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Technical Reference

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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.

Support

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

For Asia and Europe, please contact:

DEWETRON Ges.m.b.H.
Parkring 4
A-8074 Graz-Grambach
AUSTRIA
Tel.: +43 316 3070
Fax: +43 316 307090
Email: support@dewetron.com
Web: <http://www.dewetron.com>

The telephone hotline is available
Monday to Friday between
08:00 and 17:00 CET (GMT +1:00)

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Wakefield, RI 02879
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Tel.: +1 401 284 3750
Toll-free: +1 877 431 5166
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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)

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Printing History

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Safety instructions

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 for all DEWETRON systems

- The DEWETRON data acquisition systems may only be installed by experts.
- Read your manual before operating the system.
- Observe local laws when using the instrument.
- Ground the equipment: For Safety Class 1 equipment (equipment having a protective earth terminal), a non interruptible safety earth ground must be provided from the mains power source to the product input wiring terminals or supplied power cable.
- DO NOT operate the product in an explosive atmosphere or in the presence of flammable gases or fumes and do not bring the system in contact with water.
- DO NOT operate damaged equipment: Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to a DEWETRON sales and service office for service and repair to ensure that safety features are maintained.
- Keep away from live circuits: Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers or shields are for use by service-trained personnel only. Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid dangerous electrical shock, DO NOT perform procedures involving cover or shield removal unless you are qualified to do so.
- No modifications are allowed at the instrument. The fuse in the power module has to be replaced by the same type. For continued protection against fire, replace the line fuse(s) only with fuse(s) of the same voltage and current rating and type. DO NOT use repaired fuses or short-circuited fuse holder labels and print on the power module may not be removed.
- DO NOT service or adjust alone. Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.
- DO NOT substitute parts or modify equipment: Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Return the product to a DEWETRON sales and service office for service and repair to ensure that safety features are maintained.
- Before opening the instrument (experts only) or exchanging the fuse in the power module disconnect power!
- Don't touch internal wiring!
- Don't use higher supply voltage than specified and take care of the correct polarity, otherwise the system will be damaged!
- Use only original plugs and cables for harnessing.
- Install filler-panels in unused slots.
- The power-cable and -connector serve as Power-Breaker. The cable must not exceed 10 feet, disconnect function must be possible without tools.
- Keep the ventilation slots free and check them frequently to avoid an overheating of the system. The cleaning interval of the filter pads depends on the environmental conditions.
- Safety of the operator and the unit depend on following these rules.
- DEWETRON is not responsible for any damage or injury that could result from improper connection or misuse!

General Information

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.

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.

DEWE-501 Battery Powered Instrument

- Portable, battery powered data acquisition system
- Up to 2 DEWE-ORION-3216 cards with 64 A/D converters
- DEWE-501-A with modular MDAQs
- DEWE-501-B with fixed DSUB connectors
- Up to 10 counter- / encoder inputs
- A/D converter specs see appendix A



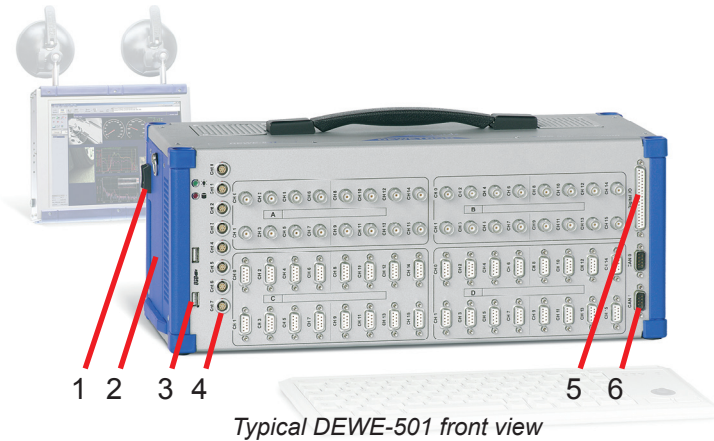
System specifications

DEWE-501	
	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-BE MDAQ-FILT-10 MDAQ-FILT-10-S1 MDAQ-AAF-4-5-BU
Channel 0 to 7 Channel 8 to 15	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Channel 16 to 23 Channel 24 to 31	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Channel 32 to 39 Channel 40 to 47	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Channel 48 to 55 Channel 56 to 63	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Power supply Battery management	18 to 24 V _{DC} <input type="checkbox"/> BBDC-02 (120 W) <input type="checkbox"/> BB-04 (150 W) <input type="checkbox"/> MP-04 (192 W) <input type="checkbox"/> XP-04 (320 W)
DC-DC converter	<input type="checkbox"/> Dual DC-DC converter module <input type="checkbox"/> DC-023 <input type="checkbox"/> DC-023-12V <input type="checkbox"/> DC-123 for details see next pages
Operating temperature	-10 °C to +50 °C when discharging batteries (with MDAQ-SUB-ACC modules 0 °C to +50 °C) 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	Shape Sine Frequency range 10 - 150 Hz Acceleration 2 g Sweep rate 1 oct./min. Duration 20 Cycles Test in 3 directions
Vibration test EN 60721-3-2 Class 2M2	Shape Random Frequency range 10 - 200 Hz Power spectral density 1 m/s ² / Hz from 10 – 200 Hz Duration 30 Minutes per axis
Shocktests EN 60068-2-27	Shape Half-sine Acceleration amplitude 15 g Duration 11 ms Test in 3 axis, 3 shocks in each axis and direction
Dimensions (W x D x H)	DEWE-501: 439 x 188 x 181 mm (17.3 x 7.4 x 7.1 in.)
Weight	typ. 6 to 10 kg (13.2 to 22 lbs), depending on configuration

Main System

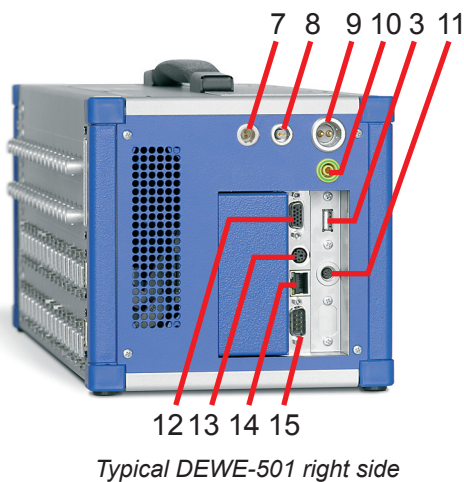
Note: If you don't use the system for more than 2 weeks, please remove the batteries and store them separately! Otherwise the batteries will be discharged completely and may be destroyed!

Connectors



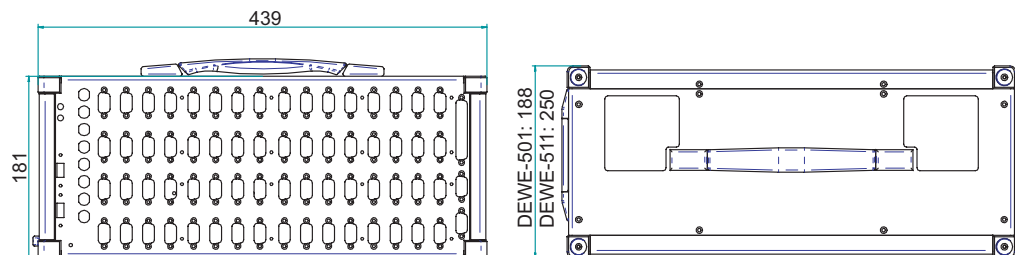
Connector overview:

- 1 Power-on button
- 2 Batteries
- 3 USB interface connectors
- 4 Counter inputs
- 5 Digital I/O connector
- 6 CAN interface
- 7 Ignition (IGN) input (Lemo EGJ.1B.302.CLA)
- 8 Power supply for accessories (12 V_{DC} / 1.8 A) Lemo FGG1B-302
- 9 Power supply input (Lemo FGJ2B-30)
- 10 Ground connector
- 11 EPAD interface
- 12 VGA connector
- 13 PS/2 connector
- 14 Ethernet LAN connector
- 15 RS-232 interface connector



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

Dimensions*



* Dimensions in mm
(1 inch = 25.4 mm)

Power supply

External DC power supply (option)

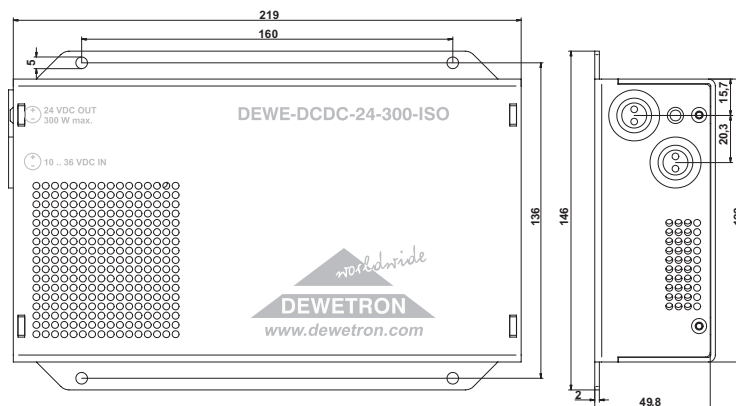
DC/DC Power supply	DEWE-DCDC-24-300-ISO
Input:	
Input voltage:	10 to 36 V _{DC} (the input is protected against wrong polarity)
Max. input current:	36 A @ 10 V _{DC} input voltage (15 A @ 24V _{DC})
Input connector:	2-pin LEMO connector male, type: EGJ.3B.302.CLA
Output:	
Output voltage:	24 V
Output power:	300 W
Output current:	12.5 A
Output connector:	2-pin LEMO connector female, type: EGG.3B.302.CLL
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-501 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-501 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-501 without or with charged batteries.

Dimensions*



* Dimensions in mm
(1 inch = 25.4 mm)

Main System

Internal DC power supply

DC power supply			
Input:			
Input range:	18 to 24 V _{DC} (nom. 18 V _{DC})		
Input frequency:	DC		
Max. input current:	12 A		
Output:			
Output power:	120 W with BBDC-02 (battery management and DC-DC on a single board)		
	150 W with BB-04 battery management		
	192 W with MP-04 battery management		
	320 W with XP-04 battery management (only single DC-DC)		
Output voltages:	Single DC-DC converter	Dual DC-DC converter	BBDC-02
	+3.3 V (max. 10 A)	+3.3 V (max. 19 A)	+3.3 V (max. 10 A)
	+5 V (max. 10 A)	+5 V (max. 19 A)	+5 V (max. 10 A)
	+12 V (max. 7 A / 12 A*)	+12 V (max. 13 A)	+12 V (max. 7 A)
DC-023-12V option:	-12 V (max. 0.25 A)	-12 V (max. 0.45 A)	-12 V (max. 0.3 A)

*) max. current with XP-04 battery management

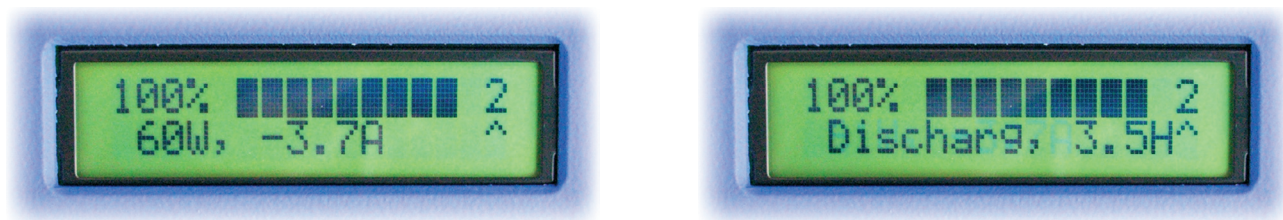
Power supply pin assignment:



Lemo FGJ2B-30

LCD display for battery status

The LCD Display contains two lines of information. One line is used for a bar graph displaying the amount of charge left in the battery system. The bar graph also indicates if the battery is charging or discharging.



The second line of the LCD display can show the power consumption and the current entering or leaving the battery subsystem. The second line of the display can also show the time of fully charged when charging the batteries or the time to fully discharge the batteries when power to the system is being supplied by the batteries.

Ignition power control unit (IGN)

With the OS Power control circuit it is possible to turn the instrument on and off by a control voltage (example: ignition).

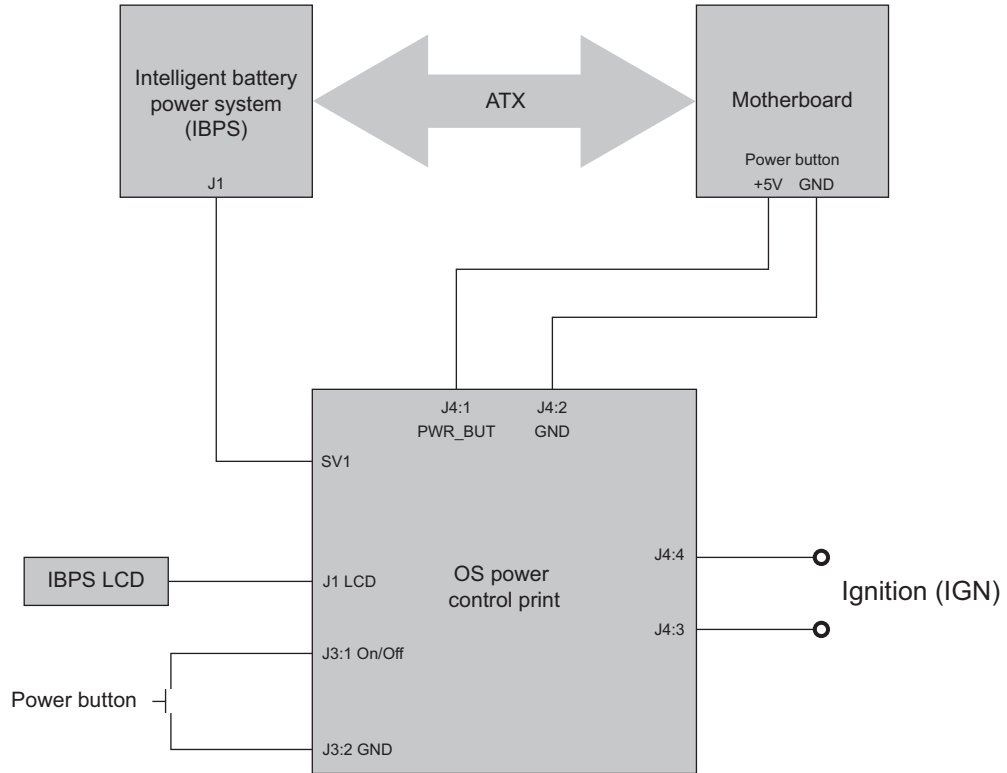


Figure 1: Block diagram

There are three operation modes possible:

■ Operation by Power Button

The instrument is turned on by the Power Button and shut down manually by Windows. Attention: If the Power Button is pressed longer than 3 seconds the power supply (IBPS) is turned off (not shut down!). See Figure 2.

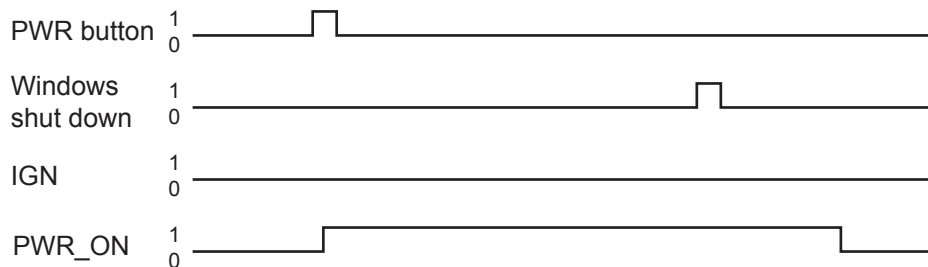


Figure 2: Operation by power button

Main System

■ Operation by control voltage (IGN)

When the control voltage is high for longer than 4 seconds the instrument is started. To shut down the instrument, the control voltage must be low for longer than 30 seconds. After further 30 seconds it is controlled if the computer has really shut down, if not the power supply (IBPS) is turned off. See Figure 3.

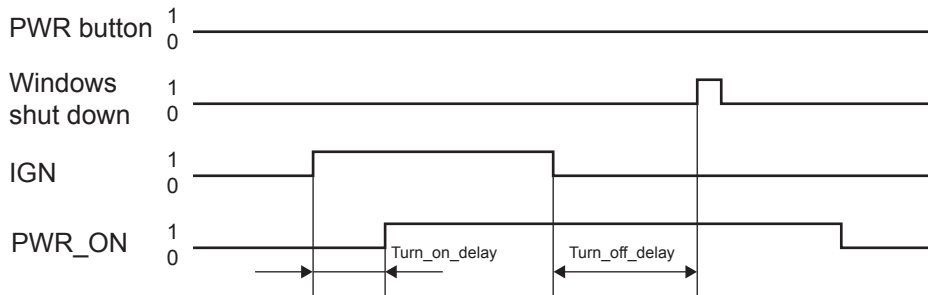


Figure 3: Operation by control voltage

■ Mixed operation

When the instrument is turned on by the Power Button and later the control voltage is also turned on the unit will shut down (with turn off delay) if the control voltage is turned off (See Figure 4).

When the instrument is shut down manually by Windows and the control voltage is on, the control voltage has to be turned off before the unit can be started again by control voltage.

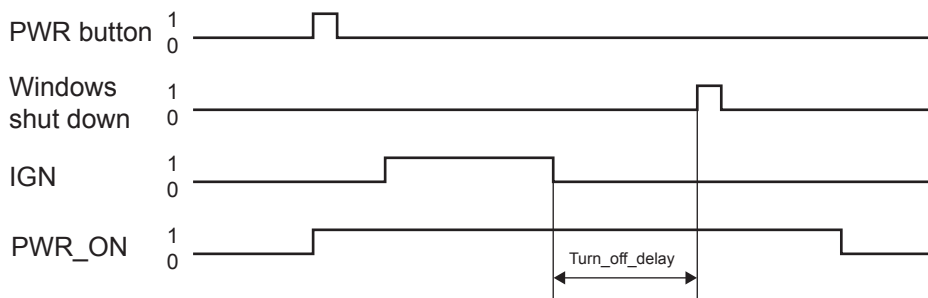


Figure 4: Mixed operation

Electrical characteristics

Power supply (by IBPS)	
I_{Supply} ($V_{IGN} = \text{Low}$)	400 μ A
I_{Supply} ($V_{IGN} = \text{High}$)	800 μ A
V_{IGN} input (galvanically isolated)	
Low	0 .. 1 V
High	5 .. 24 V
$I_{IGN} = 12$ V	5 mA
$I_{IGN} = 24$ V	6 mA

PS/2 mouse / keyboard connector

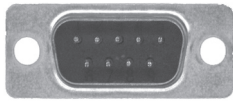
The mouse / keyboard connector could be used to connect a keyboard or an external PS/2 mouse. The connector meets standard PS/2 pin assignment.

USB interface connectors (Universal Serial Bus)

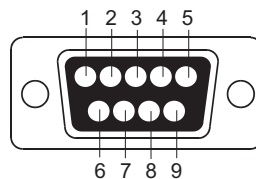
The USB interface connectors meets standard USB pin assignment.

RS-232 interface connector (COM1)

The RS-232 interface connector (male) is located on the rear side of the DEWE-501. 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)



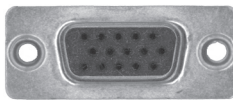
Schematic

Pin assignment

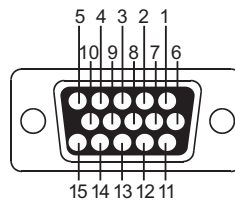
- 1: DCD (Data Carrier Detector)
- 2: RD (Received Data)
- 3: TD (Transmitted Data)
- 4: DTR (Data Terminal Ready)
- 5: GND (Ground)
- 6: DSR (Data Set Ready)
- 7: RTS (Request To Send)
- 8: CTS (Clear To Send)
- 9: RI (Ring Indicator)

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

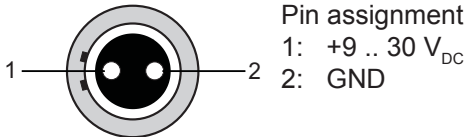
- 1: Red video
- 2: Green video / Sync on green
- 3: Blue video
- 4: -
- 5: -
- 6: Red video ground
- 7: Green video ground
- 8: Blue video ground
- 9: -
- 10: Ground
- 11: Ground
- 12: Data line
- 13: H-Sync / HV-Sync
- 14: V-Sync
- 15: Clock line

Main System

Lemo connector (IGN)

The ignition connector is used to provide the ignition power control unit with +9 .. 30 V_{DC}. The connector is located on the side panel of the DEWE-501.

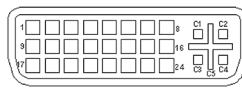
Please refer to chapter "Ignition power control unit (IGN)" for further information.



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

Ethernet connector

The DEWE-501 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. To shut down the system exit windows and press the power-on button for more than 3 seconds.

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 connector

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

Power supply for accessories

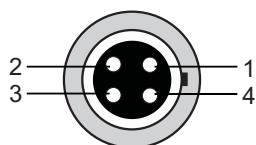
To supply your accessories with 12 V_{DC}. Fused with an 1.8 A self-healing fuse.



Lemo FGG1B-302

EPAD connector

To connect DEWETRON EPAD modules to the system.



4-pin. LEMO
connector (female)

Pin assignment

1: RS-485 A

2: RS-485 B

3: +12 V

4: GND

Shield is connected on housing



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

Main System

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.

A/D & D/A Conversion

Notes

Internal Wiring

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>

Internal Wiring

Notes

EC-Certificate of conformity

EC-Certificate of conformity

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-501**

Kind of product: *Battery powered 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

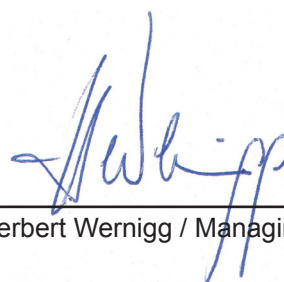
"Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility amended by the directives 91/263/EEC, 92/31/EEC, 93/68/EEC and 93/97/EEC"

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

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

Graz, Nov. 15th, 2004

Place / Date of the CE-marking



Ing. Herbert Wernigg / Managing director

Notes
