

PDAC Universal Temperature/ Process Digital Recorder

With the Athena PDAC, food processing and consumer packaged goods (CPG) manufacturing facilities no longer need to manually collect data. The PDAC digital data recorder provides information integrity and accuracy that can ensure FSMA-compliant processes.

With integrated, accurate tracking and reporting, PDAC keeps process data safer and transfers it wherever needed and in the required format. Process data can be stored in any format...an open CSV format or a secure, check-summed format for data integrity.

The Athena PDAC is a ¼ DIN panel mounted digital recorder that offers four high accuracy universal inputs for data recording. This secure data sampling and recording device is enhanced by a full color ¼ VGA 320 x 240 pixel display to bring crystal clear operator interface to even the smallest machine.

Standard Ethernet communication fits easily into a data network, allowing files to be transferred for further analysis and archiving. The PDAC recorder is deal for applications where data storage is critical.

- Secure data recording
- 4 universal input channels
- 3.5 TFT color screen
- NEMA 4 (IP65) rating
- Alarms 2 per channel
- 50 MB memory for data storage
- Recording destinations: Internal flash, FTP server or USB memory stick
- MODBUS TCP/IP master/slave
- 8 Hz sample and recording rate
- Multiple I/O options
- Cascade with auto-tune
- 2 PID control loops
- ETHERNET communications



Technical Specifications

Operating Limits

Ambient Temperature: 32 °F to 131 °F (0 °C to 55 °C)
Humidity Range: Non-condensing
Protection: Front panel: IP65; Front panel washdown: IP66, NEMA4X (International)
Altitude: <2,000 m
Atmosphere: Not suitable for use in explosive or corrosive atmosphere
Supply Voltage: Standard: 100 to 230 Vac +/- 15% at 48 to 62 Hz; Low voltage: 24 Vac (+ 10% - 15%) at 48 to 62 Hz, or 24 Vdc (+ 20% - 15%), 9 W (max), No internal fuse fitted
Power Dissipation: 9 W (max), No internal fuse fitted

Analogue Input

General

Number of Inputs: Four
Input Types: dc Volts, dc mV, dc mA, (external shunt required), Thermocouple, RTD (2-wire and 3-wire), Digital (contact closure)
Input Type Mix: Freely configurable
Sample Rate: 8 Hz (125 ms)
Conversion Method: 16 bit delta sigma
Input Ranges: See Table 1 and Table 2
Mains Rejection (48 to 62 Hz): Series Mode: > 95 dB; Common Mode: > 179 dB
Common Mode Voltage: 250 Vac max
Series Mode Voltage: 280 mV at lowest range; 5 V peak to peak at highest range
Input Impedance: 40 mV, 80 mV, 2 V ranges > 100 M Ω; 62.5 k Ω for input voltages > 5.6 V; 667 k Ω for input voltages < 5.6 V
Overvoltage Protection: Continuous: +/- 30 V RMS; Transient (< 1 ms): +/- 200 V peak to peak between terminals
Sensor Break Detection:
Type: ac sensor break on each input giving quick response with no associated dc errors
Recognition Time: < 3 seconds
Minimum Break Resistance: 40 mV, 80 mV ranges: 5 k Ω; other ranges: 12.5 k Ω
Shunt (mA inputs only): 1 Ω to 1 k Ω mounted externally
Additional Error Due to Shunt: 0.1% of input
Isolation:
Channel to Channel: 300 V RMS or dc (double insulation)
Channel to Common Electronics: 300 V RMS or dc (double insulation)
Channel to Ground: 300 V RM or dc (double insulation)

Dielectric Strength:

Test: BS EN 61010, 1 minute type test
Channel to Channel: 2500 Vac
Channel to Ground: 1500 Vac

Low Range	High Range	Resolution	Maximum Error (Instrument at 25 °C)	Temperature Performance
- 40 mV	40 mV	1.9 μV	4.6 μV + 0.053% of reading	13 ppm of input per °C
- 80 mV	80 mV	3.2 μV	7.5 μV + 0.052% of reading	13 ppm of input per °C
- 2 V	2 V	82 μV	420 μV + 0.044% of reading	13 ppm of input per °C
- 3V	10 V	500 μV	1.5 mV + 0.063% of reading	45 ppm of input per °C

Table 1 Voltage Input Ranges

Low Range	High Range	Resolution	Maximum Error (Instrument at 25 °C)	Temperature Performance
0 Ω	400 Ω	20 mΩ	120 mΩ + 0.023% of reading	25 ppm of input per °C

Table 2 Ohms (RTD) Input Ranges

Resistance Input Ranges

Temperature Scale: ITS90
Types, Ranges & Accuracies: See Table 3
Maximum Source Current: 200 μA
Pt100 Figures:
Range: 0 to 400 Ω (- 200 to + 850 °C)
Resolution: 0.05 °C
Calibration Error: +/- 0.31 °C +/- 0.023% of measurement in °C at 25 °C ambient
Temperature Coefficient: +/- 0.01 °C/°C +/- 25 ppm/°C measurement in °C from 25 °C ambient
Measurement Noise: 0.05 °C peak to peak with 1.6 s input filter
Linearity Error: 0.0033% (best fit straight line)
Lead Resistance: 0 to 22 Ω matched lead resistance
Bulb Current: 200 μA nominal

RTD Type	Overall Range (°C)	Standard	Max. Linearisation Error
Cu10	- 20 to + 400	General Electric Co.	0.02 °C
Cu53	- 70 to + 200	RC21-4-1966	0.01 °C
JPT100	- 220 to + 630	JIS C1604:1989	0.01 °C
Ni100	- 60 to + 250	DIN43760:1987	0.01 °C
Ni120	- 50 to + 170	DIN43760:1987	0.01 °C
Pt100	- 200 to + 850	IEC751	0.01 °C
Pt100A	- 200 to + 600	Eurotherm Recorders SA	0.09 °C

Table 3 RTD Type Details



Thermocouple Data

Temperature Scale: ITS90

CJC:

Types: Off, internal, external, remote

Remote CJC Source: Any input channel

Internal CJC Error: < 1 °C max, with instrument at 25 °C

Internal CJC Rejection Ratio: 40:1 from 25 °C

Upscale/Downscale Drive: High, low or none independently configurable for each channel's sensor break detection

Types, Ranges and Accuracies: See Table 4

T/C Type	Overall Range (°C)	Standard	Max. Linearisation Error
B	0 to + 1820	IEC584.1	0 to 400 °C = 1.7 °C 400 to 1820 °C = 0.03 °C
C	0 to + 2300	Hoskins	0.12 °C
D	0 to + 2495	Hoskins	0.08 °C
E	- 270 to + 1000	IEC584.1	0.03 °C
G2	0 to + 2315	Hoskins	0.07 °C
J	- 210 to + 1200	IEC584.1	0.02 °C
K	- 270 to + 1372	IEC584.1	0.04 °C
L	- 200 to + 900	DIN43710:1985 (to IPTS68)	0.02 °C
N	- 270 to + 1300	IEC584.1	0.04 °C
R	- 50 to + 1768	IEC584.1	0.04 °C
S	- 50 to + 1768	IEC584.1	0.04 °C
T	- 270 to + 400	IEC584.1	0.02 °C
U	- 200 to + 600	DIN43710:1985	0.08 °C
NiMo/NiCo	- 50 to + 1410	ASTM E1751-95	0.06 °C
Platinel	0 to + 1370	Engelhard	0.02 °C
Mi/NiMo	0 to + 1406	Ipsen	0.14 °C
Pt20%Rh/Pt40%/Rh	0 to + 1888	ASTM E1751-95	0.07 °C

Table 4 Thermocouple Types, Ranges and Accuracies

Relay and Logic I/O

O/P1, O/P2 and O/P3 Logic I/O and Relay Specifications

Active (current on) Current Sourcing Logic Output (O/P1 or O/P2 only)

Voltage O/P Across Terminals: + 11 V min; + 13 V max
Short Circuit Output Current: 6 mA min (steady state); 44 mA max (switch current)

Inactive (current off) Current Sourcing Logic Output (O/P1 or O/P2 only)

Voltage Output Across Terminals: 0 V min; 300 V max
Output Source Leakage Current into Short Circuit: 0 µA (min); 100 µA (max)

Active (current on) Contact Closure Sourcing Logic Input (O/P1 only)

Input Current: Input at 12 V: 0 mA (min); 44 mA (max)
Input at 0 V: 6 mA min (steady state); 44 mA max (switch current)

Open Circuit Input Voltage: 11 V (min); 13 V (max)
Open Circuit (inactive) Resistance: 500 Ω (min); ∞ (max)
Closed Circuit (active) Resistance: 0 Ω (min); 300 Ω (max)
Relay Contacts
Contact Switching Power (Resistive): Max 2 A at 230 V RMS +/- 15%; Min 100 mA at 12 V
Current Through Terminals: 2 A

Digital Inputs

Dig InA and Dig InB Contact Closure Logic Input

Contact Closure

Short Circuit Sensing Current (Source): 5.5 mA (min); 6.5 mA (max)
Open Circuit (inactive) Resistance: 600 Ω (min); ∞ (max)
Closed Circuit (active) Resistance: 0 Ω (min); 300 Ω (max)

DC Output (Option)

O/P1, O/P2 and O/P3 DC analogue outputs

Current Outputs (O/P1, O/P2 and O/P3)

Output Ranges: Configurable within 0 to 200 mA
Load Resistance: 500 Ω (max)
Calibration Accuracy: < +/- 100 µA +/- 1% of reading

Voltage Outputs (O/P3 only)

Output Ranges: Configurable within 0 to 10 V
Load Resistance: 500 Ω (min)
Calibration Accuracy: < +/- 50mV +/- 1% of reading

General

Isolation: 300 Vac double insulated from instrument and other I/O

Resolution: > 11 bits

Thermal Drift: < 100 ppm/°C

Ethernet Communications

Type: 10/100 baseT Ethernet (IEEE802.3)

Protocols: Modbus TCP/IP master/slave, Ethernet/IP client/server

Cable Type: Category 5

Maximum Length: 100 metres (110 yards)

Termination: RJ45; Green LED illuminated = link connected; Amber LED flashing shows link activity

USB Port

Number of Ports: One at rear of instrument

Standard: USB1.1

Transmission Speeds: USB1.1

Maximum Current: < 100 mA

Peripherals Supported: Memory stick (8GB max), Bar code reader, QWERTY keyboard

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Technical Specifications *(continued)*

Update/Archive Rates

Sample Rate (input/output): 8 Hz
Trend Update: 8 Hz max
Archive Sample Value: Latest value at archive time
Display Value: Latest value at display update time

Mechanical Characteristics

Battery Backup

Stored Data: Time, date
Replacement Period: Three years typical
Clock (real-time clock) Data:
Support Time: Minimum of 1 year with unit unpowered
Temperature Stability: 0 to 55 °C ≤ +/- 3.5 ppm
RTC Aging: First year to 10 year < +/- 5 ppm
Type: Poly-carbonmonofluoride/lithium (BR2330) (PA260195)
 Replace battery with Panasonic BR2330/BE only. Use of another battery may present a risk of fire or explosion. See owners manual for safety instructions.

Caution: Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Approvals and Compliance Details

General: CE and cUL, EN61010
PV Input: AMS2750D compliant
RoHS: EU; China
Packaging: BS61131-2 section 2.1.3.3

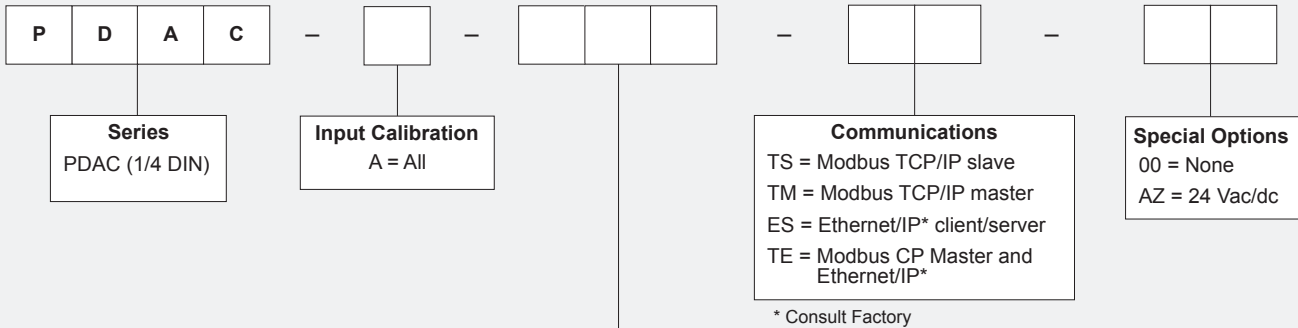
Physical

Panel Mounting: 1/4 DIN
Weight (Instrument only): 0.44 kg (15.52 oz)
Panel Cutout Dimensions: 92 mm x 92 mm (both -0.0 +0.8)
Depth Behind Panel: 90 mm (3.54 in) excluding wiring

Operator Interface

Display: 3.5" TFT colour display (320 pixels wide x 240 pixels high)
Controls: Four navigation pushbuttons below the display screen (Page, Scroll, Lower and Raise)

Ordering Information



Code	Output 1	Output 2	Output 3
SBB =	S = Pulsed 20 Vdc	B = Relay	B = Relay
LRD =	L = Logic	R = Relay	D = Iso DC output
LLR =	L = Logic	L = Logic	R = Relay
RDD =	R = Relay	D = Iso DC	D = Iso DC
DDD =	D = Iso DC	D = Iso DC	D = Iso DC
LDD =	L = Logic	D = Iso DC	D = Iso DC

Code combinations for outputs 1, 2 and 3 are fixed.



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