• R400

Higher levels of EHPM integration with Experion PKS systems can be achieved for the purpose of the following functions:

- C300/ACE peer to peer control with EHPM
- Direct EHPM data retrieval for Experion Server standard historization
- Direct HMIWeb displays access to the EHPM

The above integration functionality requires the optional EHPM Experion Connection Enabler license. The minimum EPKS software release for this functionality is:

Honeywell Software System	Minimum Software Release Level
EPKS	• R431for ENIM connected EHPM's • R432 for ENB connected EHPM's
EHPM connection license to EPKS	One usage license per EHPM

Honeywell Model Number	Description
EP-EHPMSP	EHPM EXPERION CONNECTION ENABLER 1 EHPM
EP-EHPMS5	EHPM EXPERION CONNECTION ENABLER 5 EHPM
Note 1: An EHPM Connection Enabler License is required for every EHPM controller, or controller pair, connecting to Experion Note 2: Each Experion Server, or redundant pair, needs to be licensed for the number of EHPM controllers that will be connected (Figure 3)	

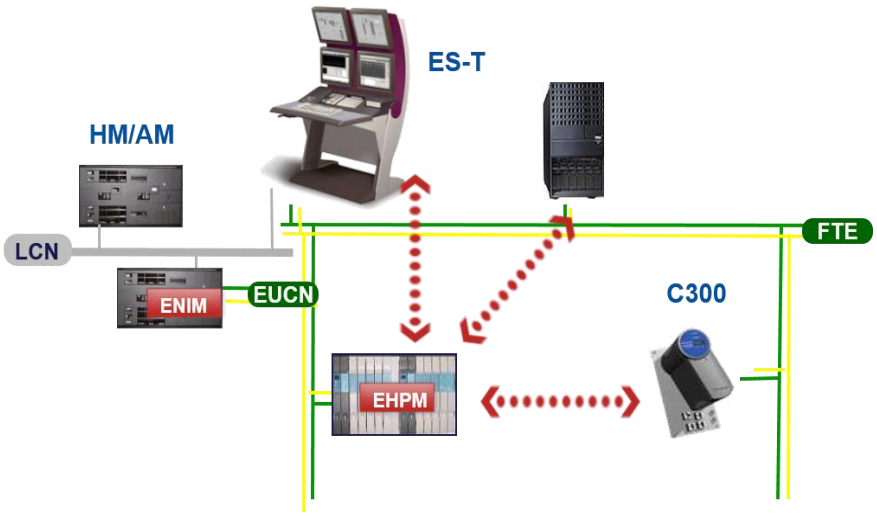


Figure 3. EHPM to EPKS integration by use of EHPM connection license

2.5. Functional Overview

The EHPM Controller is intended to perform all of the functions of the existing HPM controller with the exception of the upper level communication protocol. Similar to the HPM, the Enhanced High-Performance Process Manager is designed to provide flexible and powerful process scanning and control capabilities. To do this, the EHPM uses a multiprocessor architecture with separate microprocessors dedicated to perform specific tasks. As depicted in Figure 4, the EHPM consists of the High-Performance Process Manager Communications and Control Subsystem and the I/O Link Subsystem.

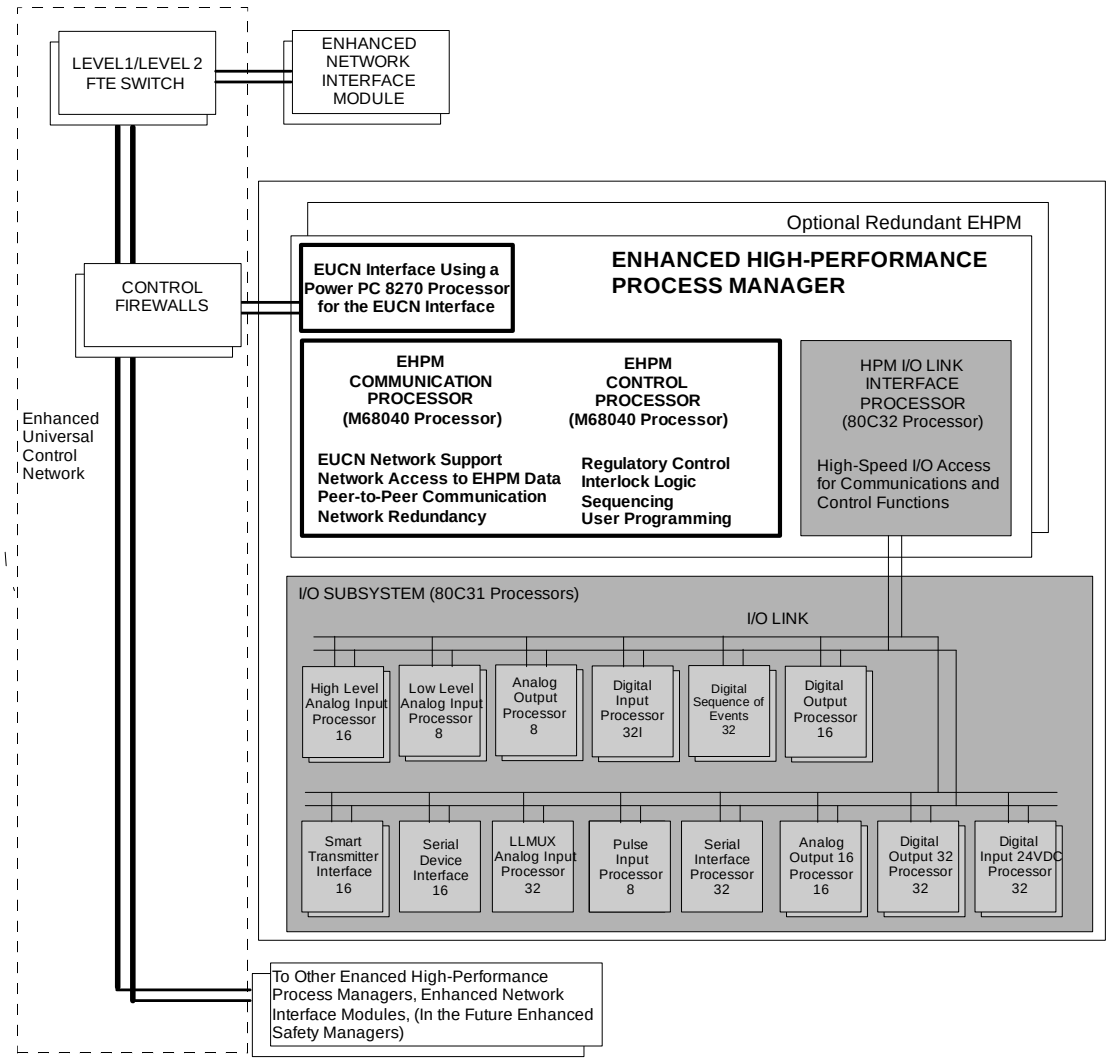


Figure 4: Block Diagram of the EHPM

The Enhanced High-Performance Process Manager consists of a dual 68040 Communication and Control Processor, an I/O Link Interface Processor, and a EUCN Interface processor. A redundant EHPM can be optionally provided.

The Communication Processor along with the EUCN Interface processor is optimized to provide high-performance network communications, handling such functions as network data access and peer-to-peer communications. It also supports high-accuracy time stamping.

The Control Processor is the EHPM resource dedicated to executing regulatory, logic, and sequence functions, including user programming facility. Because communication and I/O processing are performed by separate dedicated hardware, the full power of the High-Performance Control Processor can be applied to control strategy implementation.

3. Specifications

3.1. General Specifications

Specification	Limit
Power requirement	24 V provided through power cables by the Enhanced High Performance Process Manager Power System
EHPM Card Dimensions	(12.4”) 315 mm depth (10“) 254 mm height, (1.2 “) 30.5 mm width
Agency Approvals	
FM	Class I, Division 2, Group A, B, C, D
CE-LVD	IEC 61010-1, 2001, 2 ed. Safety requirements for electrical equipment, for measurement, control, and laboratory use
CSA	CSA C22.2 No. 1010.1-92(R1999) & 1010.1B-97 (R2001) Am. 2, Safety requirements for electrical equipment, for measurement, control, and laboratory use
CE	EN 61326 -12002 Electrical equipment for measurement, control and laboratory use -EMC requirements. EN 50082-2-1995 Electromagnetic Compatibility - Generic Immunity Standard, Part 2: Industrial Environment. EN 55011-1991 Limits and Methods of Measurement of Radio Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment.
C-Tick	Australian Radio Communications Act of 1997, Section 182
Operating Temperature	0-50 degrees Celsius
Relative Humidity	10 to 90 % (non condensing)
Vibration	Frequency 10 to 60 Hz Acceleration 0.5 g max Displacement 0.1 Inch
Mechanical Shock	Acceleration 5 g max Duration 30 mSec maximum
Barometric Pressure Altitude	-300m to +3000 m
EMI	10 V/M External to cabinet with doors closed
ESD	4kV Contact Discharge / 8kV Air Discharge
Corrosion Resistance	MC- model numbers (Conformally Coated Boards) support the harsh environment or G3 level (ANSI/ISA-S71.04-1985 corrosion standard)
Supported I/O Types	PMIO in any combination
Supported IOP Modules	40 I/O Processor Modules
Processors	
EHPM	Dual 68040 Communication and Control Processors Connected to a PowerPC 8270 Processor for the EUCN Interface.
HPM I/O Link	80C32 Processor for I/O Link Communication
Regulatory Control Points	250 MAX
Regulatory PV Points	400 MAX
Digital Composite	999 max
Device Control	400 max
Logic Slots	400 max
Process Modules	250 at 1 Process Units (PU) per EHPM program, or 125 at 2 Process Units (PU) per EHPM program
Array points	500 max (from which up to 80 Serial Interface (SI) arrays at 1 second scan or 20 SI arrays at ¼ second scan rate
Scan rates	¼ Second and 1 Second
Supported Input/output signals	Low Level Analog Input High Level Analog Input STI Analog Output Pulse Input

Specification	Limit
	Digital Input Digital Output Serial interface
RAM Retention	50 hours with rechargeable battery pack
CL/EHPM Programs	250 max Process Module Points Local Variables 127 flags, 80 Numbers, 4 Time and 16 String variables per point
Global variables	16,384 Box Flags 16,384 Box Numerics 16,384 Box Strings 4,096 Box Times 64 Box Timers
Global variables grouping per array point (max)	1023 Flags (boolean) 240 Numeric 240 Strings 240 Times
Global variables grouping per SI array point (max)	512 Flags (boolean) 16 Numeric (Reals) 32 Numerics (Integers) 64 Characters of String Data
Regulatory PV Algorithms	Data Acquisition Flow Compensation Middle-of-3 Selector High/Low/Average Selector Summer Totalizer Variable Dead Time with Lead/Lag General Linearization Calculator
Regulatory Control Algorithms	PID PID with Feedforward PID with External Reset Feedback PID with Position Proportional Position Proportional Ratio Control w/Ramping Bias Ramp Soak Auto/Manual Station Incremental Summer Switch Override Selector Multiply/Divide Summer
Logic Block Algorithms	LOGIC (AND, OR, NOT, NAME, NOR, XOR, QUALIFIED- OR2, QUALIFIED-OR3, DISCREP3) COMPARE REAL (EQ, NE, GT, GE, LT, LE) DELAY (ON DELAY, OFF DELAY, DELAY) PULSE (FIXPULSE, MAXPULSE, MINPULSE) WATCHDOG TIMER FLIP-FLOP CHECK for BAD SWITCH CHANGE DETECT
EHPM connection licenses to EPKS	Up to 63 for EPKS R431 and R432 Up to 125 for next EPKS software releases

3.2. Topologies and Configuration Examples

The EHPM can be configured as either a single controller or as a redundant pair. The EHPM can be mounted in either 7 or 15 slot card files. This allows for 3 possible configurations (single, redundant 7–slot and redundant 15-slot). Each of those configurations is shown in Figure 5.

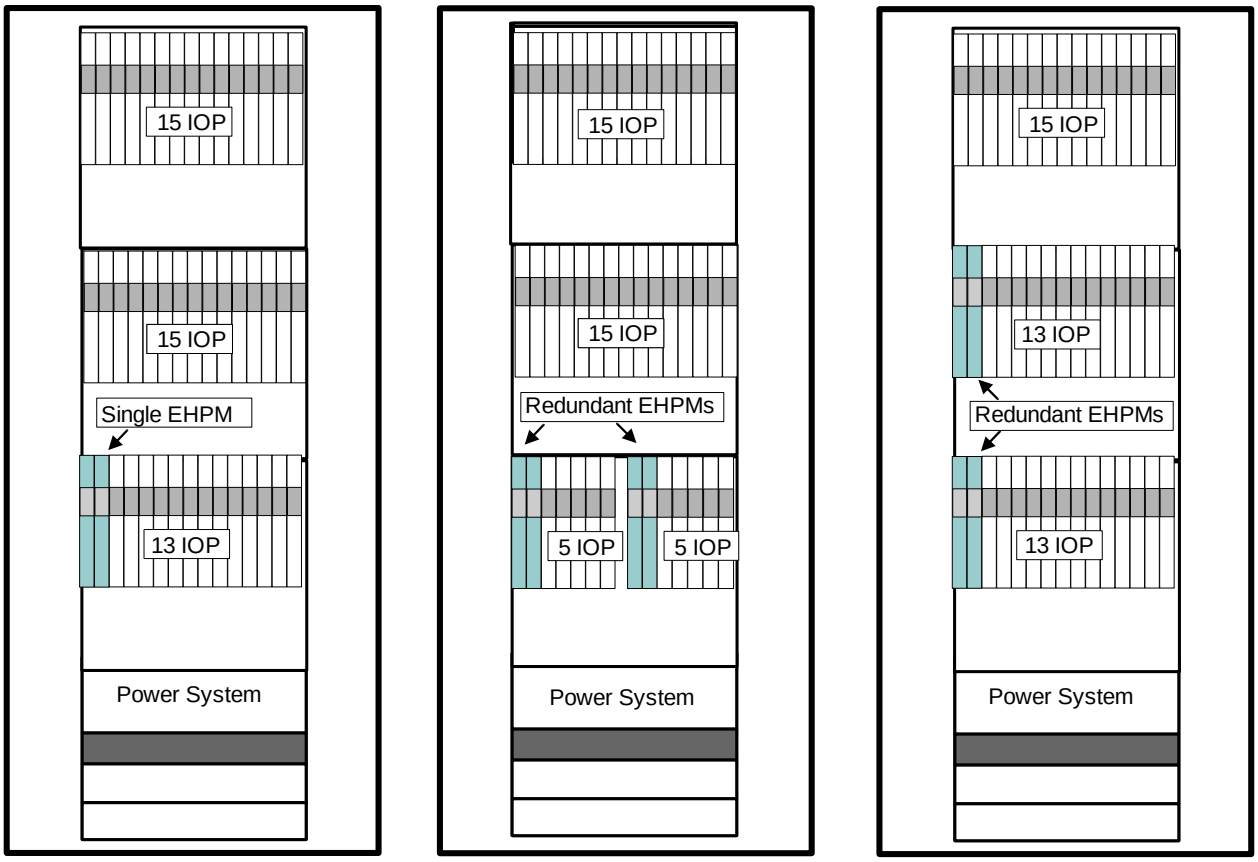


Figure 5: Various Configurations of EHPM

4. Model Numbers

4.1. EHPM Models

Description	Uncoated Model Number	Coated Model Number
EHPM Module Board Sets		
EHPM Module Board Set — Single	--	MC-EHPMS1
EHPM Module Board Set — Redundant	--	MC-EHPMR1
Upgrade Kits		
UPG, CF9 IN PM CABINET FOR EHPM	--	CC-ZCF9PM
UPG, PM/APM TO 15-SLOT EHPM, REDUNDANT	--	MC-ZEHPR2
UPG, PM/APM TO 7-SLOT EHPM, REDUNDANT	--	MC-ZEHPR7
UPG, PM/APM TO 15-SLOT EHPM, NON-RED	--	MC-ZEHPS2
UPG, PM/APM TO 7-SLOT EHPM, NON-RED	--	MC-ZEHPS7
UPG, HPM TO EHPM, REDUNDANT	--	MC-ZH2EHR
UPG, HPM TO EHPM, NON-REDUNDANT	--	MC-ZH2EHS
Card Files (Telephone Connector Version)		
HPM 7-Slot file, Slots 1-7, Empty, Non-CE	MU-HPFH01	MC-HPFH01
HPM 7-Slot file, Slots 9-15, Empty, Non-CE	MU-HPFH11	MC-HPFH11
HPM 15-Slot file, Empty, Non-CE	MU-HPFX02	MC-HPFX02
HPM+I/O 7-Slot file, Slots 1-7, Empty, CE**(1)**	MU-HPFH03	MC-HPFH03
HPM+I/O 7-Slot file, Slot 9-15, Empty, CE**(1)**	MU-HPFH13	MC-HPFH13
HPM+I/O 15-Slot file, Empty, CE**(1)**	MU-HPFX03	MC-HPFX03
I/O-Only 7-Slot file, Slots 1-7, Empty, CE**(1)**	MU-HPFI03	MC-HPFI03
I/O-Only 7-Slot file, Slot 9-15, Empty, CE**(1)**	MU-HPFI13	MC-HPFI13
I/O-Only 15-Slot file, Empty, CE**(1)**	MU-HPFI23	MC-HPFI23
HPM-to-I/O File Conversion Kit, CE**(1)**	MU-ZPFI03	
HPM Center Filler Plate, Slot 8	MU-HPFP01	
HPM 8-Slot Cover Plate	MU-HPCP01	
HPM Redundancy Cable	51201667-100	
HPM Fuse Puller	51309123-100	
HPM Cardfile Mounting Bracket	51404256-100	
Cabinet Fan Assemblies (All Styles)		
Cabinet Fan Assembly (240 Vac-50/60 Hz)	MU-FAN501	n/a
Cabinet Fan Assembly with Alarm (240 Vac-50/60 Hz)	MU-FAN511	MC-FAN511
Cabinet Fan Assembly (120 Vac-50/60 Hz)	MU-FAN601	n/a
Cabinet Fan Assembly with Alarm (120 Vac-50/60 Hz)	MU-FAN611	MC-FAN611
Power Systems Including, or Upgradable to, System Battery Backup		
PM/APM/HPM/EHPM Redundant Power System with Mounting (20 A)	MU-PSRX04	MC-PSRX04
PM/APM/HPM/EHPM Single Power System with Mounting (20 A)	MU-PSSX04	MC-PSSX04
PM/APM/HPM/EHPM Redundant Power System with System Battery Backup Mounting (20 A)	MU-PSRB04	MC-PSRB04
AC-Only Power Systems		
AC-Only Redundant Power Supply 120 Vac (8 A)	MU-PAR111	MC-PAR111
AC-Only Redundant Power Supply 240 Vac (8 A)	MU-PAR211	MC-PAR211
AC-Only Single Power Supply 120 Vac (8 A)	MU-PAS111	MC-PAS111
AC-Only Single Power Supply 240 Vac (8 A)	MU-PAS211	MC-PAS211
AC-Only Redundant Power Supply 120 Vac (16 A)	MU-PAR121	MC-PAR121
AC-Only Redundant Power Supply 240 Vac (16 A)	MU-PAR221	MC-PAR221

Description	Uncoated Model Number	Coated Model Number
AC-Only Single Power Supply 120 Vac (16 A)	MU-PAS121	MC-PAS121
AC-Only Single Power Supply 240 Vac (16 A)	MU-PAS221	MC-PAS221
AC-Only Power System Cover Plate	MU-PACP01	MC-PACP01
24 Vdc Power Distribution		
Power Distribution FTA (24 Vdc)	MU-TDPR02	MC-TDPR02

Description	Model Number
Cabinets and Cabinet Components (Markhon Style)	
Cabinet — Dual Access (.8 W x .8 D x 2.1 H [meters])	MU-CBDM01
Cabinet — Single Access (.8 W x 5.5 D x 2.1 H [meters])	MU-CBSM01
Cabinet Lifting Eyebolts (4)	MU-CLBM01
Cabinet (Dual Access) Forklift Base	MU-CFDM01
Cabinet (Single Access) Forklift Base	MU-CFSM01
Cabinet Trim File Filler Panel	MU-CTFP11
Vertical Trim Panel Set — Full Height	MU-CTVF11
Vertical Trim Panel Set — Half Height	MU-CTVH11
FTA Mounting Channel — Narrow	MU-TMCN11
FTA Mounting Channel with Shield Ground Bar — Narrow	MU-TMCN12
FTA Mounting Channel — Wide	MU-TMCW11
FTA Mounting Channel with Shield Ground Bar — Wide	MU-TMCW12
Cabinets and Cabinet Components (Rittal Style)	
Cabinet — Dual Access (.8 W x .8 D x 2 H [meters])	MU-CBDX01
Cabinet — Single Access (.8 W x .5 D x 2 H [meters])	MU-CBSX01
Cabinet Trim File Filler Panel	MU-CTFP01
Vertical Trim Panel Set — Full Height	MU-CTVF1
Vertical Trim Panel Set — Half Height	MU-CTVH01
FTA Mounting Channel — Narrow	MU-TMCN01
FTA Mounting Channel with Shield Ground Bar — Narrow	MU-TMCN02
FTA Mounting Channel — Wide	MU-TMCW01
FTA Mounting Channel with Shield Ground Bar — Wide	MU-TMCW02
Cabinets and Cabinet Components (RHC)	
Cabinet - Remote Hardened Controller Cabinet - 120 Vac	MU-RCAB01

Description	Model Number
Cabinet - Remote Hardened Controller Cabinet - 240 Vac	MU-RCAB02
FTA Mounting Channel with Shield Ground Bar — Narrow	MU-TMCN02
Short FTA Mounting Channel with Shield Ground Bar — Narrow	MU-TMCN22
EUCN Cables (Indoor Use)	
EUCN Cable (Tree A-Yellow Boots) (2 m)	51305482-102
EUCN Cable (Tree B-Green Boots) (2 m)	51305482-202
EUCN Cable (Tree A-Yellow Boots) (5 m)	51305482-105
EUCN Cable (Tree B-Green Boots) (5 m)	51305482-205
EUCN Cable (Tree A-Yellow Boots) (10 m)	51305482-110
EUCN Cable (Tree B-Green Boots) (10 m)	51305482-210
EUCN Cable (Tree A-Yellow Boots) (20 m)	51305482-120
EUCN Cable (Tree B-Green Boots) (20 m)	51305482-220
Lengths over 20 meters available on request	

4.2. Upgrade Kits

Kits are available to allow upgrades from existing PM/APM/HPM based systems to EHPM. The upgrade process has been designed to minimize system downtime and impact to the existing hardware installations. In the future, customers may migrate to Experion Supervisory and Control software while preserving their investment in EHPM hardware.

Model Number	Description
EHPM Kits	
CC-ZCF9PM	UPG, CF9 IN PM CABINET FOR EHPM
MC-ZEHPR2	UPG, PM/APM TO 15-SLOT EHPM, REDUNDANT, CE
MC-ZEHPR7	UPG, PM/APM TO 7-SLOT EHPM, REDUNDANT, CE
MC-ZEHPS2	UPG, PM/APM TO 15-SLOT EHPM, NON-RED, CE
MC-ZEHPS7	UPG, PM/APM TO 7-SLOT EHPM, NON-RED, CE
MC-ZEPS2N	UPG, PM/APM TO 15-SLOT EHPM, NON-REDUNDANT, NON-CE
MC-ZEPR2N	UPG, PM/APM TO 15-SLOT EHPM, REDUNDANT, NON-CE
MC-ZEPS7N	UPG, PM/APM TO 7-SLOT EHPM, NON-REDUNDANT, NON-CE
MC-ZEPR7N	UPG, PM/APM TO 7-SLOT EHPM, REDUNDANT, NON-CE
MC-ZH2EHR	UPG, HPM TO EHPM, REDUNDANT
MC-ZH2EHS	UPG, HPM TO EHPM, NON-REDUNDANT

4.3. Licenses

Optional license for expanded level of EHPM integration in Experion PKS

Model Number	Description
EP-EHPMSP	EHPM EXPERION CONNECTION ENABLER 1 EHPM
EP-EHPMS5	EHPM EXPERION CONNECTION ENABLER 5 EHPM

For More Information

To learn more about Honeywell's products or solutions visit our website www.honeywell.com/ps or contact your Honeywell account manager.

Automation & Control Solutions

Honeywell Process Solutions

1860 W. Rose Garden Lane
Phoenix, AZ 85027
Tel: 800-822-7673

www.honeywell.com/ps

EHPM03-600
July 2016

Honeywell