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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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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12.2 LLMux Version

12.2.1 LLMux Configurations

CE Compliance

All models of the Low Level Analog Input Multiplexer (LLMux) Field Termination Assemblies (FTAs), the Power Adapter, and its IOP can be used in a CE Compliant application. However, they must be used with the model MU-KFTSxx IOP to FTA cable and the IOP must be installed in a CE Compliant card file. Table 12-1 lists FTA, Power Adapter, and IOP model and part numbers.

Table 12-1 LLMux Assembles

Model Number	Description	Part Number
MU-TAMR03	LLMux RTD FTA	51309218-125
MC-TAMR03	LLMux RTD FTA – Conformally Coated	51309218-175
MU-TAMT03	LLMux TC FTA	51309223-125
MC-TAMT03	LLMux TC FTA – Conformally Coated	51309223-175
MU-TAMT13	LLMux TC FTA with Remote CJR	51309213-125
MC-TAMT13	LLMux TC FTA with Remote CJR – Conformally Coated	51309213-175
MU-TLPA02	Power Adapter	51309204-125
MC-TLPA02	Power Adapter – Conformally Coated	51309204-175
MU-PLAM02	LLMux IOP	51304362-100
MC-PLAM02	LLMux IOP – Conformally Coated	51304362-150

Compatibility

The LLMux assemblies are compatible only with each other. The assemblies are not compatible with the RHMUX assemblies that are discussed in subsection 12.3.

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12.2.1 LLMux Configurations, Continued

Non-CE Compliance

The FTAs and the Power Adapter can also be used for a non-CE Compliant applications.

Conformal coating

The LLMux FTA, Power Adapter, and IOP assemblies are available with conformal coating. See Table 12-1.

Power Adapter

A CE Compliant version of the model MU-TLPA02 Power Adapter (part number 51309204-125 or 51309204-175) must be used with the LLMux FTA models for CE Compliant applications.

Description

Figure 12-1 illustrates a Low Level Analog Input Multiplexer (LLMux) configuration.

In Figure 12-1, the LLMux FTA, model MU-TAMR03 or MU-TAMT03/13, communicates with a model MU-PLAM02 LLMux IOP through the model MU-TLPA02 Power Adapter. This can be a non-CE Compliant or CE-Compliant application depending upon the model of the card file that is used.

Two types of LLMux FTAs

The LLMux FTAs that connect to the Power Adapter can be either of two types of FTAs; the model MU-TAMT03/13 Thermocouple (TC) FTA or the model MU-TAMR03 Resistive Temperature Device (RTD) FTA. The combination of the FTA mother board and the daughter board determines the type of FTA.

The two LLMux FTAs that connect to the Power Adapter can be the same type, or different types.

Two thermocouple LLMux FTAs

There are two versions of the Thermocouple LLMux FTA. The model MU-TAMT03 FTA has a single local Cold Junction Reference (CJR) interface, while the model MU-TAMT13 FTA has a remote CJR interface. This allows the CJR to be located up to 50 meters (164 feet) from the FTA with the use of appropriate cabling.

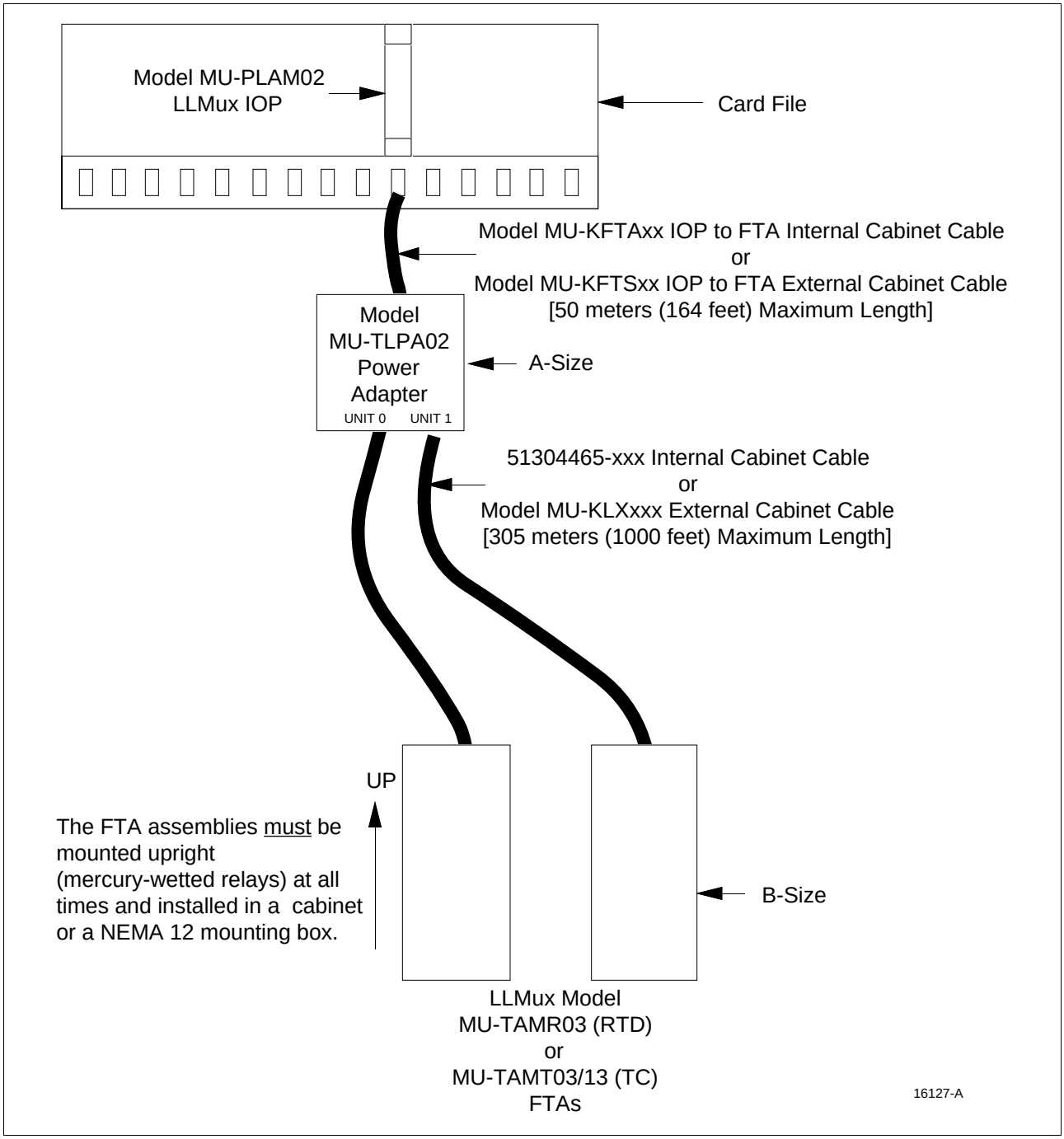
16 LLMux FTA channels

Each type of LLMux FTA has 16 channels that accept low level analog inputs. Two LLMux FTAs connected to a Power Adapter provide 32 channel inputs to the LLMux IOP. This concept causes the LLMux to be known also as the 32 point LLMux.

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CE Compliant LLMux configuration

Figure 12-1 LLMux Configuration Interconnections – CE Compliant



12.2.2 LLMux IOP Placement

Install the IOP in any card file

The LLMux IOP can be installed in any available slot in an HPMM or IOP card file.

12.2.3 LLMux Power Adapter Placement

Within 50 meters of IOP

The LLMux Power Adapter can be installed on any available FTA Mounting Channel that is within 50 meters (164 feet) of the LLMux IOP. The restriction is that the longest IOP to FTA cable cannot exceed 50 meters.

IOP to Power Adapter cable

The IOP to Power Adapter interconnection is provided by a model MU-KFTAxx nonshielded cable (the suffix "xx" represents the length of the cable in meters) in 12 sizes, up to 50 meters (164 feet) in length for internal cabinet applications. A model MU-KFTSxx shielded cable is used for external cabinet applications. See the *High-Performance Manager Service* or *Process Manager/Advanced Process Manager Installation* manual for the lengths that are available.

Power Adapter size

The Power Adapter has the same dimensions as an A-size (6 inches) FTA.

12.2.4 LLMux FTA Placement

FTA size

The LLMux FTA is a B-size (12 inches) FTA

EMI sensitivity

The LLMux FTA is designed to be mounted in a shielded enclosure. This can be accomplished in either of two ways.

- Install the FTA in a standard High-Performance Process Manager cabinet on an FTA Mounting Channel. The FTA must be grounded to the cabinet and the cabinet must be grounded to Safety Ground (building ground).
- Install the FTA in a NEMA 12 box with the FTA Mounting Channel grounded to the box, and the box connected to Safety Ground.

WARNING

WARNING—The practice of mounting an FTA on panel rails is not acceptable because the installed FTA can not be adequately shielded. The FTA must mount on an FTA Mounting Channel.

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12.2.4 LLMux FTA Placement, Continued

Within 305 meters of Power Adapter

The remote LLMux FTA cabinet or NEMA 12 box can be located up to 305 meters (1000 feet) from the Power Adapter. The restriction is that the longest Power Adapter to FTA cable cannot exceed 305 meters (1000 feet).

CAUTION

CAUTION—The remotely-installed FTA's environment must meet the same environmental conditions imposed on equipment installed in Process Manager or Advanced Process Manager cabinets. See Section 5 in this manual and the *TPS System Site Planning* and *Process Manager I/O Installation* manuals for additional information.

Mercury-wetted relay contacts

LLMux FTAs contain relays with mercury-wetted contacts and must be positioned with the LLMux power connector-side up.

Local FTA to Power Adapter cabling

When the LLMux FTA is installed in the same cabinet, or cabinet complex, as the Power Adapter FTA, a 51304465-xxx cable ("xxx" represents five sizes – 30, 66, 100, 200, and 300 centimeters) with stripped wire ends is used for the interconnection. See the *High-Performance Process Manager Service* manual for part numbers.

The cable can be used for both non-CE Compliant and CE Compliant applications.

The cable has two individually shielded, twisted-pair wires. For non-CE Compliant applications, the shields must be connected to ground at the Power Adapter end only, and for CE Compliant applications, the shields must be connected to ground at both ends of the cable. The wire connections are made using the compression terminals in a 6-pin connector at the Power Adapter end and in a 4-pin or 6-pin connector at the FTA end.

External Power Adapter to FTA cabling

When LLMux FTA is not installed in the same cabinet, or cabinet complex, as the Power Adapter and up to 305 meters (1000 feet) from the Power Adapter, a model MU-KLXxxx cable ("xxx" represents three sizes – 76, 152, and 305 meters for external cabinet installation). This is a single-twist, four-conductor Belden type 83654 cable with a braided shield and must be used for the interconnection for a CE Compliance application. See the *High-Performance Process Manager Service* manual for part numbers.

References

For additional LLMux IOP and FTA information, see the *Process Manager I/O Installation* or *High-Performance Process Manager Service* manual.

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Low Level Analog Input Multiplexer Processor - **32 Inputs** (continued) **MU-PLAM02**

Data Conversion Performance--Resistive Temperature Device (RTD)	
Parameter	**Specification**
RTD (3 Wire) Input Signal Range Pt: 100 □ DIN (4376) Pt: 100 □ JIS (C-1604) Ni: 120 □ Ed #7 Cu: 10 □	 -200 to 850°C -200 to 650°C -45 to 315°C -20 to 250°C
CMRR, dc to 60 Hz (0-100 mV)	10□ RTD: 120 dB min. 100□ RTD: 110 dB min.
NMRR, at line frequency (50 or 60 Hz)	10□ RTD: 60 dB min. (for 50/60 Hz noise of 0-15 mV) 100□ RTD: 60 dB min. (for 50/60 Hz noise of 0-75 mV)
NMRR, at other than line frequency 10□ RTD: (0-15 mV) 100□ RTD: (0-75 mV)	NMRR = -20 □$\log_{10}\left(\frac{\sin(\pi^{x} f^{x} t)}{(\pi^{x} f^{x} t)}\right)$ Where: □= 3.14159 f= Noise Frequency t= Integration Time (20 ms @ 50 Hz, 16.66ms @ 60 Hz)
Hardware Reference Junction Accuracy	±1.0□C maximum at 23.5□ ±2□C (in cabinet)
Temperature Stability RTD Input	 30 ppm/□C RSS 40 ppm/□C maximum
RTD Max Lead Resistance	15 □
CMRR = Common Mode Rejection Ratio. NMRR = Normal Mode Rejection Ratio.	