4.5 Connecting IOMs and field devices through I/O Termination Assemblies

All connections between IOMs and field devices are through I/O Termination Assemblies (IOTAs). IOTAs are sometimes connected to ancillary hardware that pre-conditions the signal for use in Experion.

The following table defines the relationship between IOM type and the ancillary hardware.

Table 15: IOM types and ancillary hardware

If IOM type is	Then the ancillary hardware
DO Digital Output	takes the output signal and drives a set of relays
AI LLMUX	can be one to four Field Termination Assemblies.

These FTA's pre-condition and package the signals before they are received by the IOTA.

To simplify system hardware selection and to minimize spare parts requirements, IOMs can be used with various types of IOTAs. The following table provides a list of IOMs, their associated IOTAs, and ancillary hardware. All IOM models listed within the same cell can be installed on any of the IOTAs listed in the adjacent cell.

Attention

Connecting Series C IOM's into a Galvanically Isolated / Intrinsically Safe (GI/IS) environment requires specific GI/IS IOTAs.

Refer to the following for GI/IS IOTAs and the IOMs they support: “GI/IS IOTA models” on page 596

Table 16: IOMs, IOTAs, and ancillary cards

IOM block type	IOM model number	IOTA model number	IOTA description [7]	IOTA supported FTAs or ancillary cards
AI-HART	Cx-PAIH01 Refer to Attention	Cx-TAIX01	AI, non-redundant	None
		Cx-TAIX11	AI, redundant	None
		Cx-GAIX11	AI, GI-IS, non-redundant	MTL4541 MTL4575
		Cx-GAIX21	AI, GI-IS, redundant	MTL4544
		CC-TAID01	Analog Input, Non-redundant, 16 ch. differential	
	Cx-PAIH51	Cx-TAIX51	AI, non-redundant	None
		Cx-TAIX61	AI, redundant	None
AI-HART Differential/ Single-ended	CC-PAIH02	Cx-TAIX01	Analog Input, Non-redundant, 4 ch. differential	None
		Cx-TAIX11	Analog Input, Redundant, 4 ch. differential	None
		Cx-GAIX11	Analog Input, GI-IS, Redundant, no differential, 4-20 mA only	MTL4544
		Cx-GAIX21	Analog Input, GI-IS, Non-redundant, no differential, 4-20 mA only	MTL4541 MTL4575
		CC-TAID11	Analog Input, Redundant, 16 ch. differential	None

IOM block type	IOM model number	IOTA model number	IOTA description [7]	IOTA supported FTAs or ancillary cards
AI-HL	Cx-PAIN01	Cx-TAIN01	AI, Non-redundant	None
		Cx-TAIN11	AI, Redundant	None
AI-HL	Cx-PAIX01 Refer to Attention	Cx-TAIX01	AI, Non-redundant	None
		Cx-TAIX11	AI, Redundant	None
		Cx-GAIX11	AI, GI-IS non-redundant	MTL-4541 MTL-4575
		Cx-GAIX21	AI, GI-IS redundant	MTL-4544
AI-HL Differential/ Single-ended	CC-PAIX02	CC-TAIX01	AI, non-redundant	None
		CC-TAIX11	AI, redundant	None
		Cx-GAIX11	AI, GI-IS, non-redundant	MTL4541 MTL4575
		Cx-GAIX21	AI, GI-IS, redundant	MTL4544
		CC-TAID01	AI, non-redundant	None
		CC-TAID11	AI, redundant	None
AI	CC-PAIN01	CC-TAIN01	Analog Input, Non-redundant, no differential, 4-20 mA only	None
		CC-TAIN11	Analog Input, Redundant, no differential, 4-20 mA only	None
AI-LLMUX	Cx-PAIM01	Cx-TAIM01[4] (note 1a)	LLMUX, non-redundant, non-coated	Mx-TAMT04 Mx-TAMR04 Mx-TAMT14
AI-LLAI	Cx-PAIM51	Cx-TAIM51	LLAI, non-redundant, non-coated	None
Cx-TAIM51	LLAI, non-redundant, non-coated			None
AO-HART	Cx-PAOH01	Cx-TAOX01	AO, non-redundant	None
		Cx-TAOX11	AO, redundant	None
		Cx-GAOX11	AO,GI-IS non-redundant	MTL4546C
		Cx-GAOX21	AO, GI-IS redundant	MTL4549C
	Cx-PAOH51	Cx-TAOX51	AO, non-redundant	None
		Cx-TAOX61	AO, redundant	None
AO	Cx-PAOX01	Cx-TAOX01	AO, Non-redundant	None
		Cx-TAOX11	AO, Redundant	None
		Cx-GAOX11	AO, GI-IS, Non-redundant	MTL4546C
		Cx-GAOX21	AO, GI-IS, Redundant	MTL4549C
AO	Cx-PAON01	Cx-TAON01	AO, Non-redundant	None
		Cx-TAON11	AO, Redundant	None
DI-HV	Cx-PDIH01	Cx-TDI110	DI, 120VAC non-redundant	None
		Cx-TDI120	DI, 120VAC redundant	None
		Cx-TDI220	DI, 240VAC non-redundant	None
		Cx-TDI230	DI, 240VAC redundant	None

IOM block type	IOM model number	IOTA model number	IOTA description [7]	IOTA supported FTAs or ancillary cards
DI-HV PROX	Cx-PDIH01	CC-TDI151	DI,120VAC non-redundant	None
DI-24	Cx-PDIL01	Cx-TDIL01	DI-24V, non-redundant	None
		Cx-TDIL11	DI-24V, redundant	None
		Cx-GDIL11	DI-24VDC, GI-IS, redundant	MTL4516 MTL4517
		Cx-GDIL21	DI-24VDC, GI-IS, non-redundant	MTL4510
		Cx-GDIL01	DI-24VDC, GI-IS, redundant (for expander)	MTL4511
		Cx-SDXX01	GI-IS expander	MTL4511
	Cx-PDIL51	Cx-TDIL51	DI-24V, non-redundant	None
		Cx-TDIL61	DI-24V, redundant	None
DI_SOE	Cx-PSOE01 (note 4)	Cx-TDIL01	DI-24V, non-redundant	None
DO-24B	Cx-PDOB01	Cx-TDOB01	DO-24V, bussed, non-redundant	None
		Cx-TDOB11	DO-24V, bussed, redundant	None
		Cx-TDOR01	DO- High Voltage Relay, non-redundant	Cx-SD0R01[2] (note 2)
		Cx-TDOR11	DO- High Voltage Relay, redundant	Cx-SD0R01[2] (note 2)
		Cx-GDOL01	DO-24VDC, GI-IS, redundant (for expander)	MTL4521
		Cx-SDXX01	GI-IS expander	MTL4521
	Cx-PDOD51	Cx-TDOD51	DO-24V, bussed, non-redundant	None
		Cx-TDOD61	DO-24V, bussed, redundant	None
SVPM	CC-PSV201	CC-TSV211	Servo Valve Positioner IOTA, Redundant, Coated	None
SPM	CC-PSP401	CC-TSP411	Speed Protection IOTA, Redundant, Coated	None
PI	CC-PPIX01	CC-TPIX11	Pulse Input w/ Fast Cutout, Redundant	None
UIO	CC-PUIO01	CC-TUIO01	UIO, Non-Redundant	None
		CC-TUIO11	UIO, Redundant	
UIO-2	CC-PUIO31	CC-TUIO31	Universal IO-2, non-redundant, coated	None
		CC-TUIO41	Universal IO-2, redundant, coated	
DI-24	DC-PDIL51	DC-TDIL01	DI 24V IOTA (Non-Redundant)	None
		DC-TDIL11	DI 24V IOTA (Redundant)	
DI-SOE	DC-PDIS51	DC-TDIL01	DI 24V IOTA (Non-Redundant)	None
		DC-TDIL11	DI 24V IOTA (Redundant)	
DO-24B	DC-PDOD51	DC-TDOD51	DO 24V Bussed without RB IOTA (Non-Redundant)	None
		DC-TDOD61	DO 24V Bussed without RB IOTA (Redundant)	

NOTES

1. Cx-TAIM01 - This does NOT require the MU-TLPA02 Power Adapter and supports in-cabinet configuration or in a suitable enclosure up to 1,000 feet remote from the LLMUX IOTA as displayed in Figure 15.
2. Cx-TAIM21 requires the MU-TLPA02 Power Adapter and can be mounted in-cabinet and remotely.
3. One CC-KREBxx uncoated cable is used to connect the IOTA to the relay extension board.
4. One CC-KREBxx coated cable is used to connect the IOTA to the relay extension board.
5. Bussed IOM (PDOB01) is used for both bussed outputs and relay outputs, however, only relay outputs require the additional card.
6. Redundantly configured IOMs must be installed on a redundant IOTA.
7. Non-redundant IOMs can be installed on non-redundant and redundant IOTAs. However, when installed on a redundant IOTA, non-redundant IOMs must be installed in the upper IOM slot of the redundant IOTA.
8. The IOTA type used for Series C IO DI-24V is used with the DI-SOE IOM also.
9. Non-redundant differential IOTA (CC-TAID01) length is 9', non-redundant IOTA (CC-TAIX01 and CC-TAIN01) length is 6', and differential redundant IOTAs (CC-TAID11, CC-TAIN11, and CC-TAIX11) length is 12'.
10. A third level of connector is available for all differential mode connections as an extension of channel 13 through 16 terminals for all 16 channels.
11. Differential configuration does not require any custom wiring as the IOTAs (CC-TAID01 and CC-TAID11) performs it internally.
12. Two new models of AI-HART (CC-PAIH02) and AI-HL (CC-PAIX02) modules are introduced to replace the older models of the AI-HART (CC-PAIH01) and AI-HL (CC-PAIX01) modules. The new models support both single-ended and differential inputs.
13. With R410, new models of AI-HART (Cx-PAIH51), AO-HART (Cx-PAOH51), DI-24V (Cx-PDIL51), and DO-24B2 (Cx-PDOD51) are introduced.

5.4 Differential Analog input IOTA (Models CC-TAID01 and CC-TAID11)

The Series C Analog Input 6 inch, 9 inch, and 12 inch modules supports all 16 channels for differential configuration. These channels can be configured to support different inputs such as 4-20mA, 1-5V, and 0-5V. All I/O field terminations of this IOTA is designed to accept up to 14 gauge stranded wire.

Note:

- These differential analog input modules are configured for differential configuration by default.
- The channels of these modules can be used for any configuration. that is, single-ended or differential configuration

5.4.1 Compatible IOTA models for differential analog input and output channels

IOM model number	IOM Block Name	Description	Compatible IOTA model number
CC-PAIH02	AI-HART	Differential/Single-ended Analog Input. It supports 16 channels and following inputs. • 4-20mA • 1-5V • 0-5V	CC-TAID01 - Non-redundant CC-TAID11 - Redundant CC-TAIX01 - Non-redundant CC-TAIX11 - Redundant CC-GAIX11 - GI-IS-Non-Redundant CC-GAIX21 - GI-IS-Redundant
CC-PAIX02	AI	Differential/Single-ended Analog Input without HART functionality. It supports 16 channels and following inputs. • 4-20mA • 1-5V • 0-5V	CC-TAID01 - Non-redundant CC-TAID11 - Redundant CC-TAIX01 - Non-redundant CC-TAIX11 - Redundant CC-GAIX11 - GI-IS-Non-Redundant CC-GAIX21 - GI-IS-Redundant
CC-PAIN01	AI-HL	Non-HART Analog Input module It supports 16 channels.	CC-TAIN01 (AI non-redundant; IOTA - 6') CC-TAIN11 (AI redundant; IOTA - 12')
CC-PAON01	AO	Non-HART Analog Output module It supports 16 channels.	CC-TAON01 (AO, non-redundant; IOTA - 6') CC-TAON11 (AO, redundant; IOTA - 12')

5.4.2 Standard and self-powered two-wire transmitter wiring - Differential Analog input module

The differential AI IOM/IOTA is optimized for use with classic two-wire transmitters. All 16 channels can accept inputs from two-wire transmitters. Note that, by default, the jumper settings must be changed to 'single-