



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

DEWE-POWERBOX-12

Technical reference manual



Re-inventing Data Acquisition



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

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

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

Content

General Information, Safety Instructions	5
Training	5
Calibration.....	5
Support	5
Service/repairs	5
Warranty Information	6
Printing History.....	6
Safety symbols in the manual	7
General safety and hazard warnings for all DEWETRON systems	8
Windows updates and antivirus/security software	11
Problematic network stacks	11
Environmental Considerations	11
First steps	
DEWE-POWERBOX-12	9
Fuses.....	9
GND-Supply	10
Connectors	10
CE-Certificate of conformity	C1

Table of content

Training

DEWETRON offers training at various offices around the world several times each year. DEWETRON headquarters 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 headquarter. 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)

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.

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)

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.

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

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

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

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

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 refer 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).

Safety instructions

- 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 connectors 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 be 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 circuits 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 refer 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 be 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 observed 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 refer 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 its 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.

First steps

Notes

DEWE-POWERBOX-12

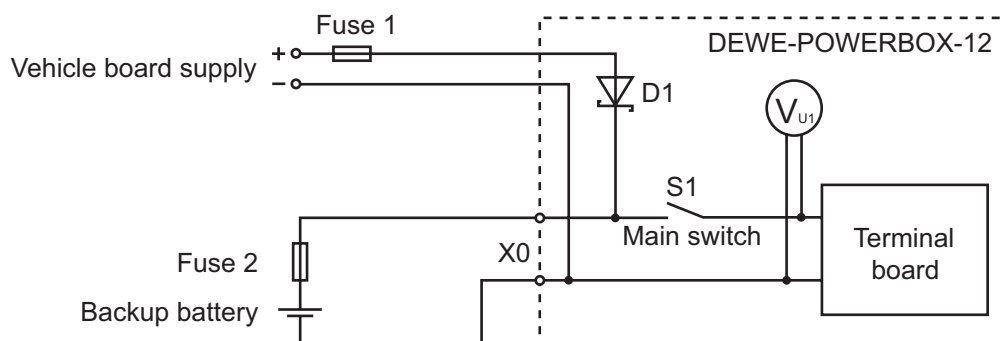
DEWE-POWERBOX-12

- Power distributor for automotive applications
- Optional backup battery connector for cold start
- 12 output connectors for several consumer loads
- High output current design
- 12 V_{DC} or 24 V_{DC} board supply
- Indication of supply voltage level



The DEWE-POWERBOX-12 allows to supply multiple consumer loads out of the vehicle board supply with a total power consumption of up to 600 W. The main problem of supplying high power consumption loads out of the typical 12 V_{DC} board supply is the high current (50 A load for 600 W at 12 V_{DC}) which causes voltage drop through the supply lines. The usage of a high flexible 10 mm² for the main supply line minimize the potential drop across the cable. For checking the supply voltage, the voltmeter U1 measures the level directly at the terminal board. The measurement range is from 8 to 40 V.

In addition to this also one high current connector for a backup battery is installed. As back up battery a standard lead accumulator with the same voltage level as the board supply should be used. The positive supply input of this backup battery is connected with a diode to the positive supply of the vehicle board supply. This guaranties that all electrical loads connected to the DEWE-POWERBOX-12 are supplied through the back up battery if the vehicle board supply break down for example during starting the engine. The current will not flow from the back up battery to board supply because of the installed diode. Because of the voltage drop at the diode of approximately 0.3 V at 30 A load, the supply voltage level of all electrical loads connected to the DEWE-POWERBOX-12 is 0.3 V lower than the input voltage level. Some applications need the full voltage, so it is also possible to connect the vehicle board supply to X0 instead of the backup battery to bypass the diode. This connection will bypass the diode for getting full output voltage. Please dont forget to isolate the ends of the main supply line doing this configuration.



Note: Backup batterie voltage level has to be the same as the vehicles board supply!

Fuses

Please note that Fuse 1 and Fuse 2 are installed to protect the main power and the backup battery cable. The 50 ampere fuse will not protect the cable from the DEWE-POWERBOX-12 to the external electrical loads connected regarding over load. We recommend to use cables with cross-section area higher than 1.5 mm² which are also protected against short cut – the fuse will blow before the cable or the connector will be destroyed.

Note: Replace the fuses only with fuses of the same voltage, current rating and type!

DEWE-POWERBOX-12

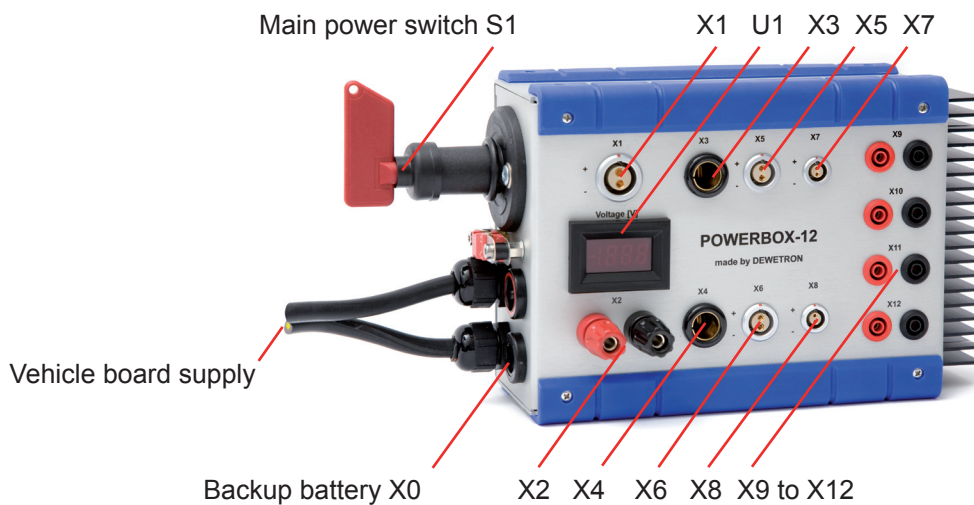
GND-Supply

The DEWE-POWERBOX-12 is shipped with a 5 m cable for the main supply. Although the high cross-section area of 10 mm² the voltage dropout at 30 A load will be around 0.3 V. This is usual not a problem at the positive supply line. Since this voltage drop is also at the negative supply line ground loops may occur depending on the ground concept of the connected load. To avoid this it is recommended to split the main supply cable. The cable for the minus input should be shorten and connected to a suitable screw direct at the vehicle chassis.

One additional solution is to connect the minus input of the backup battery directly to the vehicle chassis for getting a very low ohm ground connection.

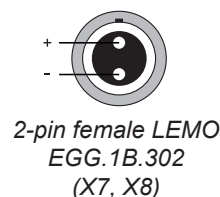
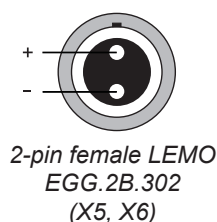
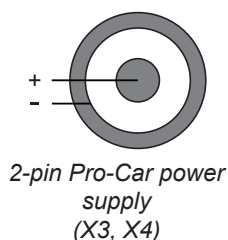
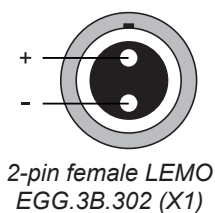
This is not needed if the POWERBOX is connected to DEWE-2010, DEWE-3020, DEWE-4010 or DEWE-5000 because of the galvanic isolation of the supply voltage.

Connectors



The following table gives you an overview of the used connectors and maximum current. Also the absolute limits of other used components are described.

Device no.	Max. current	Producer and type number
X0:	50 A	Multi-Contact, ID-S6ARNS, ID-B6ARNS
X1:	30 A	Lemo, EGG.3B.302
X2:	16 A	Hirschmann, PKNI10B
X3, X4:	16 A	Pro-Car, 57607000
X5, X6:	30 A	Lemo, EGG.2B.302
X7, X8:	15 A	Lemo, EGG.1B.302
X9 to X12:	16 A	Multi-Contact, SLB-4F
Fuse 1:	50 A	Pudenz, BF1-50A
Fuse 2:	50 A	Pudenz, BF1-50A
D1:	120 A / 45 V	International Rectifier, 120CNQ045
S1:	100 A	B&R Control Solution, 0-605-00
U1:	-	Datel, DMS-20PC-1-DCM



CE-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-POWERBOX-12

Kind of product:

Power supply

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, October 14, 2008

Place / Date of the CE-marking

Dipl.-Ing. Roland Jeutter / Managing director

Notes
