Honeywell

Technical Information

Experion Series-C I/O Specification

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4. I/O Module Sizes

IOTA Sizing is nominal (6in = 152mm, 9in =228mm, 12in =304mm, 18in = 457mm)I/O modules are associated with their respective IOTAs in the table below. An I/O Module is supported by one or more IOTAs.

I/O Module	IOTA	Description	Circuits	Size (in ")	Red.
CC-PAIH01		High-Level AI HART	16		√
	CC-TAIX01	AI IOTA		6	
	CC-TAIX11	AI IOTA Red		12	√
CC-PAIH02 CC-PAIX01 / 02		High-level AI HART High-level AI w/o HART	16		√
	CC-TAIX01	AI IOTA		6	
	CC-TAIX11	AI IOTA Red		12	√
	CC-TAID01	AI IOTA – 16 Channel Differential		9	
	CC-TAID11	AI IOTA Red – 16 Channel Differential		12	√
CC-PAIH51		High-level AI HART	16		√
	CC-TAIX51	AI IOTA		6	
	CC-TAIX61	AI IOTA Red		12	√
CC-PAIN01		High-level AI w/o HART	16		√
	CC-TAIN01	AI IOTA		6	
	CC-TAIN11	AI IOTA Red		12	√
CC-PPIX01		Pulse Input w/ Fast Cut-off	8		√
	CC-TPIX11	PI IOTA Red		12	√
CC-PAIM01		PMIO LL Mux	64		
	CC-TAIM01	PMIO LL Mux IOTA		6	
	FTA				
	Mx-TAMT04	LL Mux TC FTA	16	12	
	Mx-TAMT14	LL Mux TC FTA w/Remote CJR	16	12	
	Mx-TAMR04	LL Mux RTD FTA	16	12	
CC-PAIL51	CC-TAIL51	Low-level AI	16	9	
CC-PPIX01	CC-TPIX01	Pulse Input	8	12	√

5.5. Low Level Analog (Temperature) Input – LLMUX – CC-PAIM01

Function

The LLMUX IOP module supports up to 64 channels of temperature inputs. Low level inputs use the Honeywell PMIO LLMUX FTA. Each FTA supports 16 channels. Two types of LLMUX FTA are supported. One provides 16 RTD inputs. The other provides 16 TC or MV inputs. Any combination of FTAs may be used to provide the mix of TC, mV or RTD points required.

Notable Features

- TC and RTD operation
- Remote cold junction capability
- 1 Second PV scanning with OTD protection
- Configurable OTD protection (See below)
- Temperature points can be added in 16 point increments

Temperature Support

The Temperature Input LLMUX supports the existing solid state PMIO LLMUX FTA. The PMIO LLMUX FTA supports RTD and Thermocouple (TC) inputs. The Temperature variable is collected from all points at a 1 second rate. The 1 second update includes a configurable check for Open Thermocouple Detection (OTD) (see below) before propagation of the temperature variable. All TC inputs are compensated using a Cold Junction Compensation (CJT) device.

Sampling and Open Sensor Detect

The Temperature multiplexer supports RTD and Thermocouples with Open Sensor Detect before PV delivered if so configured. With the OTD configuration active, the PV is sampled and held while an OTD cycle is performed within the same measurement window. If the OTD is negative, the PV is propagated up through the system. If the OTD is positive, the PV is set to NAN and the input channel soft failure is set. In this way, no inappropriate control action occurs for PV values that are invalid due to an open thermocouple. PV sampling/reporting incurs no added delays from OTD processing.

Detailed Specs - Low Level Input Multiplexer

Parameter		Specification
Input / Output Model		CC PAIM01
PMIO FTA Models [1]		MU-TAMR04, TAMT04, TAMT14
Input Type		Thermocouple and / or RTD
Input channels		64 fully-isolated channel-to-channel, channel-to-PM, and channel-to-power supply common in 16 channel increments.
Input scan rate		1 Second fixed by IOM (up to 64 channels/sec max.)
Channel bandwidth		0 to 4.7 Hz (-3 dB)
Nominal input range (TC only)		-20 to +100 millivolts
Maximum normal mode continuous input non-damaging (any thermocouple type configured)		-10 to +10 volts (TC) -1 to +2 Volts @ 100 milliamps (RTD)
Gain error (-20 to +100 millivolt range)		0.050% full scale max
Temperature stability	TC, millivolt inputs	+/-20 ppm per deg C max
	RTD inputs	+/-20 ppm per deg C max
Long term drift		500 ppm

Parameter	Specification	
Input impedance	1 megohm at dc (TC only)	
CMV with respect to Power System common, dc to 60 Hz	+/-250 VDC or VAC RMS	
CMRR, 50 or 60 Hz (with 1000 ohms source impedance max.)	120 dB min	
Voltage, channel-to-channel, dc to 60 Hz	+/-250 VDC or VAC RMS	
Crosstalk, dc to 60 Hz	80 dB (120 dB at 50 and 60 Hz)	
NMRR at 50/ 60 Hz	60 dB min	
Line frequency integration	Fixed selection of 50 Hz or 60 Hz	
RTD sensor excitation current	1 milliamp	
Cold Junction Reference (CJR) Accuracy	0 to +50 deg C - +/-1.0 deg C Max -20 to +60 deg C - +/-1.5 deg C Max	
TC Linearization Accuracy [2]	± 0.05 Ω / deg C	
Open Thermocouple Detection	Each conversion qualified, ≤ 1000 Ω = guaranteed no-trip ≥ 1500 Ω guaranteed trip.	
RTD Max Lead Resistance	15 Ω	
Surge protection (sensor terminals)	EN 61000-4-5 (for Industrial locations, 1kV line to line, 2kV line to gnd.)	
Surge protection (power/serial link with cable adapter option)	EN 61000-4-5 (for Industrial locations, 1kV line to line, 2kV line to gnd.)	
Maximum cable distance IOTA to FTA using cable adapter	1000 feet 16 gauge wire, two twisted pair per FTA	
Supported types (RTD)	Pt: 100 ohm DIN 4376	-180 to +800 deg C
	Pt: 100 ohm JIS C-1604	-180 to +650 deg C
	Ni: 120 ohm ED #7	-45 to +315 deg C
	Cu: 10 ohm SEER	-20 to +250 deg C
Supported thermocouple types	ANSI specification J	-200 to +1200 deg C
	ANSI specification K	-100 to +1370 deg C
	ANSI specification E	-200 to +1000 deg C
	ANSI specification T	-230 to +400 deg C
	ANSI specification B	+100 to +1820 deg C
	ANSI specification S	0 to +1700 deg C
	ANSI specification R	0 to +1700 deg C

Parameter	Specification	
	JAPAN TYPE R'	0 to +1770 deg C
Supported millivolt types	-20 to +100 millivolts	
FTA dimensions [1]	2.5 D x 4.9 W x 12.1 L (inches) 63.5 D x 124.46 W x 307.34 L (millimeters)	
Note 1: FTAs are PMIO FTAs. These must be installed in FTA channels. These are similar to but not identical to Series C channels. The TPC will support this configuration. Refer to PM20-660 for FTA power, environmental and approval certifications details not covered in this document. Note 2: Linearization polynomials are 4th order and based on NIST Monograph 175, ITS90 and JIS C-1602-1995.		

5.6. Low Level Analog (Temperature) Input – CC-PAIL51

Function

The Low Level IOP module supports up 16 channels of temperature inputs. Any single channel can support either Thermocouple or Resistance Temperature Device (RTD) inputs. Unlike the LLMUX (CC-PAIM01), 16 channels are supported directly on the Series-C IOTA. No external Process Manager FTA is required.

Notable Features

- TC and RTD operation
- Cold junction compensation
- 1 Second PV scanning with OTD protection
- Configurable OTD protection (See below)

Detailed Specs - Low Level Input 16 Channel

Parameter	Specification	
Input / Output Model	CC-PAIL51	
IOTA (16pt)	CC-TAIL51	9”
Input Type	Thermocouple or RTD (configurable per channel)	
Temperature	Operating Temperature	-40 to +70
	Storage Temperature	-40 to +85
Input Channels	Fully isolated Channel to Channel and Channel to Power System	
Input scan rate	1 Second	
Channel bandwidth	0 to 4.7 Hz (-3 dB)	
Nominal input range (TC only)	-20 to +100 millivolts	
Maximum normal mode continuous input (non-damaging)	-10 to +10 volts (TC) -1 to +2 Volts @ 100 milliamps (RTD)	
Gain error	0.050% full scale max	
Temperature stability	TC, Millivolt inputs	+/-20 ppm per max
	RTD inputs	+/-20 ppm per max
Long term drift	500 ppm	
Input impedance	1 megohm at dc (TC only)	
CMV with respect to Power System common, dc to 60 Hz	+/-250 VDC or VAC RMS	
CMRR, 50 or 60 Hz (with 1000 ohms source impedance max.)	120 dB min	
Voltage, channel-to-channel, dc to 60 Hz	+/-250 VDC or VAC RMS	
Crosstalk, dc to 60 Hz	80 dB (120 dB at 50 and 60 Hz)	

Parameter	Specification	
NMRR at 50/ 60 Hz	60 dB min	
Line frequency integration	Fixed selection of 50 Hz or 60 Hz	
RTD sensor excitation current	1 milliamp	
Cold junction compensation range	-20 to +60 ℃ (+/-0.5 ℃ typical)	
TC Linearization Accuracy (2)	± 0.05 Ω / ℃	
Open Thermocouple Detection	Each conversion qualified, ≤ 1000 Ω = guaranteed no-trip 1500 Ω guaranteed trip.	
RTD Max Lead Resistance	15 Ω	
Supported types (RTD)	Pt: 100 ohm DIN 4376	-180 to +800 ℃
	Pt: 100 ohm JIS C-1604	-180 to +650 ℃
	Ni: 120 ohm ED #7	-45 to +315 ℃
	Cu: 10 ohm SEER	-20 to +250 ℃
	Cu: 50 ohm SEER	-50 to +150 ℃
Supported types (Thermocouple)	ANSI specification J	-200 to +1200 ℃
	ANSI specification K	-100 to +1370 ℃
	ANSI specification E	-200 to +1000 ℃
	ANSI specification T	-230 to +400 ℃
	ANSI specification B	+100 to +1820 ℃
	ANSI specification S	0 to +1700 ℃
	ANSI specification R	0 to +1700 ℃
Supported millivolt types	-20 to +100 millivolts	