



Automotive
Energy & Power Analysis
Field Service
Environmental
Research & Development

DEWE-Modules

Technical Reference Manual



... the precision signal conditioning company



Copyright © DEWETRON elektronische Messgeraete Ges.m.b.H.

This document contains information which is protected by copyright. All rights are reserved. Reproduction, adaptation, or translation without prior written permission is prohibited, except as allowed under the copyright laws.

All trademarks and registered trademarks are acknowledged to be the property of their owners.

The information contained in this document is subject to change without notice.

DEWETRON elektronische Messgeraete Ges.m.b.H. (DEWETRON) shall not be liable for any errors contained in this document. DEWETRON MAKES NO WARRANTIES OF ANY KIND WITH REGARD TO THIS DOCUMENT, WHETHER EXPRESS OR IMPLIED. DEWETRON SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. DEWETRON shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory, in connection with the furnishing of this document or the use of the information in this document.

Warranty Information:

A copy of the specific warranty terms applicable to your DEWETRON product and replacement parts can be obtained from your local sales and service office.

Restricted Rights Legend:

Use austrian law for duplication or disclosure.

DEWETRON GesmbH

Parkring 4

A-8074 Graz-Grambach / Austria

Printing History:

Version 2.1.0

Released December 2, 2004

Copyright © 1998 - 2004 DEWETRON GesmbH

This document contains information which is protected by copyright. All rights are reserved. Reproduction, adaptation, or translation without prior written permission is prohibited, except as allowed under the copyright laws.

All trademarks and registered trademarks are acknowledged to be the property of their owners.

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 Ges.m.b.H.
Parkring 4
A-8074 Graz-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 17:00 CET (GMT -1:00)

For the Americas, please contact:

DEWETRON, Inc.
PO Box 1460
Charlestown, RI 02813
U.S.A.
Tel.: +1 401 364 9464
Toll-free: +1 877 431 5166
Fax: +1 401 364 8565
Email: support@dewamerica.com
Web: <http://www.dewamerica.com>

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 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.

Adjustment information are only mentioned if they are required for operation (e.g. DAQP-TRQ).

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 (-30 °F to 185 °F)
Temp. range operating: -5 °C to +60 °C (-4 °F to 140 °F)

Relative humidity
(MIL202): 0 to 95 % at 60 °C, non-condensing

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

All modules are produced according ISO9001 and ISO14001.

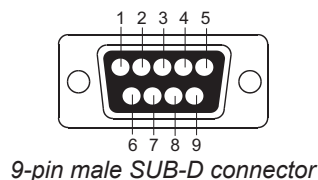
Module connectors

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.



DAQx and PAD module
rear view



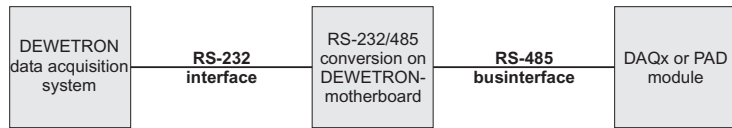
Interface pin assignment:

- 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)
- 8 reserved
- 9 -9 V power supply

General Module Information

RS-232/485 interface

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-2010, DEWE-3020, DEWE-4010 and DEWE-5000 systems). This converter allows communication with 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 |

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-2010, DEWE-3020, DEWE-4010 and DEWE-5000 systems are prepared as a standard to work with 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 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 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-2010, DEWE-3020 and DEWE-4010 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*.

3 channel thermoresistor amplifier

- Intelligent amplifier with integrated A/D conversion
- 3 input channels for RTD measurement
- Internal watchdog timer for device failure protection
- Signal connection via 25-pin SUB-D connector



Module specifications

| | PAD-RTD3 |
|-------------------------------|---|
| RTD sensors: | 2-, 3- or 4-wire Pt100 and Ni120 sensors |
| Input channels: | 3 input channels |
| Input signals: | |
| Pt100 ($\alpha = 0.00385$) | -100 °C to 100 °C 0 °C to 100 °C 0 °C to 200 °C 0 °C to 600 °C |
| Pt100 ($\alpha = 0.003916$) | -100 °C to 100 °C 0 °C to 100 °C 0 °C to 200 °C 0 °C to 600 °C |
| Ni100: | 0 °C to 100 °C |
| Ni120: | 0 °C to 100 °C |
| Resolution: | 16-bit |
| Accuracy: | Better than ± 0.1 % |
| Isolation voltage: | 300 V _{DC} |
| RS-485 interface: | Yes |
| Interface speed: | 9600 bps |
| Power supply voltage: | +12 V _{DC} (± 10 %) |
| Power consumption: | Typical 1.2 W |

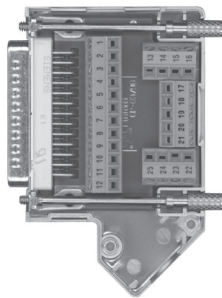
PAD-RTD3

Signal connection

PAD-RTD3 module



The current module address is labeled in the address field.



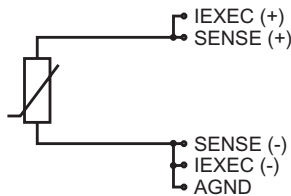
- | | |
|----------------|------------------|
| 1 IEXEC 0 (+) | 13 SENSE 2 (-) |
| 2 SENSE 0 (+) | 14 IEXEC 2 (-) |
| 3 SENSE 0 (-) | 15 AGND 2 |
| 4 IEXEC 0 (-) | 16 Not connected |
| 5 AGND 0 | 17 Not connected |
| 6 IEXEC 1 (+) | 18 Not connected |
| 7 SENSE 1 (+) | 19 Not connected |
| 8 SENSE 1 (-) | 20 Not connected |
| 9 IEXEC 1 (-) | 21 Init *1 |
| 10 AGND 1 | 22 GND / Init *1 |
| 11 IEXEC 2 (+) | 23 Not connected |
| 12 SENSE 2 (+) | 24 Not connected |
| | 25 Not connected |

*1 If the module settings are not known, a short power off - power on procedure has to be done after doing a shortcut between pin 21 and 22. This resets the module to default address 00, baud rate 9600, checksum disable and watchdog timer disable.

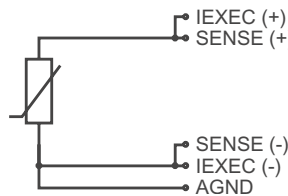
Remove the shortcut after changing the baud rate.

Sensor connection

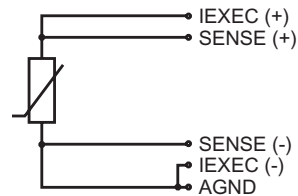
2 wire sensor



3 wire sensor



4 wire sensor



Connection option for PAD-RTD3 module

PAD-OPT2

25-pin SUB-D connector with screw terminal
(not included as a standard)

