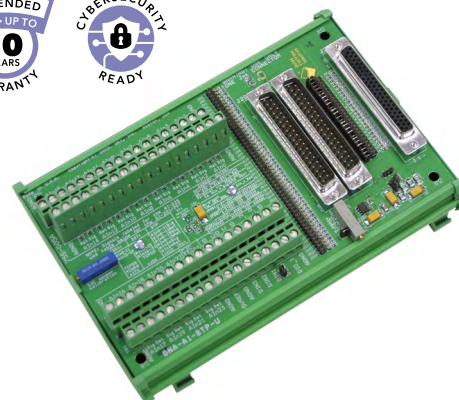


# DNA-STP-AI-U

## Universal PowerDNA Analog Input Terminal Panel

- Supports DNA-AI-207 and DNA-AI-225 analog input layers
- Embedded CJC sensor with calibration
- Open TC detection
- Precision 5.000V reference with calibration
- Jumper-enabled RC filter on every channel
- Voltage-excited RTD support; Direct TC connection
- DIN-rail-compatible Phoenix housing



### General Description:

The DNA-STP-AI-U is a universal screw-terminal panel designed for PowerDNA analog input layers including DNA-AI-207 and DNA-AI-225. Unlike most of the conventional STP panels, the DNA-STP-AI-U uses a 4-layer PCB design which ensures the highest quality low-level analog signals. This terminal panel features per-channel jumper-selectable configuration including voltage RTD (resistance temperature device) excitation, 10MΩ or 10kΩ pull-down resistors, as well as 10MΩ pull-up resistors to 1/101 of the power supply rail. In addition to that, all input signals may be filtered with the simple RC (22.1Ω / 0.1μF) filter.

The terminal also incorporates an isothermal block and calibratable CJC (cold-junction compensation) sensor mounted directly on the panel. For the precision sensors and RTD devices, the panel offers 3ppm/°C stable 5.000V reference with calibration range ±0.2%.

### Pinout Diagram:

J207/208 — DB-37 (male)

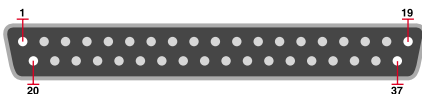
37-pin connector:

AIN-N15	20	1	DIO1/TRIG
AIN-N14	21	2	AIN-P15
+VA13/AGND	22	3	AIN-P14
AIN-P13	23	4	AIN-N13
AIN-P12	24	5	AIN-N12
AIN-P11	25	6	AIN-N11
AIN-P10	26	7	AIN-N10
AIN-N9	27	8	AGND
AIN-N8	28	9	AIN-P9
AIN-N7	29	10	AIN-P8
AIN-N6	30	11	AIN-P7
AIN-P24/AGND	31	12	AIN-P6
AIN-P5	32	13	AIN-N5
AIN-P4	33	14	AIN-N4
AIN-P3	34	15	AIN-N3
AIN-P2	35	16	AIN-N2
AIN-N1	36	17	AGND
AIN-N0	37	18	AIN-P1
		19	AIN-P0

J201/202 — DB-37 (male)

37-pin connector:

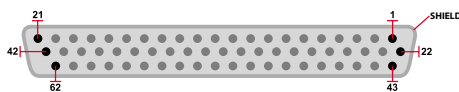
-VA18	20	1	AGND
+VA18	21	2	AGND
DIO2/CLKOUT	22	3	DIO0/CLKIN
AIN-N11	23	4	DIO1/TRIG
AIN-N10	24	5	AIN-P11
AIN-N9	25	6	AIN-P10
AIN-N24	26	7	AIN-P9
AIN-N8	27	8	AIN-P24
AIN-N7	28	9	AIN-P8
AIN-N6	29	10	AIN-P7
AGND	30	11	AIN-P6
AIN-N5	31	12	AGND
AIN-N4	32	13	AIN-P5
AIN-N3	33	14	AIN-P4
AGND	34	15	AIN-P3
AIN-N2	35	16	AGND
AIN-N1	36	17	AIN-P2
AIN-N0	37	18	AIN-P1
		19	AIN-P0



J225 — DB-62 (female)

62-pin connector:

62	DIO0	42	AGND	21	+VA9
61	AIN-P1	41	AIN-N0	20	AIN-P0
60	AIN-N2	40	AIN-P2	19	AIN-N1
59	AIN-P4	39	AIN-N3	18	AIN-P3
58	AIN-N5	38	AIN-P5	17	AIN-N4
57	AIN-P7	37	AIN-N6	16	AIN-P6
56	AIN-N8	36	AIN-P8	15	AIN-N7
55	AIN-P10	35	AIN-N9	14	AIN-P9
54	AIN-N11	34	AIN-P11	13	AIN-N10
53	AIN-P13	33	AIN-N12	12	AIN-P12
52	AIN-N14	32	AIN-P14	11	AIN-N13
51	AIN-P16	31	AIN-N15	10	AIN-P15
50	AIN-N17	30	AIN-P17	9	AIN-N16
49	AIN-P19	29	AIN-N18	8	AIN-P18
48	AIN-N20	28	AIN-P20	7	AIN-N19
47	AIN-P22	27	AIN-N21	6	AIN-P21
46	AIN-N23	26	AIN-P23	5	AIN-N22
45	AGND	25	AIN-N24	4	AIN-P24
44	DIO2	24	AGND	3	-VA9
43	DIN0	23	DIN2	2	DIO1
		22	DIN1	1	DIN3

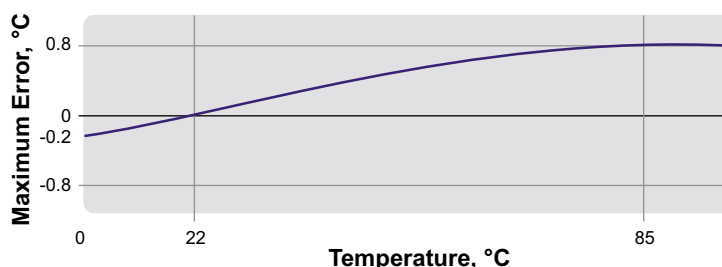


### Technical Specifications:

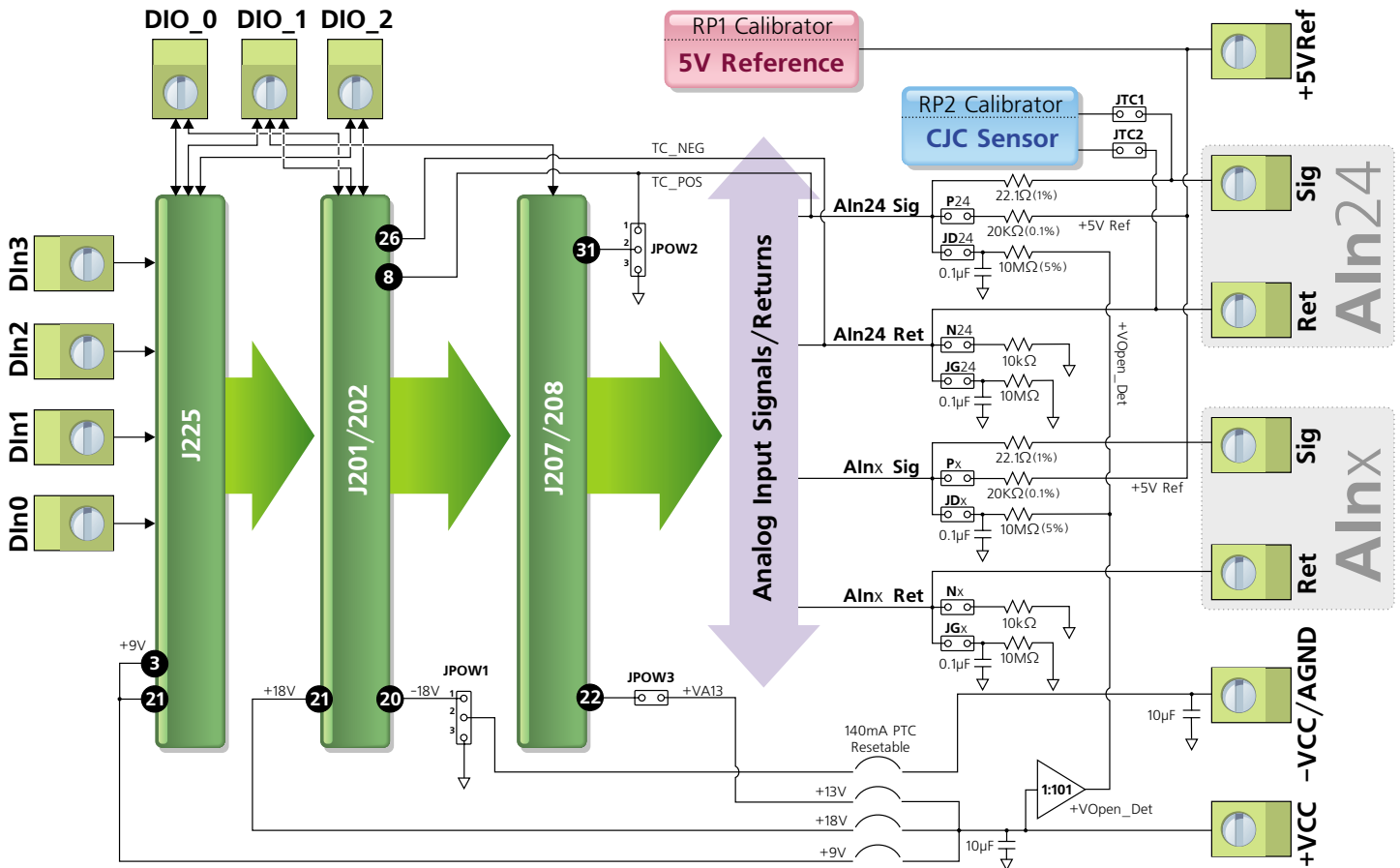
Number of channels: with DNA-AI-207 with DNA-AI-225	16 differential 25 differential
CJC sensor	AD590 (installed inside the isothermal plate),
CJC channel	routed to dedicated Ain24 channel
Reference: VOut Accuracy Temp. coefficient Max current	5.000V 0.02% initial 3ppm/°C 20mA
Open TC detection and RC filter (22.1Ω/0.1μF)	10MΩ pull-up to 1/101 of the power supply
Constant open TC detection offset for DNA-AI-207 for DNA-AI-225	< 0.1°C < 0.1°C
RTD resistors	20KΩ, 0.1%, 15ppm
±VCC max current	140mA, PTC resettable fuse
Physical dimensions	7" x 4.2" x 1.1"
Operating temp. range	-40°C to +85°C
Operating humidity	90%, non-condensing

### CJC Sensor Absolute Temperature Error vs Temperature

(Calibrated to ±0.1°C at 22°C temperature, Error may be as high as 1.8°C at -40°C)



## Block Diagram:



## Layer-to-Panel Pins Reference:

	Layer Pins <sup>1</sup>	Terminal Panel Pins	
Layer	DNA-AI-225	AINx	AINx Sig
	AINx Return	AINx Ret	
	AIN24/AIN24 Return	CJC or AIN24 Sig/AIN24 Ret	
	DIO0 - DIO2	DIO_0 - DIO_2	
	4 x reserved for Rev3 SDK	DIN0 - DIN3	
	9V@20mA	+VCC	
	AGND	AGND	
	DNA-AI-207	AINx+	AINx Sig
AINx-	AINx Ret		
+13V 50mA	+VCC		
CJC+	AIN24 Sig		
DIO1	DIO_1		
AGND	AGND		

<sup>1</sup> As per corresponding PowerDNA layer's pinout diagram.

## Channel Configuration Options:

Jumper	Settings
JTC1/JTC2	<b>ON:</b> Enable CJC Sensor <sup>2</sup>
JPOW2	<b>1-2:</b> DNA-AI-207 <b>2-3:</b> DNA-AI-225
JPOW3	<b>ON:</b> DNA-AI-207 only
JPOW1	<b>1-2:</b> <b>2-3:</b> DNA-AI-207, DNA-AI-225

<sup>2</sup> Enabling CJC compensation requires the jumpers JD24, N24 and JG24 to be installed as well.

Jumper	Function
Px	Connect 5V ref via 20kΩ 0.1% for voltage RTD excitation
JDx <sup>3</sup>	Open TC detection + 22.1Ω/0.1μF low pass filter on signal
Nx	Connect Return to Ground via 10kΩ (grounded thermocouple connection)
JGx <sup>3</sup>	10MΩ to Ground + 0.1μF to Ground

<sup>3</sup> When used with DNA-AI-225, JDx and JGx should be installed for a better noise floor.