

Honeywell MU-TAIH02  
**High Input Analog / STI Input Terminal Assembly**

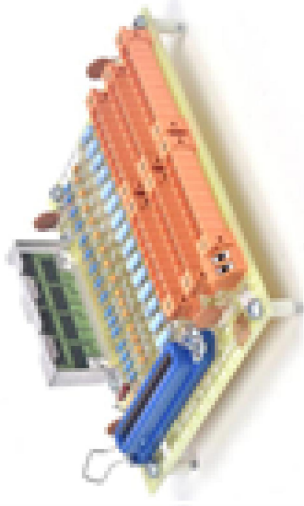
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# **High-Performance Process Manager Planning**

**HP02-500**

## Section 2 – HPM Description

### 2.1 Overview

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**HPM major assemblies**      The High-Performance Process Manager subsystem (HPM) consists of major assemblies described in the following subsections. The major High-Performance Process Manager assemblies are

- High-Performance Process Manager Module (HPMM) card file
- Input/Output Processor (IOP) card file
- Input/Output Processor (IOP) card
- I/O Link Extender
- Field Termination Assembly (FTA)
- Power System

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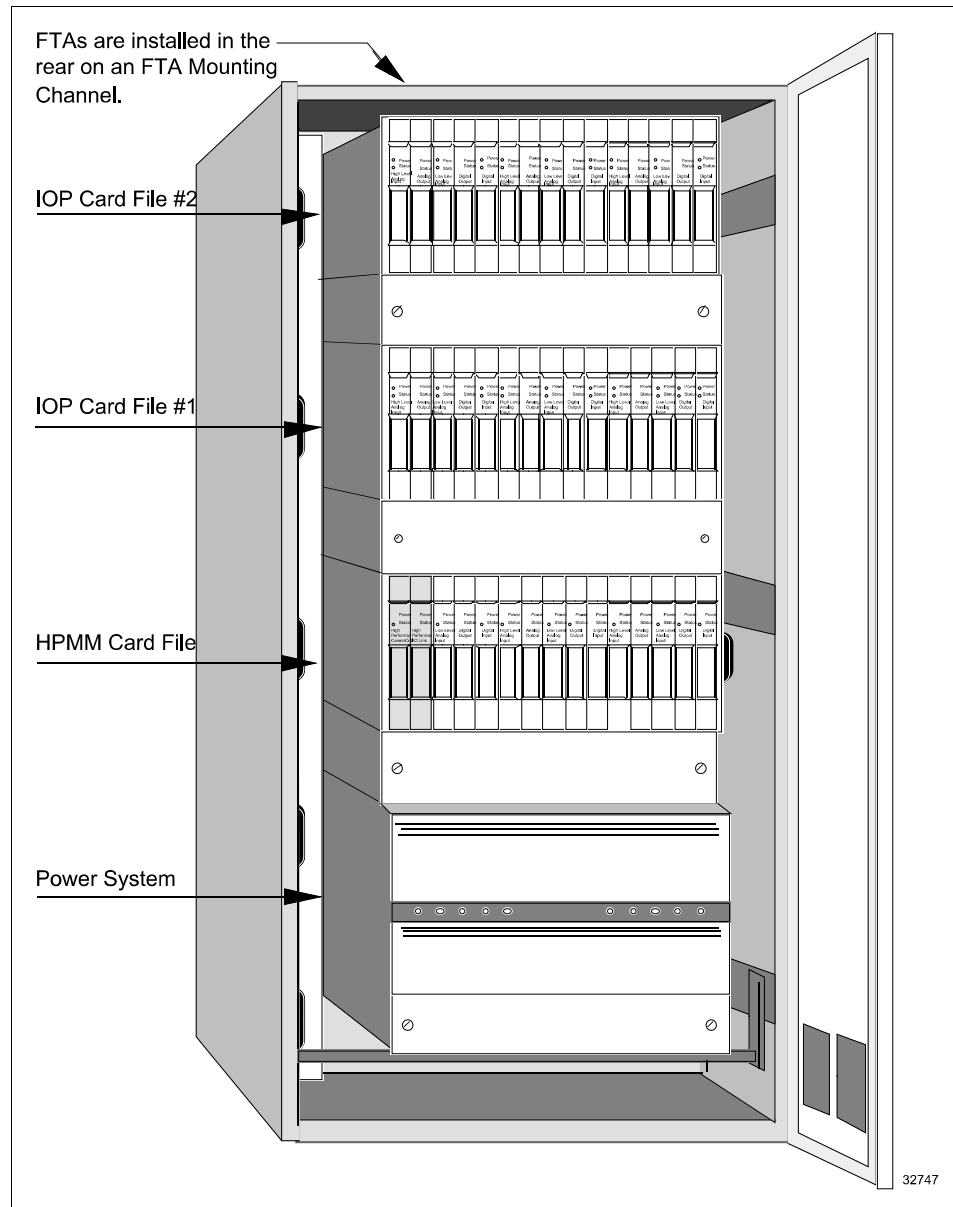
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## 2.1 Overview, Continued

### Nonredundant HPM cabinet layout

Figure 2-1 is an illustration of a single High-Performance Process Manager cabinet containing a nonredundant High-Performance Process Manager Module (HPMM) with supporting assemblies. The HPMM cards (2) and the IOPs cards are installed in 15-Slot HPMM card files. IOP cards occupy the IOP card files.

Figure 2-1 Nonredundant HPMM Cabinet Layout



## 2.2 Card Files

### Introduction

There are nine card file models. Three models are not CE Compliant and six models are CE Compliant. Table 2-1 lists the nine card file models. All models are also available with conformal coating (a model number with a prefix of MC, rather than MU).

Table 2-1 Card File Models

Card File Description	CE Compliant	Non-CE Compliant
Left 7-Slot HPMM or IOP	N/A	MU-HPFH01
Right 7-Slot HPMM or IOP	N/A	MU-HPFH11
15-Slot HPMM or IOP	N/A	MU-HPFX02
Left 7-Slot HPMM	MU-HPFH03	N/A
Right 7-Slot HPMM	MU-HPFH13	N/A
15-Slot HPMM	MU-HPFX03	N/A
Left 7-Slot IOP	MU-HPFI03	N/A
Right 7-Slot IOP	MU-HPFI13	N/A
15-Slot IOP	MU-HPFI23	N/A

### Non-CE Compliant card file models

The non-CE Compliant card file models can be designated as an HPMM card file or an IOP card file by either installing an HPMM card set in the two left-most card slots or installing IOP cards.

### CE Compliant card file models

Unlike the non-CE Compliant card file models, the CE Compliant card file models are designated either an HPMM card file or an IOP card file because even though there is no electrical difference in the backpanel, they differ mechanically. The addition of a ground plate and filtered IOP connectors in the two left-most slots prohibits the installation of an HPMM card set.

The card file is designated an IOP card file when the ground plate and filtered connectors are present.

The card file is designated an HPMM card file when the ground plate and filtered connectors are absent.

### Conversion kit

A CE Compliant HPMM card file can be converted to an IOP card file with a model MU-ZPFI03 upgrade kit. The kit adds 2 filtered IOP adapter connectors to the two left-most card slots and a ground plate extension.

## 2.2.1 HPMM Card Files

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### Three types of HPM card files

There are three types of HPMM card files. The two left-most slots of each type are populated by the three assemblies that comprise the HPMM. The remaining slots accommodate IOPs.

If the card file is a non-CE Compliant card file, the two left-most slots of each type can also accommodate IOPs with no alterations. The card file is then designated an IOP card file.

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### HPMM description

The High-Performance Process Manager Module (HPMM) is composed of two card assemblies that install in the two left-most slots in a 7-Slot or 15-Slot card file, and a UCN interface module that mounts and connects to the 50-pin connector that is directly below the left-most card.

The three HPMM assemblies are identified as follows:

- High-Performance Communications/Control (High-Performance Comm/Control) card
- High-Performance I/O Link Interface (High-Performance I/O Link) card
- High-Performance UCN Interface (HPM UCN Interface) module

The HPM UCN Interface module connects to the 50-pin connector below the High-Performance Comm/Control card.

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### Left 7-Slot HPMM card file description

The Left 7-Slot card file accepts the two HPMM cards and the HPM UCN Interface module that comprise the HPMM, and accommodates up to five IOP cards. The card slots are numbered 1 through 7, starting at the left-most position.

The High-Performance Comm/Control and High-Performance I/O Link cards occupy slots 1 and 2, while the HPM UCN Interface module mounts below slot 1 and connects to its 50-pin connector.

Slots 3 through 7 can accommodate IOP cards. The IOP card slots assume numerical I/O Link Interface addresses of 3 through 7 and binary I/O Link Interface addresses of 2 through 6.

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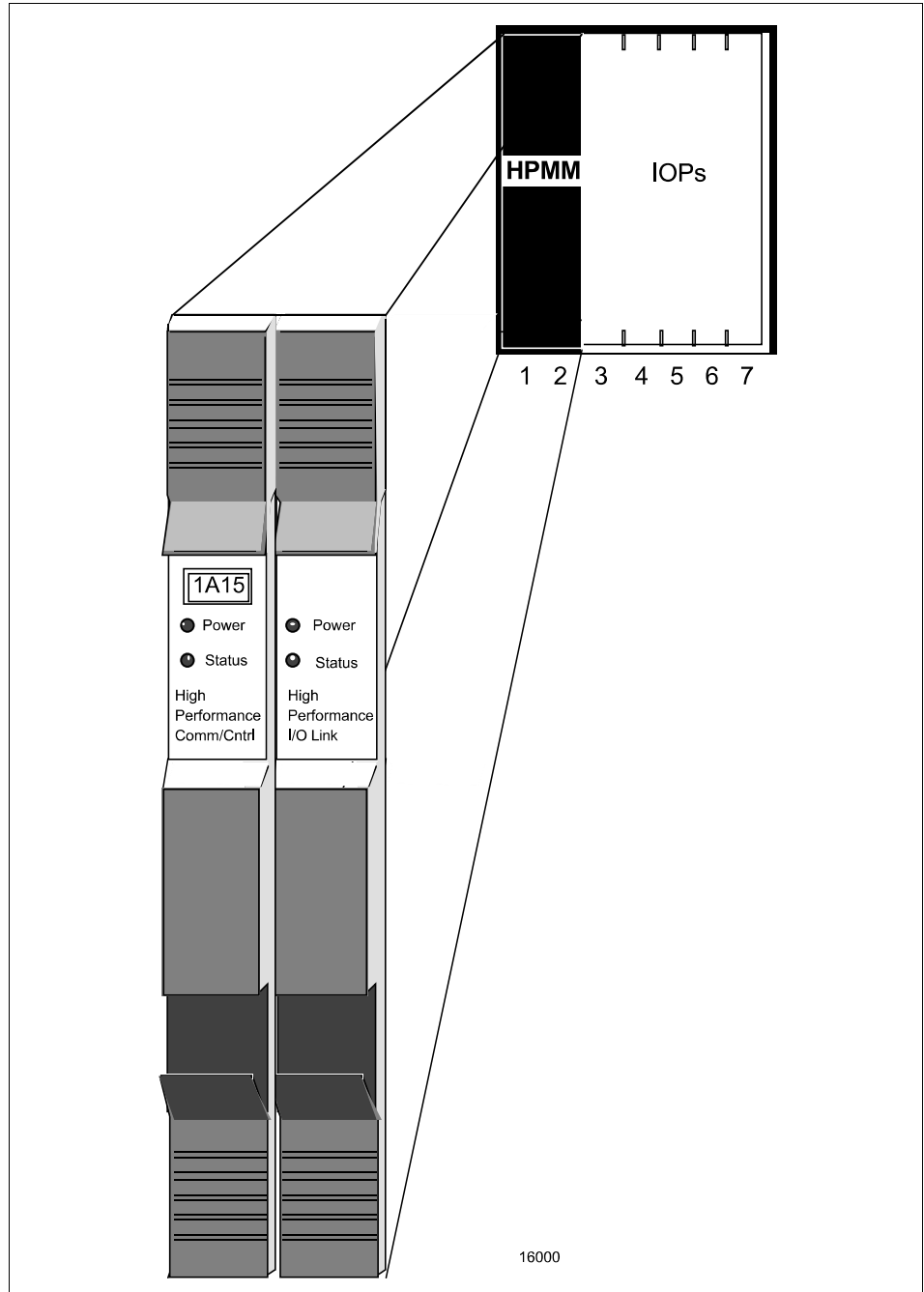
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## 2.2.1 HPMM Card Files, Continued

### Left 7-Slot HPMM card file illustration

Figure 2-2 is an illustration of a Left 7-Slot HPMM card file and the two HPMM cards that occupy slots 1 and 2.

Figure 2-2 Left 7-Slot HPMM Card File



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## 3.4.1 Typical 24 Vdc Power Draw Calculations

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### Overview

Two examples of +24 Vdc power requirement calculations are illustrated in subsections 3.3 and 3.4. The Single Power System Example assumes a single cabinet with a dedicated Power System. The Dual Power System Example assumes a dual cabinet complex with each cabinet having a dedicated separate Power System.

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### Power calculation procedure

The calculations are based on the power requirements of the assemblies listed in Table 3-1. The current requirements are based on the typical maximum, assuming all channels are in use. Use the following steps to calculate the number of each type of IOP and associated FTA that an individual Power System must support.

1. Determine the number of channels needed for each type of IOP and associated FTA. Divide the total number by the number of channels that are available in the IOP. For example, using Table 3-1, if 256 High Level Analog Input (HLAI) IOP channels are needed, 16 IOPs and FTAs are required ( $256 \text{ channels} \div 16 \text{ channels per IOP} = 16 \text{ IOPs and } 16 \text{ FTAs}$ ).
  2. Multiply the number of IOPs by the current requirement for the type of IOP. For example, 16 model MU-PAIH02 HLA IOPs require 2928 mA ( $16 \text{ HLA IOPs} \times 183 \text{ mA} = 2928 \text{ mA or } 2.928 \text{ A}$ ). The current requirement is added to the **Total Module Current** for the Power System.
  3. Multiply the number of FTAs by the current requirement for the type of FTA. For example, 16 model MU-TAIH12/52 HLA IOPs require 5120 mA ( $16 \text{ HLA IOPs} \times 320 \text{ mA} = 5120 \text{ mA or } 5.12 \text{ A}$ ). The current requirement is added to the **Total Module Current** for the Power System.
  4. If redundant IOPs are required in the same Power System, double the IOP type count. For example, 16 redundant HLA IOP channels, A and B, require two IOPs ( $16 \text{ channels} \div 16 \text{ channels per IOP} \times 2 = 2 \text{ IOPs}$ ). When the redundant IOPs reside in separate Power Systems, half the IOP power requirement is added to each Power System's Module Current power requirement (IOP A and IOP B).
  5. To determine the **Total Module Current**, add together the total current for both the IOPs and their associated FTAs. For example, using Table 3-1, 256 HLA IOP channels require 2928 mA of IOP current and 5120 mA of FTA current ( $256 \text{ HLA IOP channels} = 2928 \text{ mA} + 5120 \text{ mA} = 8048 \text{ mA or } 8.048 \text{ A}$ ).
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### 3.4.1 Typical 24 Vdc Power Draw Calculations, Continued

**Assembly 24 Vdc power usage**

Table 3-1 is a list of the power usage for High-Performance Process Manager assemblies.

Table 3-1 HPM Assembly 24 Vdc Power Usage

Description	Model Number	Channels	Assembly Current (Milliamps)
Left 7-Slot Card File—Slots 1-7, non-CE Compliant	MU-HPFH01	N/A	0
Left 7-Slot HPMM Card File—Slots 1-7, CE Compliant	MU-HPFH03	N/A	0
Right 7-Slot Card File—Slots 9-15, non-CE Compliant	MU-HPFH11	N/A	0
Right 7-Slot HPMM Card File—Slots 9-15, CE Compliant	MU-HPFH13	N/A	0
15-Slot Card File—Slots 1-15, non-CE Compliant	MU-HPFX02	N/A	0
15-Slot HPMM Card File—Slots 1-15, CE Compliant	MU-HPFX03	N/A	0
Left 7-Slot IOP Card File—Slots 1-7, CE Compliant	MU-HPFI03	N/A	0
Right 7-Slot IOP Card File—Slots 9-15, CE Compliant	MU-HPFI13	N/A	0
15-Slot IOP Card File—Slots 1-15, CE Compliant	MU-HPFI23	N/A	0
IOP Card File	MU-IOFX02	N/A	0
Nonredundant HPMM Card Set	MU-HPMS01	N/A	1375
Redundant HPMM Card Set	MU-HPMR01	N/A	2700
LLAI IOP Card	MU-PAIL02	8	58
LLMux IOP Card	MU-PLAM02	16	70
RHMUX IOP Card (requires an IS or NI Power Adapter)	MU-PRHM01	32	100
HLAI IOP Card	MU-PAIH02	16	183
HLAI IOP Card	MU-PAIH03	16	155
STI IOP Card	MU-PSTX02	16	100
STIM IOP Card	MU-PSTX03	16	100
AO IOP Card	MU-PAOX02	8	100
AO IOP Card	MU-PAOX03	8	100
AO IOP Card	MU-PAOY22	16	112
DI IOP Card	MU-PDIX02	32	90
DI IOP Card	MU-PDIY22	32	89
DISOE IOP Card	MU-PDIS11	32	210
DISOE IOP Card	MU-PDIS12	32	210
DO IOP Card	MU-PDOX02	16	64
DO IOP Card	MU-PDOY22	32	98

*Continued on next page*

### 3.4.1 Typical 24 Vdc Power Draw Calculations, Continued

**Assembly 24 Vdc  
power usage,  
continued**

Table 3-1 HPM Assembly 24 Vdc Power Usage, Continued

Description	Model Number	Channels	Assembly Current (Milliamps)
PI IOP Card	MU-PPIX02	8	208
SDI IOP Card	MU-PSDX02	2	70
SI IOP Card	MU-PSIM11	2	70
LLAI FTA	MU-TAIL02	8	350
LLAI FTA	MU-TAIL03	8	350
LLMux—RTD FTA	MU-TAMR02	16	185
LLMux—RTD FTA	MU-TAMR03	16	185
LLMux—TC/Local CJR FTA	MU-TAMT02	16	185
LLMux—TC/Local CJR FTA	MU-TAMT03	16	185
LLMux—TC/Remote CJR FTA	MU-TAMT12	16	185
LLMux—TC/Remote CJR FTA	MU-TAMT13	16	185
RHMUX—TC/Local CJR FTA (ISPA or NIPA provides power to FTA)	MC-GRMT01	16	0
RHMUX GI/IS Power Adapter (ISPA)	MU-GRPA01	32 *	300
RHMUX GI/NI Power Adapter (NIPA)	MU-TRPA01	32 *	575
HLAI/STI FTA	MU-TAIH02	16	320
HLAI FTA	MU-TAIH03	16	320
HLAI/STI FTA	MU-TAIH12/52	16	320
HLAI FTA	MU-TAIH13/53	16	320
HLAI/STI FTA	MU-TAIH22/62	16	320
HLAI FTA	MU-TAIH23	16	320
STI FTA	MU-TSTX03	16	320
STI FTA	MU-TSTX13/53	16	320

\* An RHMUX Power Adapter provides the interface between one RHMUX IOP and one or two RHMUX FTAs. Each RHMUX FTA has 16 input channels providing a total of 32 inputs for the RHMUX subsystem.

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## 4.2 FTA Selection, Continued

### FTA types

Because of FTA size differences, the number of FTAs that can be installed in a cabinet will vary. Tables 4-1 and 4-2 are lists of FTAs and support assemblies by model number. When appropriate, the FTA's or supporting assembly's field terminal connector type, number of input or output signal channels, and mounting size are listed.

### Standard FTAs

For standard types of FTAs, the terminal connector types are compression (C), nonremovable screw (S), and removable screw (RS).

Table 4-1 Standard FTAs and Associated Assemblies

Model Number	Description	Terminal Type	Channels	Mounting Size
MU-TAIH02	High Level Analog Input/STI (Single IOP)	C	16	A
MU-TAIH03	High Level Analog Input (Single IOP)	C	16	A
MU-TAIH12	High Level Analog Input/STI	C	16	B
MU-TAIH13	High Level Analog Input	C	16	B
MU-TAIH22	Enhanced Power High Level Analog Input/STI	C	16	B
MU-TAIH23	Enhanced Power High Level Analog Input	C	16	B
MU-TAIH52	High Level Analog Input/STI	S	16	B
MU-TAIH53	High Level Analog Input	S	16	B
MU-TAIH62	Enhanced Power High Level Analog Input/STI	S	16	B
MU-TSTX03	Smart Transmitter Interface (Single IOP)	C	16	A
MU-TSTX13	Smart Transmitter Interface	C	16	B
MU-TSTX53	Smart Transmitter Interface	S	16	B
MU-TAIL02	Low Level Analog Input (Single IOP)	C	8	B
MU-TAIL03	Low Level Analog Input (Single IOP)	C	8	B
MU-TAMR02	Low Level Analog Input Multiplexer—RTD (Single IOP)	C	16	B
MU-TAMR03	Low Level Analog Input Multiplexer—RTD (Single IOP)	C	16	B
MU-TAMT02	Low Level Analog Input Multiplexer—TC—Local CJR (Single IOP)	C	16	B
MU-TAMT03	Low Level Analog Input Multiplexer—TC—Local CJR (Single IOP)	C	16	B
MU-TAMT12	Low Level Analog Input Multiplexer—TC—Remote CJR (Single IOP)	C	16	B
MU-TAMT13	Low Level Analog Input Multiplexer—TC—Remote CJR (Single IOP)	C	16	B

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## 5.3 Mounting and Operating the HPM in a Division 2 Location, Continued

Approved Division 2  
area equipment,  
continued

Table 5-2 HPM Equipment Approved for Use in Division 2 Areas,  
Continued

Model Number	Description
<b>Standard FTA Components</b>	
MU-TAIH02	High Level Analog Input/STI with compression terminals
MU-TAIH03	High Level Analog Input/STI with compression terminals
MU-TAIH12	High Level Analog Input/STI with compression terminals
MU-TAIH13	High Level Analog Input/STI with compression terminals
MU-TAIH22	High Level Analog Input/STI with compression terminals
MU-TAIH23	High Level Analog Input with compression terminals
MU-TAIH52	High Level Analog Input/STI with screw terminals
MU-TAIH53	High Level Analog Input/STI with screw terminals
MU-TAIH62	High Level Analog Input/STI with screw terminals
MU-TAIL02	Low Level Analog Input with compression terminals
MU-TAIL03	Low Level Analog Input with compression terminals
MU-TAMR02	LLMux Analog Input RTD with compression terminals
MU-TAMR03	LLMux Analog Input RTD with compression terminals
MU-TAMT02	LLMux Analog Input TC with compression terminals
MU-TAMT03	LLMux Analog Input TC with compression terminals
MU-TAMT12	LLMux Analog Input TC with remote CJR, compress terminals
MU-TAMT13	LLMux Analog Input TC with remote CJR, compress terminals
MU-TAOX02	Analog Output with compression terminals
MU-TAOX12	Analog Output with compression terminals
MU-TAOX52	Analog Output with screw terminals
MU-TAOY22	Analog Output with compress terminals, with Standby Manual
MU-TAOY23	Analog Output with comp terminals, without Standby Manual
MU-TAOY52	Analog Output with screw terminals, with Standby Manual
MU-TAOY53	Analog Output with screw terminals, without Standby Manual

*Continued on next page*

## 7.5 FTAs

### Introduction

Many types of FTAs are available that are CE Compliant. Some are identified by a model number that is different than the model number for the non-CE Compliant FTA. Other CE Compliant FTA types have the same model number as the non-CE Compliant FTA, but are generally identified by the tab number of the part number that ends in “25.”

The CE Compliant FTAs feature filtered connectors to interface the CE Compliant model MU-KFTSxx IOP to FTA cable(s).

### Conformal coating

All FTAs are available with and without conformal coating.

### Nonconformally coated FTAs

Table 7-4 is a list of CE Compliant and non-CE Compliant FTAs that are not conformally coated. Model numbers and part numbers identify the assemblies.

Table 7-4 Field Termination Assemblies—Nonconformally Coated

FTA Type	Model Number	Non-CE Compliant Part Number	CE Compliant Part Number
LLAI	MU-TAIL02	51304437-100	N/A
LLAI	MU-TAIL03	N/A	51309202-125
LLMux RTD	MU-TAMR02	51304477-100	N/A
LLMux RTD	MU-TAMR03	N/A	51309218-125
LLMux TC	MU-TAMT02	51401491-100	N/A
LLMux TC	MU-TAMT03	N/A	51309223-125
LLMux TC Remote	MU-TAMT12	51401573-100	N/A
LLMux TC Remote	MU-TAMT13	N/A	51309213-125
RHMUX GI/IS Power Adapter	MU-GRPA01	N/A	51304724-125
RHMUX GI/NI Power Adapter	MU-TRPA01	N/A	51304722-125
HLAI/STI	MU-TAIH02	51304453-100	N/A
HLAI/STI	MU-TAIH12	51304337-100	N/A
HLAI/STI	MU-TAIH22	80366195-100	N/A
HLAI/STI	MU-TAIH52	51304337-200	N/A
HLAI/STI	MU-TAIH62	80366192-100	N/A
HLAI	MU-TAIH03	N/A	51309136-125
HLAI	MU-TAIH13	N/A	51309138-125

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