

DAQP-MULTI

- **Thermocouple:** *Freely programmable ranges within full thermocouple input span*
- **Bridge:** ± 0.5 to ± 1000 mV/mA
- **Voltage input:** ± 5 mV to ± 5 V (freely programmable within ± 5 V)
- **RTD** *Resistance Temperature Detector (Pt100 to Pt2000), freely programmable ranges within full RTD input span*
- **Resistance:** 1Ω to 1 M Ω (freely programmable between 1Ω and 1 M Ω)
- **Bandwidth:** 3 kHz
- **Signal connection:** *Standard miniature thermocouple socket, 9-pin D-SUB socket*

Isolated multifunctional module



Module specifications

DAQP-MULTI	
Input types	High speed Resistance Temperature Detector (RTD); voltage; resistance; bridge with constant current excitation
Thermocouple	
Type	K, J, T, R, S, N, E, B, L, C, U, others on request
Range	Min. to max. of the input range is freely programmable within the full thermocouple input span
CJC absolute accuracy	± 0.3 °C
CJC stability	0.03 °C/°C ambient temperature change
CJC equilibrium time	5 minutes
Accuracy	Typical 0.4° for type K including CJC error; details see table „Input ranges and detailed specifications for thermocouple“.
Linearization	DSP based linearization
Nonlinearity	> 0.01°C
Open thermocouple detection	100 M Ω pull up; software selectable
Connector	Mini thermocouple socket with integrated cold junction compensation sensor
RTD	
Type	Pt100, Pt200, Pt500, Pt1000, Pt2000, others on request
Range	Min. and max. of the input range is freely programmable within the full RTD input span
Constant current	Pt100: 1 mA; Pt200, Pt500: 0.5 mA; Pt1000, Pt2000: 0.2 mA
Accuracy	Typical accuracy 0.2 °C for Pt100, details see table „Input ranges and detailed specifications for RTD“
Linearization	DSP based linearization
Nonlinearity	> 0.01 °C
Voltage	
Input range	± 5 mV, ± 10 mV, ± 20 mV, ± 50 mV, ± 100 mV, ± 200 mV, ± 500 mV, ± 1 V, ± 2 V, ± 5 V, freely programmable within ± 5 V
Accuracy	± 5 to ± 100 mV Range: 0.02 % of reading ± 0.02 % of Range ± 5 μ V ± 0.1 mV to ± 5 V Range: 0.02 % of reading ± 0.02 % of Range ± 200 μ V
Offset drift	Typical ± 0.3 μ V/°K ± 10 ppm of range/°K
Gain drift	Typical 15 ppm/°K
Input impedance	> 100 M Ω (power off: 50 k Ω)
Input noise	8 nV * \sqrt Hz
Resistance	
Range	1, 3, 10, 30, 100, 300, 1k, 3k, 10k, 30k, 100k, 1M, freely programmable between 1Ω and 1 M Ω
Accuracy	According to table „Input ranges and detailed specifications for resistance“
Drift	Typical 15 ppm/°K
Constant current	From 5 μ A to 5 mA, depending on range
Bridge	
Range	0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000 mV/mA
Accuracy	0.02 % of reading ± 0.01 % of Range ± 5 μ V
Offset drift	typical ± 0.3 μ V/°K ± 10 ppm of range/°K
Gain drift	typical 15ppm/°K
Input impedance	> 100 M Ω (power off: 50 k Ω)
Input noise	8 nV * \sqrt Hz
Automatic bridge balance	± 200 % of range
Supported sensors	4 wire full bridge
Connector	D-SUB-9; DEWETRON bridge type pinout

Excitation current			
Excitation current	1, 2, 4 mA; software programmable		
Accuracy	0 to 200 μ A:	0.02 % \pm 50 nA	
	200 μ A to 5 mA:	0.02 % \pm 1 μ A	
Drift	15 ppm/ $^{\circ}$ K		
Compliance voltage	15 V		
Source resistance	>150 k Ω		
Bandwidth (-3dB)			
	3 kHz		
Filters			
	3 Hz, 10 Hz, 30 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz		
Group delay			
	300 μ s with highest filter		
Filter characteristics			
	Butterworth or Bessel, 2 nd , 4 th , 6 th 8 th order programmable		
Typ. CMRR	0 to 100 mV range	100 mV to 5 V range	Thermocouple input
	50 Hz	125	105
	1 kHz	120	100
	3 kHz	115	95
Isolation			
	1 kV _{RMS} ¹⁾		
Over voltage protection			
	\pm 100 V between inputs (clamping voltage: 5 V @ TC input; 11 V @ Voltage input)		
Output voltage			
	\pm 5 V; 0 to 5V; (\pm 10 V and 0 to 10 V with special DEWE-30)		
Output resistance			
	22 Ω		
Output current			
	Max. 5 mA		
Output protection			
	Continuous short to ground		
RS-485 interface			
	Yes		
RS-485 data output			
	Yes		
Supported TEDS chips			
	DS2406, DS2430A, DS2431, DS2432, DS2433, DS28EC20		
MSI support			
	No		
Power supply voltage			
	\pm 9 V _{DC} (\pm 5 %)		
Power consumption			
	1 W typical		

¹⁾ Although the rated input voltage is 33 V_{RMS}, 46,7 V_{PEAK} or 70 V_{DC} according to EN-61010-1 and EN-61010-2-30, the galvanic isolation for input, excitation and TEDS has been tested with 1 kV_{RMS} for 1 min.

Input ranges and detailed specifications for thermocouple

Thermocouple accuracy including CJC error											
Type	Standard	Input range		Accuracy			Accuracy				
		min	max	-270 to -200 $^{\circ}$ C -454 to -328 $^{\circ}$ F [$^{\circ}$ F] $^{\circ}$ C	-200 to -100 $^{\circ}$ C -328 to -148 $^{\circ}$ F [$^{\circ}$ F] $^{\circ}$ C	-100 to 0 $^{\circ}$ C -148 to 32 $^{\circ}$ F [$^{\circ}$ F] $^{\circ}$ C	0 to 100 $^{\circ}$ C 32 to 212 $^{\circ}$ F [$^{\circ}$ F] $^{\circ}$ C	100 to 400 $^{\circ}$ C 212 to 752 $^{\circ}$ F [$^{\circ}$ F] $^{\circ}$ C	400 to 1000 $^{\circ}$ C 752 to 1832 $^{\circ}$ F [$^{\circ}$ F] $^{\circ}$ C	>1000 $^{\circ}$ C > 1832 $^{\circ}$ F [$^{\circ}$ F] $^{\circ}$ C	
K	DIN EN 60584-1	[-454] -270	[2501] 1372	[17.41] 9.67	[1.82] 1.01	[1.92] 0.51	[0.70] 0.39	[0.79] 0.44	[1.08] 0.6	[1.39] 0.77	
J	DIN EN 60584-1	[-346] -210	[2192] 1200	[1.76] 0.98	[1.57] 0.87	[0.85] 0.47	[0.67] 0.37	[0.76] 0.42	[0.92] 0.51	[1.01] 0.56	
T	DIN EN 60584-1	[-454] -270	[752] 400	[11.38] 6.32	[1.78] 0.99	[0.99] 0.55	[0.70] 0.39	[0.61] 0.34	-	-	
R	DIN EN 60584-1	[-58] -50	[3200] 1760	-	-	[2.30] 1.28	[1.60] 0.89	[1.17] 0.65	[0.95] 0.53	[1.28] 0.71	
S	DIN EN 60584-1	[-58] -50	[3200] 1760	-	-	[2.07] 1.15	[1.57] 0.87	[1.21] 0.67	[1.04] 0.58	[1.39] 0.77	
N	DIN EN 60584-1	[-454] -270	[2372] 1300	[23.81] 13.23	[2.02] 1.12	[0.97] 0.54	[0.67] 0.42	[0.70] 0.39	[0.86] 0.48	[1.03] 0.57	
E	DIN EN 60584-1	[-454] -270	[1832] 1000	[11.00] 6.11	[1.06] 0.87	[0.88] 0.49	[0.65] 0.36	[0.61] 0.34	[0.86] 0.48	-	
L	DIN 43710	[32] 0	[1652] 900	-	-	-	[0.65] 0.36	[0.74] 0.41	[0.77] 0.43	-	
C	ASTM E988-96	[32] 0	[4190] 2310	-	-	-	[0.88] 0.49	[0.86] 0.48	[1.06] 0.59	[1.69] 0.94	
U	DIN 43710	[-328] -200	[1112] 600	[1.67] 0.93	[1.67] 0.93	[0.99] 0.55	[0.70] 0.39	[0.63] 0.35	[0.56] 0.31	-	
B	DIN EN 60584-1	[32] 0	[3308] 1820	-	-	-	[54.56] 30.31	[5.47] 3.04	[1.40] 0.78	[0.92] 0.51	

■ = calculated specifications, not verified.

Input ranges and detailed specifications for RTD

RTD									
Type	Standard	Input range		Current	Accuracy				
		min	max		-200 to -100 $^{\circ}$ C -328 to -148 $^{\circ}$ F [$^{\circ}$ F] $^{\circ}$ C	-100 to 0 $^{\circ}$ C -148 to 32 $^{\circ}$ F [$^{\circ}$ F] $^{\circ}$ C	0 $^{\circ}$ C to fullscale 32 $^{\circ}$ F to fullscale (% of reading + [$^{\circ}$ F] $^{\circ}$ C)		
Pt100 (385)	DIN EN 60751	[-328] -200	[1562] 850	0.2	[0.25] 0.14	[0.37] 0.21	0.07	[0.37] 0.21	
Pt200 (385)	DIN EN 60751	[-328] -200	[1562] 850	0.1	[0.32] 0.18	[0.48] 0.27	0.10	[0.48] 0.27	
Pt500 (385)	DIN EN 60751	[-328] -200	[1562] 850	0.2	[0.61] 0.34	[0.75] 0.42	0.09	[0.75] 0.42	
Pt1000 (385)	DIN EN 60751	[-328] -200	[1562] 850	0.2	[0.39] 0.22	[0.52] 0.29	0.09	[0.52] 0.29	
Pt2000 (385)	DIN EN 60751	[-328] -200	[1562] 850	0.2	[0.45] 0.25	[0.63] 0.35	0.12	[0.64] 0.36	
Pt100 (3926)	DIN EN 60751	[-328] -200	[1562] 850	0.2	[0.25] 0.14	[0.37] 0.21	0.07	[0.37] 0.21	

Input ranges and detailed specifications for resistance

Resistance			
Range [Ω]	Current [mA]	Accuracy	
		[% of reading]	[% of range]
1000000	0.005	0.04	1.02
300000	0.015	0.04	0.35
100000	0.05	0.04	0.11
30000	0.1	0.04	0.07
10000	0.1	0.04	0.08
3000	0.2	0.04	0.07
1000	0.5	0.04	0.25
300	1	0.04	0.18
100	1	0.04	0.12
30	2	0.04	0.08
10	4	0.04	0.06
3	5	0.04	0.10
1	5	0.04	0.23

Detailed specifications for excitation current

Excitation		
	[% of reading]	[μA]
0 to 200 μA	0,02	0,05
>0.2 to 5 mA	0,02	1