



DEWETRON

▼

DAQP-MULTI /-THERM Module

TECHNICAL REFERENCE MANUAL

▼

WELCOME TO THE WORLD OF DEWETRON!

Congratulations on your new device! It will supply you with accurate, complete and reproducible measurement results for your decision making.

Look forward to the easy handling and the flexible and modular use of your DEWETRON product and draw upon more than 30 years of DEWETRON expertise in measurement engineering.

▼

ISO9001



THE MEASURABLE DIFFERENCE.

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▼ Notice

Safety symbols in the manual



Indicates hazardous voltages.

WARNING *Calls attention to a procedure, practice, or condition that could cause bodily injury or death.*

CAUTION *Calls attention to a procedure, practice, or condition that could possibly cause damage to equipment or permanent loss of data.*

WARNINGS

The following general safety precautions must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. DEWETRON Elektronische Messgeraete Ges.m.b.H. assumes no liability for the customer's failure to comply with these requirements.

All accessories shown in this document are available as option and will not be shipped as standard parts.

Safety instructions for DEWETRON amplifiers

- The DEWETRON data acquisition systems and amplifiers may only be installed by experts.
- Read your manual carefully before operating.
- Observe local laws when using the amplifiers.
- Ground the equipment: For Safety Class 1 equipment (equipment having a protective earth terminal), a non interruptible safety earth ground must be provided from the mains power source to the product input wiring terminals or supplied power cable.
- DO NOT operate the product in an explosive atmosphere or in the presence of flammable gases or fumes.
- DO NOT operate damaged equipment: Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to a DEWETRON sales and service office for service and repair to ensure that safety features are maintained.
- Keep away from live circuits: Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers or shields are for use by service-trained personnel only. Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid dangerous electrical shock, DO NOT perform procedures involving cover or shield removal unless you are qualified to do so.
- No modifications are allowed at the amplifiers.
- DO NOT service or adjust alone. Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.
- DO NOT substitute parts or modify equipment: Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Return the product to a DEWETRON sales and service office for service and repair to ensure that safety features are maintained.
- DO NOT touch internal wiring!
- DO NOT use higher supply voltage than specified!
- Use only original plugs and cables for harnessing.
- Safety of the operator and the unit depend on following these rules.

▼ Support

For any support please contact your local distributor first or DEWETRON directly.

For Asia and Europe, please contact:

DEWETRON GmbH
Parkring 4
8074 Grambach
AUSTRIA
Tel.: +43 316 3070
Fax: +43 316 307090
Email: support@dewetron.com
Web: <http://www.dewetron.com>

The telephone hotline is available Monday to Friday between 08:00 and 12:00 CET (GMT -1:00) and Monday to Thursday between 13:00 and 17:00 CET.

For the Americas, please contact:

DEWETRON, Inc.
2850 South County Trail, Unit 1
East Greenwich, RI 02818
U.S.A.
Tel.: +1 401 284 3750
Toll-free: +1 866 598 3393
Fax: +1 401 284 3755
Email: us.support@dewetron.com
Web: <http://www.dewetron.us>

The telephone hotline is available Monday to Friday between 08:00 and 17:00 GST (GMT +5:00)

General Module Information

Calibration information

All DEWETRON modules are calibrated at 25 °C after a warmup time of 30 minutes and meet their specifications when leaving the factory.

The time interval for recalibration depends on environmental conditions. Typically, the calibration should be checked once a year.

Calibration certificates are available from DEWETRON as an option. DEWETRON offers two types:

- ISO traceable DEWETRON certificate
- Calibration certificate according to ÖKD (equivalent to DKD)

This manual contains no calibration information. For self calibration, there is a separate calibration kit for the DAQ series modules available. The CAL-KIT contains the required cables, software and instructions.

General module specifications

Module dimensions: 20 x 65 x 105 mm (0.79 x 2.56 x 4.13 in.)
(W x H x D without front cover and connectors)

Frontcover: 20 x 87 x 2 mm (0.79 x 3.43 x 0.08 in.)
(W x H x D without connector)

Environmental:

Temp. range storage: -30 °C to +85 °C (-22 °F to 185 °F)

Temp. range operating: -5 °C to +60 °C (23 °F to 140 °F)

Relative humidity

(MIL202): 0 to 95 % at 60 °C, non-condensing (unless otherwise noticed)

RFI susceptibility: ±0.5 % span error at 400 MHz, 5 W, 3 m

All specifications within this manual are valid at 25 °C!

All modules are produced according ISO9001 and ISO14001.

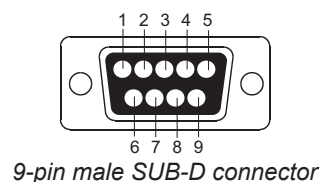
Module connectors

Frontpanel connector: Accessable to the user. The connector type and pin assignment varies from module to module. Detailed pin assignment of each module is shown in the appropriate module description.

Rear connector: 9-pin male SUB-D, interface to the DEWE-System, not accessible to the user.



HSI/DAQx and PAD module
rear view



Interface pin assignment:

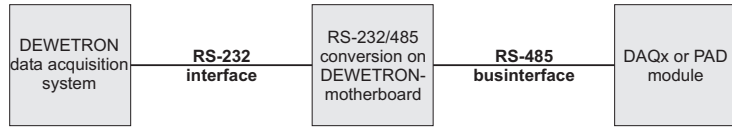
- 1 Module output (± 5 V)
- 2 RS-485 (A)
- 3 RS-485 (B)
- 4 GND
- 5 +9 V power supply
- 6 +12 V power / sensor supply
- 7 Module input (from D/A converter of the A/D board)¹⁾
- 8 reserved
- 9 -9 V power supply

¹⁾ Triggerout at DAQP-FREQ-A

General Module Information

RS-232/485 interface

HSI/DAQP modules can be configured via RS-485 interface, PAD modules require this interface for all data transfers.



For all DEWETRON systems, an internal RS-232/485 converter is available (standard with DEWE-800, -2000, -2500, -3000, -4000, -5000 series systems). This converter allows communication with HSI/DAQP and PAD modules.

To communicate with the modules, the RS-232 interface has to be set to the following parameters:

baud rate:	9600 bps
data bits:	8
parity:	no parity
stop bits:	1
handshake:	not required

HSI/DAQP module configuration

1. Push button selection

All ranges and filters can be selected directly by pressing the push buttons on the module. Approx. 15 sec. after changing range and / or filter, the range and filter information is stored in an EEPROM. This procedure increases the lifetime of the EEPROM.

The current input range setting is shown all the time by LED. To change the range just press **RANGE** button a few times until the required range is displayed.

To see the current filter setting just press the **FILTER** button once. The corresponding LED is flashing for approx. 3 seconds. Within this time, the filter can be selected by pressing the **FILTER** button again. Approx. 3 seconds after the last key activity, the information will be stored, the LED stops flashing and shows the input range again.

CAUTION: Power loss during this time leaves the module in the former settings.

2. RS-232/485 programming

All ranges and filters can also be selected via RS-232/485 interface. All new DEWE-800, -2000, -2500, -3000, -4000, -5000 series systems are prepared as a standard to work with HSI/DAQP modules.

The easiest way to change the configuration is to use the DEWEConfig software, which comes as a standard with the DEWETRON data acquisition system.

Detailed information about HSI/DAQP modules programming for customer applications is available in the *DEWE-Modules Programmers Reference Manual*.

CAUTION: All range and filter changes which are done via RS-232/485 interface are not stored in the EEPROM of the HSI/DAQP modules! You have to store this information in a separat initialisation file to keep settings information for next system start!

PAD module communication

All PAD modules are only working through the RS-232/485 interface. All new DEWE-800, -2000, -2500, -3000, -4000, -5000 series systems are prepared as a standard to work with PAD modules. The easiest way to change the configuration is to use the DEWEConfig software, which comes as a standard with the DEWETRON data acquisition system.

Detailed information about PAD modules programming for customer applications is available in the *DEWE-Modules Programmers Reference Manual*.

DAQP-MULTI / DAQP-THERM

Isolated multifunctional amplifier

- Input ranges: Thermocouple, RTD, Resistance, Voltage, Constant current supplied Bridge
- Bandwidth: 3 kHz
- Filter: 6 programmable low pass filter (3 Hz to 3 kHz) and Programmable filter order (2nd, 4th, 6th, 8th)
- Output: Free programmable linearized voltage output



Module specifications

DAQP-MULTI / DAQP-THERM	
Input types	High speed thermocouple (TC) 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 °C for type K including CJC error; details see table „Input ranges and detailed specifications“.
Linearization	DSP based linearization
Nonlinearity	< 0.01 °C
Open thermocouple detection	100 MΩ 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 specification“.
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 ±5V
Accuracy	±5 mV to ±100 mV Range: 0.02 % of reading ±0.02 % of Range ±0.1 V to ±5V Range: 0.02 % of reading ±0.02 % of Range
Offset drift	Typical ±0.3 μV/°K ±10 ppm of range/°K
Gain drift	Typical 15 ppm/°K
Input impedance	> 100 MΩ (power off: 50 kΩ)
Input noise	8 nV * √Hz
Resistance	
Range	1, 3, 10, 30, 100, 300, 1k, 3k, 10k, 30k, 100k, 1M, freely programmable between 1 Ω and 1 MΩ
Accuracy	According to table „Input ranges and detailed specifications“.
Drift	Typical 15 ppm/°K
Constant current	From 5 μA 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 μV
Offset drift	typical ±0.3 μV/°K ±10 ppm of range/°K
Gain drift	typical 15ppm/°K
Input impedance	> 100 MΩ (power off: 50 kΩ)

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DAQP-MULTI / DAQP-THERM

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Input noise	8 nV * √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 µA:	0.02 % ±50 nA	
	200 µA to 5 mA:	0.02 % ±1 µA	
Drift	15 ppm/°K		
Compliance voltage	15 V		
Source resistance	>150 kΩ		
Bandwidth (-3dB)	3 kHz		
Filters	3 Hz, 10 Hz, 30 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz		
Filter characteristics	Butterworth or Bessel, 2 nd , 4 th , 6 th , 8 th order programmable		
Group delay	300 µs with highest filter		
Typ. CMRR	0 to 100 mV range	100 mV to 5 V range	Thermocouple input
50 Hz	125	105	160
1 kHz	120	100	135
3 kHz	115	95	130
Isolation	1 kV _{RMS} ¹⁾		
Over voltage protection	±100 V between inputs (clamping voltage: 5 V @ TC input; 11 V @ Voltage input)		
Output voltage	±5 V; 0 to 5V; (±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	±9 V _{DC} (±5 %)		
Power consumption	1 W typical		

= DAQP-MULTI support only

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.

Front panel control

LED indication:

Power LED: This LED is always on when the module is supplied.

Status LED: This LED has three functions:



- It is flashing three times when the module receives a valid command.
- It displays an input overflow if it flashes with the duty cycle 800 ms on / 200 ms off. In thermocouple mode this will indicate an open thermocouple detection.
- It displays an internal error if it flashes with the duty cycle 200 ms on / 800 ms off.

Push button operation:

- Module readdressing: Push the **ID** button for allowing the software to change the address.
- Module reset: Press the **ID** button during power on, and keep it pressed for at least 5 seconds. The module will reset to default settings.

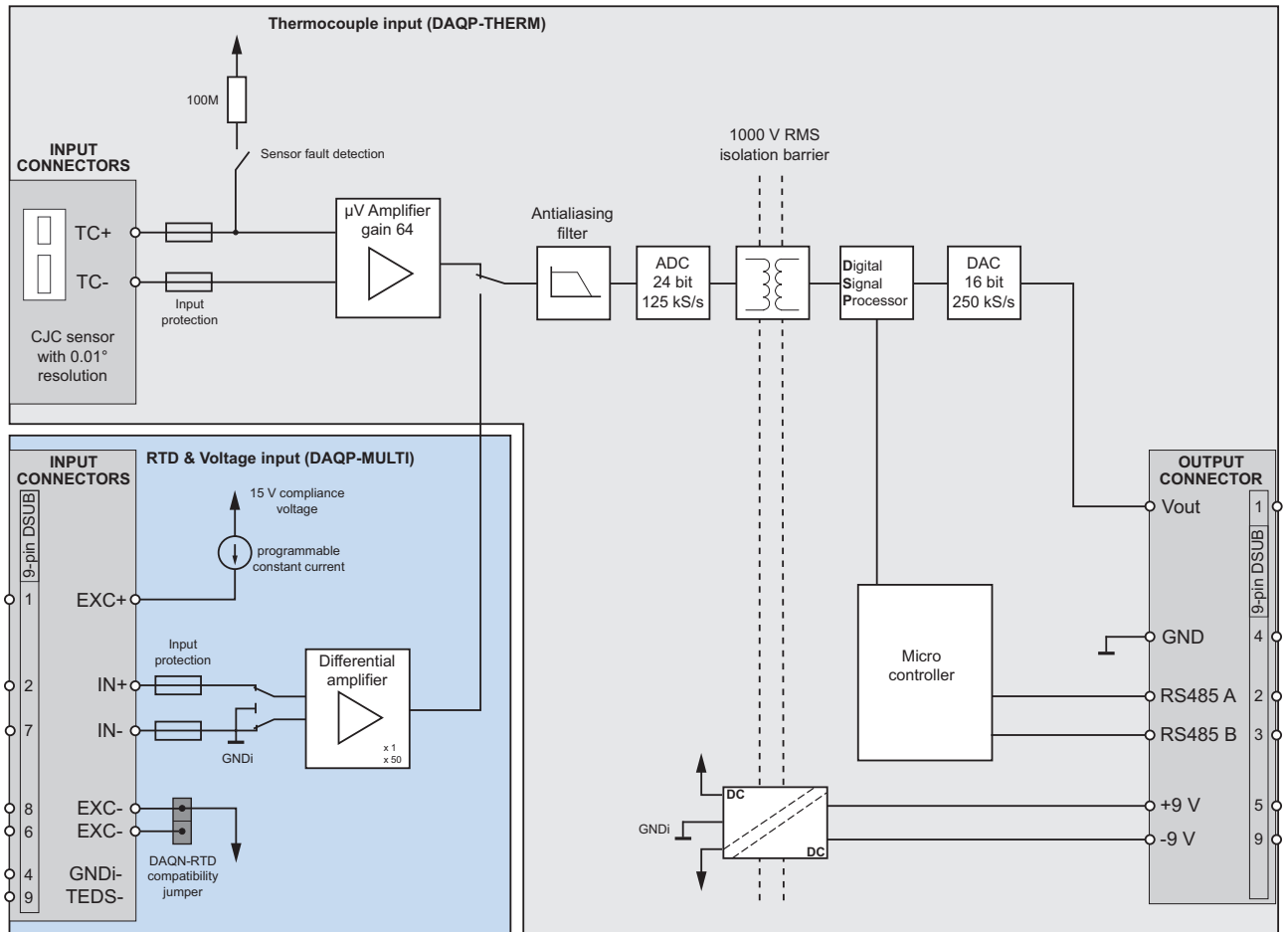
Address: 0

Baud rate: 9600 bps

Module setup: Load backup setup and calibration data (last setup will be overwritten)

Block diagram

The base block diagram of the DAQP-MULTI and the DAQP-THERM gives an idea of the internal structure.



Amplifier description

The DAQP-MULTI consists of two separate input amplifiers. The first one is optimized for thermocouple measurement. Its main properties are extremely low offset drift and noise. The sensor is connected to a mini thermocouple connector with copper contacts. A precision temperature sensor with a resolution of 0.01 °C measures the temperature directly on the junction between the copper contact and the TC material of the sensor connector. This minimizes the error due to the CJC and allows the connection of all TC types.

The second input combines a programmable constant current source and a differential input amplifier on a standard DSUB9 connector. It allows all kind of resistance measurement as well as voltage measurement. Bridge sensors using current excitation are also supported. The small input offset drift could be eliminated by using the internal short circuit function.

The conditioned analog signal passes a low pass filter and then comes to an aliasing free analog to digital converter. The digital data stream is isolated before getting into a high speed **Digital Signal Processor**. It allows the complete linearization and filtering with a very low signal delay. Linearization tables are stored with up to 512 points which minimizes the nonlinearity error for thermocouples and RTD to less than 0.01°C. The complete data processing internally runs at 125 kS/sec. The output digital to analog converter runs at the double speed, 250 kS/sec. That improves the signal quality on the analog output. The measured value is also available on the RS485 as an ASCII value. That allows using the module also as a full measurement instrument without AD-Card or analog wiring.

DAQP-MULTI / DAQP-THERM

Input ranges and detailed specifications¹⁾

Thermocouple accuracy including CJC error											
Type	Standard	Input range		Accuracy							
		min	max	-270 to -200 °C -454 to -328 °F	-200 to -100 °C -328 to -148 °F	-100 to 0 °C -148 to 32 °F	0 to 100 °C 32 to 212 °F	100 to 400 °C 212 to 752 °F	400 to 1000 °C 752 to 1832 °F	>1000 °C > 1832 °F	
		[°F] °C	[°F] °C	[°F] °C	[°F] °C	[°F] °C	[°F] °C	[°F] °C	[°F] °C	[°F] °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.

RTD								
Type	Standard	Input range		Current mA	Accuracy			
		min	max		-200 to -100 °C -328 to -148 °F	-100 to 0 °C -148 to 32 °F	0 °C to fullscale 32 °F to fullscale (% of reading + [°F] °C)	
		[°F] °C	[°F] °C		[°F] °C	[°F] °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)		[-328] -200	[1562] 850	0.2	[0.25] 0.14	[0.37] 0.21	0.07	[0.37] 0.21

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

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

¹⁾ All accuracy specifications mentioned on this page are 1-year specifications. They are valid for module calibration temperature ±5 °C and 30 to 90 % relative humidity.

Amplifier function

Free programmable module range

Regardless which input mode is selected, the module measurement range is completely free programmable. Simply by entering the lower and upper limit the amplifier adjusts its gain and offset factors automatically. The amplifier output is scaled to either ± 5 V or 0 to 5 V. With the 16-OUT-10 option which is available on all DEWETRON signals conditioning systems also ± 10 V or 0 to 10 V output signals are possible. This is especially designed for test rig applications. Converting a nonlinear temperature signal from an RTD or a TC to a linear 0 to 10 V analog output is one of the key features of this amplifier.

Filter

The module has 6 selectable low pass filters from 3 Hz to 1 kHz. The filter characteristic could be chosen between Butterworth and Bessel. Also the filter order could be selected between 2nd, 4th, 6th and 8th order. The 2nd order filter up to 1 kHz is fully compatible to any other DAQP series filter.

Amplifier balance

The amplifier balance function allows automatic elimination of all internal amplifier offsets. It switches the differential amplifier inputs IN+ and IN- to the internal isolated GND reference point. Then the output offset of the module is automatically adjusted to zero for all ranges. All previously stored sensor offset values are cleared.

Sensor balance

The DAQP-Multi can automatically balance any sensor offset up to 200 % of range. Depending on the input range, also higher offsets can be balanced (e.g. input range is 100 mV/mA, excitation is 1 mA, offset can be balanced up to 5000 %).

Short

Switches the differential amplifier inputs IN+ and IN- from the input terminals to the internal isolated GND reference point. With this function the absolute sensor offset could be determined.

CAL

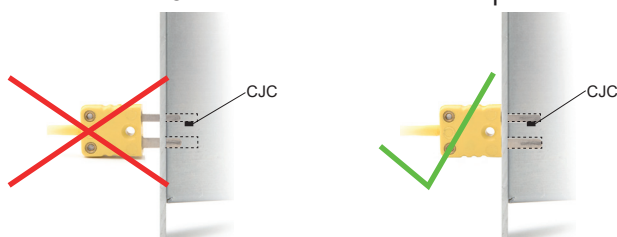
Applies a high precision internal reference signal with 80% of the full scale value (4.0000 V) to the module output. This function allows compensating the actual error of the AD-Board, to get the full accuracy of the DAQP-MULTI.

Open thermocouple detection

The open thermocouple detection of the DAQP-MULTI consists of an 100 M Ω pull-up resistor. That typically drives a 50 nA current through the sensor which normally does not take effect on the measurement, but is enough to generate an input overflow if the sensor breaks. Despite of that small current, there are sensors available where this current generates a big error. Those sensors are typically non-contact infrared thermocouples and fast response thermocouples. In that case the open thermocouple detection can simply be deactivated in the software. Sensors with up to 50 k Ω output impedance could be measured in that way.

CJC

The DAQP-MULTI as well as the DAQP-THERM comes with an integrated cold junction compensation sensor with an absolute accuracy of ± 0.2 °C. In order to achieve this accuracy the sensor has to be connected for at least 5 minutes to the thermocouple connector (CJC equilibrium time).



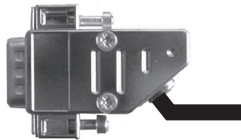
DAQP-MULTI / DAQP-THERM

Signal connection

DAQP-MULTI



Signal connection via D-SUB connector



- 1 EXC +
- 2 IN +
- 3 n.c.
- 4 GND_{isolated}
- 5 n.c.
- 6 reserved for EXC -
- 7 IN -
- 8 EXC -
- 9 TEDS

Signal connection via mini TC connector

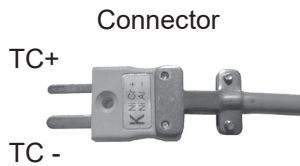


Signal connection

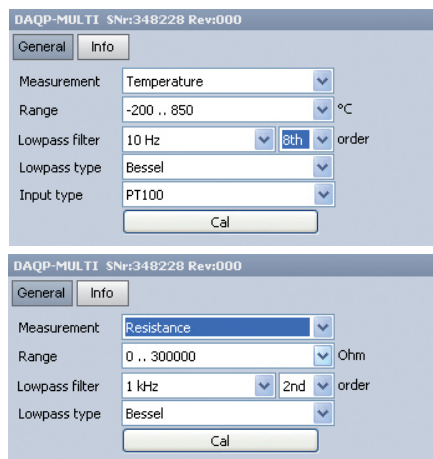
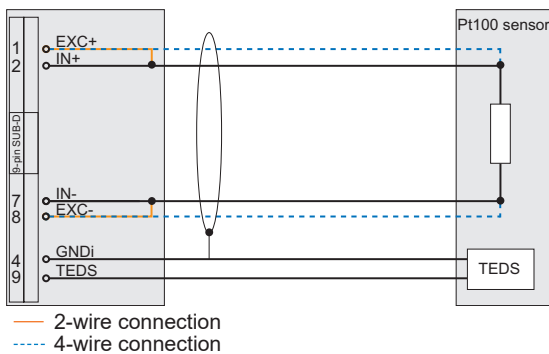
DAQP-THERM



Signal connection via mini TC connector



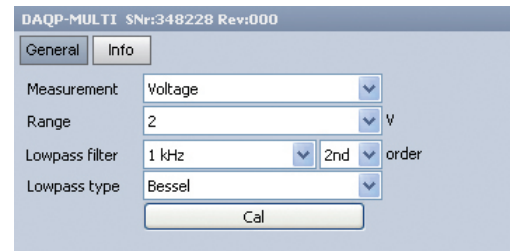
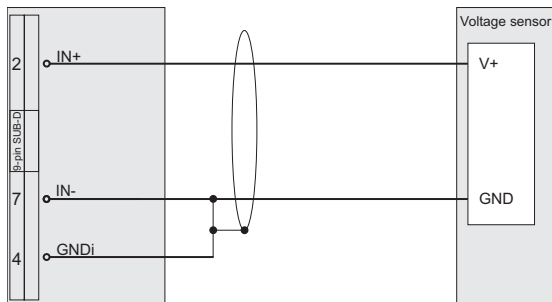
Resistance, RTD 2-wire and 4-wire



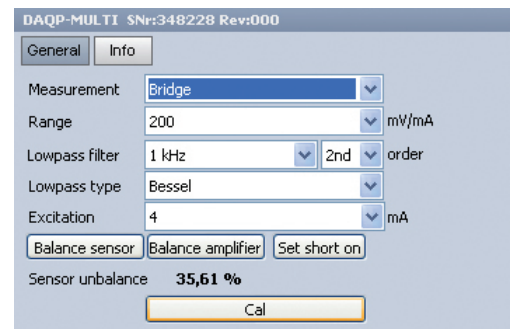
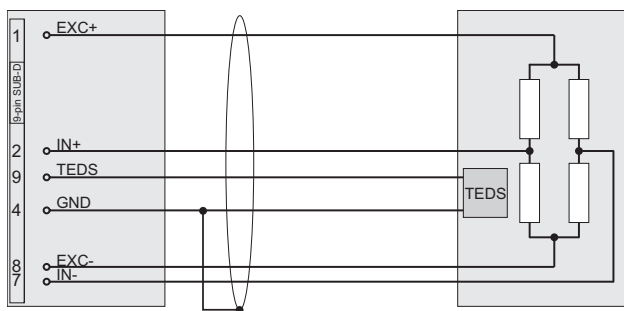
For resistance and RDT mode the 4-wire connection is recommended. The 2-wire connection will not compensate the wire resistance.

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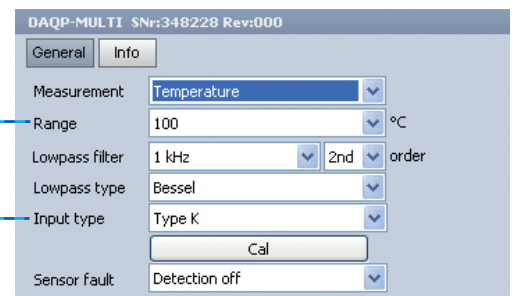
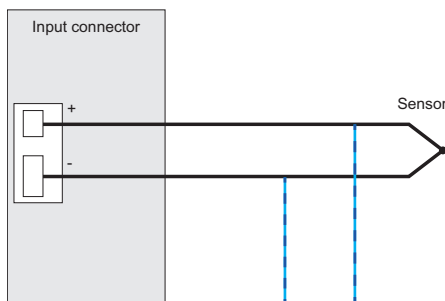
Voltage measurement



Bridge I sensor



Thermocouple sensor



Thermocouple types						
Type	IEC color code	ANSI color code	Temperature range °C [°F]	Alloy combination		Comments
				+	-	
K	green	yellow	-270 to 1372 [-454 to 2501]	Ni	CrNi	Wide temperature range, most popular calibration
J	black	black	-210 to 1200 [-346 to 2193]	Fe	CuNi	Used in vacuum, reduced and inert atmosphere
T	brown	blue	-270 to 400 [-454 to 752]	Cu	CuNi	Low temperature & cryogenic applications
R	orange	green	-50 to 1760 [-58 to 3214]	Pt13Rh	Pt	High temperature
S	orange	green	-50 to 1760 [-58 to 3214]	Pt10Rh	Pt	High temperature
U	orange	green	-200 to 600 [-328 to 1112]	Cu	CuNi	Also known as RX & SX extension wire.
N	rose	orange	-270 to 1300 [-450 to 2372]	NiCrSi	NiSi	Alternative to type K. More stable at high temp.
E	purple	purple	-270 to 1000 [-454 to 1832]	NiCr	CuNi	Highest EMF change per degree
B	grey	grey	0 to 1820 [32 to 3308]	Pt30Rh	Pt6Rh	High temperature. Common use in glass industry
L	blue		-200 to 900 [-328 to 1652]	Fe	CuNi	Similar to type J
C*	no standard IEC color	red*	0 to 2310 [32 to 4208]	W5Re	W26Re	Highest temperature range

*) no official symbol or standard designation

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DAQP-MULTI / DAQP-THERM

Notes

CE-Certificate of conformity



Manufacturer:

DEWETRON GmbH

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8074 Grambach, Austria**

Tel.: +43 316 3070 0

Fax: +43 316 3070 90

e-mail: sales@dewetron.com

http://www.dewetron.com

Name of product:

DEWE-MODULES

Kind of product:

Signal conditioning modules

The product meets the regulations of the following EC-directives:

73/23/EEC

"Directive on the approximation of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits amended by the directive 93/68/EEC"

89/336/EEC

"Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility amended by the directives 91/263/EEC, 92/31/EEC, 93/68/EEC and 93/97/EEC"

The accordance is proved by the observance of the following standards:

L V E M C	Safety	IEC/EN 61010-1:1992/93 IEC 61010-1:1992/300 V CATIII Pol. D. 2 IEC/EN 61010-2-031 IEC 1010-2-031
	Emissions	EN 61000-6-4 EN 55011 Class B
	Immunity	EN 61000-6-2 Group standard

Graz, April 28, 2010

Place / Date of the CE-marking

Dipl.-Ing. Roland Jeutter / Managing director

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Notes
