Automotive
Energy & Power Analysis
Aerospace & Defense
Transportation
General Test & Measurement

DEWE-5000

Technical reference manual

ISO9001

Re-inventing Data Acquisition

worldwide

DEWETRON

www.dewetron.com

Thank you!

Thank you very much for your investment in DEWETRON's unique data acquisition systems. These are top-quality instruments which are designed to provide you years of reliable service. This guide has been prepared to help you get the most from your investment, starting from the day you take it out of the box, and extending for years into the future.

This guide includes important startup notes, as well as safety notes and information about keeping your DEWETRON system in good working condition over time.

We strongly suggest that you read this entire manual, especially the safety and care sections, as well as to avoid damaging your DEWETRON system.

What is the DEWE-5000?

This product is used for measuring of different physical and/or electrical sizes (depending on model or configuration). The connection is depending on model or configuration and takes place via safety banana plugs, BNC connectors (± 50V max.), D-SUB connectors (± 50V max.), thermocouple connectors (± 50V max.), BINDER® connectors (± 50V max.), SMB connetcors (± 50V max.), μdot connectors (± 50V max.), LEMO® connectors or RJ-45 connectors.

Preface

Notes

Training

DEWETRON offers training at various offices around the world several times each year. DEWETRON headquaters in Austria have a very large and professional conference and seminar center, where training classes are conducted on a regular basis starting with sensors and signal conditioning, A/D technology and software operation. For more information about training services, please visit:
http://www.dewetron.com/support/training

Dewetron Inc. in the USA also has a dedicated training facility connected to its headquarters, located in Rhode Island. For more information about training services in the US, please visit:
http://www.dewamerica.com/support/training

Calibration

Every instrument needs to be calibrated at regular intervals. The standard norm across nearly every industry is annual calibration. Before your DEWETRON data acquisition system is delivered, it is calibrated at our DEWETRON headquater. Each of this system is delivered with a certificate of compliance with our published specifications. Detailed calibration reports from our calibration system are available for purchase with each order. We retain them for at least one year, so calibration reports can be purchased for up to one year after your system was delivered.

Support

DEWETRON has a team of people ready to assist you if you have any questions or any technical difficulties regarding the system. 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.
10 High Street, Suite K
Wakefield, RI 02879
U.S.A.
Tel.: +1 401 284 3750
Toll-free: +1 877 431 5166
Fax: +1 401 284 3755
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)

Service/repairs

The Team of DEWETRON also performs any kinds of repairs to your system to assure a safe and proper operation in future. For information regarding service and repairs please contact your local distributor first or DEWETRON directly.

Notice

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

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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

Please refer to the page bottom for printing version.

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.

For safety reasons max. 50 V may be applied to the BNC input-connectors!
Refer to the regulation of maximum allowable touch potential.

Safety instructions

Your safety is our primary concern! Please be safe!

General safety and hazard warnings for all DEWETRON systems

- Use this system under the terms of the specifications only to avoid any possible danger.
- Maintenance will be executed by qualified staff only.
- During the use of the system, it might be possible to access another parts of a more comprehensive system. Please read and follow the safety instructions provided in the manuals of all other components regarding warning and security advices for using the system.
- With this product, only use the power cable delivered or defined for the host country.
- DO NOT connect or disconnect sensors, probes or test leads, as these parts are connected to a voltage supply unit.
- The system is grounded via a protective conductor in the power supply cord. To avoid electric shocks, the protective conductor has to be connected with the ground of the power network. Before connecting the input or output connectors of the system, make sure that there is a proper grounding to guarantee potential free usage. For countries, in which there is no proper grounding, please refere to your local legally safety regulations for safety use.

  DC systems: Every DC system has a grounding connected to the chassis (yellow/green safety banana plug).
- Please note the characteristics and indicators on the system to avoid fire or electric shocks. Before connecting the system, please carefully read the corresponding specifications in the product manual.
- The inputs are not, unless otherwise noted (CATx identification), for connecting to the main circuit of category II, III and IV.
- The power cord separates the system from the power supply. Do not block the power cord, since it has to be accessible for the users.
- DO NOT use the system if equipment covers or shields are removed.
- If you assume the system is damaged, get it examined by authorised personnel only.
- Any use in wet rooms, outdoors or in adverse environmental condition is not allowed!
  Adverse environmental conditions are:
  - Moisture or high humidity
  - Dust, flammable gases, fumes or dissolver
  - Thunderstorm or thunderstorm conditions (except assembly PNA)
  - Electrostatic fields, et cetera.
- The measurement category can be adjusted depending on module configuration.
- Any direct voltage output is protected with a fuse against short cut and reverse-polarity, but is NOT galvanically isolated (except it is explicit marked on the system).
- The system must be connected and operated to an earthed wall socket at the AC mains power supply only (except for DC systems).
- Any other use than described above may damage your system and is attended with dangers like shortcut, fire or electric shocks.
- The whole system must not be changed, rebuilt or opened (except for changing DAQ, DAQP, PAD modules).

- If you assume a more riskless use is not provided anymore, the system has to be rendered inoperative and should be protected against inadvertent operation. It is assumed that a more riskless operation is not possible anymore, if
  - the system is damaged obviously or causes strange noises.
  - the system does not work anymore.
  - the system has been exposed to long storage in adverse environmental.
  - the system has been exposed to heavy shipment strain.
- DO NOT touch any exposed connetors or components if they are live wired. The use of metal bare wires is not allowed. There is a risk of short cut and fire hazard!
- Warranty void if damages caused by disregarding this manual. For consequential damages NO liability will be assumed!
- Warranty void if damages to property or persons caused by improper use or disregarding the safety instructions.
- Unauthorized changing or rebuilding the system is prohibited due to safety and permission reasons (CE). Exception: changing modules like DAQ, DAQP or PAD.
- The assembly of the system is equivalent to protection class I. For power supply, only the correct power socket of the public power supply must be used, except the system is DC powered.
- Be careful with voltages >25 VAC or >35 VDC! These voltages are already high enough in order to get a perilous electric shock by touching the wiring.
- The product heats during operation. Make sure there is adequate ventilation. Ventilation slots must not covered!
- Only fuses of the specified type and nominal current may be used. The use of patched fuses is prohibited.
- Prevent using metal bare wires! Risk of short cut and fire hazard!
- DO NOT use the system before, during or shortly after a thunderstorm (risk of lightning and high energy overvoltage). An advanced range of application under certain conditions is allowed with therefore designed products only. For details please refer to the specifications.
- Make sure that your hands, shoes, clothes, the floor, the system or measuring leads, integrated curcuits and so on, are dry.
- DO NOT use the system in rooms with flammable gases, fumes or dust or in adverse environmental conditions.
- Avoid operation in the immediate vicinity of:
  - high magnetic or electromagnetic fields
  - transmitting antennas or high-frequency generators

  For exact values please refere to enclosed specifications.
- Use measurement leads or measurement accessories aligned to the specification of the system only. Fire hazard in case of overload!
- Do not switch on the system after transporting it from a cold into a warm room and vice versa. The thereby created condensation may damage your system. Acclimatise the system unpowered to room temperature.
- Do not disassemble the system! There is a high risk of getting a perilous electric shock. Capacitors still might charged, even the system has been removed from the power supply.
- The electrical installations and equipments in industrial facilities must be observed by the security regulations and insurance institutions.

Safety instructions

- The use of the measuring system in schools and other training facilities must be observerd by skilled personnel.
- The measuring systems are not designed for use at humans and animals.
- Please contact a professional if you have doubts about the method of operation, safety or the connection of the system.
- Please be careful with the product. Shocks, hits and dropping it from already lower level may damage your system. For exact values please refere to enclosed specifications.
- Please also consider the detailed technical reference manual as well as the security advices of the connected systems.

This product has left the factory in safety-related flawless and proper condition.
In order to maintain this condition and guarantee safety use, the user has to consider the security advices and warnings in this manual.

EN 61326-3-1:2008

IEC 61326-1 applies to this part of IEC 61326 but is limited to systems and equipment for industrial applications intended to perform safety functions as defined in IEC 61508 with SIL 1-3.

The electromagnetic environments encompassed by this product family standard are industrial, both indoor and outdoor, as described for industrial locations in IEC 61000-6-2 or defined in 3.7 of IEC 61326-1. Equipment and systems intended for use in other electromagnetic environments, for example, in the process industry or in environments with potentially explosive atmospheres, are excluded from the scope of this product family standard, IEC 61326-3-1.

Devices and systems according to IEC 61508 or IEC 61511 which are considered as “operationally well-tried”, are excluded from the scope of IEC 61326-3-1.

Fire-alarm and safety-alarm systems, intended for protection of buildings, are excluded from the scope of IEC 61326-3-1.

CAUTION

- The system BIOS is protected by password. Any change in the BIOS may cause a system crash. When the system is booting, do not press ESC-button on keyboard. This may clear the BIOS settings and cause system faults.
- Any change in the file structure as deleting or adding files or directories might cause a system crash.
- Before installing software updates contact DEWETRON or your local distributor. Use only software packages which are released by DEWETRON. Further informations are also available in the internet (http://www.dewetron.com).
- After power off the system wait at least 10 seconds before switching the system on again. Otherwise the system may not boot correct. This prolongs also the life of all system components.

Windows updates and antivirus/security software

Before installing Windows software updates consult with DEWETRON for compatibility guidance. Please also keep in mind that the use of any antivirus or other security software may slow down your system and may cause data loss.

Problematic network stacks

Often intrusive IT software or network processes can interfere with the primary function of the DEWETRON system: to record data. Therefore we recommend strongly against the installation of IT/MIS software and running their processes on any DEWETRON data acquisition system, and cannot guarantee the performance of our systems if they are so configured.

Environmental Considerations

Information about the environmental impact of the product.

Product End-of-Life Handling

Observe the following guidelines when recycling a DEWETRON system:

System and Components Recycling

Production of these components required the extraction and use of natural resources. The substances contained in the system could be harmful to your health and to the environment if the system is improperly handled at it's end of life! Please recycle this product in an appropriate way to avoid an unnecessary pollution of the environment and to keep natural resources.

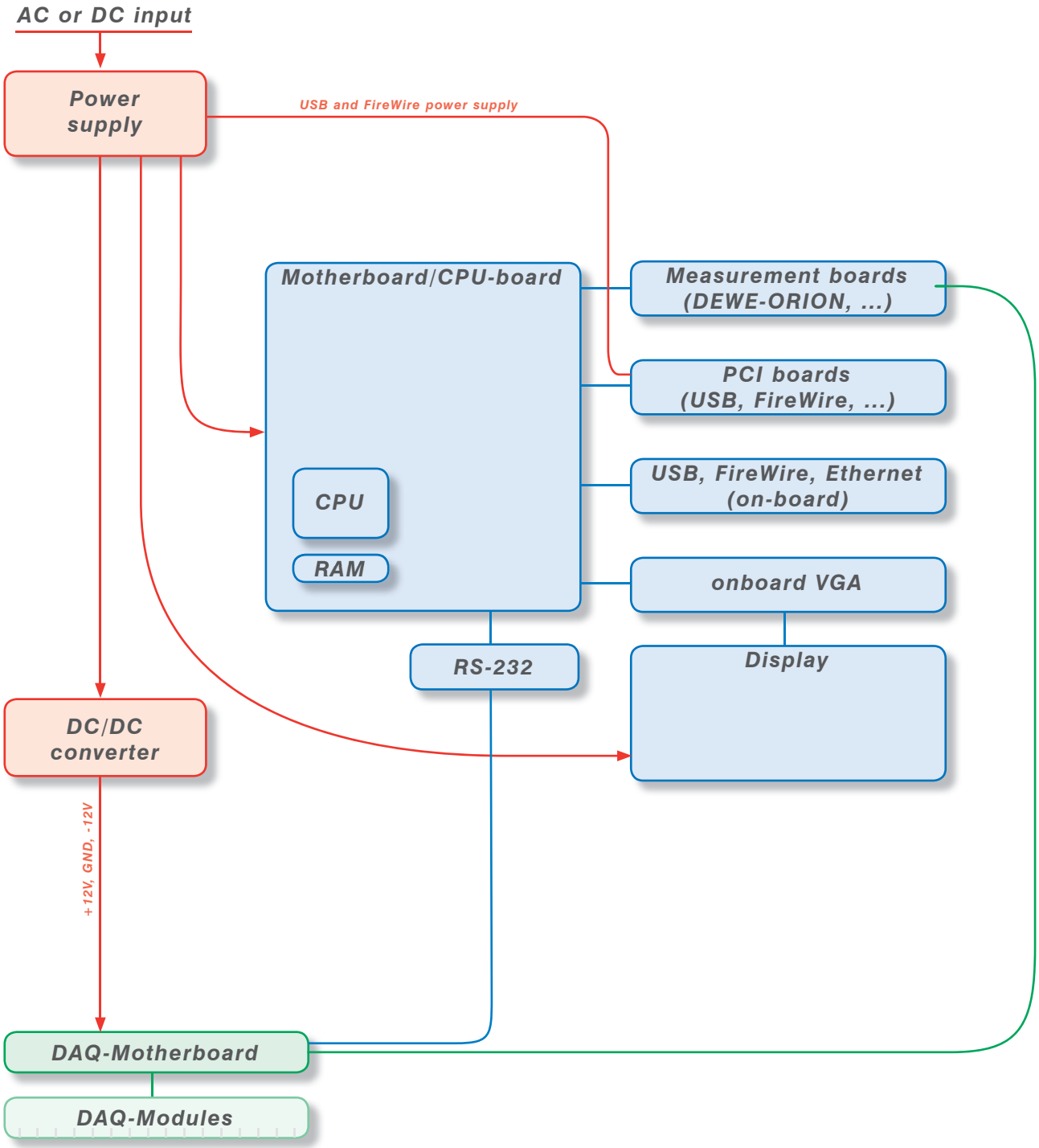
This symbol indicates that this system complies with the European Union’s requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Please find further informations about recycling on the DEWETRON web site
www.dewetron.com

Restriction of Hazardous Substances

This product has been classified as Monitoring and Control equipment, and is outside the scope of the 2002/95/EC RoHS Directive. This product is known to contain lead.

Signal processing

Blockdiagram of the internal signal processing

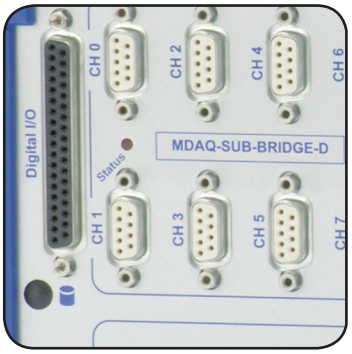


First steps

1

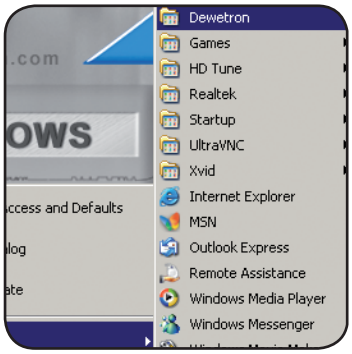
Power-on your system.

2



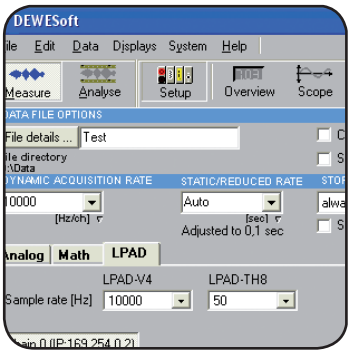
Connect your sensors to the system.

3



Run DEWESoft usually via "Start" >"Programs" > "Dewetron" > "DEWESoft x.x" > "DEWESoft x.x"

4



Start recording your data!

First steps

Notes

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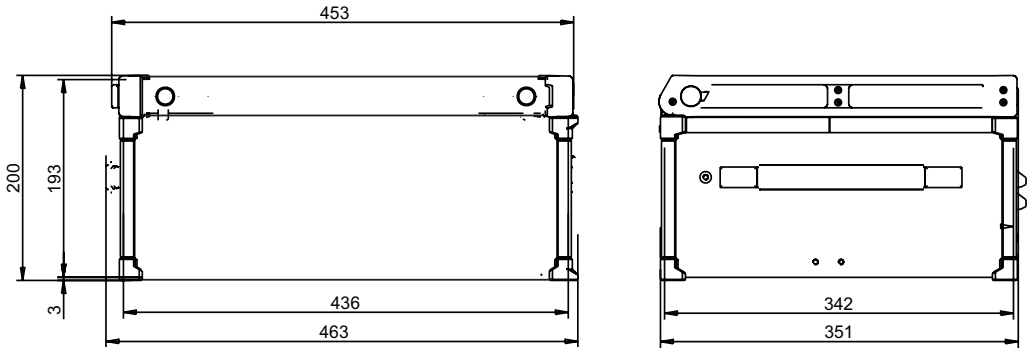
DEWE-5000 PC instrument series

- Portable data acquisition system
- Up to 256 channels with external expansion racks or PAD modules
- A/D converter specs see appendix A
- 16 internal slots for DEWE-DAQ/PAD modules

System specifications

	DEWE-5000
Power supply: option 5000-PS-BAT:	❑ 400 W AC ATX power supply MPM-842P ❑ 400 W AC ATX power supply BEA-640 ❑ 300 W DC ATX power supply DX-300HEW ❑ 300 W DC ATX power supply APT-DY300H ❑ 320 W DC ATX power supply XP-04 with DC-123 for details see next pages
Operating temperature:	-5 °C to 50 °C (standard)
Storage temperature:	-20 °C to +70 °C
Humidity (operating):	10 % to 80 %, non condensing 5 % to 95 %, rel. humidity
Vibration*:	MIL-STD 810F 514.5 procedure I operating test procedure frequency range: 5 to 200 to 5 Hz; 5 x 12 min each direction displacement amplitude ±3.5 mm (5 to 8.45 Hz) acceleration amplitude 1 g (8.45 to 92 Hz) displacement amplitude 92 to 113 Hz: ±0.029 mm acceleration amplitude 1.5 g (113 to 200 Hz)
Shock*:	MIL-STD 810F 516.5 procedure I non operating test procedure ½ sinus 11 ms 10 g, 3 shocks positive, 3 shocks negative
Dimensions (W x D x H):	approx. 453 x 200 x 351 mm (17.8 x 7.9 x 13.8 in.)
Weight:	typ. 17 kg (37.4 lbs), depending on configuration
*) tested with SSD disc	

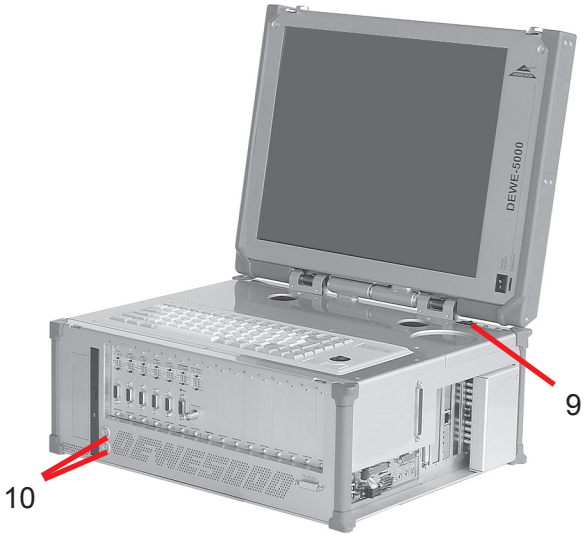
Dimensions*



* Dimensions in mm
(1 inch = 25.4 mm)

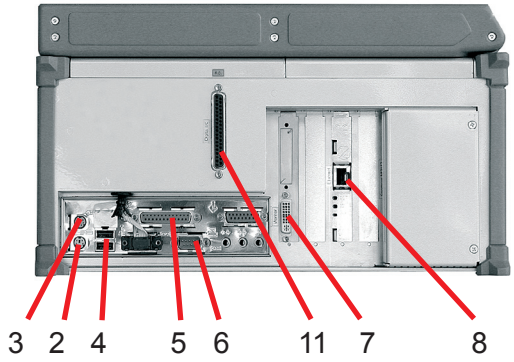
Main System

Connectors



Typical DEWE-5000 front view

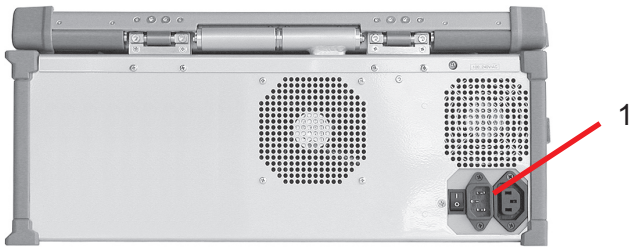
Combustion Analyzer option



Typical DEWE-5000 side view

Connector overview:

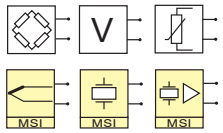
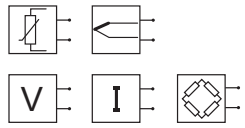
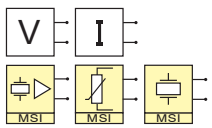
1. Power supply connector with general power switch
2. PS/2 keyboard connector
3. PS/2 mouse connector
4. USB interface connectors
5. LPT interface connector
6. 2x RS-232 interface connectors
7. VGA connector
8. Ethernet LAN connector
9. Power-on button
10. Ground connectors
11. Digital I/O connector
12. Combustion Analyzer connectors (DEWE-5000-CA only)



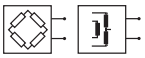
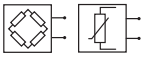
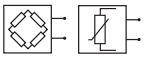
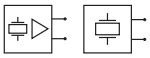
Typical DEWE-5000 rear view

Note: The location of the connectors might vary from system to system and depends on system configuration

DAQ series modules overview

Module	Input type	Ranges	TEDS	Bandwidth (BW), Filters (LP = lowpass, HP = highpass)	Isolation (ISO), Overvoltage protection (OP)
Universal measurement					
DAQP-STG  	Strain gauge, bridge sensors	±0.1 to ±1000 mV/V (@ 5 VDC_{exc})	✓	BW: 300 kHz LP: 10 Hz to 300 kHz	ISO: 350 V_{DC} OP: ±50 V_{DC}
	Piezoresistive bridge	±0.5 to 10000 mV/mA (@ 1 mA_{exc})			
	Voltage	±500 µV to ±10 V			
	Resistance	25 mΩ to 100 kΩ			
	Pt100, Pt200, Pt500, Pt1000, Pt2000	-200° C to 850° C			
	IEPE® via MSI-BR-ACC	±2.5 to ±10000 mV			
	Thermocouple via MSI-BR-TH-x	full range of TC type			
	Charge via MSI-BR-CH-50	up to 50000 pC			
	Voltage via MSI-BR-V-200	up to ±200 V			
DAQP-MULTI  	Thermoresistors	Pt100, Pt200, Pt500, Pt1000 and Pt2000, free programmable range	✓	BW: 3 kHz LP: 3, 10, 30, 100, 300, 1000 Hz	ISO: 1 kV_{RMS}
	Thermocouple	Type K, J, T, R, S, N, E, B, L, C, U free programmable range			
	Resistance	1 Ohm to 1 MOhm			
	Piezoresistive bridge	13 ranges (±0.5 to 5000 mV/mA)			
	Voltage	10 ranges from ±5 mV to ±5 V			
	Current (with external shunt)	depending on external shunt			
High voltage measurement					
DAQP-HV  	High voltage	±20 to ±1400 V	-	BW: 300 kHz LP: 10 Hz to 300 kHz	ISO: 1.8 kV_{RMS}
DAQP-HV-S3  	High voltage	±20 to ±1400 V	-	BW: 700 kHz LP: 10 Hz to 700 kHz	ISO: 1.8 kV_{RMS}
DAQP-DMM  	High voltage	±10 to ±1000 V	-	BW: 20/30 kHz LP: 10 Hz to 30 kHz	ISO: 1.5 kV_{RMS}
Voltage & current measurement					
DAQP-LV  	Voltage	±10 mV to ±50 V	✓	BW: 300 kHz LP: 10 Hz to 300 kHz	ISO: up to 1 kV_{RMS} OP: 350 V_{DC}
	Current with external shunt	20 mA / 5 A			
	IEPE® via MSI-V-ACC	±10 mV to 10 V			
	Pt100, Pt200, Pt500, Pt1000, Pt2000 and resistance via MSI-V-RTD	-200° C to 1000° C and 0 to 6.5 kOhm			
	Charge via MSI-V-CH-50	up to 50000 pC			
DAQP-V  	Voltage	10 mV to 50 V	-	BW: 50 kHz LP: 10 Hz to 50 kHz	ISO: up to 1 kV_{RMS} OP: ±500 V_{DC}
	Current with external shunt	20 mA / 5 A			
DAQN-AIN  	Voltage	±10 V (1:1 input)	-	-	OP: < ±500 V (jumper selectable)

Main System

Module	Input type	Ranges	TEDS	Bandwidth (BW), Filters (LP = lowpass, HP = highpass)	Isolation (ISO), Overvoltage protection (OP)
Current measurement					
DAQP-LA-SC  	Current *Note:* 5 A_{RMS} continuous	0.1 A to 30 A peak max. 5 A_{RMS} contin. current	-	BW: 300 kHz LP: 10 Hz to 300 kHz	ISO: 1.4 kV_{RMS}
DAQP-LA-B  	Current *Note:* typ. 20 mA application	2 mA to 600 mA	-	BW: 300 kHz LP: 10 Hz to 300 kHz	ISO: 1.4 kV_{RMS}
Bridge / strain gauge and carrier frequency amplifier					
DAQP-CFB  	AC bridge, strain gauge *Note*: 5 kHz sine wave excitation	Bridge: 0.1 to 1000 mV/V	-	BW: DC to 2.3 kHz LP: 10 Hz to 1 kHz	OP: ±10 V_{DC}
	Inductive sensors, LVDT	Inductive: 5 to 1000 mV/V			
DAQP-BRIDGE-A  	Strain gauge, bridge sensors	±1 to ±50 mV/V (@ 5 VDC)	-	BW: 20 kHz LP: 10 Hz to 20 kHz	ISO: 350 V_{DC} OP: ±10 V_{DC}
	Potentiometric sensors	200 Ω to 10 kΩ			
DAQP-B RIDGE-B  	Strain gauge, bridge sensors	±0.1 to ±100 mV/V (@ 5 VDC)	✓[1]	BW: 200 kHz LP: 10 Hz to 200 kHz	OP: ±10 V_{DC}
	Potentiometric sensors	200 Ω to 10 kΩ			
Charge / IEPE® measurement					
DAQP-ACC-A  	IEPE® sensors	±50 mV to ±5 V	-	BW: 0.5 Hz to 300 kHz LP: 1 to 300 kHz HP: 0.5 Hz and 5 Hz	-
DAQP-CHARGE-A  	Charge sensors IEPE® sensors *Note:* selectable integration and double integration	Charge: 5 to 50000 pC IEPE®: ±5 mV to 5 V	-	BW: 0.1 Hz to 50 kHz LP: 100 Hz to 50 kHz HP: 0.1 Hz to 10 Hz	-
DAQP-CHARGE-B  	Charge sensors *Note:* selectable time constant for static sensors	±100 to ±1 000 000 pC	-	BW: DC to 100 kHz LP: 10 Hz to 100 kHz HP: DC, 0.001 Hz to 0.5 Hz	ISO: 350 V_{DC}
Temperature measurement					
DAQP-THERM  	Thermocouple *Note:* internal CJC and linearisation	Type K, J, T, R, S, N, E, B, L, C and U selectable free programmable range	-	BW: 3 kHz LP: 3, 10, 30, 100, 300, 1000 Hz	ISO: 1 kV_{RMS}
Frequency measurement					
DAQP-FREQ-A  	Frequency	100 Hz to 200 kHz	-	BW: according to range Output response: 1.5 ms 30 ms 500 ms	ISO: 350 V_{DC}
Voltage output module					
DAQN-V-OUT  	Voltage output	1:1 output module with isolation Input voltage: ±10 V Output voltage: ±10 V	-	BW: 400 Hz	ISO: 240 V_{DC}

[1] TEDS support for DAQP-BRIDGE-B revision 2 only

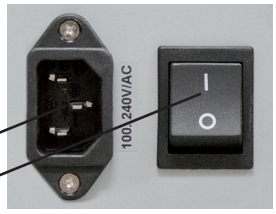
Modular smart interfaces to connect various sensors

Modular Smart Interfaces for DAQP / MDAQ modules, DEWE-43 and DEWE-101							
	MDAQ-SUB-STG-D	**MDAQ-SUB-BRIDGE-D**	**MDAQ-SUB-V-200-D**	**DAQP-STG-D**	**DAQP-LV-D**	**DEWE-43**	**DEWE-101**
MSI-BR-ACC	✓	✓	-	✓	-	✓	✓
	Isotron (constant current powered) adapter for MDAQ-SUB-BRIDGE / -STG modules with DB9 connector Excitation current 4 mA at 21 V, High pass filter 1.5 Hz, BNC connector Bandwidth and ranges are defined by connected amplifier Automatic adapter identification						
MSI-BR-V-200	✓	✓	-	✓	-	✓	✓
	200 V input adapter for MDAQ-SUB-BRIDGE / -STG modules with DB9 connector Differential input configuration, BNC connector Bandwidth and ranges are defined by connected amplifier Automatic adapter identification						
MSI-BR-RTD	✓	✓	-	not needed	-	✓	✓
	Pt100, Pt200, Pt500, Pt1000 and Pt2000 adapter for MDAQ-SUB-BRIDGE / -STG modules with DB9 connector 2, 3 and 4 wire connection methods, 5-pin Binder 710 series connector Automatic adapter identification						
MSI-BR-CH-x	✓	✓	-	✓	-	✓	✓
	Charge input interface for DAQP-STG and MDAQ-SUB-BRIDGE / -STG with DB9 connector Range up to 50000 pC, AC coupled with 0.07 Hz, BNC signal connection Max. 100 kHz bandwidth (dependent on the max. bandwidth of the amplifier) Automatic adapter identification						
MSI-BR-TH-x	✓	✓	-	✓	-	✓	✓
	isolated TC sensor			any TC sensor		isolated TC sensor	
	Thermocouple type K / J / T adapter for DAQP-BRIDGE-x and MDAQ-SUB-BRIDGE / -STG modules with DB9 connector For use with **isolated** thermocouple sensors only ! (except in combination with DAQP-BRIDGE-A*) High accuracy cold junction reference measurement, 1 m thermo cable with Mini TC connector Automatic adapter identification						
MSI-V-ACC	-	-	✓	-	✓	-	-
	Isotron (constant current powered) adapter for DAQP-LV and MDAQ-SUB-V-200 modules with DB9 connector Excitation current 4 mA at 21 V, High pass filter 1.5 Hz, BNC connector Bandwidth and ranges are defined by connected amplifier Automatic adapter identification						
MSI-V-RTD	-	-	✓	-	✓	-	-
	Pt100, Pt200, Pt500 and Pt1000 adapter for DAQP-LV and MDAQ-SUB-V-200 modules with DB9 connector 2, 3 and 4 wire connection methods, 5-pin Binder 710 series connector Automatic adapter identification						
MSI-V-CH-50	-	-	✓	-	✓	-	-
	Charge input interface for DAQP-LV, MDAQ-SUB-V-200 modules with DB9 connector Range up to 50000 pC, AC coupled with 0.07 Hz, BNC signal connection Max. 100 kHz bandwidth (dependent on the max. bandwidth of the amplifier) Automatic adapter identification						

Power supply connectors

400 W AC power supply

400 W AC power supply	BEA-640
Input:	
Input range:	100 to 240 V_{AC} (active PFC)
Input frequency:	47 to 63 Hz
Max. input current:	7 A (115 V_{AC}), 3.5 A (230 V_{AC})
Output:	
Output power:	400 W continuous
Output voltages:	+3.3 V (max. 28 A) +5 V (max. 35 A) -5 V (max. 0.5 A) +5 Vsb (max. 2 A) +12 V (max. 30 A) -12 V (max. 0.8 A)

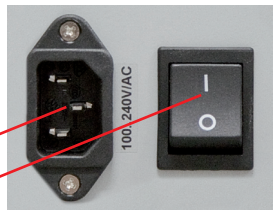


AC power supply

AC power switch

400 W AC power supply

AC power supply	400 W AC ATX power supply MPM-842P
Input:	
Input range:	100 to 240 V_{AC} (auto selecting)
Input frequency:	47 to 63 Hz
Max. input current:	8 A (115 V_{AC})
Output:	
Output power:	400 W continuous (450 W peak)
Output voltages:	+3.3 V (max. 22 A) +5 V (max. 21 A) +5 Vsb (max. 1.5 A) +12 V (max. 22 A) -12 V (max. 0.8 A)

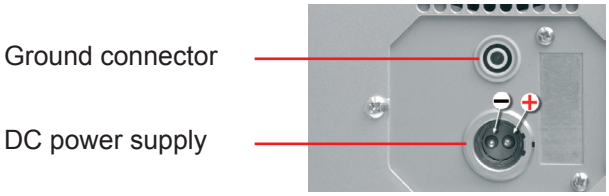


AC power supply

AC power switch

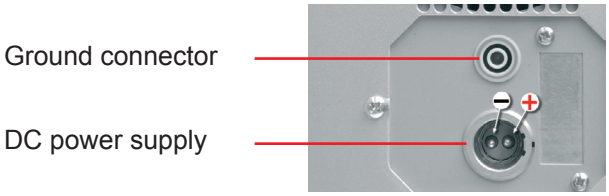
300 W DC power supply

300 W DC power supply	APT-DX 300HEW		
Input:			
Input range:	9 to 18 V_{DC} (12 V_{DC} nom.)		
Input frequency:	DC		
Max. input current:	50 A		
Output:			
Output power:	300 W		
Output voltages:	+3.3 V (max. 20 A, min. 0.3 A)		
	+5 V (max. 35 A, min. 0.3 A)	-5 V	(max. 0.5 A)
	+5 Vsb (max. 2 A)		
	+12 V (max. 15 A)	-12 V	(max. 1 A)



300 W DC power supply

300 W DC power supply	APT-DY300HEW		
Input:			
Input range:	18 to 36 V_{DC} (24 V_{DC} nom.)		
Input frequency:	DC		
Max. input current:	25 A		
Output:			
Output power:	300 W		
Output voltages:	+3.3 V (max. 28 A)		
	+5 V (max. 30 A, min. 3 A, peak 35 A)	-5 V	(max. 1 A)
	+5 Vsb (max. 1.5 A)		
	+12 V (max. 12 A, min. 1 A, peak 15 A)	-12 V	(max. 2 A)



Main System

Internal battery power supply: option DEWE-5000-PS-BAT

320 W DC power supply with XP-04 battery management	
Input:	
Input range:	18 to 24 V_{DC} (nom. 18 V_{DC})
Input frequency:	DC
Max. input current:	12 A
External AC power supply:	90 to 260 V_{AC} (DEWE-POW-24-350 included as standard accessory)
Output:	
Output power:	320 W with XP-04 battery management (with DCDC-123)
Output voltages:	+3.3 V (max. 10 A)
	+5 V (max. 10 A)
	+12 V (max. 12 A)

Power supply pin assignment:

Connector type
2-pin. male
LEMO EGJ.2B.302

If option 5000-PS-BAT is installed, there are 3 slots for hot-swappable smart batteries available in the system. Standard shipment includes 2 smart batteries, more can be ordered additionally (option BAT-95WH).

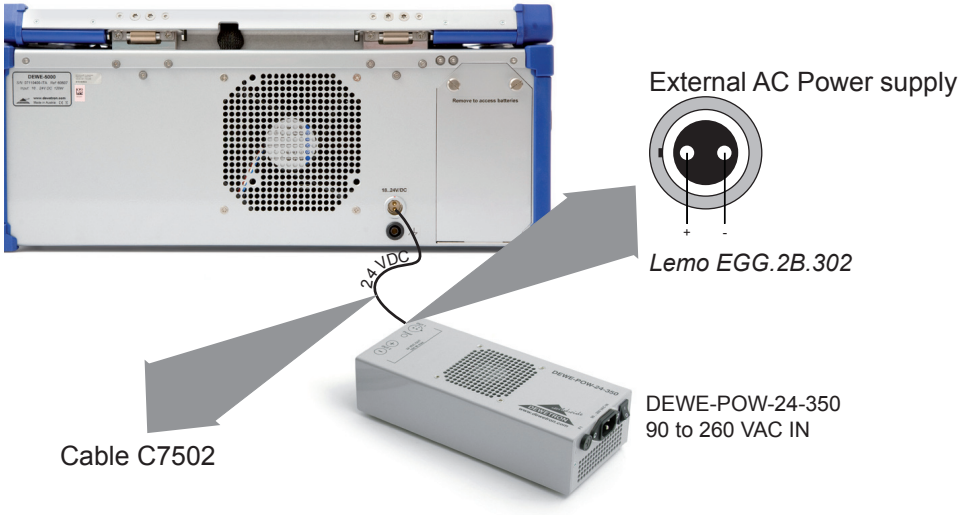
Optional cables:
C7502: LEMO 2B jack to LEMO 2B plug, 2 m. (used for connecting DEWE-2600 to DEWE-POW-24-350 or to DEWE-DCDC-24-350-ISO)
C8502: LEMO 2B jack to banana plugs, 2 m.

Note: If the system is powered by batteries, please take care that there are at least 2 batteries installed! In some special applications 3 batteries are necessary! (Hot swap of the batteries not possible)

External AC/DC power supply (standard accessory included with option 5000-PS-BAT)

AC/DC power supply	DEWE-POW-24-350
Input:	
Input voltage:	90 to 264 V_{AC} / 127 to 370 V_{DC} universal input
Input frequency:	47 to 63 Hz
Input current (typ.):	2 A @ 230 V_{AC} / 4 A @ 115 V_{AC}
Inrush current (typ.):	44 A @ 230 V_{AC} / 22 A @ 115 V_{AC}
Leakage current:	<2 mA @ 240 V_{AC}
P.F.C. (typ.):	0.95 @ 230 V_{AC} / 0.98 @ 115 V_{AC}
Output:	
Output voltage:	24 V
Min. load:	0 A
Rated load (free / fan):	12.5 A / 14.6 A
Output tolerance:	±2 %
Ripple & Noise (max.):	150 mV
Efficiency (typ.):	88 %
Output connector:	Banana jacks and LEMO EGG.2B.302
Protection:	
Overload:	105 % to 130 % constant current limiting, auto recovery
Over voltage:	26.7 to 32.4 V; Hiccup mode, auto recovery after fault has been removed
Over temperature:	> 80°C ±5°C detect on heat sink of power transistor Shutdown, auto recovery after temp. has fallen
Short curcuit:	Yes
Setup time:	<2000ms @ 230V_{AC} / 4000ms @ 115V_{AC}
Rise time:	<100ms @ 230 V_{AC} / 100ms @ 115 V_{AC}
Holdup time:	16ms @ 230 V_{AC} / 16ms @ 115 V_{AC}
Withstand voltage:	I/P-O/P:3 KV_{AC}, I/P-FG:1.5 KV_{AC}, O/P-FG:0.5 KV_{AC} / 1 minute
Isolation resistance:	I/P-O/P, I/P-FG, O/P-FG: 500 V_{DC} / 100 MOhm
Switching frequency:	100 kHz
Temperature:	
Operating:	-10 to 65°C
Derating:	45 to 60°C: 2 %/°C (3.5 & 5 V: 40 to 65°C: 2 %/°C)
Storage:	-40 to 85°C
Humidity:	
Operating:	20 to 90 % RH
Storage:	10 to 95 % RH (non condensing)
M.T.B.F.:	> 106 K hours (according to MIL-HDBK-217F at 25°C environment)
Safety:	Approved: UL 60950-1 / TÜV EN60950-1
EMC:	
EMI	EN55022 Class B / EN61000-3-2,3
EMS	EN61000-4-2,3,4,5,6,8,11 / ENV50204
Dimensions (W x D x H):	248 x 106 x 62 mm (9.8 x 4.2 x 2.4 in.)
Weight:	1.7 kg (3.7 lbs)

DEWE-5000 with option PS-BAT and external AC/DC power supply



Smart battery packs

Smart battery packs are equipped with an integrated circuit which stores information (such as manufacturer, serial number, production date etc.) and monitors the current battery status in terms of discharge rate, predicted remaining capacity, temperature, voltage etc. The battery packs, supplied with every battery powered DEWETRON system, are even capable of displaying their charge state without a separate device. With the push of a button, a LED display on the battery pack shows the current charge state in 25% steps. An intelligent battery controller, integrated in our DEWETRON systems, takes care of the charging and discharging process in order to ensure maximum battery performance and life time.

Main System

External battery charger (optional)

External battery charger	CH5000A/E/U
Power supply:	
Input voltage:	90 to 260 VAC, 24V
Input current:	2.5 A
Mains Cord:	CH5000E - 220 V European 2-pin connector with ground recess
Dimensions (WxDxH):	180 mm x 92 mm x 58 mm
Weight:	ca. 250 g
Mating connector:	5-blade standard battery connector

From time to time, due to the aging process of the batteries, it is necessary to recalibrate the battery in order to retain the accuracy and reliability of the fuel gauge. This can be archieved with an external battery charger (BAT-CHARGER) which is optionally available. Another advantage of the BAT-CHARGER is that additional batteries can be recharged without being in the measurement unit. This allows the measurement unit to run non-stop without being connected to the power net, thanks to the hot-swap capability of the battery packs.

PS/2 mouse connector

The mouse / trackball connector is used to connect the trackball embedded in the keyboard or an external PS/2 mouse. The connector meets standard PS/2 pin assignment.

PS/2 keyboard connector

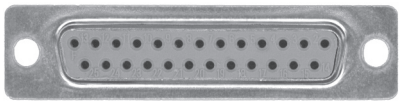
The keyboard connector is used to connect PS/2 keyboard to DEWE-5000 system. The connector meets standard PS/2 pin assignment.

USB interface connectors (Universal Serial Bus)

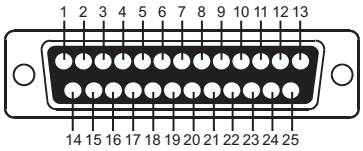
The USB interface connectors meets standard USB pin assignment.

LPT printer interface connector

The printer interface connector (female) is located on the right side of the DEWE-5000. It is configured as standard LPT interface.



25-pin SUB-D connector (female)



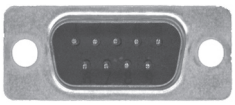
Schematic

Pin assignment

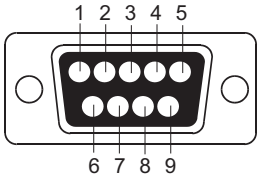
1:	Strobe	14:	Auto FD
2:	Data 1	15:	Error
3:	Data 2	16:	Init
4:	Data 3	17:	Select In
5:	Data 4	18:	GND
6:	Data 5	19:	GND
7:	Data 6	20:	GND
8:	Data 7	21:	GND
9:	Data 8	22:	GND
10:	ACK	23:	GND
11:	Busy	24:	GND
12:	PE	25:	GND
13:	Select		

RS-232 interface connector (COM1)

The RS-232 interface connector (male) is located on the right side of the DEWE-5000. It is configured as standard RS-232 interface COM 1 and can be used for mouse or other peripheral units.



9-pin SUB-D connector (male)



Schematic

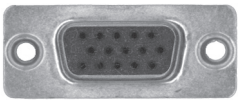
Pin assignment

1: DCD (Data Carrier Detector)
2: RD (Received Data)
3: TD (Transmitted Data)
4: DTR (Data Terminal Ready)
5: GND (Ground)
6: DSR (Data Set Ready)
7: RTS (Request To Send)
8: CTS (Clear To Send)
9: RI (Ring Indicator)

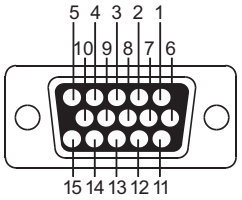
Main System

VGA connector

The VGA connector offers the possibility to connect an external CRT or other standard VGA displays to the system.



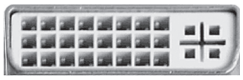
15-pin mini-SUB-D connector (male)



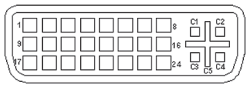
Schematic

Pin assignment
1: Red video
2: Green video / Sync on green
3: Blue video
4: -
5: -
6: Red video ground
7: Green video ground
8: Blue video ground
9: -
10: Ground
11: Ground
12: Data line
13: H-Sync / HV-Sync
14: V-Sync
15: Clock line

Some systems have a DVI connector instead or additionally to the VGA.



15-pin mini-SUB-D connector (male)



Schematic

Pin assignment

1: TDMS-data 2-
2: TDMS-data 2+
3: Shield TDMS-data 2,4
4: TDMS-data 4-
5: TDMS-data 4+
6: DDC clock
7: DDC data
8: Analog: V-Sync
9: TDMS-data 1-
10: TDMS-data 1+
11: Shield TDMS-Daten 1,3
12: TDMS-data 3-
13: TDMS-data 3+
14: +5 volt
15: Ground for +5 volt
16: Hotplug-Detect
17: TDMS-data 0-
18: TDMS-data 0+
19: Shield TDMS-data 0,5
20: TDMS-data 5-
21: TDMS-data 5+
22: Shield TDMS-Takt
23: TDMS-clock+
24: TDMS-clock -
C1: Analog: red
C2: Analog: green
C3: Analog: blue
C4: Analog: H-Sync
C5: Analog: ground

Ethernet connector

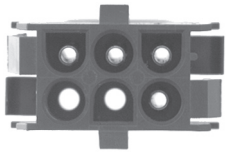
The DEWE-5000 system supports 10/100 BaseT Ethernet with standard RJ45 connector.

Power-on button

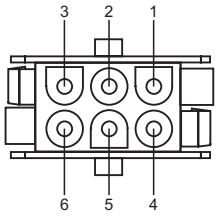
The power-on button has to be used to switch on the system. It only works when the main power switch is on.

Power supply backplane / cooling fan

The AMP connector is the internal power supply connection to the internal rack and the cooling fan, mounted on the backplane of the DEWE-5000 system.



6-pin AMP connector



Schematic

Pin assignment
1: +12 V
2: GND
3: not connected
4: -12 V
5: GND (EPAD supply)
6: +12 V (EPAD supply)

Digital I/O connector

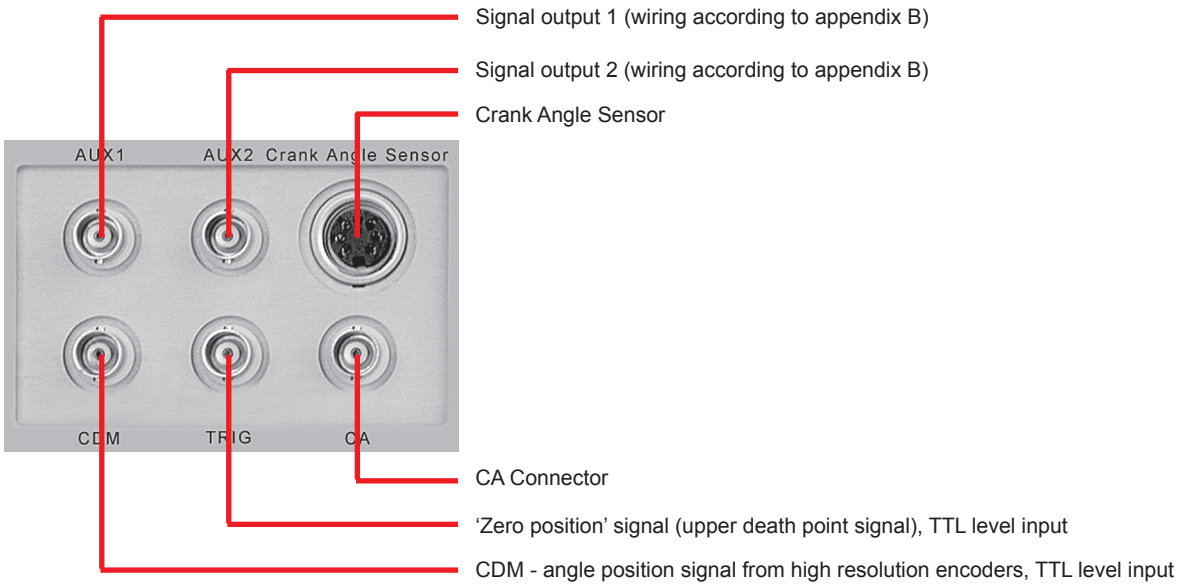
This connector supports digital input and output lines of the built-in A/D board. If this board does not support digital I/O's, the connector is not available.
The pin assignment is depending on the used A/D board - details are available in appendix B.

Ground connectors

For some kind of measurements, it's necessary to give the system an additional ground connection.

Combustion Analyzer I/O connectors (DEWE-5000-CA)

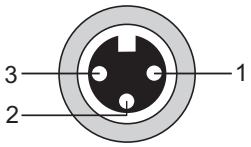
The Combustion Analyzer requires several special input signals to work. Please refer to appendix B (wirings) for details.



Optional connector for current power probe supply

This connector supports ±9 V current power probe supply for connecting current clamps.

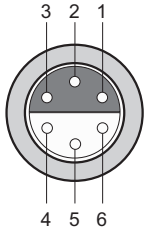
3-pin Binder series connector



BINDER-712 series

Pin assignment
1: +9 V
2: GND
3: -9 V

6-pin male/female Lemo connector (with digital inputs of ORION board)



Lemo EGG.1B.306

Pin assignment
1: +15 V
2: -15 V
3: +9 V
4: DGND
5: DI(x)
6: DGND

x .. digital inputs 0..7 of the ORION board

DEWESoft

DEWESoft turns your hardware into a powerful data acquisition system. Our award-winning data acquisition package is second to none when it comes to both pure recording power and ease of use. Normally this is a difficult balancing act: providing lots of capability and performance, without making the user interface hard to learn. But we‘ve done it!

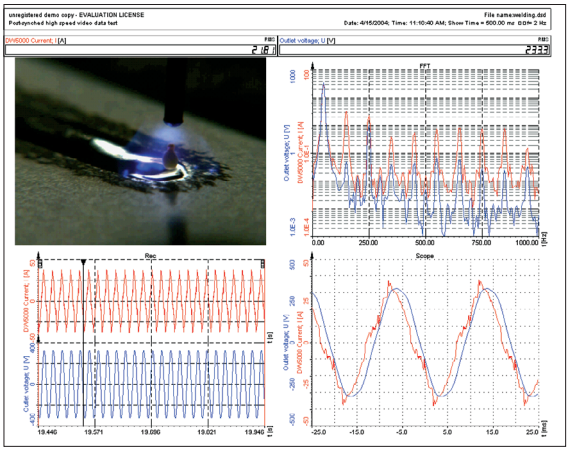
DEWESoft is the solution to acquire signals synchronous from different sources, display and store them together and offer the data for post analysis.

Measure Scope Recorder FFT Video Export Print

One of the most powerful and yet easy to use aspect of DEWESoft is the creation of displays. Of course, a few standard displays are built-in for you, like screens for these instruments:

- Recorder (vertical and horizontal recorder screens are included)
- Oscilloscope (free run, triggered, with 2D and 3D waterfall displays, and more)
- FFT (with selectable axes, line length, window, type, averaging, overlapping, weighting, and more)
- Video – Scalable video window with an assignable recorder graph below
- GPS – Track with background map, plus speed, distance, heading, etc.

Analyze Mode
REPLAY, EXPORT, SHARE DATA!



Here you can replay any captured data file, zoom in with the recorder graph cursors, make measurements, print in full color to any Windows printer, and export the data to a wide variety of formats compatible with today‘s popular analysis software packages, like Flexpro, Matlab, Excel, and many more.

You can even export a AVI video file from your recorded data to create “moving documentation.“ NO LICENSE is needed to use DEWESoft in the ANALYZE mode, so you can install the software on all your computers, or even distrbute it to your customers, and they can install it. In this way, all of your colleagues and customers can replay your data files and do all of the functions that you can – just give them the data file to open.

Notes

A/D Conversion

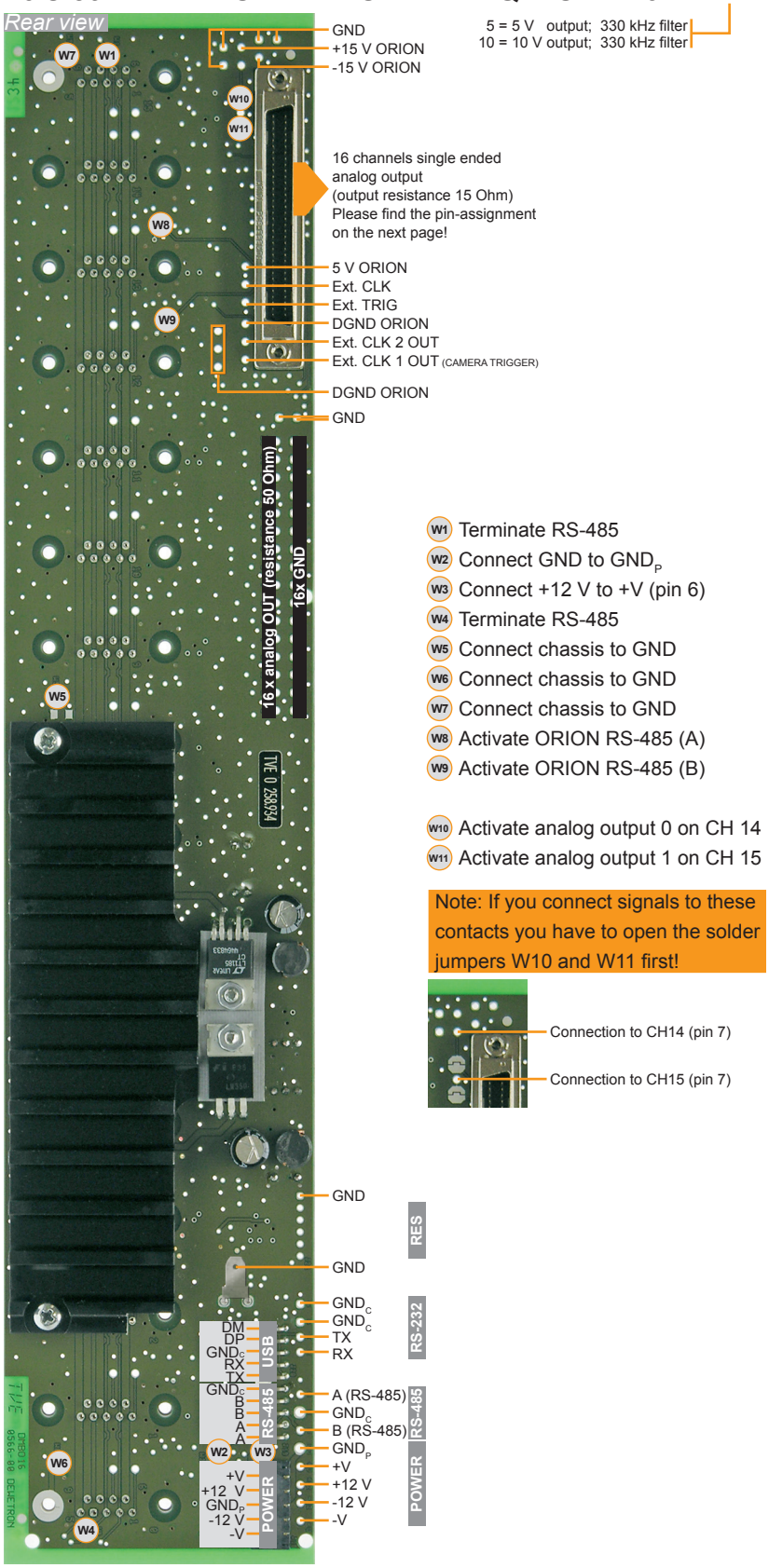
Please find information about the A/D conversion in the attached DEWE-ORION series manual.
The latest version of the manual can be downloaded from:

http://download.dewetron.com/dl/components/adboards

Informations regarding different manufacturer's see the corresponding D/A card manual.

Notes

16 slot DEWE-MOTHERBOARD DAQ-MOTH-16-DE-x



9-pin SUB-D pin assignment:

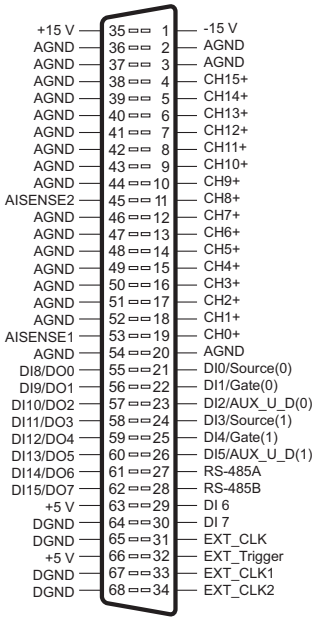
1	Module input (±5 V)
2	RS-485 (A)
3	RS-485 (B)
4	GND
5	+9 V power supply
6	+12 V power (default) / +V sensor supply
7	Module output (from A/D board)
8	-V sensor supply
9	-9 V power supply

The 16 slot DEWE-MOTHERBOARD receives the ±12 V_{DC} power supply via a DC/DC converter from the internal power supply.

Internal Wiring

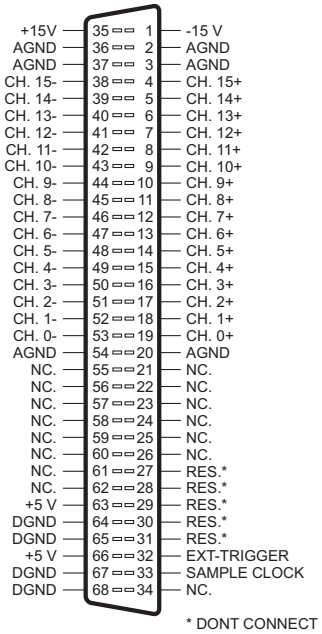
Analog output connector pin-assignment

Connector for DEWE-ORION-1616 cards



68-pin high density connector

Connector for DEWE-ORION-1624 cards



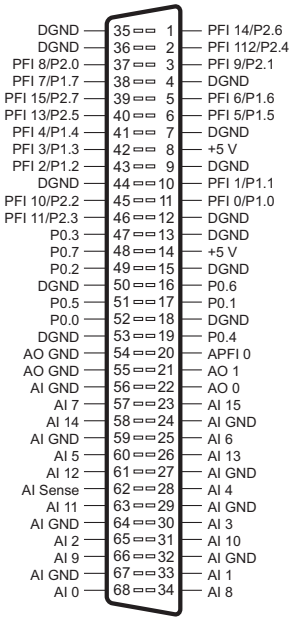
68-pin high density connector

16 slot DEWE-MOTHERBOARD DAQ-MOTH-16-NI-x-U

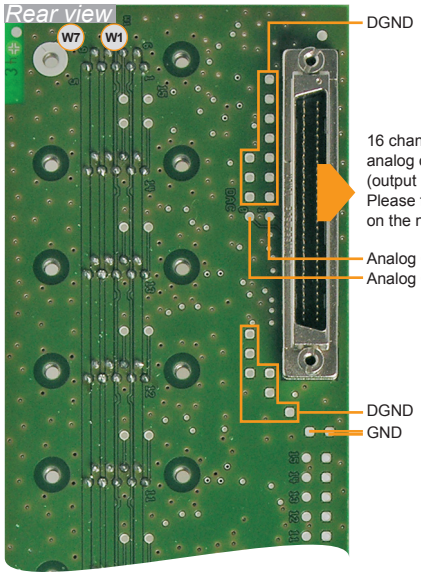
5 = 5 V output; 330 kHz filter
10 = 10 V output; 330 kHz filter

USB interface on-board

Connector for National Instruments™ A/D cards



68-pin high density connector



- W1 Terminate RS-485
- W2 Connect GND to GND_P
- W3 Connect +12 V to +V (pin 6)
- W4 Terminate RS-485
- W5 Connect chassis to GND
- W6 Connect chassis to GND
- W7 Connect chassis to GND

CE-Certificate of conformity

CE

Manufacturer:

DEWETRON Elektronische Messgeraete Ges.m.b.H.

Address:

Parkring 4
A-8074 Graz-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-5000**

Kind of product: *Data acquisition instrument*

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:

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

Graz, October 14, 2008

Place / Date of the CE-marking

Dipl.-Ing. Roland Jeutter / Managing director

Notes