



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

DEWE-30-8

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-30-8?

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

Notes

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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)

For the Americas, please contact:

DEWETRON, Inc.
10 High Street, Suite K
Wakefield, RI 02879
U.S.A.
Tel.: +1 401 284 3750
Toll-free: +1 877 431 5166
Fax: +1 401 284 3755
Email: support@dewamerica.com
Web: <http://www.dewamerica.com>

The telephone hotline is available
Monday to Friday between
08:00 and 17:00 GST (GMT -5:00)

Service/repairs

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

Notice

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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.

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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 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

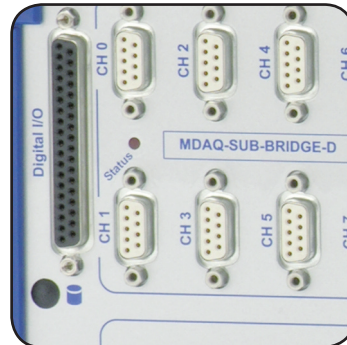
First steps

1



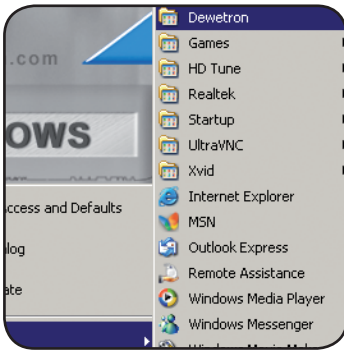
Power-on your system.

2



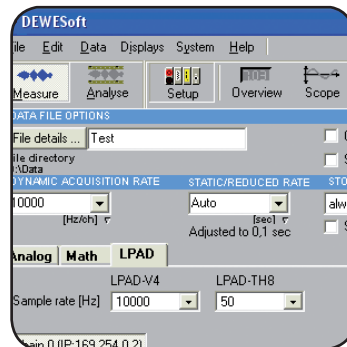
Connect your sensors to the system.

3



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

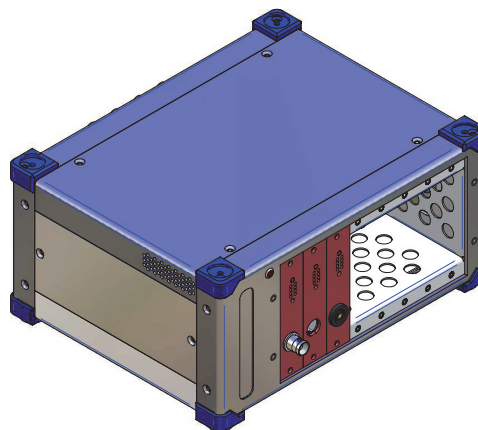
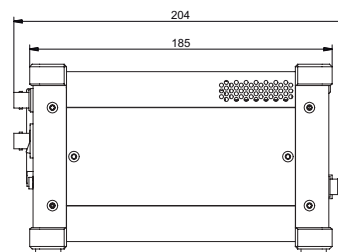
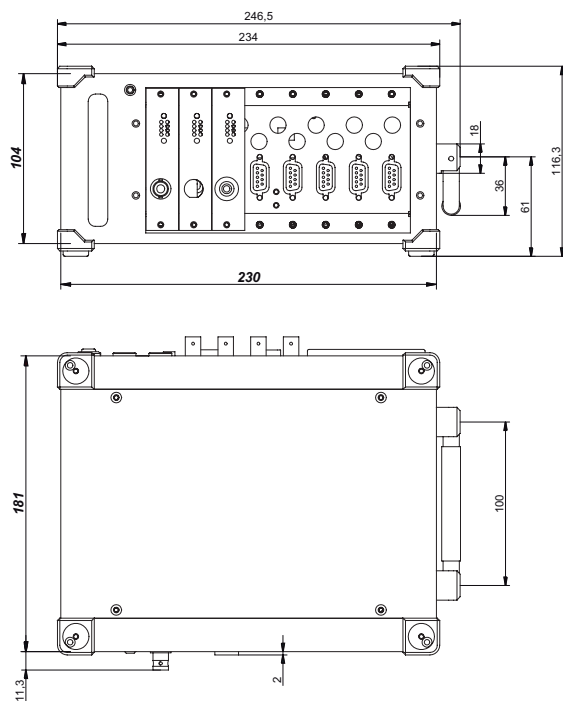
4



Start recording your data!

Main System

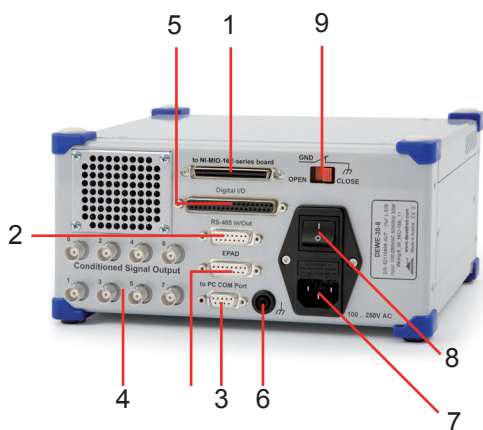
Dimensions*



* Dimensions in mm
(1 inch = 25.4 mm)

DEWE-30-8 at a glance

Typical DEWE-30-8 rear view



- 1 68-pin SUB-D socket for conditioned signal output
- 2 RS-485 In/Out
- 3 to PC COM port, RS-232
- 4 Optional 8 BNC sockets for conditioned signal output
- 5 Optional 37-pin SUB-D socket for digital I/O
- 6 Ground connector
- 7 Power supply input connector
- 8 Power-on switch
- 9 Ground switch
- 10 EPAD interface connector

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

1 68-pin SUB-D socket for conditioned signal output

The standard pinout is prepared to match DEWE-ORION series A/D cards.

The schematic shows the pin assignment of the output connector. A standard 68-pin high density female type with 0.05 inch pin distance is used for the signal interface.

Cabling:

A “DE-C03xx” cable is used to connect the DEWE-30-8 to DEWE-ORION-16xx A/D cards.

Note: xx ... specifies cablelength

Digital Input				Digital Input			
-	+15AV	35 == 1	-15AV	-			
-	AGND	36 == 2	AGND	-			
-	AGND	37 == 3	AGND	-			
-	AGND	38 == 4	CH15+	-			
-	AGND	39 == 5	CH14+	-			
-	AGND	40 == 6	CH13+	-			
-	AGND	41 == 7	CH12+	-			
-	AGND	42 == 8	CH11+	-			
-	AGND	43 == 9	CH10+	-			
-	AGND	44 == 10	CH9+	-			
-	AISENSE2	45 == 11	CH8+	-			
-	AGND	46 == 12	CH7+	-			
-	AGND	47 == 13	CH6+	-			
-	AGND	48 == 14	CH5+	-			
-	AGND	49 == 15	CH4+	-			
-	AGND	50 == 16	CH3+	-			
-	AGND	51 == 17	CH2+	-			
-	AGND	52 == 18	CH1+	-			
-	AISENSE1	53 == 19	CH0+	-			
-	AGND	54 == 20	AGND	-			
-	Bx_DI 8	55 == 21	Source Bx_CNT0	-	Bx_DI 0		
-	Bx_DI 9	56 == 22	Gate Bx_CNT0	-	Bx_DI 1		
-	Bx_DI 10	57 == 23	Aux Bx_CNT0	-	Bx_DI 2		
-	Bx_DI 11	58 == 24	Source Bx_CNT1	-	Bx_DI 3		
-	Bx_DI 12	59 == 25	Gate Bx_CNT1	-	Bx_DI 4		
-	Bx_DI 13	60 == 26	Aux Bx_CNT1	-	Bx_DI 5		
-	Bx_DI 14	61 == 27	RS-485A	-			
-	Bx_DI 15	62 == 28	RS-485B	-			
-	+5DV	63 == 29	-	-	Bx_DI 6		
-	DGND	64 == 30	-	-	Bx_DI 7		
-	DGND	65 == 31	EXT_CLK	-			
-	+5DV	66 == 32	EXT_Trigger	-			
-	DGND	67 == 33	EXT_CLK1	-			
-	DGND	68 == 34	EXT_CLK2	-			

68-pin Amplimite series
(AMP: 174339-5) SCSI II

Main System

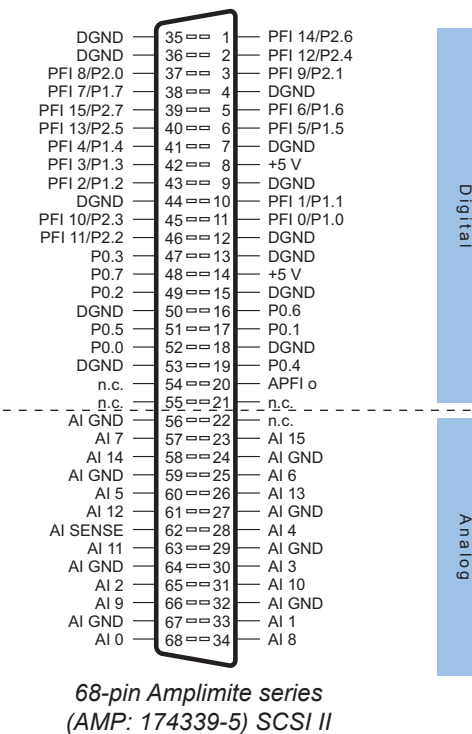
Option 30-NI

Changes the pinout of the SUB-D-68 socket to match NI 622x and 625x A/D cards. The schematic shows the pin assignment of the output connector. A standard 68-pin high density female type with 0.05 inch pin distance is used for the signal interface.

Cabling:

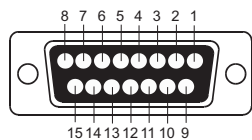
A “DE-C58xx” cable is used to connect the DEWE-30-8 to NI 622x and NI 625x A/D cards.

Note: xx ... specifies cablelength



2 RS-485 In/Out

The RS-485 signals of the integrated DAQ-motherboard are available on this connector.



15-pin female SUB-D connector

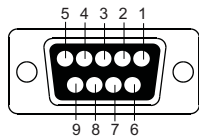
Pin assignment

- 1: RS-485 A
- 2: RS-485 B
- 3: GND

all remaining pins are not connected!

3 RS-232 Interface (to PC COM port)

The RS-232 interface connector meets standard RS-232 pin assignment.



9-pin female SUB-D connector

Pin assignment

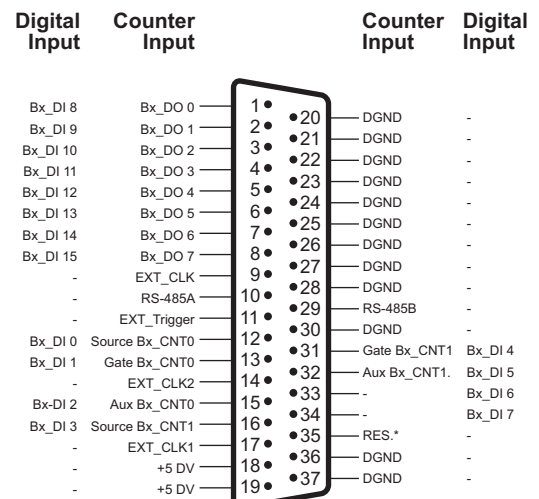
- | | |
|---------|---------|
| 1: n.c. | 6: n.c. |
| 2: RX | 7: n.c. |
| 3: TX | 8: n.c. |
| 4: n.c. | 9: n.c. |
| 5: GND | |

4 Optional conditioned signal output (option 30-OUT-5)

The conditioned signal output of each DAQP- / HSI-series module is also available on a BNC socket on the rear panel of the DEWE-30-8 as a ± 5 V signal.

5 Optional 37-pin female SUB-D connector for option 30-DIO-DE

This connector is for accessing the digital I/O lines of the DEWE-ORION series A/D card on a 37-pin SUB-D socket.



37-pin SUB-D connector

6 Ground connector

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

7 Power supply input connector

This connector supports standard 100 .. 250 V_{AC} power supply input for your system.

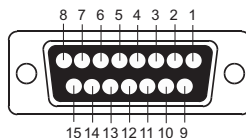
8 Power-on switch

The power-on switch has to be used to switch on the system.

9 Ground switch

10 EPAD interface connector

To connect DEWETRON EPAD modules to the system.



15-pin female SUB-D connector

Pin assignment

1: RS-485 A

2: RS-485 B

14: GND (power supply EPAD modules)

15: +12 V (power supply EPAD modules)

all remaining pins are not connected!

Main System

Bandwidth

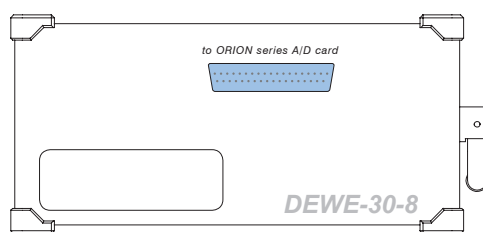
Standard DEWE-30-8 configuration

- 300 kHz standard
- no bandwidth limitation with 30-HSI option



HSI ready

by option 30-HSI



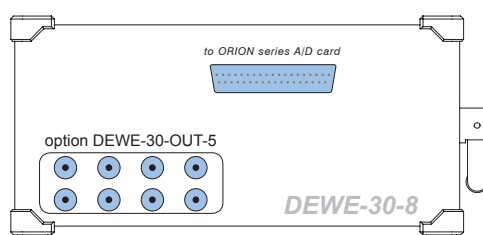
DEWE-30-8 with option DEWE-30-OUT-5

- 300 kHz
- no bandwidth limitation with 30-HSI option



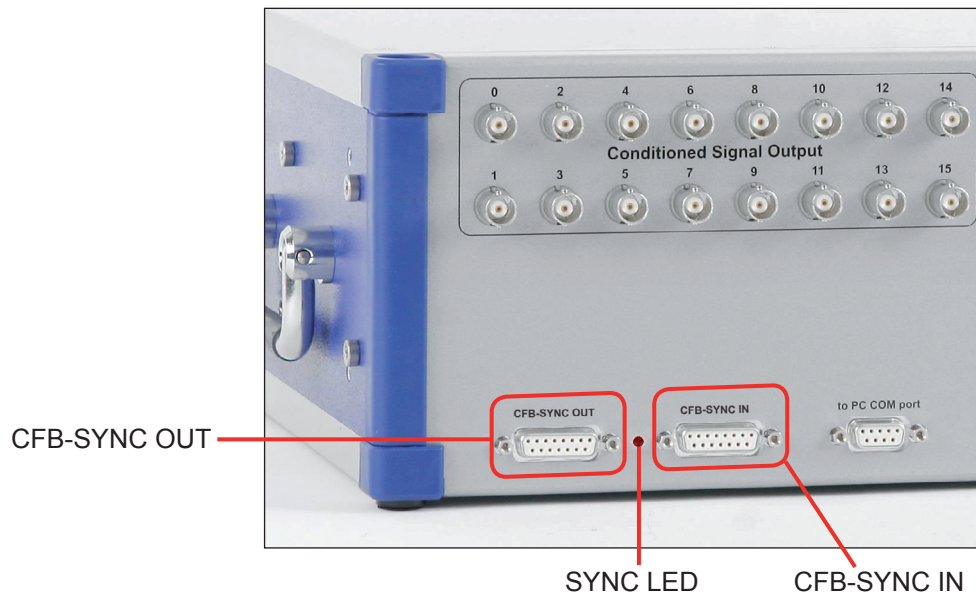
HSI ready

by option 30-HSI



Option DAQP-CFB-SYNC

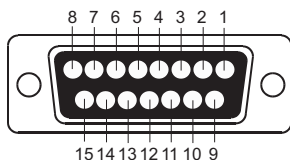
If more than one DEWE-30 is equipped with DAQP-CFB modules and these DEWE-30 are used together, the carrier frequency of the master DAQ-CFB must also be connected from one DEWE-30 to the other in order to keep synchronisation.



If a signal is connected to CFB-SYNC IN the SYNC LED is turned on!
The DAQP-CFB connectors replace the standard RS-485 In/Out sockets.

Pin assignment of 15-pin female SUB-D connector

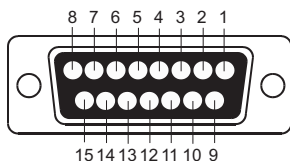
CFB-SYNC IN



Pin assignment

1:	RS485 A	8:	CFB-SYNC IN+
2:	RS485 B	9:	n.c.
3:	GND	10:	n.c.
4:	n.c.	11:	n.c.
5:	GND	12:	n.c.
6:	n.c.	13:	n.c.
7:	CFB-SYNC IN-	14:	GND
		15:	+12 V fused (1A)

CFB-SYNC OUT



Pin assignment

1:	RS485 A	8:	CFB-SYNC OUT
2:	RS485 B	9:	n.c.
3:	GND	10:	n.c.
4:	n.c.	11:	n.c.
5:	GND	12:	n.c.
6:	n.c.	13:	n.c.
7:	GND	14:	GND
		15:	+12 V fused (1A)

Main System

Option 30-HSI

CAUTION: If option 30-HSI is installed, the cable length of the analog output cable is limited to 4 m and the following modules are not supported:

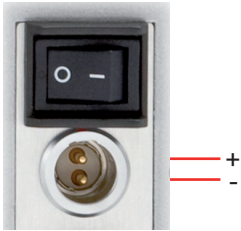
DAQP-CHARGE-A
DAQP-FREQ-A

Already phased out models which are also not supported if 30-HSI option is installed:

DAQN-THERM
DAQN-RTD
DAQN-OHM
DAQN-POT
DAQN-BRIDGE
DAQP-BRIDGE-B
DAQP-V-B-x
DAQP-V-A-x
DAQP-TRQ
DAQP- μ V

Option 30-8-DC

This connector is only available with option 30-8-DC. The DC power supply (9 .. 40 V_{DC}) replaces the standard AC power supply, incl. 2 m DC connection cable with banana jacks.



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

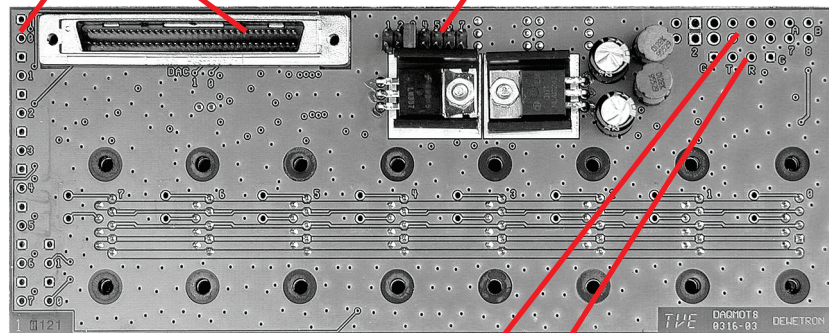
8 slot DEWE-MOTHERBOARD

I/O connectors

Ixx: Analog input xx (leads to
DAQ-module pin 1 in slot xx)
Oxx: Analog output xx (leads to
DAQ-module pin 7 in slot xx)
G: GND (reference for A/D card)
68-pin high-density sub-D connector

Baud rate for onboard RS-232/485 converter

1	115000
2	57600
3	38400
4	19200
5	9600
6	4800
7	2400



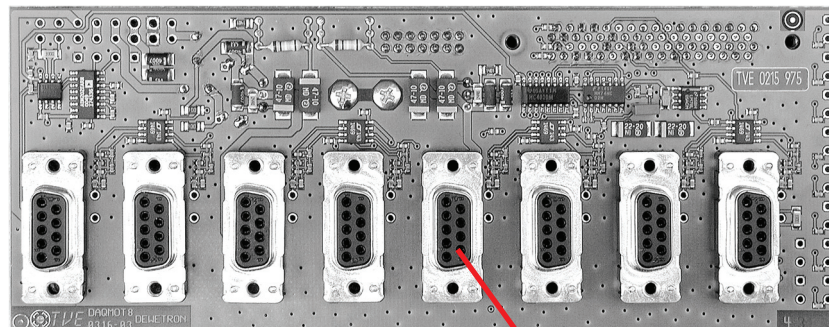
Rear view

Supply voltages, RS-485 connection

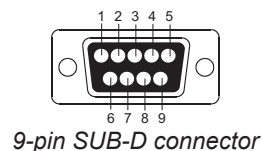
- 1 +12 V (supply voltage)
- 2 GND (system ground)
- 3 GND (referenced ground)
- 4 -12 V (supply voltage)
- 5 +Vcc (sensor supply, normally +12 V,
leads to DAQ-module pin 6)
- 6 -Vcc (normally not connected, leads
to DAQ-module pin 8)
- 7 A (RS-485)
- 8 B (RS-485)

RS-232 connection

- G GND
T Transmit
R Receive
G GND



Front view (connectors for DAQ-modules)



9-pin SUB-D connector

Interface pin assignment:

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

The 8 slot DEWE-MOTHERBOARD receives the ± 12 V_{DC} power supply via a DC/DC converter from the internal power supply.

Internal Wiring

Notes

CE-Certificate of conformity



Manufacturer:

DEWETRON Elektronische Messgeraete Ges.m.b.H.

Address:

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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-30-8

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 Pol. 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
