Automotive
Energy & Power Analysis
Aerospace
Transportation
General Test & Measurement

DEWE-2600

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-2600 ?

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.) or LEMO® connectors.

Preface

Notes

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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.

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

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 warning in this manual.

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.

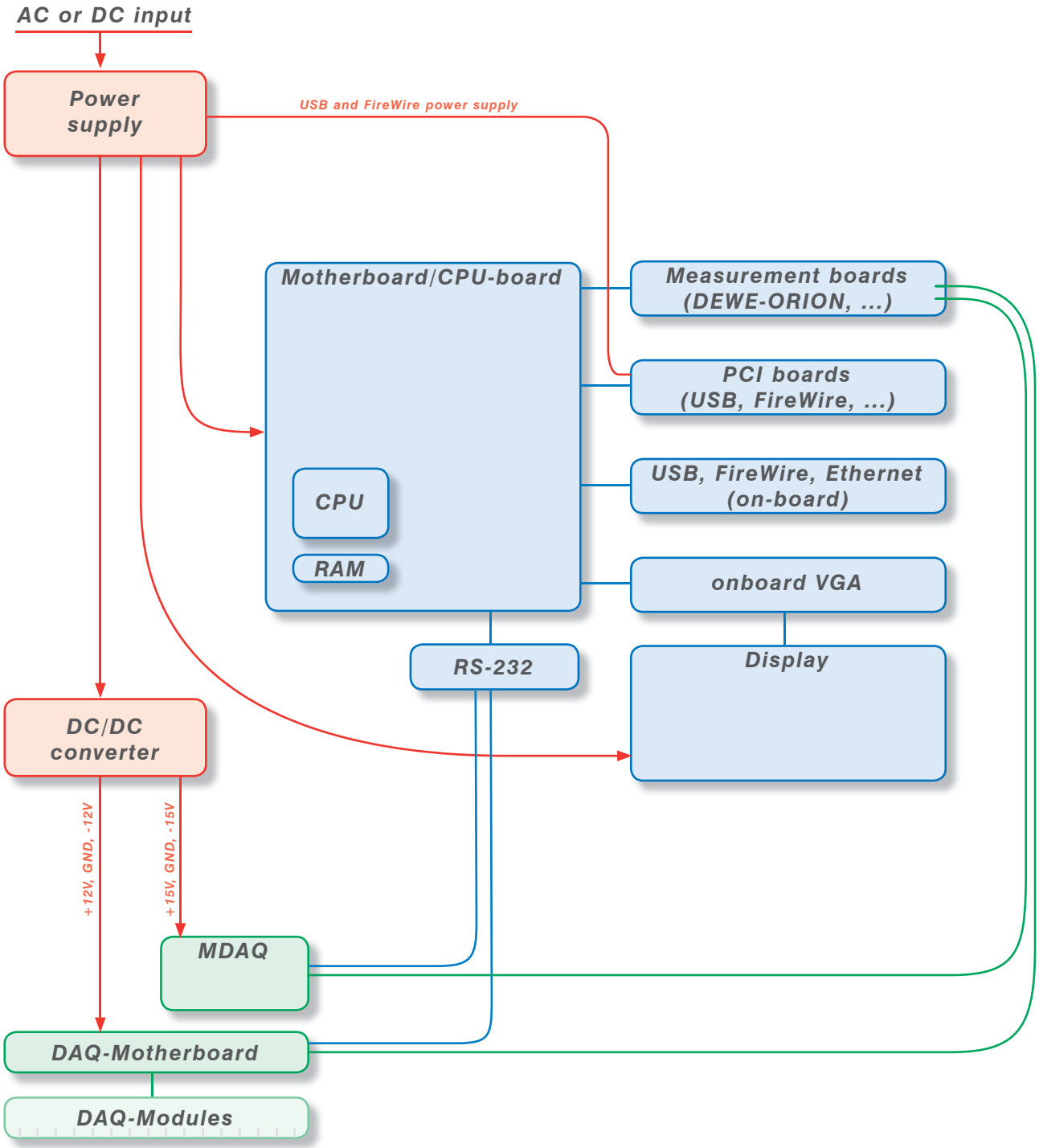
This symbol indicates that this system complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Please find further informations about recycling on the DEWETRON web site
www.dewetron.com

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

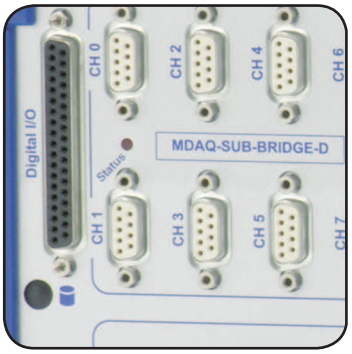


First steps

1

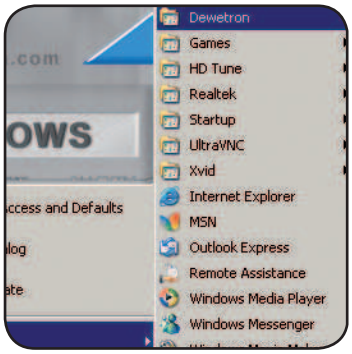
Power-on your system.

2



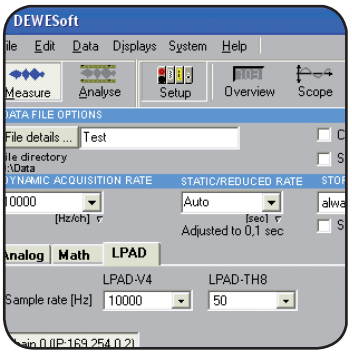
Connect your sensors to the system.

3



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

4



Start recording your data!

First steps

Notes

DEWE-2600 series instruments

- Portable data acquisition system
- Up to 16 channels with isolation
  (in conjunction with DEWE-DAQ modules)
- Up to 64 channels with differential inputs
  (in conjunction with DEWE-MDAQ modules)

System specifications

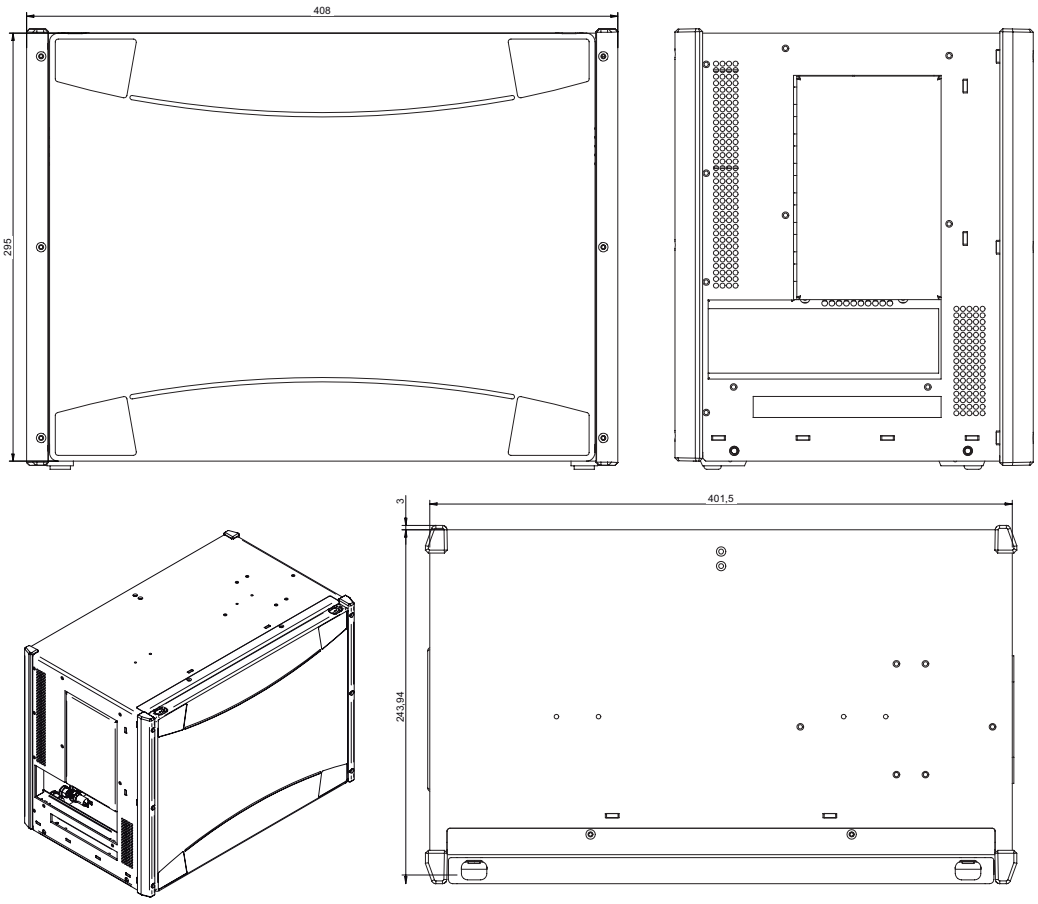
	DEWE-2600													
	MDAQ-DIRECT	MDAQ-V-10	MDAQ-V-100	MDAQ-SUB-V-200	MDAQ-SUB-ACC-x	MDAQ-SUB-ACC-A-x	MDAQ-SUB-BRIDGE	MDAQ-SUB-STG	MDAQ-BASE-5	MDAQ-BASE-10	MDAQ-FILT-5-BU	MDAQ-FILT-5-BU-S1	MDAQ-FILT-5-BE	MDAQ-FILT-10	MDAQ-AAF4-5-BU
Channel 0 to 7* Channel 8 to 15*	❑	❑	❑	❑ ❑	❑ ❑	❑ ❑	❑ ❑	❑ ❑	❑	❑	❑	❑	❑	❑	❑
Channel 16 to 23* Channel 24 to 31*	❑	❑	❑	❑ ❑	❑ ❑	❑ ❑	❑ ❑	❑ ❑	❑	❑	❑	❑	❑	❑	❑
Channel 32 to 39* Channel 40 to 47*	❑	❑	❑	❑ ❑	❑ ❑	❑ ❑	❑ ❑	❑ ❑	❑	❑	❑	❑	❑	❑	❑
Channel 48 to 55* Channel 56 to 63*	❑	❑	❑	❑ ❑	❑ ❑	❑ ❑	❑ ❑	❑ ❑	❑	❑	❑	❑	❑	❑	❑
Standard power supply:	Input range 100 to 240 V_{AC} input (50/60 Hz)								Model ❑ MPM-842P ❑ FSP400-60PFN/PLN For details see next pages!						
Power supply options: 2600-POW-BAT	Battery powered with 18 to 24 V_{DC} input								❑ XP-04 with DC-123						
Operating temperature:	0 °C to +50 °C														
Operating temperature with 2600 POW-BAT option:	0 °C to +50 °C when discharging batteries 0 °C to +45 °C when charging batteries														
Storage temperature:	-20 °C to +70 °C														
Humidity (operating):	10 % to 80 %, non condensing 5 % to 95 %, rel. humidity														
Vibration test** EN 60068-2-6 (exceeds MIL-STD 810F 514.5 procedure I)	Shape Frequency range Acceleration Sweep rate Duration Test in 3 directions														
Vibration test** EN 60721-3-2 Class 2M2	Shape Frequency range Power spectral density Duration														
Shocktests** EN 60068-2-27 (Exceeds MIL-STD 810F 516.5 procedure I)	Shape Acceleration amplitude Duration Test in 3 axis, 3 shocks in each axis and direction														
Dimensions (W x D x H):	approx. 409 x 245 x 291 mm (16.1 x 9.6 x 11.5 in.)														
Weight:	typ. 14 kg (30.8 lbs), depending on configuration														

*) depending on system configuration! For details see next pages.
**) tested with SSD disc

Note: If option 2600-POW-BAT is installed in your system and you don't use it for more than 2 weeks, please remove the batteries and store them separately! Otherwise the batteries will be discharged completely and may be destroyed!

Main System

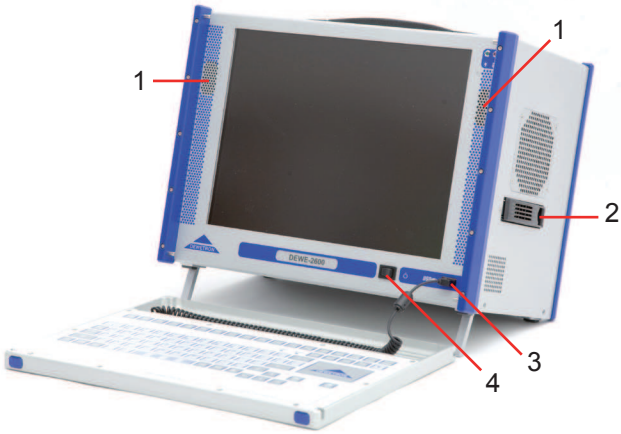
Dimensions*

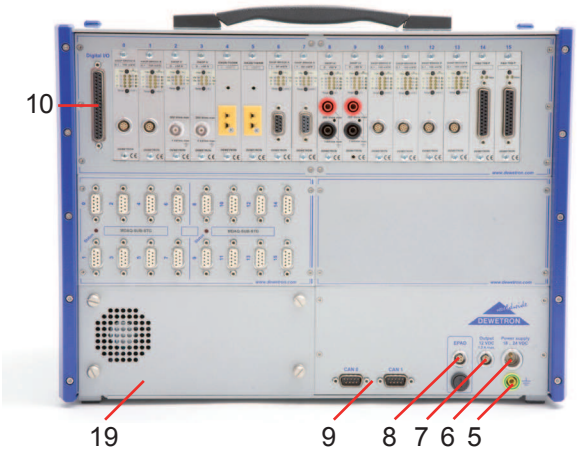


* Dimensions in mm
(1 inch = 25.4 mm)

Connectors

Typical DEWE-2600 front view



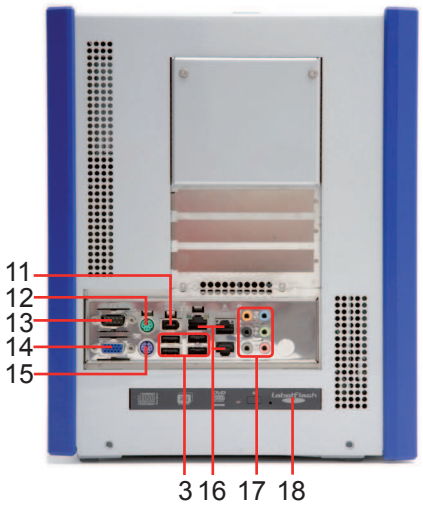


Typical DEWE-2602 DC version rear view

Typical DEWE-2602 AC version rear view

Connector overview:

1 Built in speakers
2 External HDD access
3 USB interface connector
4 Power-on button
5 Ground connector
6 Power supply input connector (with option 2600-POW-BAT)
7 Power supply for accessories (12 V_{DC} / 1.5 A)
8 EPAD connector
9 CAN interface connector
10 Digital I/O connector
11 IEEE-1394 (FireWire®) connector
12 PS/2 mouse connector
13 RS-232 interface connector
14 VGA connector
15 PS/2 keyboard connector
16 Ethernet LAN connector
17 Audio device (LINE IN, MIC, LINE OUT)
18 DVD multi-drive
19 Battery panel
20 Main power switch
21 AC power supply connector
22 Camera trigger connector
23 Optional counter inputs



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

Power-on button

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

Ground connector

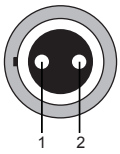
For some kind of measurements, it's necessary to give the system an additional ground connection.

Power supply input connector

For details see next pages.

Power supply for accessories

To supply your accessories with 12 V_{DC}. Fused with an 1.5 A self-healing fuse.

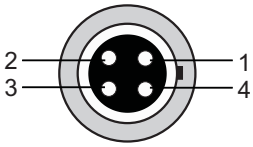


Lemo EGG.1B.302

Pin assginment
1: +12 V, max 1.5 A
2: GND

EPAD connector (LEMO)

To connect DEWETRON EPAD modules to the system.



Lemo EGG.1B.304

Pin assginment
1: RS-485 A
2: RS-485 B
3: +12 V
4: GND
Shield is connected on housing

CAN connector (optional)

This connector supports the CAN signals of the built-in A/D board. If this board does not support CAN signals, the connector is not available. For more informations please refere to Appendix-B.

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.

PS/2 mouse / keyboard connector

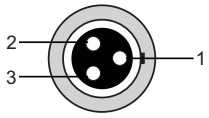
The mouse / keyboard connector could be used to connect a keyboard or an external PS/2 mouse. The connector meets standard PS/2 pin assignment.

Ethernet connector

The DEWE-2600 system supports 10/100/1000 BaseT Ethernet with standard RJ45 connector.

Camera trigger connector

The camera trigger connector allows you to connect high speed cameras to your system.



Lemo EGG.1B.303

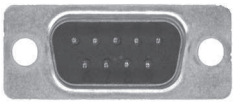
Pin assginment
1: TRG
2: GND
3: n.c.

Optional counter inputs

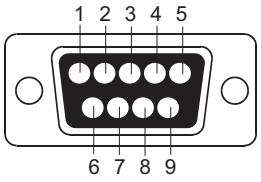
The pin assignment of the optional counter input is available in appendix B.

RS-232 interface connector

The RS-232 interface connector (male) is located on the left side of the DEWE-2600. It can be used for mouse or other peripheral units.



9-pin SUB-D connector (male)

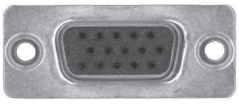


Schematic

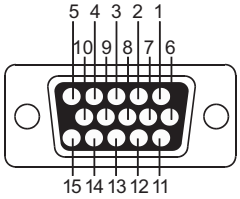
Pin assignment
1: DCD (Data Carrier Detector)
2: RD (Received Data)
3: TD (Transmitted Data)
4: DTR (Data Terminal Ready)
5: GND (Ground)
6: DSR (Data Set Ready)
7: RTS (Request To Send)
8: CTS (Clear To Send)
9: RI (Ring Indicator)

VGA connector

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



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

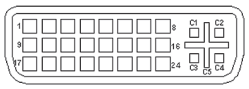


Schematic

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

USB interface connectors (Universal Serial Bus)

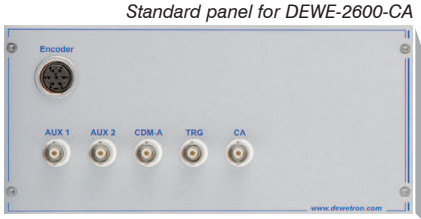
The USB interface connectors meets standard USB pin assignment.

Main System

Possible configurations

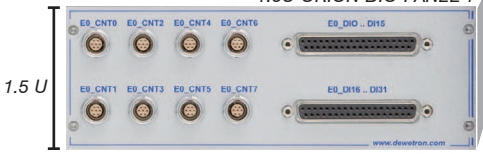
Function panels

Standard panel for DEWE-2600-CA



Combustion analyzer input

1.5U-ORION-DIO-PANEL-1



Counter input with digital input

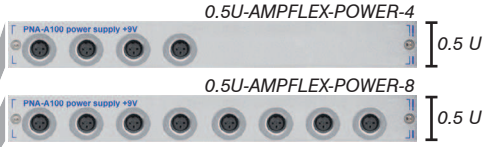
DEWE-2600

Analog input - DAQ modules

Options

0.5U-AMPFLEX-POWER-4

0.5U-AMPFLEX-POWER-8

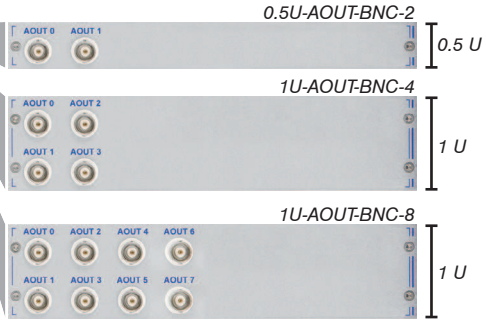


Power supply for PNA-A100 current clamps

0.5U-AOUT-BNC-2

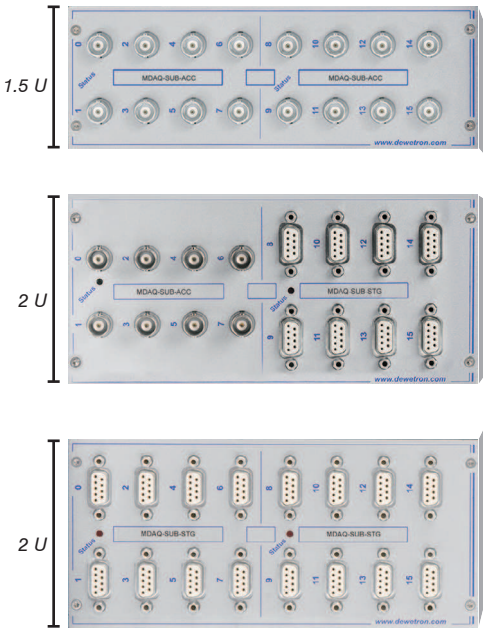
1U-AOUT-BNC-4

1U-AOUT-BNC-8



Analog output

MDAQ panels



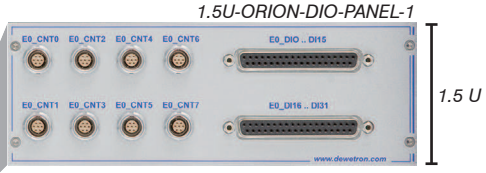
Analog input - MDAQ modules

DEWE-2601

Limited use (no 1.5 U MDAQ panel in this area)

Options

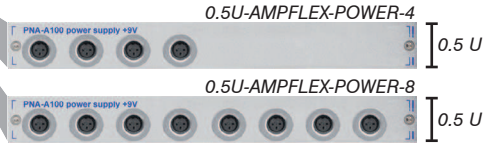
1.5U-ORION-DIO-PANEL-1



Counter input with digital input

0.5U-AMPFLEX-POWER-4

0.5U-AMPFLEX-POWER-8

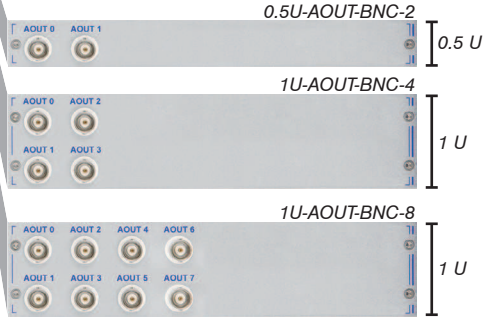


Power supply for PNA-A100 current clamps

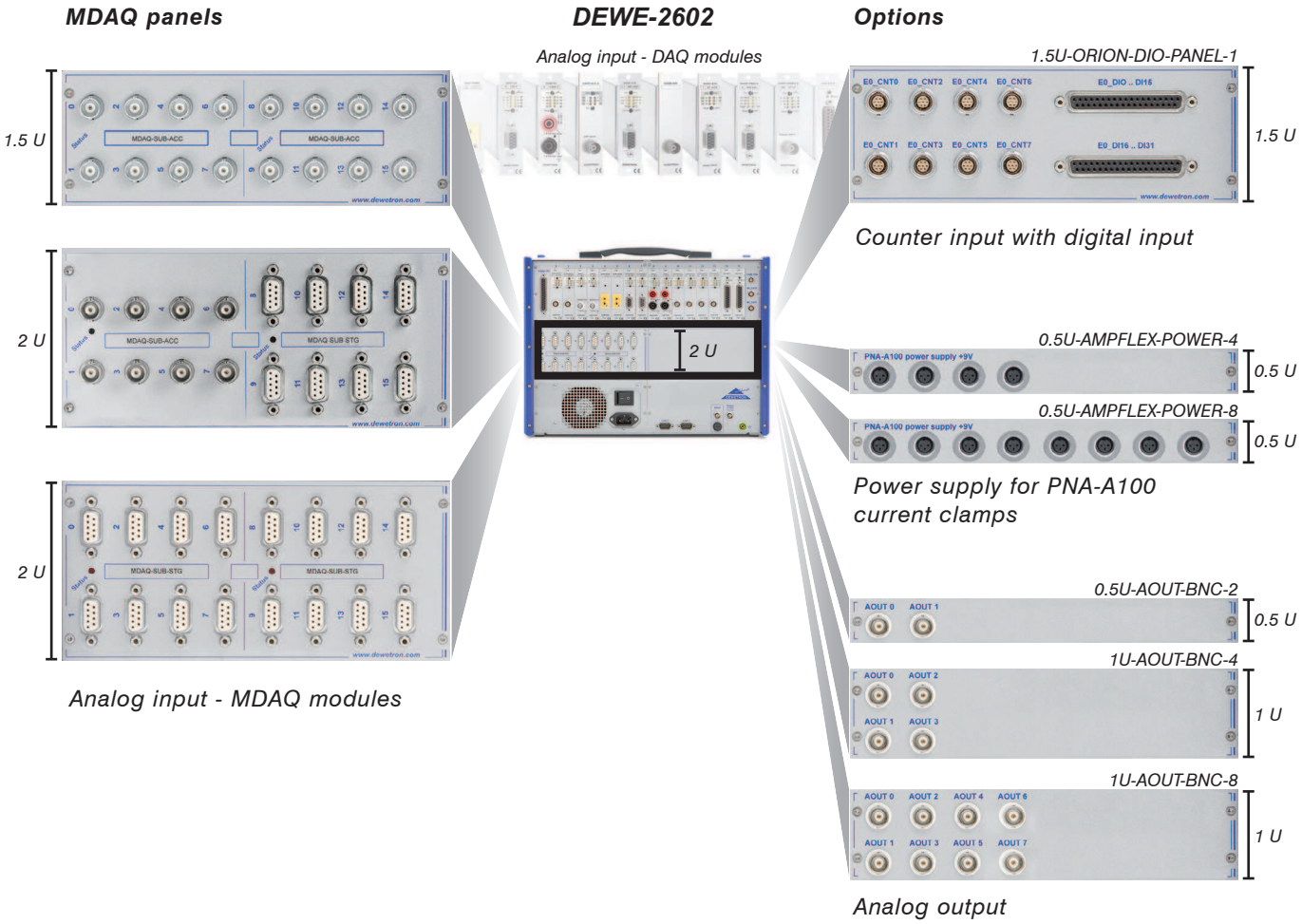
0.5U-AOUT-BNC-2

1U-AOUT-BNC-4

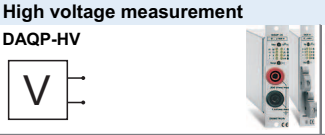
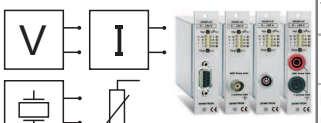
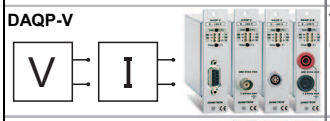
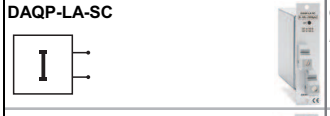
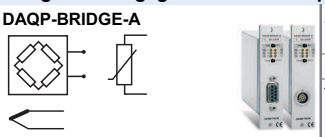
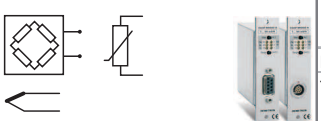
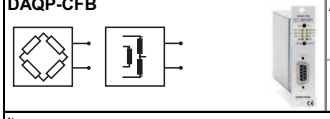
1U-AOUT-BNC-8



Analog output

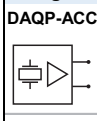
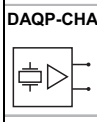
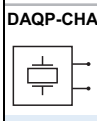


DAQ series modules overview

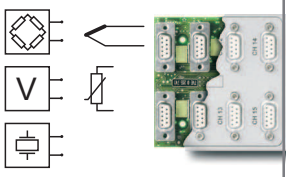
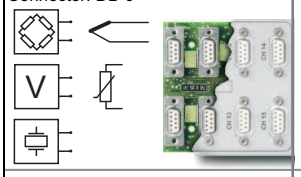
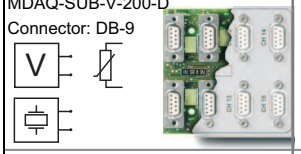
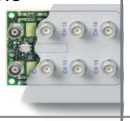
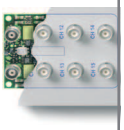
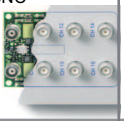
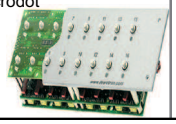
Module	Input type	Ranges	TEDS	Bandwidth (BW), Filters (LP = lowpass, HP = highpass)	Isolation (ISO), Overvoltage protection (OP)
High voltage measurement					
DAQP-HV 	High voltage	±20, ±50, ±100 V ±200, ±400, ±800, ±1400 V	-	BW: 300 kHz LP: 10, 30, 100, 300 Hz 1, 3, 10, 30, 100, 300 kHz	ISO: 1.8 kV_{RMS}
DAQP-DMM 	High voltage	±10, ±40, ±100 V ±200, ±400, ±1000 V	-	BW: 20/30 kHz LP: 10, 100 Hz, 1, 3, 20/30 kHz	ISO: 1.5 kV_{RMS}
Voltage & current measurement					
DAQP-LV 	Voltage, current with external shunt	±10, ±20, ±50 mV ±100, ±200, ±500 mV ±1, ±2.5, ±5, ±10, ±25, ±50 V	■	BW: 300 kHz LP: 10, 30, 100, 300 Hz 1, 3, 10, 30, 100, 300 kHz	ISO: up to 1 kV_{RMS} OP: 350 V_{DC}
	ICP® via MSI-V-ACC	±10, ±20, ±50, ±100, ±200 mV ±500 mV, ±1, ±2.5, ±5, ±10 V			
	Pt100, Pt200, Pt500, Pt1000, Pt2000 and resistance via MSI-V-RTD	-200° C to 1000° C and 0 to 6.5 kOhm			
DAQP-V 	Voltage Current with external shunt	±0.01, ±0.1, ±1, ±5, ±10, ±50 V	-	BW: 50 kHz LP: 10, 100 Hz, 1, 10, 50 kHz	ISO: up to 1 kV_{RMS} OP: ±500 V_{DC} or 300 V_{RMS}
DAQN-AIN 	Voltage	±10 V (1:1 input)	-	-	OP: < ±500 V (jumper selectable)
DAQP-LA-SC 	Current *Note:* 5 A_{RMS} continuous	±0.1, 0.3, 1, 3 A ± 10 A peak, ± 30 A peak max. 5 A_{RMS} contin. current	-	BW: 300 kHz LP: 10, 30, 100, 300 Hz 1, 3, 10, 30, 100, 300 kHz	ISO: 1.4 kV_{RMS}
DAQP-LA-B 	Current *Note:* typ. 20 mA application	±2, 6, 20 mA ± 60 mA, 200 mA, 0.6 A max 0.6 A	-	BW: 300 kHz LP: 10, 30, 100, 300 Hz 1, 3, 10, 30, 100, 300 kHz	ISO: 1.4 kV_{RMS}
Bridge / strain gage and carrier frequency amplifier					
DAQP-BRIDGE-A 	Strain gage, bridge sensors	±1, ±2, ±5, ±10, ±20, ±50 mV/V (@ 5 V_{DC})	-	BW: 20 kHz LP: 10, 100 Hz, 1, 5, 20 kHz	ISO: 350 V_{DC} OP: ±10 V_{DC}
	Potentiometric sensors	200 Ω - 10 kΩ			
	Thermocouple via MSI-BR-TH-x	full range of TC type			
DAQP-BRIDGE-B 	Strain gage, bridge sensors	±0.1, ±0.2, ±0.5, ±1, ±2, ±5, ±10, ±20, ±50, ±100 mV/V (@ 5 V_{DC})	■ [1]	BW: 200 kHz LP: 10, 30, 100, 300 Hz, 1, 3, 10, 30, 100, 200 kHz	OP: ±10 V_{DC}
	Potentiometric sensors	200 Ω - 10 kΩ			
	Thermocouple via MSI-BR-TH-x	full range of TC type			
DAQP-CFB 	AC bridge, strain gage	Bridge: 0.1 to 1000 mV/V Inductive: 5 to 1000 mV/V	-	BW: DC to 2.3 kHz LP: 10, 30, 100, 300 Hz, 1 kHz	OP: ±10 V_{DC}
	Inductive sensors, LVDT	Voltage: 0.2 to 1000 mV_{RMS}			

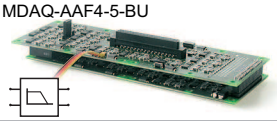
[1] TEDS support for DAQP-BRIDGE-B revision 2 only

■ = standard

Module	Input type	Ranges	TEDS	Bandwidth (BW), Filters (LP = lowpass, HP = highpass)	Isolation (ISO), Overvoltage protection (OP)
Charge / ICP® measurement					
DAQP-ACC-A 	ICP® sensors	±50, ±166, ±500 mV, ±1.66, ±5 V (Gain: 1, 3, 10, 30, 100)	-	BW: 0.5 Hz to 300 kHz LP: 1, 10, 100, 300 kHz HP: 0.5 Hz, 5 Hz	-
DAQP-CHARGE-A 	ICP® sensors, charge sensors *Note:* selectable integration and double integration	Charge: 5, 50, 500 pC 5000, 50000 pC ICP®: ±5, ±50, ±500 mV, ±5 V (0, 20, 40, 60 dB)	-	BW: 0.1 Hz to 50 kHz LP: 100 Hz, 1, 3, 10, 50 kHz HP: 0.1 Hz, 1 Hz, 10 Hz	-
DAQP-CHARGE-B 	Charge sensors *Note:* selectable time constant for static sensors	±100, ±500, ±2 000, ±10 000, ±40 000, ±200 000, ±1 000 000 pC	-	BW: DC to 100 kHz LP: 10, 30, 100, 300 Hz, 1, 3, 10, 30, 100 kHz HP: DC, 0.001 Hz to 0.5 Hz	ISO: 350 V_{DC}
Temperature measurement					
DAQN-THERM-x 	Thermocouple *Note:* internal CJC	K and J type, various ranges	-	BW: 4 Hz	ISO: 1 kV_{RMS}
DAQN-RTD-x 	Thermoresistors	Pt100, various ranges	-	BW: 10 Hz	-
Frequency measurement					
DAQP-FREQ-A 	Frequency	100 Hz, 1, 5, 20, 100, 200 kHz	-	BW: according to range LP: 100 Hz, 1, 5, 20, 100, 200 kHz	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}

MDAQ series amplifiers overview

SUB Modules for MDAQ-BASE-x						
Module	**# CH**	**Input type**	**Input ranges**	**TEDS**	**Bandwidth (BW), Highpass filters (HP)**	**Excitation**
MDAQ-SUB-STG-D Connector: DB-9 	8	*** Strain-gage (Full-, half and quarter-bridge, incl. shunt calibration)** ***for strain gage application:***	14 ranges from ±0.5 to 1000 mV/V (@ 5 V_{DC} excitation	■	BW: 30 kHz	0 to 12 V_{DC}
		*** Voltage up to ±10 V:**	15 ranges from ±2.5 mV to ±10 V			
		* ICP via MSI-BR-ACC:	7 ranges from ±0.25 mV to ±10 V			
		* Voltage up to 200 V via MSI-BR-V-200:	6 ranges from ±10 to ±200 V			
		* Thermocouple via MSI-BR-TH-x:	full range of TC type			
		* Pt100, Pt200, Pt500, Pt1000, Pt2000 and resistance via MSI-BR-RTD:	-200 °C to 1000 °C and 0 to 6.5 kOhm			
MDAQ-SUB-BRIDGE-D Connector: DB-9 	8	*** Strain-gage (Full-, and half bridge)** ***for strain gage sensors:***	14 ranges from ±0.5 to 1000 mV/V (@ 5 V_{DC} excitation	■	BW: 30 kHz HP: 0.16 Hz	+15 V_{DC} and 0 to 12 V_{DC}
		*** Voltage up to ±10 V:**	15 ranges from ±2.5 mV to ±10 V			
		* ICP, via MSI-BR-ACC:	7 ranges from ±0.25 mV to ±10 V			
		* Voltage up to 200 V via MSI-BR-V-200:	6 ranges from ±10 to ±200 V			
		* Thermocouple via MSI-BR-TH-x:	full range of TC type			
		* Pt100, Pt200, Pt500, Pt1000, Pt2000 and resistance via MSI-BR-RTD:	-200 °C to 1000 °C and 0 to 6.5 kOhm			
MDAQ-SUB-V-200-D Connector: DB-9 	8	*** Voltage up to ±200 V:**	13 ranges from ±0.125 to ±200 V	■	BW: 300 kHz	±15 V_{DC} and 0 to 12 V_{DC}
		* ICP, via MSI-V-ACC:	7 ranges from ±0.25 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			
		Note: *for safety reasons, max. 120 V_{DC} or 50 V_{AC} are allowed at this connector*				
MDAQ-SUB-V-200-BNC Connector: BNC 	8	*** Voltage up to ±200 V:** *Note:* *for safety reasons, max. 120 V_{DC} or 50 V_{AC} are allowed at this connector*	13 ranges from ±0.125 to ±200 V	-	BW: 300 kHz	-
MDAQ-SUB-ACC-BNC Connector: BNC 	8	*** ICP® or voltage up to ±10 V:** Single-ended or differential input and one highpass filter *3.4 Hz highpass filter for noise and shock response measurement*	8 ranges from ±125 mV to ±10 V	■	BW: 300 kHz HP: 3.4 Hz	4 / 8 mA
		MDAQ-SUB-ACC-BNC-S1 *0,16 Hz for structural and modal analysis, human body vibration measurement* *(rest same as MDAQ-SUB-ACC-BNC)*		■	BW: 300 kHz HP: 0.16 Hz	4 / 8 mA
MDAQ-SUB-ACC-A-BNC Connector: BNC 	8	*** ICP® or voltage up to ±10 V:** Single-ended input and two HP filters *0.16 Hz for structural and modal analysis, human body vibration measurement* *3.4 Hz for noise and shock response measurement*	8 ranges from ±125 mV to ±10 V	■	BW: 300 kHz HP: 0.16 Hz, 3.4 Hz	4 / 8 mA
MDAQ-SUB-ACC-A-MD Connector: Microdot 	8	*** ICP® or voltage up to ±10 V:** Single-ended input, two HP filters and sensor failure detection *0.16 Hz for structural and modal analysis, human body vibration measurement* *3.4 Hz for noise and shock response measurement* Option: test signal input for all channels	8 ranges from ±125 mV to ±10 V	■	BW: 300 kHz HP: 0.16 Hz, 3.4 Hz	4 / 8 mA

Filter modules for MDAQ				
Module	**# CH**	**Filter characteristics**	**Cut-off frequencies**	**Order**
MDAQ-AAF4-5-BU 	16	Butterworth	100 Hz, 1, 10, 30, 100 kHz, Bypass *Note:* *not possible in all system configurations.* *Please contact factory for details.*	4th
MDAQ-FILT-5-BU 	16	Butterworth	30, 100, 300 Hz, 1, 10 kHz, Bypass	2nd
MDAQ-FILT-5-BU-S1 	16	Butterworth	100 Hz, 1, 10, 30, 100 kHz, Bypass	2nd
MDAQ-FILT-5-BE 	16	Bessel	30, 100, 300 Hz, 1, 10 kHz, Bypass	2nd

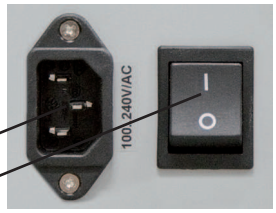
Modular smart interfaces to connect various sensors

Multisensor inputs for MDAQ and DAQP modules						
	MDAQ-SUB-STG-D	**MDAQ-SUB-BRIDGE-D**	**MDAQ-SUB-V-200-D**	**DAQP-BRIDGE-A ***	**DAQP-BRIDGE-B**	**DAQP-LV-D**
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-V-ACC 	-	-	✓	-	-	✓
	Isotron (constant current powered) adapter for DAQP-V-x 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-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 	✓	✓	-	-	-	-
	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-V-RTD 	-	-	✓	-	-	✓
	Pt100, Pt200, Pt500 and Pt1000 adapter for DAQP-V-x 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-BR-TH-K	✓	✓	-	✓	✓	-
MSI-BR-TH-J	isolated TC sensor			any TC sensor	isolated TC sensor	
MSI-BR-TH-T 	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					
* no automatic MSI identification with DAQP-BRIDGE-A						

Power supply

AC standard power supply

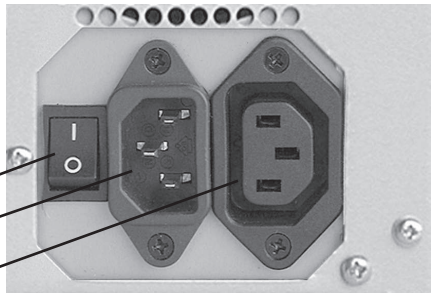
400 W AC power supply	MPM-842P
Input:	
Input range:	100 to 240 V_{AC} (auto selecting)
Input frequency:	47 to 63 Hz
Max. input current:	8 A (115 V_{AC})
Output:	
Output power:	400 W continuous (450 W peak)
Output voltages:	+3.3 V (max. 22 A) +5 V (max. 21 A) +5 Vsb (max. 1.5 A) +12 V (max. 22 A) -12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



AC power supply

AC power switch

400 W AC power supply	FSP400-60PFN/PLN
Input:	
Input range:	100 to 240 V_{AC} (auto selecting)
Input frequency:	50 to 60 Hz
Max. input current:	10 A (115 V_{AC}) or 5 A (230 V_{AC})
Output:	
Output power:	400 W (max. 235 W @ +3.3 V and +5 V)
Output voltages:	+3.3 V (max. 28 A) +5 V (max. 40 A) -5 V (max 0.3 A) +5 Vsb (max. 2 A) +12 V (max. 15 A) -12 V (max. 0.8 A)



AC power switch

AC power supply

AC power supply out

Internal battery power supply: option DEWE-2600-POW-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
Output:	
Output power:	320 W with XP-04 battery management (only single DC-DC)
Output voltages:	+3.3 V (max. 10 A) +5 V (max. 10 A) +12 V (max. 12 A)
DC-023-12V option:	-12 V (max. 0.25A)

Power supply pin assignment:

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

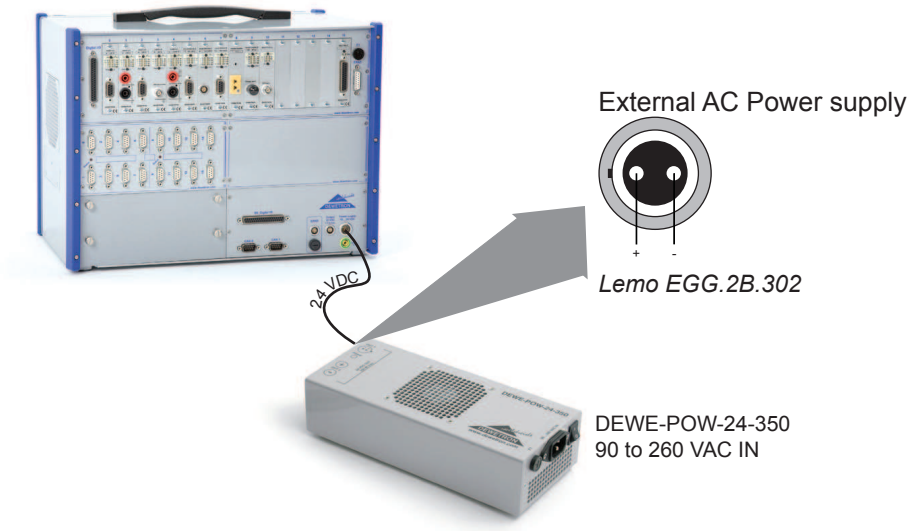
If option 2600-POW-BAT is installed, there are 3 slots for hot-swappable smart batteries available in the system. Standard shipment includes 2 smart batteries, more can be ordered additionally (option BAT-95WH).

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 inkluded with option 2600-POW-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-2600 with option POW-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.

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.

External DC/DC power supply
(recommended option if system is configured with 2600 POW-BAT power supply)

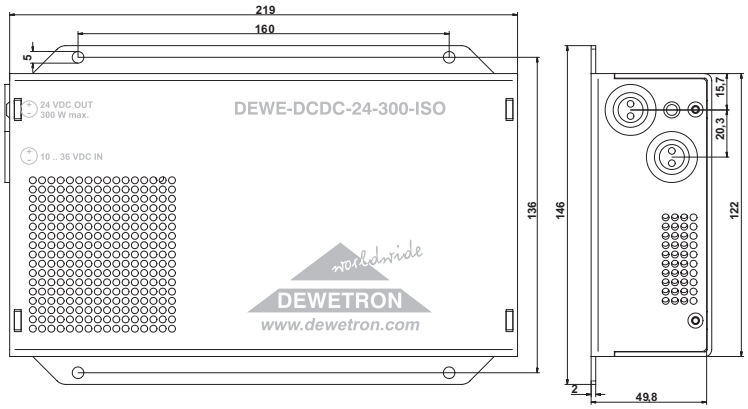
DC/DC power supply	DEWE-DCDC-24-300-ISO
Input:	
Input voltage:	10 to 36 V_{DC} (the input is protected against wrong polarity
Max. input current:	36 A @ 10 V_{DC} input voltage (15 A @ 24 V_{DC})
Input connector:	2-pin LEMO connector male, type: EGJ.3B.302
Output:	
Output voltages:	24 V
Output power:	300 W
Output current:	12.5 A
Output connector:	2-pin LEMO connector female, type: EGG.2B.302
Operating temperature:	-20 °C to 60 °C
Derating above 45 °C:	8 Watt/°C
Isolation voltage:	500 V_{DC}
Status LED:	Green LED indicates an output voltage > 21 V_{DC}
Dimensions: (W x D x H):	approx. 219 x 122 x 50 mm (8.6 x 4.8 x 2 in.)
Weight:	1.3 kg (2.9 lbs)
Power on sequence: First: Connect the system and the DCDC! Followed by the DCDC and the power supply connection.	

As an option the DEWE-2600 is shipped with the DEWE-DCDC-24-300-ISO. This power supply serves galvanic isolated voltage with a wide input range from 10 to 36 V_{DC}. The output voltage is fixed with 24 V_{DC} with a maximum output power of 300 W.

Depending on the configuration, the DEWE-2600 takes usually not more than 150 W. The typical power consumption is just around 70 W. However, if the batteries are empty the input current can go up to 12 Ampere which is an equivalent power consumption of 280 Watt! If the unit is supplied from a typical board supply of 12 V it needs an input current of 28 A!

If this high power is not available in the board supply please operate the DEWE-2600 without or with charged batteries.

Dimensions*



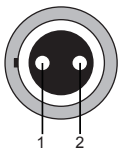
* Dimensions in mm
(1 inch = 25.4 mm)

Input connector

Lemo EGJ.3B.302

Pin assginment
1: 10 .. 36 V_{DC} input
2: GND

Output connector



Lemo EGG.2B.302

Pin assginment
1: 24 V_{DC} output
2: GND

Maintenance

External HDD access for easy service

If the system harddisk drive gets damaged, an external HDD access for easy service is available. Pull out the access bay for removing/changing the system harddisk drive.

Notes

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!

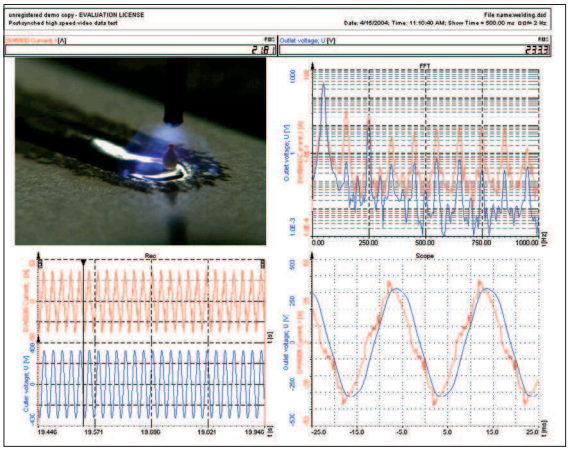
DEWESoft is the solution to acquire signals synchronous from different sources, display and store them together and offer the data for post analysis.

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 & D/A Conversion

A/D Conversion

Detailed information about the A/D card are not included in this manual.

For detailed information see the manufacturer's A/D card manual.

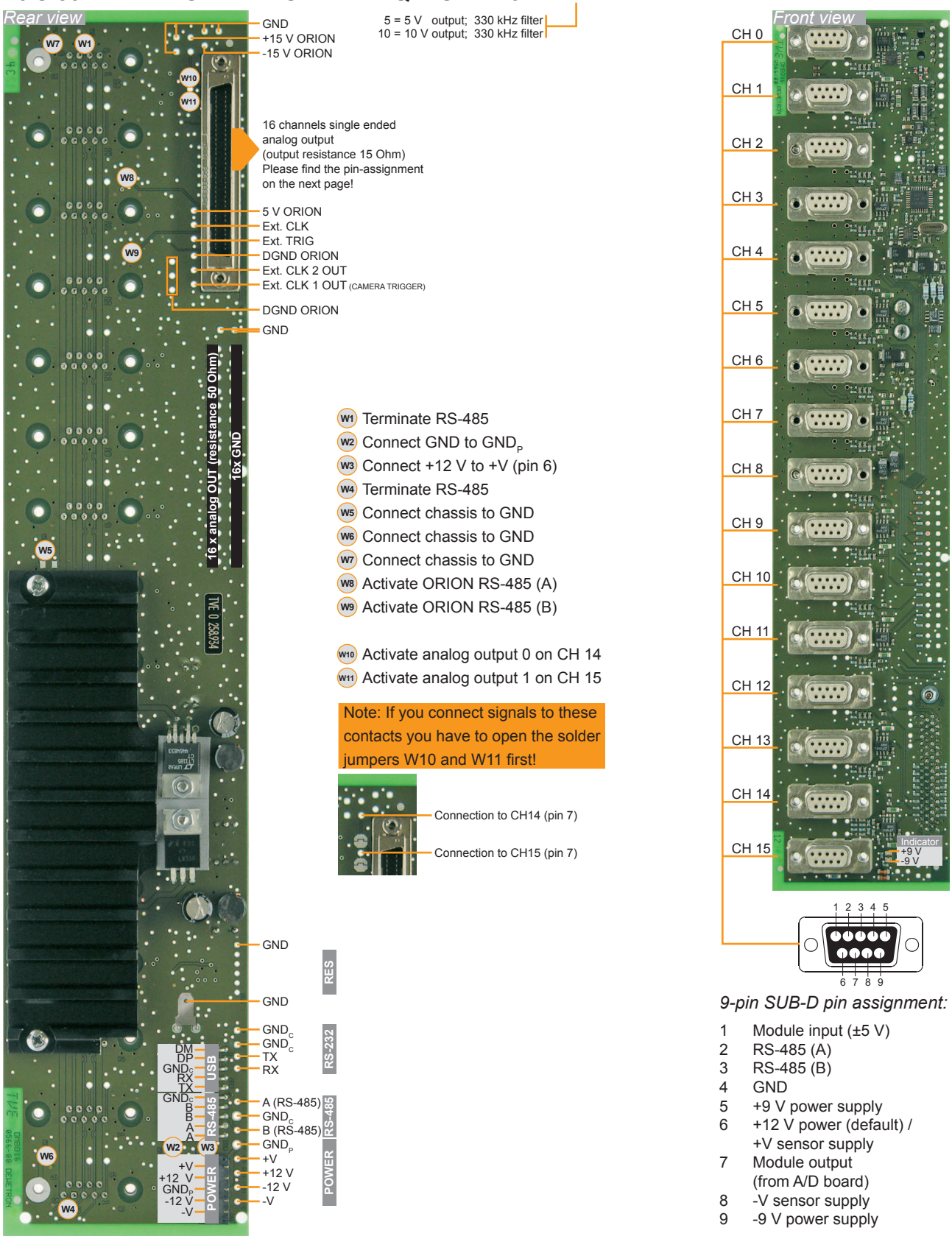
D/A Conversion

Detailed information about the D/A card are not included in this manual.

For detailed information see the manufacturer's D/A card manual.

Notes

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



9-pin SUB-D pin assignment:

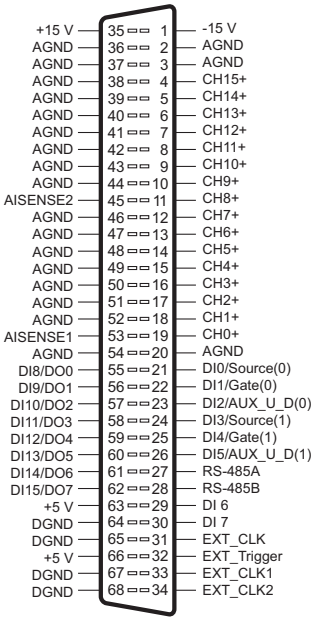
1	Module input (±5 V)
2	RS-485 (A)
3	RS-485 (B)
4	GND
5	+9 V power supply
6	+12 V power (default) / +V sensor supply
7	Module output (from A/D board)
8	-V sensor supply
9	-9 V power supply

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

Internal Wiring

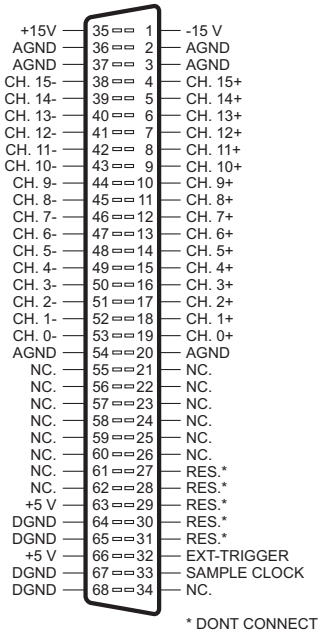
Analog output connector pin-assignment

Connector for DEWE-ORION-1616 cards



68-pin high density connector

Connector for DEWE-ORION-1624 cards

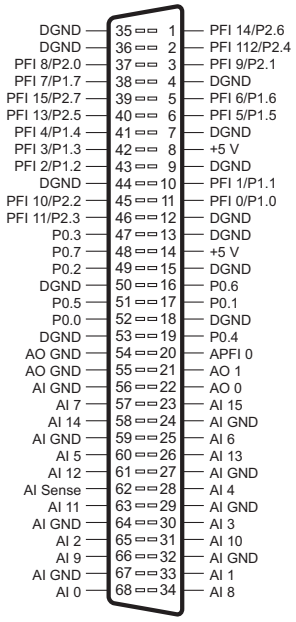


68-pin high density connector

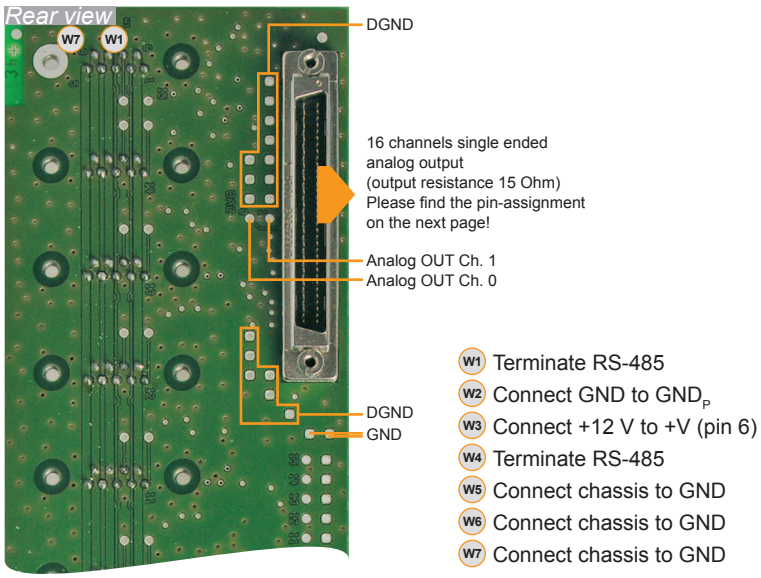
16 slot DEWE-MOTHERBOARD DAQ-MOTH-16-NI-x-U

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



Please find information about the MDAQ amplifiers in the attached MDAQ-INT series modules manual. The latest version of the manual can be downloaded from:

http://www.dewetron.com/download/index.php?search=MDAQ&catkey=manuals-amplifiers

Notes

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-2600**

Kind of product: *Portable data acquisition system*

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