



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

DEWE-51-PCI-64

Technical reference manual



Re-inventing Data Acquisition



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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-51-PCI-64?

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 ($\pm 50V$ max.), D-SUB connectors ($\pm 50V$ max.), thermocouple connectors ($\pm 50V$ max.), BINDER® connectors ($\pm 50V$ max.) or LEMO® connectors.

Preface

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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

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Warranty Information

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

Restricted Rights Legend

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DEWETRON GesmbH
Parkring 4
A-8074 Graz-Grambach / Austria

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

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.

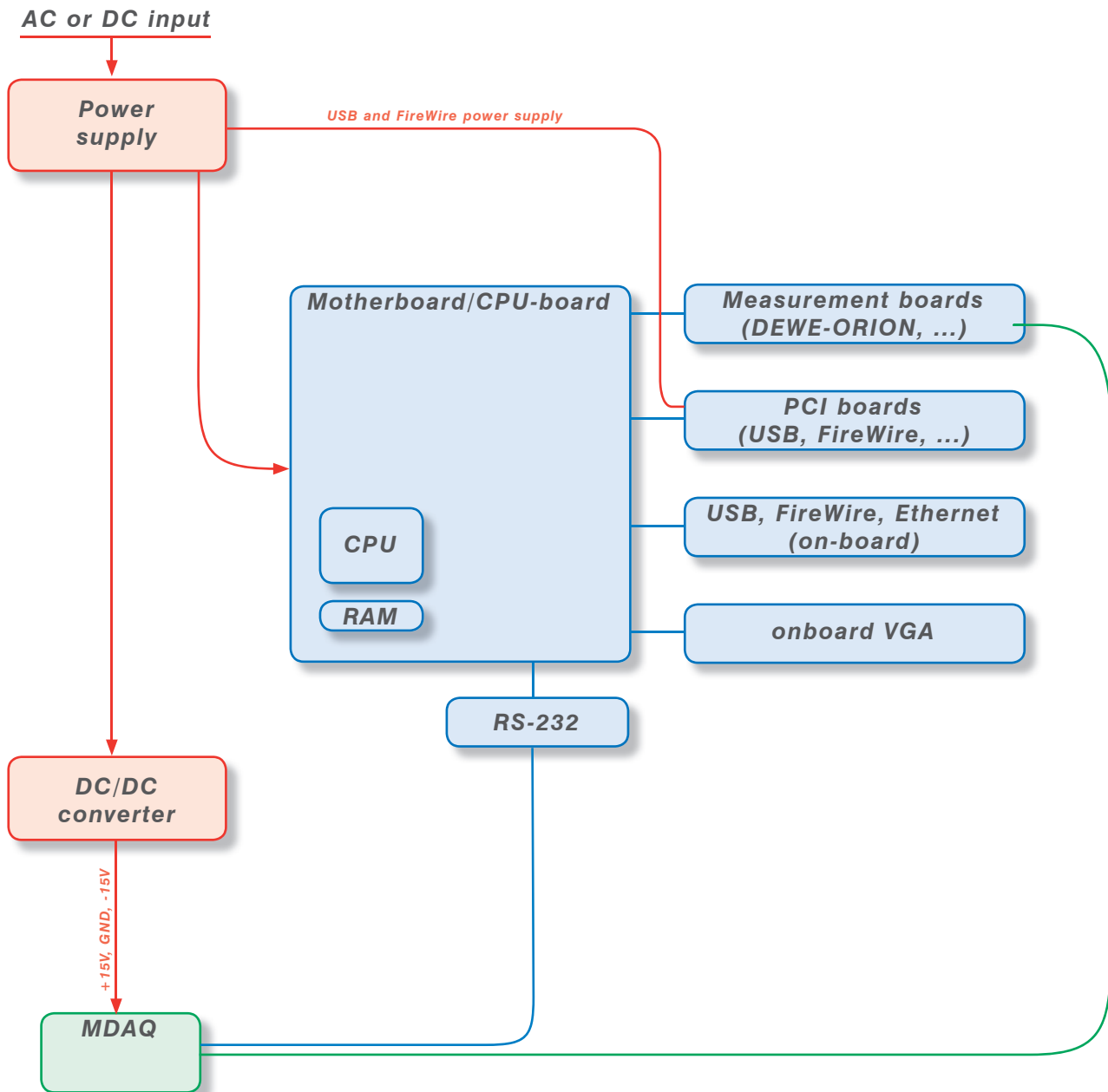
This symbol indicates that this system complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Please find further informations about recycling on the DEWETRON web site www.dewetron.com

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.

Signal processing

Blockdiagram of the internal signal processing



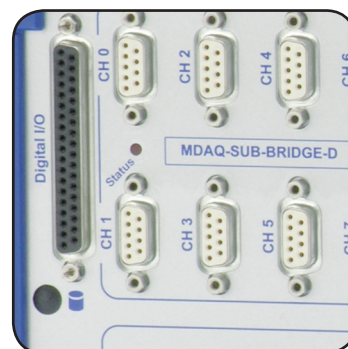
First steps

1



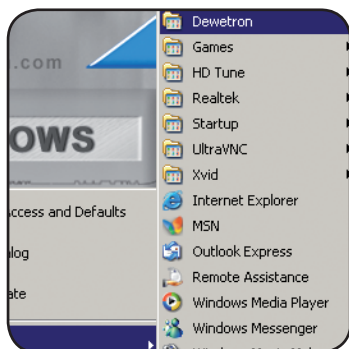
Power-on your system.

2



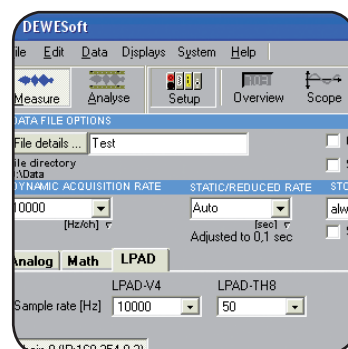
Connect your sensors to the system.

3



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

4



Start recording your data!

First steps

Notes

DEWE-51-PCI-64

- 64 channel amplifier
- Supports up to 4 half size PCI slots
- A/D converter specs: see appendix A
- Optional wiring: see appendix B
- MDAQ Modules specs: see MDAQ series Manual



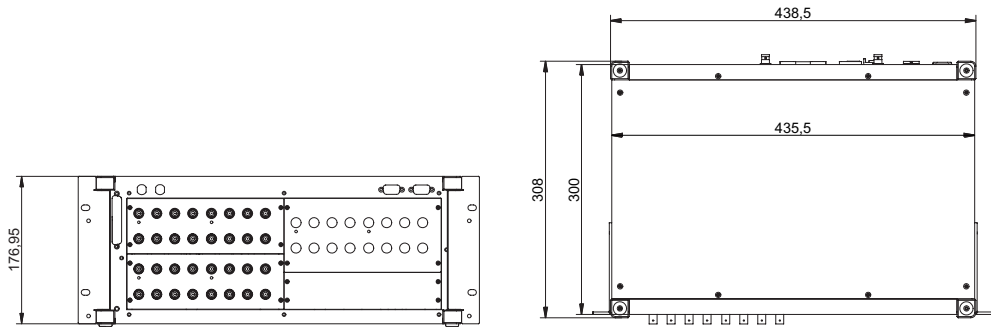
System specifications

DEWE-51-PCI-64																
Channel 0 to 7 Channel 8 to 15	<input type="checkbox"/> MDAQ-DIRECT	<input type="checkbox"/> MDAQ-V-10	<input type="checkbox"/> MDAQ-V-100	<input type="checkbox"/> MDAQ-SUB-V-200	<input type="checkbox"/> MDAQ-SUB-ACC-x	<input type="checkbox"/> MDAQ-SUB-ACC-A-x	<input type="checkbox"/> MDAQ-SUB-BRIDGE	<input type="checkbox"/> MDAQ-SUB-STG	<input type="checkbox"/> MDAQ-BASE-5	<input type="checkbox"/> MDAQ-BASE-10	<input type="checkbox"/> MDAQ-FILT-5-BU	<input type="checkbox"/> MDAQ-FILT-5-BE	<input type="checkbox"/> MDAQ-FILT-5-BU-S1	<input type="checkbox"/> MDAQ-FILT-10	<input type="checkbox"/> MDAQ-FILT-10-S1	<input type="checkbox"/> MDAQ-AAF4-5-BU
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"/>	<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"/>	<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"/>	<input type="checkbox"/>
A/D converter interface:	PCI-Bridge, PCMCIA (cable 1 m)															
RS232 / 485 interface:	<input type="checkbox"/> yes															
Power supply:	<input type="checkbox"/> 100 to 240 V _{AC} (400 W BEA-640) <input type="checkbox"/> 11 to 30 VDC with UPS battery and 90 to 260 V _{AC} power supply (200 W MPS1058-100) <input type="checkbox"/> 9 to 18 V _{DC} (250 W APT-DX250H) <input type="checkbox"/> 18 to 36 V _{DC} (300 W APT-DY300HEW)															
Operating temperature:	0 °C to 50 °C (standard)															
Storage temperature:	-20 °C to +60 °C															
Humidity (operating):	10 % to 85 %, non condensing															
Humidity (storing):	5 % to 95 %, rel. humidity															
Vibration:	MIL-STD 810F 514.5 procedure I operating test procedure frequency range: 5 to 200 to 5 Hz; 5 x 12 min each direction displacement amplitude ±3.5 mm (5 to 8.45 Hz) acceleration amplitude 1 g (8.45 to 92 Hz) displacement amplitude 92 to 113 Hz: ±0.029 mm acceleration amplitude 1.5 g (113 to 200 Hz)															
Shock:	MIL-STD 810F 516.5 procedure I non operating test procedure ½ sinus 11 ms 10 g, 3 shocks positive, 3 shocks negative															
Dimensions (W x D x H):	approx. 408 x 287 x 132 mm (16.1 x 11.3 x 5.2 in.) with 50-MK option (3U 19" mountingrack): 483 x 287 x 132 (19 x 11.3 x 5.2 in.)															
Weight:	typ. 8 kg (17.6 lbs), depending on configuration															

Main System

Dimensions*

* Dimensions in mm
(1 inch = 25.4 mm)

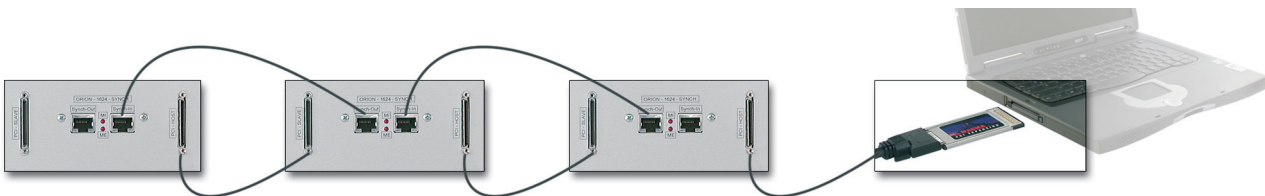


PCI-Bridge connector

Like all DEWE-51-PCI-xx and DEWE-50-PCI-xx systems the DEWE-51-PCI-64 is using PCI-to-PCI-Bridge technology as basic structure. This technique allows to expand the internal data bus of a PC or add a PCI-Bus to systems like notebooks. In addition to this also a separation between the noisy PC environment and the high sensitive signal conditioning and digitising of the analog values increases the whole system quality. Since this PCI-to-PCI-Bridges are completely transparent there are no necessary changes, from the software point of view, to operate the DEWE-51-PCI-xx and DEWE-50-PCI-xx systems. The host PC “thinks” all the PCI-Boards are installed inside the PC directly.

PCI BRIDGE and Cascading (option -CS) connector

The PCI-HOST connector is usually connected to the PCI expansion connector of the Notebook (PCMCIA card) or DESKTOP PC (PCI card). Installing multiple DEWE-50-PCI-xx or DEWE-51-PCI-xx, the PCI-SLAVE connector can be connected in daisy chain manner to the PCI-HOST connector of the neighbor system.



ORION-1624 SYNC connector (option)

The Cascading option allows to expand the number of PCI slots for installing multiple boards. But this cascading does not guarantee the time synchronisation between the sub systems. Having ORION-1624 installed in the DEWE-51-PCI-64 this synchronisation can be realised by expanding the ORION-1624 synchronisation bus. Connecting multiple systems can simply be done with daisy chaining similar like cascading the PCI bus.

With two LED's the configuration of the subsystems is indicated: The LED ME is on, if a right configured master system is connected at the Synch-IN-connector. The LED MI is on, if the DEWE-51-PCI-64 is configured to master.

Software installation

Installing single DEWE-51-PCI-64

The DEWE-51-PCI-64 is based on PCI to PCI bridge systems. It offers the expansion of the internal PCI slots of the DEWE-2010, DEWE-3020, DEWE-4010 or DEWE-5000 series or adds PCI slots to notebooks. Since the PCI bus is a basic system component of any PC, the PCI to PCI bridge has neither Plug and Play nor hot swap capabilities. Therefore the driver installation is different to standard PCI-board installation or adding USB devices to your PC. In general following rules have to be considered during the software installation of the DEWE-51-PCI-64:

In the first step the additional PCI slots have to be recognized from your system, than the drivers for additional hardware can be installed.

The following basic steps lead you through the installation process. Be aware that there are differences related to the operating system (WinXP or Win2000), the service pack and system drivers. For detailed information please refer to the MAGMA manual which is also shipped with your system.

- Ensure power is turned off to all electronic devices prior to performing any maintenance or upgrades and installations.
- Following anti-static procedures in ALL steps!
- Insert the PCMCIA card (or the PCI Expansion Host Interface to the desktop PC)
- Connect the cable to both PCMCIA (or PCI) card and DEWE-51-PCI-64
- Plug in the DEWE-51-PCI-64 power cord
- Power on the DEWE-51-PCI-64
- Power on the Notebook (or PC)

Depending on the system – as described above – the first start may be different.

Usual procedure:

- The Notebook (or PC) will find a PCI-to-PCI bridge
- Install the hardware driver by clicking 3 times <next> at the Windows hardware install wizard until reboot is prompted
- Reboot your system
- Run <setup.exe> from the DEWETRON-SYSTEM DVD at directory <\Install\Drivers\X_Various\MAGMA\Windows Cardbus Drivers\> and follow the installation instructions prompted to install the PCI expansion
- Shut down your complete system (include DEWE-51-PCI-64)
- Turn on your system again (first DEWE-51-PCI-64 followed by the Notebook or PC)
- Again one additional PCI-to-PCI bridge will be found
- Install the hardware driver but use the DEWETRON-System DVD as location for the driver
- Reboot your system again
- Now the Notebook (or PC) will find the hardware devices installed in the DEWE-51-PCI-64 (please refer below for usual hardware installing process).

It may happen that on the very first start already the PCI-hardware installed in the DEWE-51-PCI-64 is found without running <setup.exe> from the System-DVD. Please do not install any of these hardware drivers without running <setup.exe> from System-DVD. Try to do exact the steps described above. When the system prompt to install any hardware drivers before the above steps are not complete done please click <cancel> at the hardware driver install wizard. This will guarantee a well working system.

Main System

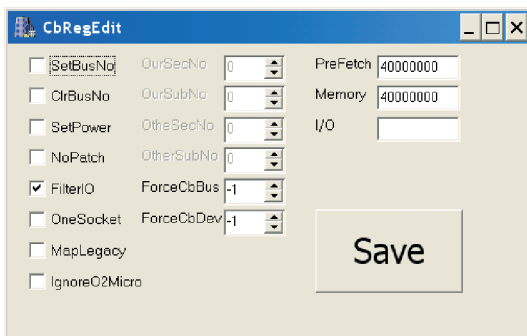
Installing multiple DEWE-51-PCI-xx or DEWE-50-PCI-xx

If several DEWETRON-systems are connected to the PC please connect at first just one DEWE-51-PCI-xx or DEWE-50-PCI-xx to the host computer. If the installation of the first system is finished continue with connecting all other expansion systems step by step to the host PC. The installation of additional DEWETRON-systems is similar to the other installing process: First of all install the PCI-Bridge and in the next step the hardware driver of the installed boards. The only difference to the installation of the first system is that the MAGMA driver don't have to be installed again.

Depending on the hardware configuration of the notebook it may happen, that the notebook does not start anymore as soon the second or the third DEWE-51-PCI-xx or DEWE-50-PCI-xx is connected. The reason of that is that the device manager of the operating system (usual W2K or WXP) will not automatically reserve the needed memory range. In this case this has to be done manually:

NOTE: Before performing this task, verify that the Magma Driver is installed. Go to add/remove programs and look for "Magma Cardbus Expansion Driver", if so - the driver is installed.

- Disconnect DEWE-51-PCI-xx or DEWE-50-PCI-xx from your notebook by ejecting the card bus card
- Reboot your system
- Go to your local disk drive and look for \C:\Programfiles\Magma\CBREGEDIT.EXE
- RUN CBREGEDIT.EXE and check Filter I/O
- Type in 20000000 in "Memory" and "Prefetch"



- Click "Save" and shutdown your notebook
- Connect the DEWE-51-PCI-xx or DEWE-50-PCI-xx unit to your Notebook. Reboot your system again and install the hardware driver
- Reboot your system again and install the hardware driver
- With the same procedure, connect step by step all your DEWE-51-PCI-xx or DEWE-50-PCI-xx to your system
- If your system hangs after adding the last chassis, run Cbregedit.exe and change the values from 20000000 to 40000000 on Prefetch and Memory. Don't forget to enable the FilterIO by placing a checkmark into the "FilterIO" box

Installing the PCI-board hardware driver

The hardware installation procedure depends on the installed hardware in the DEWE-51-PCI-xx and the DEWE-50-PCI-xx.

- In case of NI card please abort the process and then insert the NI-DAQ CD to install the drivers. Please follow the installation instructions of the NI-DAQ setup program.
- In case of ORION-1624 card please insert the DEWE-System DVD and select the location: Dewetron/Install/Drivers/6_DaqBoards/Dewetron/Orion-1624-xxxx
- For other hardware please refer to the manufacturers installation instruction. The table beyond shows the installed PCI-Boards in the DEWE-50-PCI-xx or DEWE-51-PCI-xx and also the CD name of the driver location

Installing DEWESoft

It is recommended to install all necessary drivers prior to installing DEWESoft, as DEWESoft will need to see the drivers and Orion cards present in order for the registration code to allow the software to function. Install DEWESoft, using the DEWESoft CD. Locate the license key sheet provided by DEWETRON and be prepared to enter your license key into the field when DEWETRON runs for the first time. All of the hardware must be connected and properly working in order for this process to work, because DEWESoft compares the license to some values received from hardware within the DEWE-51-PCI-xx or DEWE-50-PCI-xx.

Used PCI boards and driver location

Slot	PCI board	Driver location
1		
2		
3		
4		
5		
6		
7		

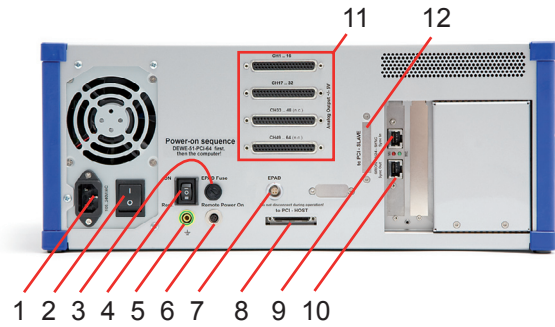
Installing DEWESoft

It is recommended to install all necessary drivers prior to installing DEWESoft, as DEWESoft will need to see the drivers and Orion cards present in order for the registration code to allow the software to function. Install DEWESoft, using the DEWESoft CD. Locate the license key sheet provided by DEWETRON and be prepared to enter your license key into the field when DEWETRON runs for the first time. All of the hardware must be connected and properly working in order for this process to work, because DEWESoft compares the license to some values received from hardware within the DEWE-51-PCI-xx or DEWE-50-PCI-xx.

Main System

Connectors

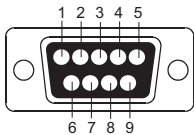
- 1 Power supply connector
- 2 Main power switch
- 3 EPAD fuse
- 4 Power on / power remote switch
- 5 Ground connector
- 6 Remote power connector
- 7 EPAD interface connector
- 8 PCI-Bridge connector (host)
- 9 Synchronisation input (DEWE-ORION-1624)
- 10 Synchronisation output (DEWE-ORION-1624)
- 11 Analog output
- 12 PCI-Bridge connector (slave)



Typical DEWE-51-PCI-64 rear view

RS-232 interface connector

The RS-232 interface connector (male) meets standard pin assignment.



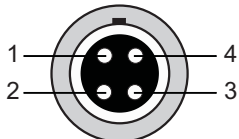
9-pin SUB-D connector (male)

Pin assignment

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

EPAD interface connector

To connect DEWETRON EPAD modules to the system.



Lemo EGG.1B.304

Pin assignment

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

Ground connector

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

Power supply connector

The supply voltage level for the DEWE-51-PCI-64 depends on the used power supply. Please refer to the system specifications on page 9.

Main power switch

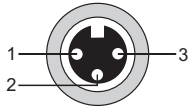
The main power switch is used to power on / off the system.

Fan control switch (option)

In "Auto" position, the internal fan speed controller keeps the temperature inside the system between defined levels. In "Off" position, the fan will only be activated when the critical temperature of 45° C is reached.

Remote power connector

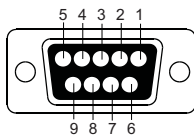
In combination with a Desktop-PC it is possible to switch on the DEWE-51-PCI-64 automatically with the PC. This can be done with a control voltage input which is connected to the power supply of the host PC. Switch the Power on / power remote switch to position "remote".



Pin assignment
1: + 5 V_{DC} input
2: GND
3: not connected

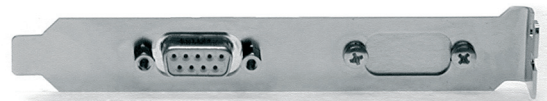
3-pin Binder 712 series connector (female)

Mount the PCI slot cover at your Desktop-PC and connect it with the internal power supply of your PC.



9-pin SUB-D connector (female)

Pin assignment
2: + 5 V_{DC} output
5: GND
the remaining pins
are not connected



PCI slot cover

Power on / power remote switch

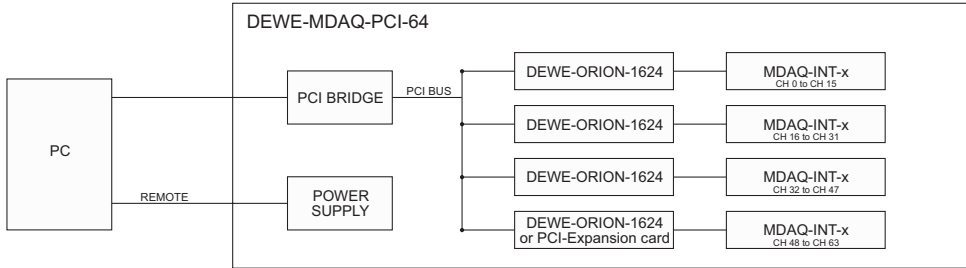
Switch to position "1" to power on the system manually. Switched to position "2" the system is powered on automatically when the connected PC is booted. Please be aware that the remote cable has to be connected.

*Please observe the power on sequence when you don't use the remote power function
DEWE-51-PCI-64 first - then your computer.*

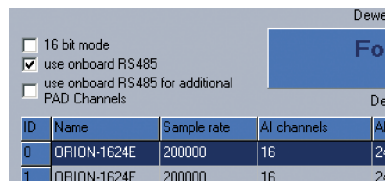
Main System

Internal signal processing for DEWE-ORION systems

The block diagram below shows the internal signal processing with DEWE-ORION A/D cards. DEWE-ORION cards have a RS-485 interface included. So you dont need an additional RS-232 PCI card.

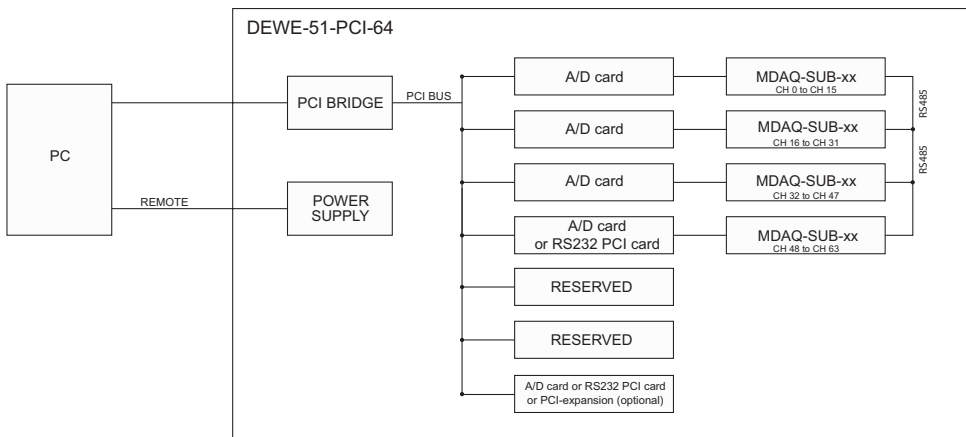


Please select "use onboard RS-485" in hardwaresetup screen to get access to the modules.



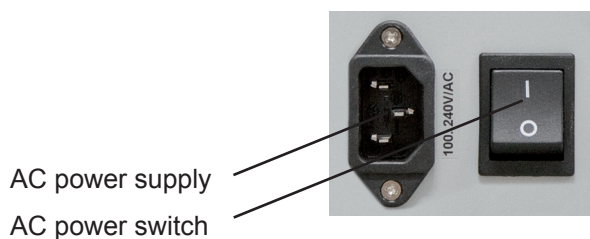
Internal signal processing with standard A/D cards

The block diagram below shows the internal signal processing with standard A/D cards.



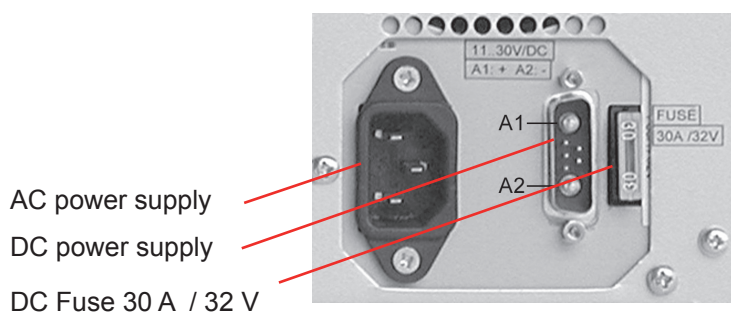
AC power supply

400 W AC power supply BEA-640	
Input:	
Input range:	90 to 260 V _{AC} (active PFC)
Input frequency:	47 to 63 Hz
Max. input current:	7 A (115 V _{AC}), 3.5 A (230 V _{AC})
Output:	
Output power:	400 W continuous
Output voltages:	+3.3 V (max. 28 A)
	+5 V (max. 35 A) -5 V (max. 0.5 A)
	+5 Vsb (max. 2 A)
	+12 V (max. 30 A) -12 V (max. 0.8 A)



AC and DC input power supply

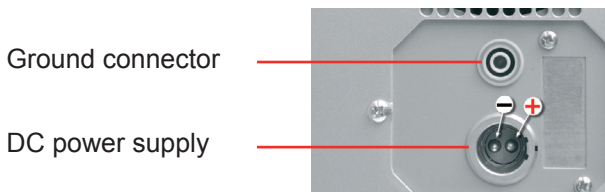
200 W dual power supply MPS1058-100	
Input:	
Input range:	90 to 260 V _{AC} (auto selecting) 11 to 30 V _{DC}
Input frequency:	47 to 63 Hz or DC
Max. input current:	4 A (110 V _{AC}), 2 A (230 V _{AC}), 30 A @ DC
Output:	
Output power:	200 W @ AC and DC > 18 V DC 18 to 11 V derate 7 W / V
Output voltages:	+3.3 V (max. 15 A)
	+5 V (max. 25 A) -5 V (max. 0.5 A)
	+5 Vsb (max. 0.75 A)
	+12 V (max. 10 A) -12 V (max. 0.8 A)



Main System

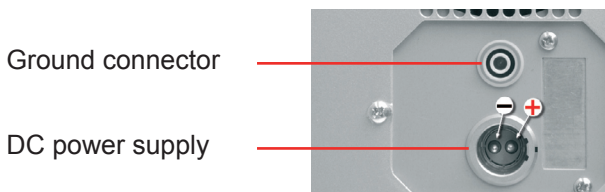
DC power supply

250 W DC power supply		APT-DX250H	
Input:			
Input range:	9 to 18 V _{DC} (12 V _{DC} nom.)		
Input frequency:	DC		
Max. input current:	50 A		
Output:			
Output power:	250 W		
Output voltages:	+3.3 V (max. 14 A)		
	+5 V (max. 25 A, min. 3 A, peak 30 A)		-5 V (max. 1 A)
	+5 Vsb (max. 1 A, peak 1.5 A)		
	+12 V (max. 10 A, min. 1 A, peak 12 A)		-12 V (max. 2 A)

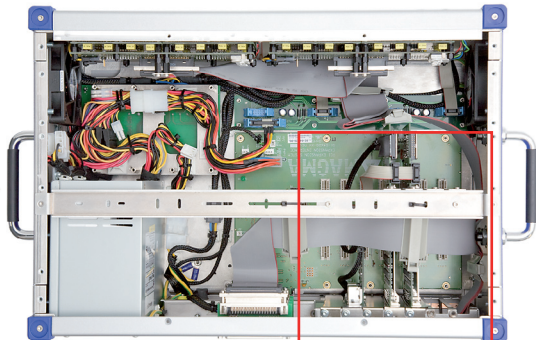


DC power supply

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



Adding or exchanging PCI-Boards



Before opening the instrument (experts only) disconnect power!

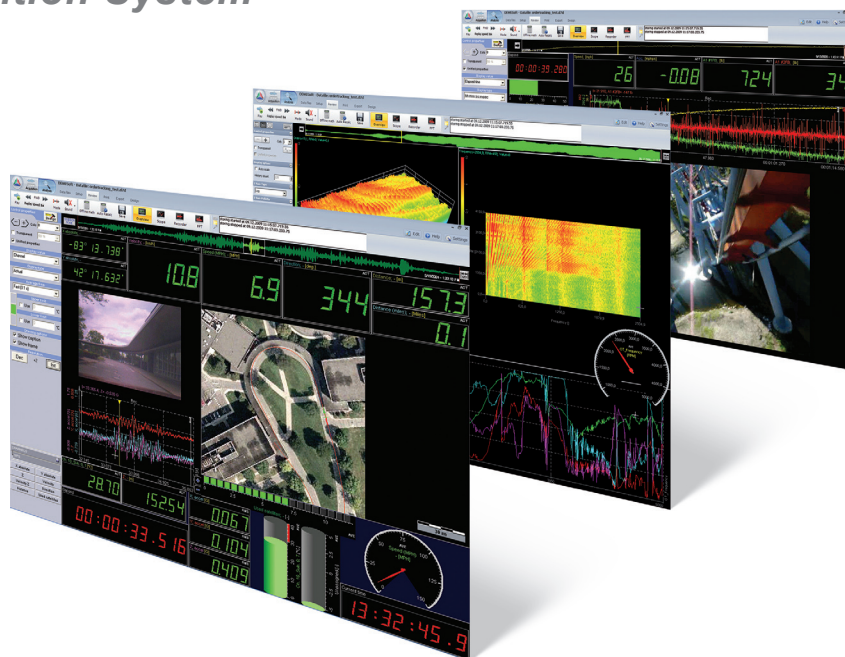
For installing additional PCI-hardware remove the top cover of the DEWE-51-PCI-64. The fixture of additional PCI-boards is similar like a standard desktop PC system. The DEWE-MDAQ-PCI-64 accepts in total 7 half size PCI-boards.

Main System

Notes

DEWESoft

DEWESoft Software Turns our 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 it is a difficult balancing act to provide lots of capability and performance, without making the user interface cumbersome and hard to learn. But with careful and innovative design, we have done exactly that!

The software can act as a simple multi-meter or recorder as well as a sophisticated combustion analyzer or power analyzer. Or anything in between these extremes, like a FFT analyzer, transient recorder, etc.

Over 10 years DEWESoft evolved into a great data acquisition software and is Nr.1 in synchronous acquisition of vastly different signals like analog, digital, CAN, GPS, PCM, counter, video, etc. In 2010 with the release of version 7, DEWESoft takes a big step toward become a very powerful data analysis tool for a wide range of test & measurement applications. Since many years you can utilize math channels in the measure mode for online calculations. Starting with version 7.0, captured data can be re-calculated in the analyze mode using the large suite of calculation (math) functions available in the measure mode. This eliminates the CPU performance limitations and thus provides unlimited offline calculation power.

Example: Performing a 10th order notch filter on 128 channels being sampled at 200 kS/s each. This is not possible online. But in analyze mode it's easy. Simply record the data and then filter it afterwards (math functions are non-destructive, i.e., they do not affect the raw channels).

Another important new feature is the sequencer which provides a way to automate test procedures.

Key Features of DEWETRON systems running DEWESoft

- Fast and easy setup
- Perfect sync of vastly different signals like analog, digital, counter, CAN, XCP, GPS, Video, ARINC, 1553, etc.
- Powerful online data processing, MATH functions, filters, statistics, reference curves
- Attractive online display of all kind of data, creation of displays is a matter of seconds
- Analog, digital or CAN data output; powerful function generator, alarms, CAN messages
- Build test procedures in a form of workflow diagram by means of sequencer
- Fast data analysis, reload GByte files in seconds
- Post processing, large suite of calculation (math) functions

DEWESoft

Hardware Support

DEWESoft supports all DEWE-ORION series A/D cards as well as some third-party cards, like Spectrum cards for transient recording. Multiple cards of the same family are supported for high channel counts.

In front of the A/D cards typically comes signal conditioning units, and there is a huge range of DEWETRON conditioners which are all perfectly implemented into the software.

Besides the analog inputs DEWESoft supports the digital I/Os, counters and CAN interfaces of the DEWE-ORION series cards.

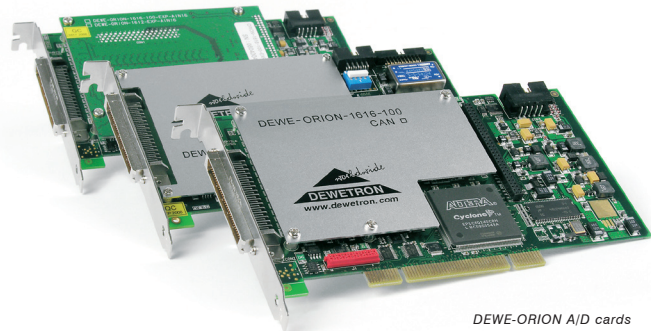
To acquire video streams in sync with the analog data there is a selection of DEWE-CAM cameras.

Further bus systems like PCM telemetry, XCP, ARINC, 1553, etc. are supported, too. DEWETRON offers the appropriate hardware for all of these.

For position and speed measurements there is a choice of high performance DEWE-VGPS sensors. Or use low-cost sensor which is NMEA compatible for simple position plotting and mapping applications.



DAQx modules



DEWE-ORION A/D cards

Sensor Database and TEDS (Technical Electronic Data Sheet)

The DEWESoft data acquisition software suite was developed especially for measurement technicians, thus simple sensor “connection” is a major topic. Basic settings like sensor setup are easily done. TEDS technology of newer sensors is supported on both the hardware and software side, so that all settings follow automatically, preventing user errors and saving a huge amount of time. For sensors without TEDS, there are numerous options for manual scaling as well as an integrated sensor database to make settings as efficient as possible.

#	Group	Sensor type	Serial number	Scale type	Transfer curve	Recal. date
1	Current	B0133	A_En_R01226-X	Polynom	Yes	01.04.2011
2	Current	B0133	A_En_R01226-Y	Polynom	Yes	01.04.2011
3	Current	B0133	A_En_R01226-Z	Polynom	Yes	01.04.2011
4	Beschl_Enitan	B0132	A_En_R01229-X	Linear	No	21.05.2011
5	Wegaufl. Megaton	M101	328947	Linear	No	14.09.2010
6	Beschl_FGP	FGP	254.758	Linear	No	22.11.2010
7	Beschl_FGP	FGP	254.759	Linear	No	22.11.2010
8	Beschl_Enitan	B0131	A_En_R01233-Y	Linear	No	01.01.2020
9	Beschl_Enitan	B0131	A_En_R01233-Z	Linear	No	01.01.2020
10	Beschl_Enitan	B0360	A_En_W98318-X	Linear	No	01.01.2020
11	Beschl_Enitan	B0360	A_En_W98318-Y	Linear	No	01.01.2020

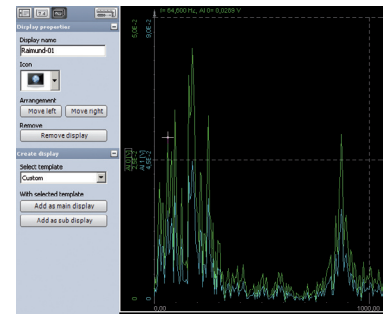
Video Recording

A camera is a perfect sensor for many applications and a lot of people like to use it in their data acquisition. Video is a useful test documentation, providing a visual record of the test conditions and setup. I can also be used for more in-depth analysis, as you can imagine. There is nothing quite like seeing your data replayed with synchronized video – this DEWETRON innovation provides a whole new level of context and understanding of your test data than you could ever imagine.



3D Graph

In the properties panel there is a function that allows you to edit the properties of the selected display, and to create new displays, and rearrange them. You can rename any display, and select a different icon for it. Of course you can add sub-displays to any main display.



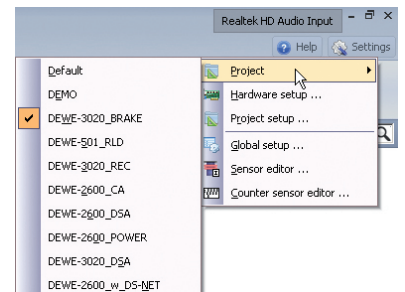
Display Screens

One of the most powerful and yet easy to use aspect of DEWESoft is the creation of displays. Of course a few standard displays like Recorders, Oscilloscope, FFT, Meters, Bars, 2D and 3D graphs, etc. are built-in for you. But this is only the beginning. You simply can create custom displays according to the needs of specific test.

Project Setup

The project files setup the measurement instruments in seconds including complete hardware setup, measurement configuration, and sensor calibration.

Since DEWESoft version 7 you can create "Projects" at the hardware setup screen level, where each project contains all of the settings for any hardware that you own. You can have an unlimited number of hardware setups, which you can freely name and edit. When you start DEWESoft 7, it will automatically load the last hardware setup that you used, of course ... but if you have changed the hardware, you can simply choose a different project from the "Settings" menu, and a completely different hardware setup will be loaded.

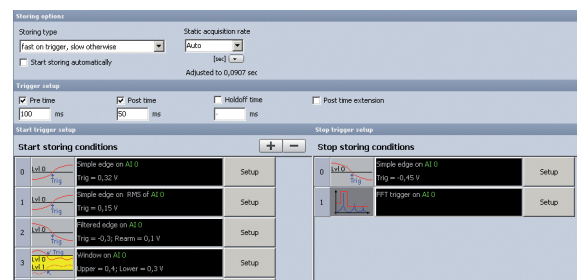


Even when using the same hardware, projects allows using different folders for setup, data and exported files. So you can create John and George projects for different users and work without interfering or you can create e.g. Road-Load and DSA projects for different tasks.

Recording

You can control recording as simple as pressing the START, STORE and STOP buttons. But there are also versatile trigger options to e.g. only store data if a trigger event occurs or to store at a slow rate usually but store at a fast rate at a trigger event with definable pre- and post times.

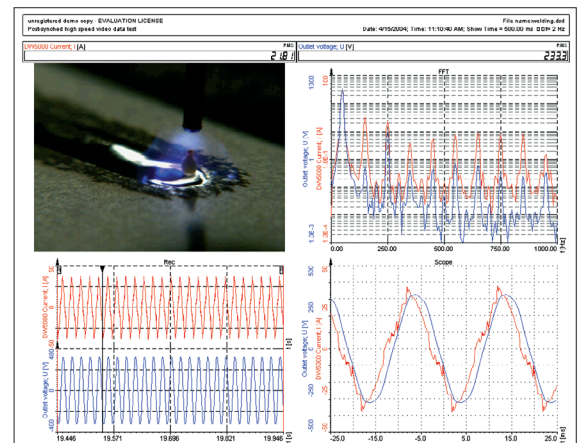
There is a large suite of calculation (math) functions which can be applied to any channels.



Analyze – Replay, Re-calculate, Export

In Analyze mode you can replay any captured data file, zoom in, make cursor measurements, print reports and export the data to a wide variety of formats, like Flexpro, Excel, Matlab, Diadem and many more.

Since version 7 all the powerful math functions such as math formulas, filtering, statistics, power analysis, frequency response function, order tracking, torsional vibration, engine combustion analysis, sound analysis, human vibration analysis, and others can also be applied off-line to captured data. So you can simply store the raw data and do all the processing off-line, on any computer, anywhere. This allows you to work with the data as you were at the test bench or on the proving ground.



Notes

A/D & D/A Conversion

A/D Conversion

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

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

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

A/D & D/A Conversion

Notes

Internal Wiring

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

<http://download.dewetron.com/dl/products/signal/mdaq>

Internal Wiring

Notes

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-51-PCI-64

Kind of product:

Data acquisition instrument

The product meets the regulations of the following EC-directives:

73/23/EEC

"Directive on the approximation of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits amended by the directive 93/68/EEC"

89/336/EEC

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

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

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
