DEWETRON

DEWE2-PA7

TECHNICAL REFERENCE MANUAL

WELCOME TO THE WORLD OF DEWETRON!

Congratulations on your new device! It will supply you with accurate, complete and reproducible measurement results for your decision making.
Look forward to the easy handling and the flexible and modular use of your DEWETRON product and draw upon more than 30 years of DEWETRON expertise in measurement engineering.

ISO9001

EN ISO 14001

THE MEASURABLE DIFFERENCE.

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 DEWE2-PA7?

A DEWETRON DEWE2-PA7 is the solution for analysis of several motors, converters or complete drive trains simultaneously. The instruments offers 7 slots for user exchangeable TRION™ series modules and with the dedicated TRION-1820-POWER-4 module and the capability for calculation of power parameters even for polyphase motors (up to 9 phases), turns the DEWE2-PA7 into a multi power analyzer.

PREFACE

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Training

DEWETRON offers training at various offices around the world several times each year. DEWETRON headquaters in Austria have a very large and professional conference and seminar center, where training classes are conducted on a regular basis starting with sensors and signal conditioning, A/D technology and software operation. For more information about training services, please visit:
http://www.dewetron.com/services/dewetron-academy/

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.dewetron.us/service-support/system-training-usa/

Calibration

Every instrument needs to be calibrated at regular intervals. The standard norm across nearly every industry is annual calibration. Before your DEWETRON data acquisition system is delivered, it is calibrated at our DEWETRON headquater. Each of this system is delivered with a certificate of compliance with our published specifications. Detailed calibration reports from our calibration system are available for purchase with each order. We retain them for at least one year, so calibration reports can be purchased for up to one year after your system was delivered.

Support

DEWETRON has a team of people ready to assist you if you have any questions or any technical difficulties regarding the system. For any support please contact your local distributor first or DEWETRON directly.

For Asia and Europe, please contact:

DEWETRON GmbH
Parkring 4
8074 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. (HQ USA)
2850 South County Trail, Unit 1
East Greenwich, RI 02818
U.S.A.
Tel.: +1 401 284 3750
Toll-free: +1 866 598 3393
Fax: +1 401 284 3755
Email: us.support@dewetron.com
Web: http://www.dewetron.us

The telephone hotline is available
Monday to Friday between
08:00 and 4:30 EST

Service/Repair Policy

We are very sorry that your DEWETRON system is not operating properly. Our team is here to ensure that your DEWETRON product is returned to peak performance as quickly as possible.
Please help us to help you by following the RMA policy.

Some problems can be solved remotely by our support team. To facilitate a quicker resolution to the problem and save unnecessary shipping costs, we ask you to first have your problem investigated by our technical support before sending your product. Contact details for our support can be found on our website. Please describe the error accurately and with as much detail as possible. This helps expedite the repair process.

If a repair is necessary, please complete our online RMA form. You will then receive an RMA (Return Material Authorization) number and detailed instructions that identify where to ship the damaged product.

Please note: Products arriving at our repair department without RMA require follow-up calls and investigation, which lead to longer turnaround. Only the team of DEWETRON is allowed to perform any kinds of repairs to your system to assure a safe and proper operation in future.

Any spare parts (screws, backplanes, cables,...) must be obtained from DEWETRON only.

NOTICE

The information contained in this document is subject to change without 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

Use austrian law for duplication or disclosure.

DEWETRON GmbH
Parkring 4
A-8074 Grambach / Austria

Printing History

Please refer to the page bottom for printing version.

Safety conventions

Observe precautions for handling electrostatic sensitive devices!

This icon denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash. When this symbol is marked on the product, refer to the technical reference manual.

Indicates hazardous voltages.

Indicates the chassis terminal

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 GmbH assumes no liability for the customer's failure to comply with these requirements.

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. If the unit is used in a manner not specified by the manufacturer the protection can be impaired!

> Ths product is intended for use in industrial locations. As a result, this product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interferences to the reception of radio and television broadcasts.

> Maintenance will be executed by qualified staff only.

> During the use of the system, it might be possible to access another parts of a more comprehensive system. Please read and follow the safety instructions provided in the manuals of all other components regarding warning and security advices for using the system.

> With this product, only use the power cable delivered or defined for the host country.

> DO NOT connect or disconnect sensors, probes or test leads, as these parts are connected to a voltage supply unit.

> The system is grounded via a protective conductor in the power supply cord. To avoid electric shocks, the protective conductor has to be connected with the ground of the power network. Before connecting the input or output connectors of the system, make sure that there is a proper grounding to guarantee potential free usage. For countries, in which there is no proper grounding, please refere to your local legally safety regulations for safety use.

  DC systems: Every DC system has a grounding connected to the chassis (yellow/green safety banana plug).

> Please note the characteristics and indicators on the system to avoid fire or electric shocks. Before connecting the system, please carefully read the corresponding specifications in the product manual.

> The inputs are not, unless otherwise noted (CATx identification), for connecting to the main circuits of category II, III and IV. The measurement category can be adjusted depending on module configuration.

> 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.

> Supply overvoltage category is II.

> 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.

> 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 TRION™ modules).
- If you assume a more riskless use is not provided anymore, the system has to be rendered inoperative and should be protected against inadvertent operation. It is assumed that a more riskless operation is not possible anymore, if
  - the system is damaged obviously or causes strange noises.
  - the system does not work anymore.
  - the system has been exposed to long storage in adverse environmental.
  - the system has been exposed to heavy shipment strain.
- DO NOT touch any exposed 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 DAQP/PAD/HSI/TRION™/TRION3™ modules.
- 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 V_{AC} or >35 V_{DC}! These voltages are already high enough in order to get a perilous electric shock by touching the wiring.
- Unless otherwise stated, maximum input voltage for measuring cards are 70 V_{DC} and 46.7 V_{PEAK}.
- The product heats during operation. Make sure there is adequate ventilation. Ventilation slots must not covered!
- Only fuses of the specified type and nominal current may be used. The use of patched fuses is prohibited.
- Prevent using metal bare wires! Risk of short cut and fire hazard!
- DO NOT use the system before, during or shortly after a thunderstorm (risk of lightning and high energy overvoltage). An advanced range of application under certain conditions is allowed with therefore designed products only. For details please refer to the specifications.
- Make sure that your hands, shoes, clothes, the floor, the system or measuring leads, integrated curcuits and so on, are dry.
- DO NOT use the system in rooms with flammable gases, fumes or dust or in adverse environmental conditions.
- Avoid operation in the immediate vicinity of:
  - high magnetic or electromagnetic fields
  - transmitting antennas or high-frequency generators

  For exact values please refere to enclosed specifications.
- Use measurement leads or measurement accessories aligned to the specification of the system only. Fire hazard in case of overload!
- Do not switch on the system after transporting it from a cold into a warm room and vice versa. The thereby created condensation may damage your system. Acclimatise the system unpowered to room temperature.
- Do not disassemble the system! There is a high risk of getting a perilous electric shock. Capacitors still might charged, even the system has been removed from the power supply.

SAFETY INSTRUCTIONS

> Direct exposure of any DEWETRON product to strong sunlight or other heat radiation shall be prevented, as this could excessively heat up the product and lead to permanent damage of the product.

> The electrical installations and equipments in industrial facilities must be observed by the security regulations and insurance institutions.

> The use of the measuring system in schools and other training facilities must be observerd by skilled personnel.

> The measuring systems are not designed for use at humans and animals.

> Please contact a professional if you have doubts about the method of operation, safety or the connection of the system.

> Please be careful with the product. Shocks, hits and dropping it from already lower level may damage your system. For exact values please refere to enclosed specifications.

> Please also consider the detailed technical reference manual as well as the security advices of the connected systems.

This product has left the factory in safety-related flawless and proper condition.
In order to maintain this condition and guarantee safety use, the user has to consider the security advices and 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.

Maintenance

The information in this section is designed for use by qualified service personal.

Service interval:

Clean dust from the chassis exterior/interior and exchange filter foam based on the operating environment.

Cleaning:

Clean surface of the chassis with dry lintfree cloth.
Use a dry velocity stream of air to clean the chassis interior.

> Disconnect all cables before servicing the unit!
> Many components within the chassis are sensitive to static discharge damage. Always wear a ground wrist strap and service the unit only in static-free environment.
> Do not use harsh chemical cleaning agents!

GENERAL INFORMATION

CAUTION

> The system BIOS is protected by password. Any change in the BIOS may cause a system crash. When the system is booting, do not press ESC-button on keyboard. This may clear the BIOS settings and cause system faults.

> Any change in the file structure as deleting or adding files or directories might cause a system crash.

> Before installing software updates contact DEWETRON or your local distributor. Use only software packages which are released by DEWETRON. Further informations are also available in the internet (http://www.dewetron.com).

> After power off the system wait at least 10 seconds before switching the system on again. Otherwise the system may not boot correct. This prolongs also the life of all system components.

Windows updates and antivirus/security software

Before installing Windows software updates consult with DEWETRON for compatibility guidance. Please also keep in mind that the use of any antivirus or other security software may slow down your system and may cause data loss.

Problematic network stacks

Often intrusive IT software or network processes can interfere with the primary function of the DEWETRON system: to record data. Therefore we recommend strongly against the installation of IT/MIS software and running their processes on any DEWETRON data acquisition system, and cannot guarantee the performance of our systems if they are so configured.

Environmental Considerations

Information about the environmental impact of the product.

Product End-of-Life Handling

Observe the following guidelines when recycling a DEWETRON system:

System and Components Recycling

Production of these components required the extraction and use of natural resources. The substances contained in the system could be harmful to your health and to the environment if the system is improperly handled at it's end of life! Please recycle this product in an appropriate way to avoid an unnecessary pollution of the environment and to keep natural resources.

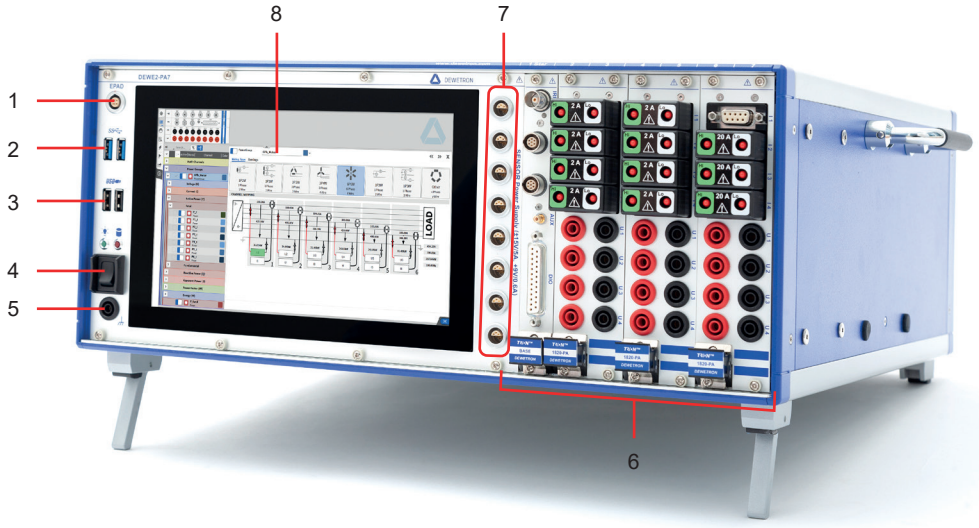
This symbol indicates that this system complies with the European Union’s requirements according to Directive 2012/19/EU on waste electrical and electronic equipment (WEEE). Please find further information about recycling on the DEWETRON website
www.dewetron.com

Restriction of Hazardous Substances

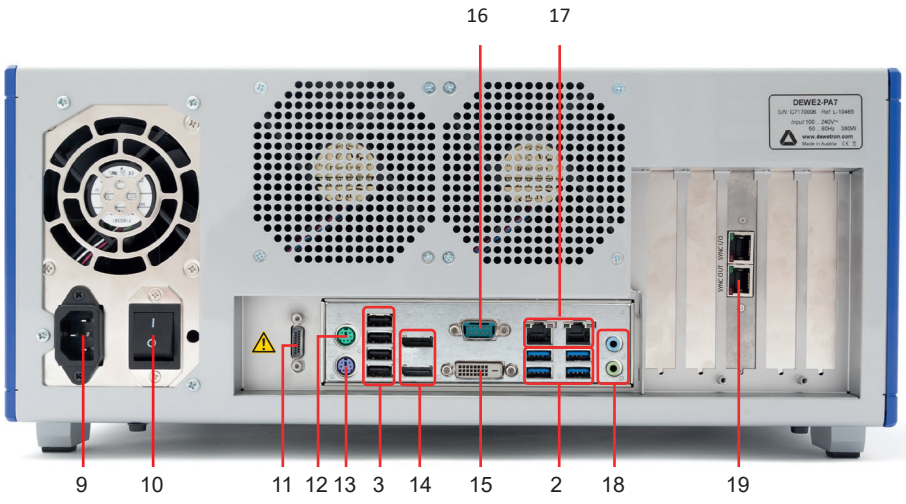
This product has been classified as Monitoring and Control equipment, and is outside the scope of the 2011/65/EU RoHS Directive. This product is known to contain lead.

DEWE2-PA7 at a glance

1 EPAD2 interface connector
2 USB 3.0 interface connectors
3 USB 2.0 interface connectors
4 Power on/off switch
5 Chassis terminal
6 TRION™ series module slots
7 Power supply connectors for current clamps
8 9" multi-touch display
9 Power supply input connector
10 Main power switch
11 Up- / Downstream interface PCIe x1
12 PS/2 interface connector (mouse)
13 PS/2 interface connector (keyboard)
14 Display port connectors
15 DVI interface connector
16 RS-232 interface connector (COM1)
17 GBit ethernet LAN connectors
18 Audio device
19 TRION™-SYNC-BUS



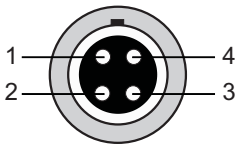
Typical DEWE2-PA7 rear view



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

1 EPAD2 interface connector (LEMO)

To connect EPAD2 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

Mating connector: LEMO FGG.1B.304.CLAD52Z (for cable diameter 4.1 to 5.0 mm)
LEMO FGG.1B.304.CLAD62Z (for cable diameter 5.1 to 6.0 mm)

2 USB2.0 interface connectors (Universal Serial Bus)

The USB2.0 interface connectors meet standard USB pin assignment.

3 USB3.0 interface connectors (Universal Serial Bus)

The USB3.0 interface connectors meet standard USB pin assignment.

4 Power on/off switch

The power on/off switch is used to switch on the system. It only works if the main power switch **(10)** to position 'I'.

5 Chassis terminal

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

6 TRION™ series module slots

7x slots for TRION™ series modules. The DEWE2-PA7 supports all modules.

7 Power supply connectors for current clamps

These connectors support ±15 V / +9 V current power probe supply for connecting current clamps. Further information refer to chapter '*Sensor power supply*'.

8 9" multi-touch display

The DEWE2-PA7 is equipped with a bright 9" wide screen multi-touch panel (1280 x 800) to control the instrument. Familiar gestures such as pinch and zoom are fully implemented within the operating system and will be described in chapter '*Operating with the touchscreen*'.

9 Power supply input connector

Input range: 100 .. 240 VAC (power cord included).
For details see chapter '*Power supply*'.

10 Main power switch

The main power switch separates the system from the grid. The Power on/off switch **(4)** only works if the main power switch **(10)** is switched to position 'I'.

11 Up- / Downstream interface PCIe x1

The DEWE2-PA7 is equipped with a PCI express x1 interface by default. In combination with the TRION™-SYNC-BUS **(19)** it allows easy high-speed channel expansion with F-series chassis.

Note: The PCIe 1X interface connector to connect a DEWE2-F series, is no longer scope of supply for newer models of the DEWE2-PA7. Please note that the TRION-SYNC-BUS interfaces are not affected by this change. To add an expansion to a DEWE2-PA7 use a TRIONet via the TRION-SYNC-BUS interface.

12 PS/2 interface connector (mouse)

To connect an external PS/2 mouse to the system. The connector meets standard pin assignment.

13 PS/2 interface connector (keyboard)

To connect a keyboard to the system. The connector meets standard pin assignment.

14 Display port connectors

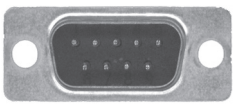
Additional to the DVI connector interface the DEWE2-PA7 supports two Display port connectors with standard pin assignment.

15 DVI connector

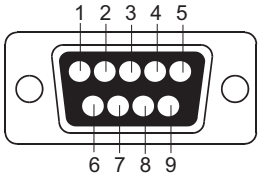
The DVI connector meets standard DVI pin assignment.

16 RS-232 interface connectors (COM1 & COM2)

The RS-232 interface connectors (male) are located on the left side of the DEWE2-A4L. They are configured as standard RS-232 interface COM 1 & COM 2 and can be used for mouse or other peripheral units.



9-pin SUB-D connector (male)



Schematic

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

17 GBit ethernet LAN connector

The DEWE2-M7 supports 10/100/1000 BaseT Ethernet with standard RJ45 connector.

18 Audio I/O interface

Mic, Headphone & Line Out.

19 TRION™-SYNC-BUS

The TRION™-SYNC-BUS in combination with the downstream interface connector **(11)** allows easy high-speed channel expansion with F-series chassis (e.g. DEWE2-F4s, F7...). Further information see chapter *'Application examples'*

Sync cable has to be ordered separately:	DW2-CBL-SYNC-01:	Sync cable with RJ45 plugs, 1 m.
	DW2-CBL-SYNC-03:	Sync cable with RJ45 plugs, 3 m.

Note: The PCIe 1X interface connector to connect a DEWE2-F series, is no longer scope of supply for newer models of the DEWE2-PA7. To add an expansion to a DEWE2-PA7 use a TRIONet via the TRION-SYNC-BUS interface. Further information see chapter 'Application examples'

Configuration examples with TRION-1820-POWER module

In order to tap the full potential of the DEWE2-PA7, DEWETRON developed the TRION-1820-POWER module which can be easily installed into the instrument. The modular design of the TRION-1820-POWER module allows for flexible measurement of current, voltage or power with input ranges of up to 1000 V_{RMS} / 20 A_{RMS} respectively. The following page will give you an overview of typical configuration examples with the TRION-1820-POWER module.

Standard 4-phase power analyzer with direct input

This is the standard configuration of a DEWE2-PA7 for 4-phase (1x 3-phase AC and 1x 1-phase DC) applications.

1 x DEWE2-PA7
1 x TRION-1820-POWER-4
4 x TRION-POWER-SUB-CUR-20A
2A -1B
02A

Standard 4-phase power analyzer with clamp input

Configuration for use with current clamps with voltage output for 4-phase applications.

1 x DEWE2-PA7
1 x TRION-1820-POWER-4
4 x TRION-POWER-SUB-CUR-dLV

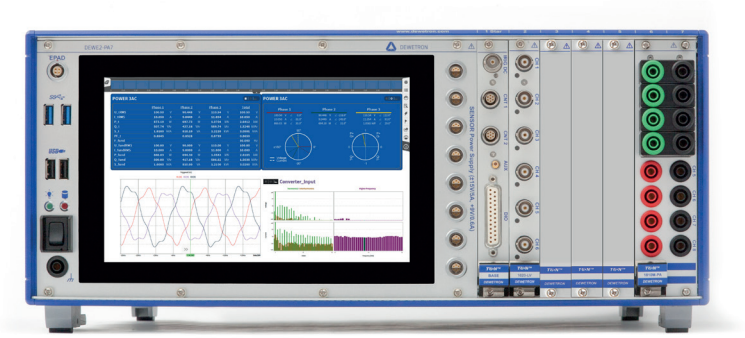
Standard 4-phase power analyzer with mixed input

Configuration for a mixed use of direct inputs and clamp inputs for 4-phase applications.

1 x DEWE2-PA7
1 x TRION-1820-POWER-4
3 x TRION-POWER-SUB-CUR-20A-1B
1 x TRION-POWER-SUB-CUR-dLV

Standard 4-phase power analyzer with mixed input

Advanced configuration for motor analysis with torque and speed inputs as well as auxiliary high-speed analog inputs for voltage and acceleration analysis.

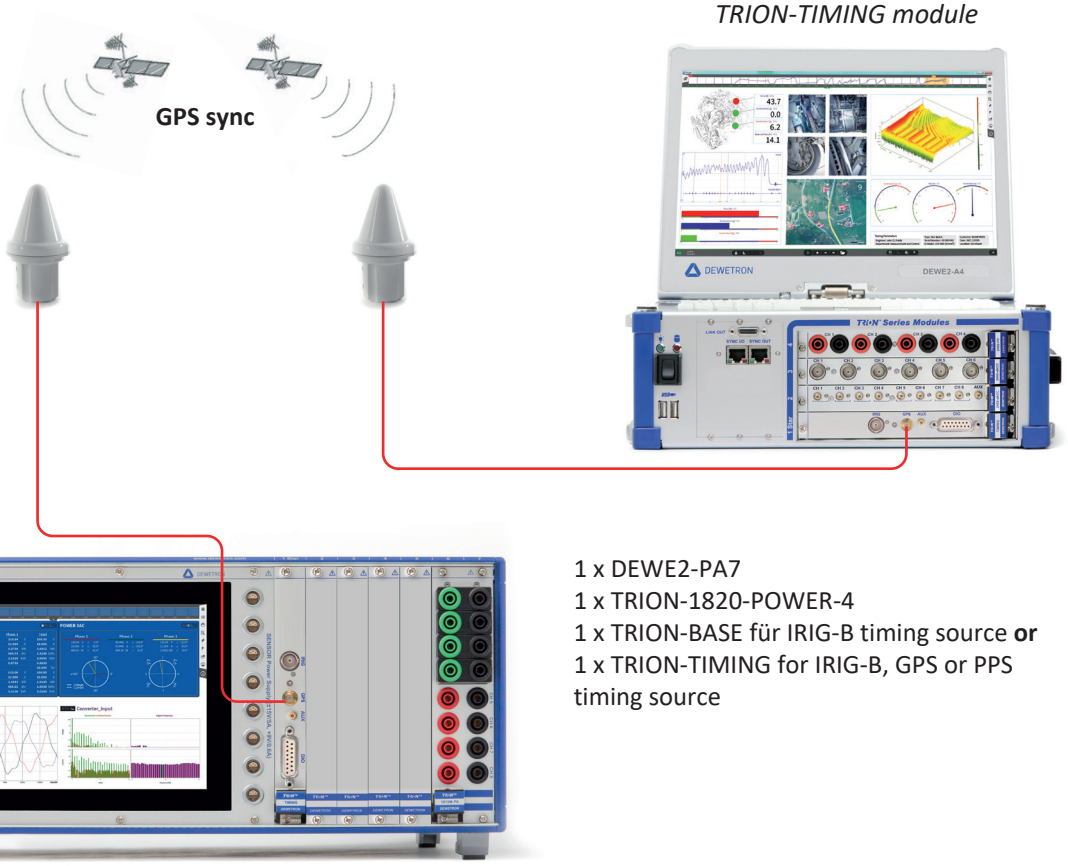


1 x DEWE2-PA7
1 x TRION-1820-POWER-4
4 x TRION-POWER-SUB-CUR-2A-1B
1 x TRION-BASE
1 x TRION-1620-ACC

Absolute time synchronization option

With this option, the power analyzer can operate synchronized with other measurement devices with an absolute time reference.

DEWE2-A4 with TRION-TIMING module



1 x DEWE2-PA7
1 x TRION-1820-POWER-4
1 x TRION-BASE für IRIG-B timing source **or**
1 x TRION-TIMING for IRIG-B, GPS or PPS timing source

Application examples

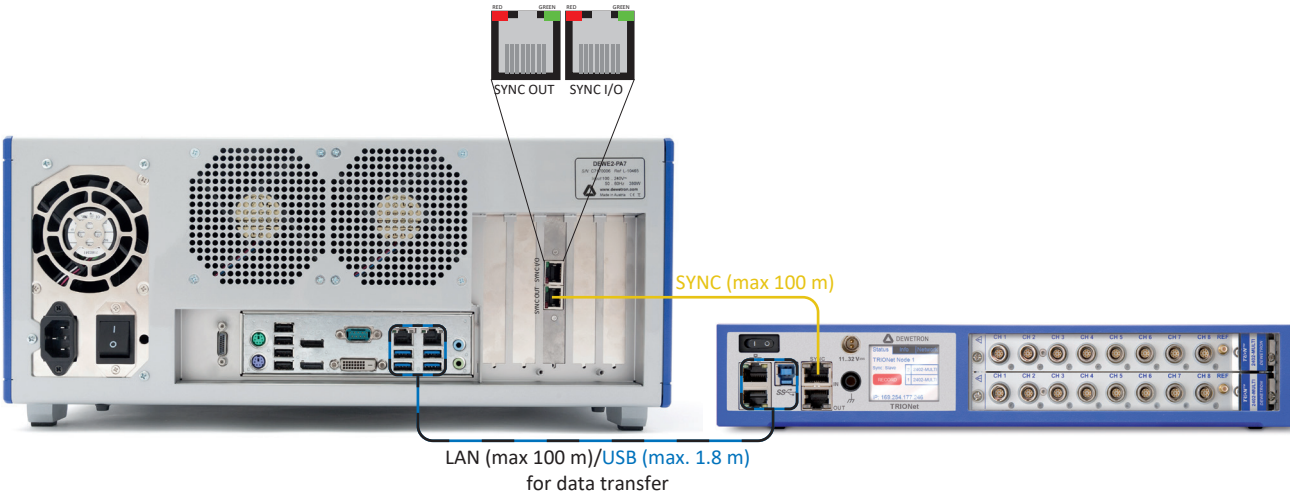
The TRION-SYNC-BUS (SYNC I/O, SYNC OUT) is used to synchronize two or more DEWE2 systems with up to 100 m distance between each node. The TRION-SYNC-BUS consists of two RJ-45 sockets. One socket being a synchronization OUT, whilst the other one could either be used as synchronization IN or OUT.

LED indication:

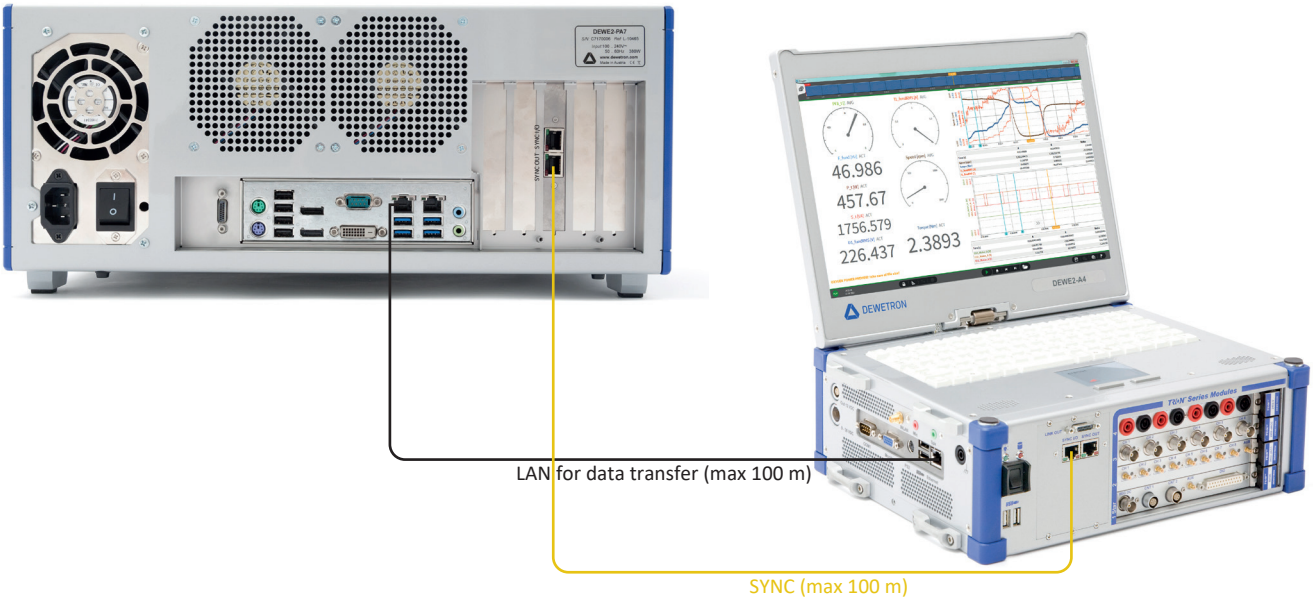
	SYNC OUT	SYNC I/O
RED (stable)	Clock detected	Clock detected / Receiving clock
GREEN (stable)	Acquisition running	Acquisition running

Depending on the usage of the SYNC I/O (input or output) the LED indicates if the system clock is available or received correctly from another system. The green LED indicates that the acquisition is running. If the acquisition stops the LED will be off.

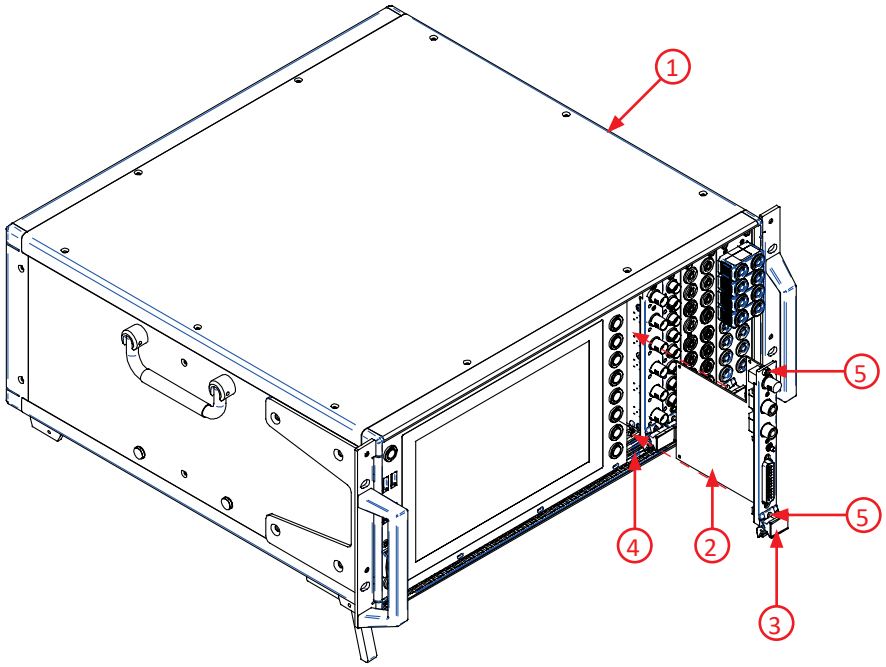
Channel expansion with TRIONet



Network with multiple systems



Installing a TRION™ module into the DEWE2-PA7



1 DEWE2-PA7 chassis
2 TRION™ series module
3 Injector/ejector handle
4 Module guides
5 Mounting screws

Step 1: Proper ESD precautions must be taken to avoid any damage to the unit.

Step 2: Power off and unplug all connected cables including sensors from the DEWE2-PA7 and TRION™ series modules.

Step 3: Identify a supported TRION™ peripheral slot. Some modules require a TRION™ STAR-slot.

Step 4: Remove the filler panel of an unused TRION™ peripheral or STAR-slot.

Step 5: Place the module edges of the TRION™ modules into the module guides at the top and bottom of the chassis.

Step 6: Insert the TRION™ module to the rear of the chassis until a resistance appears.

Step 7: Pull up on the injector/ejector handle to latch the device

Step 8: Secure the installed TRION™ front panel to the chassis using the mounting screws.

WARNING: *Unused TRION slots must not remain uncovered! Make sure to reinstall the filler panels of unused TRION™ slots to guarantee proper cooling of the installed modules. WARRANTY VOID if the modules overheat due to missing filler panels!*

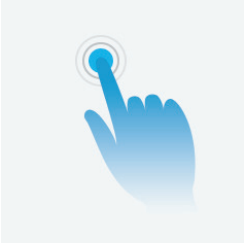
Operating with the Touchscreen

Touchscreen gestures

The DEWE2-PA7 is equipped with a bright 9" high resolution multi-touch panel to control the DEWE2-PA7.
You can use your fingers on the touchscreen, like you would on a smartphone. For example, drag the sidebar from the right side across the screen to open the channel setup.

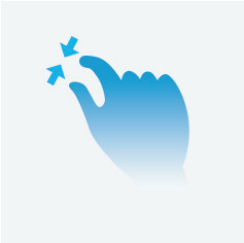
Tap? Swipe? Here's a glossary of touch gestures that you can use with the DEWE2-PA7.

Tap



How to do it: Tap once on something.
What it does: Open, selects, or activates whatever you tap.
Similar to clicking with a mouse.

Pinch or stretch

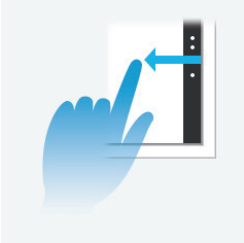


How to do it: Touch the screen with two fingers, and then move the fingers toward each other (pinch) or away from each other (stretch).
What it does: Zooms in or out of a graph or data.

Tap and hold

How to do it: Press your finger down and hold for about a second.
What it does: Rearranges objects on your main screen.

Swipe / Drag



How to do it: Drag your finger on the screen.
What it does: - Scrolls through recorded data (like scrolling with a mouse).
- Drags the sidebar from the right side across the screen to open the channel setup

Further information on how to operate with OXYGEN please find in the corresponding user manual available at:
https://ccc.dewetron.com/pl/oxygen

TRION™ module for 4-phase power analysis

- Channels: 4 power channels
- Sampling: up to 2 MS/s
- Resolution: 18-bit
- Voltage input: 1000 V_{RMS}
- Modular input: Current (CAT II): 0.2 A_{RMS} to 20 A_{RMS}
  Voltage (not isolated): 5 V_{RMS} / 1 V_{RMS}
  Voltage (CAT II): 600 V_{RMS} / 5 V_{RMS}


TRION-1820-POWER-4 with TRION-POWER-SUB-CUR-xA-1B


TRION-1820-POWER-4 with TRION-POWER-SUB-dLV-1

Module specifications

TRION-1820-POWER-4		
Input channels	4 Power channels, each with one voltage and one current input	
Resolution	18-bit	
Sample Rate	up to 2 MS/sec; 512 MByte onboard data buffer	

The following are all accuracy conditions referenced in this section:
Temperature: 23±5°C, Humidity: 40 to 60 % RH, Input waveform: sine wave, Common mode voltage: 0 V, Line filter: Auto (8th order Butterworth), Sample rate: 2 MS/s, Resolution: 24 bit, Driver Version >= 3.7, Power factor: 1, After warm-up. After zero level, 12-month Accuracy ±(Reading error + Range error), Accuracy: Frequency (f) in [kHz]

Fixed high-voltage inputs U1 .. U4 (permanently installed)

Input range	1000 V (±2000 V_{PEAK}) CF = 2	
Accuracy[1) 2)]	DC:	±0.02 % of reading ±0.02 % of range
	0.5 Hz to 1 kHz:	±0.03 % of reading
	1 kHz to 5 kHz:	±0.15 % of reading
	5 kHz to 10 kHz:	±0.35 % of reading
	10 kHz to 50 kHz:	±0.6 % of reading
	50 kHz to 300 kHz:	±(0.02 % * f) of reading
Gain drift	20 ppm / °C	
Offset drift	5 mV / °C	
Typical THD	-95 dB	
CMRR	>85 dB @ 50 Hz; >60 dB @ 1 kHz; >40 dB @ 100 kHz	
Bandwidth	5 MHz	
Safety	CAT IV 600 V / CAT III 1000 V	
Instantaneous maximum allowable input	4000 V_{PEAK} or 3000 V_{RMS} (1s)	
Continuous maximum allowable input	2000 V_{RMS} or 2000 V_{DC}	
Input resistance	5 MΩ; 2 pF	
Isolation (earth) resistance	100 GΩ; 2.5 pF	
Connector	Safety banana sockets	

[1)] add 0.02 % of reading with filter settings OFF
[2)] below 1 % of range, add 10 ppm of range

Interchangeable sub-modules (I1 .. I4)

20 A module	TRION-POWER-SUB-CUR-20A-1B	
Range	20 A (±40 A_{PEAK})	
Accuracy[1) 2)]	DC:	±0.02 % of reading ±0.02 % of range[3)]
	0.5 Hz to 1 kHz:	±0.03 % of reading
	1 kHz to 5 kHz:	±0.15 % of reading
	5 kHz to 10 kHz:	±0.35 % of reading
	10 kHz to 50 kHz:	±(0.3 % + 0.05 % * f) of reading
	50 kHz to 300 kHz:	±(0.10 % * f) of reading
Safety	CAT II 600 V, unfused	
Bandwidth	300 kHz	
Connector	Safety banana sockets (male)	
Instantaneous maximum allowable input	50 A_{PEAK} or 40 A_{RMS} (1s)	
Continuous maximum allowable input	20 A_{RMS}	
Input resistance	2 mΩ	

[1)] For self-generated heat caused by current input, add 0.00008 × I² % of reading + 15 × I² µA to the current accuracy. 'I' is the current reading [A]. The influence from self-generated heat continues until the temperature of the shunt resistor inside the DEWE2-Chassis lowers even if the current input changes to a small value.
[2)] below 1 % of range, add 50 ppm of range
[3)] add 0.03 % of range with no zero level

continued on next page ...

MAIN SYSTEM

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2 A module	TRION-POWER-SUB-CUR-2A-1B	
	Range	2 A (±4 A_{PEAK})
	Accuracy[1]	DC: ±0.02 % of reading ±0.02 % of range[2]
		0.5 Hz to 10 kHz: ±0.03 % of reading
		10 kHz to 30 kHz: ±0.1 % of reading
		30 kHz to 200 kHz: ±(0.015 % * f) of reading
		200 kHz to 300 kHz: ±(0.1 % * f) of reading
	Safety	CAT II 600 V, unfused
	Bandwidth	300 kHz
	Connector	Safety banana sockets (male)
	Instantaneous maximum allowable input	10 A_{PEAK} or 5 A_{RMS} (1s)
	Continuous maximum allowable input	3 A_{RMS}
	Input resistance	50 mΩ

[1] below 1 % of range, add 25 ppm of range
[2] add 0.03 % of range with no zero level

1 A module	TRION-POWER-SUB-CUR-1A-1B	
	Range	1 A (±2 A_{PEAK})
	Accuracy[1]	DC: ±0.02 % of reading ±80 µA[2]
		0.5 Hz to 10 kHz: ±0.03 % of reading
		10 kHz to 30 kHz: ±0.1 % of reading
		30 kHz to 200 kHz: ±(0.015 % * f) of reading
		200 kHz to 300 kHz: ±(0.1 % * f) of reading
	Safety	CAT II 600 V, unfused
	Bandwidth	300 kHz
	Connector	Safety banana sockets (male)
	Instantaneous maximum allowable input	4 A_{PEAK} or 2 A_{RMS} (1s)
	Continuous maximum allowable input	1.1 A_{RMS}
	Input resistance	500 mΩ

[1] below 1 % of range, add 25 ppm of range
[2] add 0.03 % of range with no zero level

0.2 A module	TRION-POWER-SUB-CUR-02A-1B	
	Range	0.2 A (±0.4 A_{peak})
	Accuracy[1]	DC: ±0.02 % of reading ±0.02 % of range[2]
		0.5 Hz to 10 kHz: ±0.03 % of reading
		10 kHz to 30 kHz: ±0.1 % of reading
		30 kHz to 200 kHz: ±(0.015 % * f) of reading
		200 kHz to 300 kHz: ±(0.1 % * f) of reading
	Safety	CAT II 600 V, unfused
	Bandwidth	300 kHz
	Connector	Safety banana sockets (male)
	Instantaneous maximum allowable input	2 A_{PEAK} or 1 A_{RMS} (1s)
	Continuous maximum allowable input	0.4 A_{RMS}
	Input resistance	500 mΩ

[1] below 1 % of range, add 25 ppm of range
[2] add 0.03 % of range with no zero level

Clamp input module with high bandwidth	TRION-POWER-SUB-dLV-xV	
	TRION-POWER-SUB-dLV-5V range	5 V (±10 V_{PEAK}) **NOT ISOLATED** ⚠
	TRION-POWER-SUB-dLV-1V range	1 V (±2 V_{PEAK}) **NOT ISOLATED** ⚠
	Accuracy	DC: 0.015 % of reading ±200 µV
		0.5 Hz to 10 kHz: 0.03 % of reading
		10 kHz to 500 kHz: ±(0.006 % * f) of reading
		500 kHz to 3000 kHz: ±(0.006 % * f) of reading
 ⚠	Gain drift	10 ppm / °C
 ⚠	Offset drift	10 µV / °C
	Typical THD	-100 dB
	Typical CMRR	>70 dB @ 50 Hz; >65 dB @ 10 kHz; >45 dB @ 100 kHz
	Bandwidth (-3dB)	5 MHz
	Isolation	None. Use with isolated current transducer!
	Common mode voltage	10 V_{DC}
	Overvoltage protection	±300 V_{DC}
	Connector	DSUB-9
	Input impedance	5 MΩ; 15 pF
	Sensor supply (+9 V)	max. 40 mA

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Clamp input module	TRION-POWER-SUB-dLV-1	
	Range	5 V (±10 V_{peak}) **NOT ISOLATED** ⚠
	Accuracy[1)]	DC: ±0.02 % of reading ±0.02 % of range
		0.5 Hz to 5 kHz: ±0.03 % of reading
		5 kHz to 30 kHz: ±(0.01 % * f) of reading
		30 kHz to 50 kHz: ±(0.02 % * f) of reading
		50 kHz to 100 kHz: ±(0.1 % * f) of reading
 	Typical THD	-95 dB
	Typical CMRR	80 dB @ 50 Hz; 80 dB @ 1 kHz; 65 dB @ 10 kHz; 45 dB @ 100 kHz
	Safety	Depending on connected clamp
	Absolute maximum voltage	±30 V
	Bandwidth	100 kHz
	Connector	DSUB9
	Input resistance	1 MΩ
	Sensor supply (+9 V)	max. 40 mA

[1)] below 1 % of range, add 10 ppm of range

Voltage input 5 V (600 V isolated) module	TRION-SUB-5V	
	Range	5 V (±10 V_{PEAK}) CF=2
	Accuracy	DC: ±0.02 % of reading ±0.005 % of range
		0.5 Hz to 1 kHz: ±0.03 % of reading
		1 kHz to 100 kHz: ±(0.02 % * f) of reading
		100 kHz to 200 kHz: ±(0.04 % * f) of reading
	Gain drift	20 ppm / °C
	Offset drift	1 µV / °C
	Typical THD	-102 dB
	Typical CMRR	>140 dB @ 50 Hz; >106 dB @ 10 kHz; >102 dB @ 100 kHz
	Bandwidth (-3dB)	300 kHz
	Rated voltage according to EN 61010-2-30	600 V CAT II
	Isolation	600 V_{RMS}; 35 kV/µs transient immunity
	Common mode voltage	600 V_{RMS}
	Transient immunity	35 kV/µs
	Overvoltage protection	600 V_{RMS} or 1000 VDC
	Input impedance	5 MΩ; 22 pF
	Isolation (earth) resistance	100 GΩ; 4 pF (IN- to GND)
	Connector	Safety banana sockets
Voltage input 600 V CATII module	TRION-SUB-600V	
	Range	600 V (±1500 V_{PEAK}) CF=2.5
	Accuracy	DC: ±0.02 % of reading ±0.005 % of range
		0.5 Hz to 10 kHz: ±0.03 % of reading
		10 kHz to 100 kHz: ±(0.015 % * f) of reading
		100 kHz to 200 kHz: ±(0.04 % * f) of reading
	Gain drift	20 ppm / °C
	Offset drift	1 mV / °C
	Typical THD	-105 dB
	typical CMRR	>100 dB @ 50 Hz; >90 dB @ 1 kHz; >70 dB @ 10 kHz; >50 dB @ 100 kHz
	Bandwidth (-3dB)	300 kHz
	Rated voltage according to EN 61010-2-30	600 V CAT II
	Isolation	600 V_{RMS}; 35 kV/µs transient immunity
	Common mode voltage	600 V_{RMS}
	Transient immunity	35 kV/µs
	Overvoltage protection	1500 V_{PEAK} (1s)
		1000 V_{RMS} or 1500 V_{DC}
	Input impedance	5 MΩ; 3.5 pF
	Isolation (earth) resistance	100 GΩ; 4 pF (IN- to GND)
	Connector	Safety banana sockets

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MAIN SYSTEM

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Power specifications

Accuracy[1] with PF=1	DC:	±0.03 % of reading ±0.03 % of range[2]
	0.5 Hz to 1 kHz:	±0.04 % of reading
	1 kHz to 5 kHz:	±0.2 % of reading
	5 kHz to 10 kHz:	±0.5 % of reading
	10 kHz to 50 kHz:	±(0.5 % + 0.05 % * f) of reading
Influence of power factor	Add 0.01 % × f/50 × √(1/PF²-1)	

[1] voltage and current channel have a minimum input of 1 % of range, otherwise individual uncertainty have to be calculated
[2] add 0.03 % of range with no zero level

Typical Signal-to-noise ratio, Spurious free SNR, Effective number of Bits[1]

	Voltage input 2000 V			20 A module			2 A module			1 A module			0.2 A module			Clamp input module 10 V		
	SNR	SFDR[2]	ENOB[3]	SNR	SFDR[2]	ENOB[3]	SNR	SFDR[2]	ENOB[3]	SNR	SFDR[2]	ENOB[3]	SNR	SFDR[2]	ENOB[3]	SNR	SFDR[2]	ENOB[3]
Sample rate	[dB]	[dB]	[Bit]	[dB]	[dB]	[Bit]	[dB]	[dB]	[Bit]	[dB]	[dB]	[Bit]	[dB]	[dB]	[Bit]	[dB]	[dB]	[Bit]
0.1 kS/s	129	142	21.1	101	117	16.5	110	125	18.0	131	149	21.5	108	128	17.6	129	146	21.1
1 kS/s	126	139	20.6	100	119	16.3	107	126	17.5	125	149	20.5	107	123	17.5	119	131	19.5
10 kS/s	121	136	19.8	98	113	16.0	105	122	17.1	116	144	19.0	104	121	17.0	109	124	17.8
100 kS/s	113	135	18.5	93	110	15.2	100	120	16.3	106	137	17.3	100	114	16.3	99	119	16.2
1000 kS/s	103	128	16.9	85	110	13.8	91	114	14.8	96	134	15.7	92	114	15.0	94	115	15.3
2000 kS/s	85	106	13.8	84	107	13.7	90	114	14.7	95	130	15.5	90	114	14.7	92	114	15.0

[1] LP Filter in auto mode
[2] SFDR excluding harmonics
[3] ENOB calculated from SNR

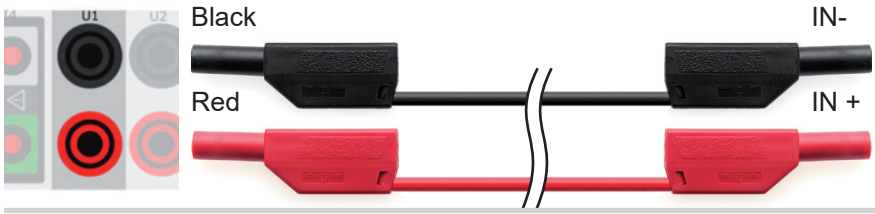
Additional specifications

Typical channel to channel phase mismatch (Voltage-Voltage, Current-Current, Voltage-Current)	<250 ns (0.1° @ 1 kHz, 0.005° @ 50 Hz)
Typical board-to-board phase mismatch	
same board type	<250 ns (0.1° @ 1 kHz, 0.005° @ 50 Hz)
different board type	±1 Sample or 0.2° @ 1 kHz (whichever is higher)
Low pass filter (-3 dB, digital and analog combined)	100 Hz to 1 MHz freely programmable or OFF
Filter order & characteristics	2nd, 4th, 6th, 8th Bessel or Butterworth
Filter delay compensation	up to 15 µs the group delay of the selected filter will be automatically compensated. This works for: 2nd order filter 15 kHz to 1 MHz 4th order filter 30 kHz to 1 MHz 6th order filter 60 kHz to 1 MHz

Signal connection

Voltage with fixed installed inputs

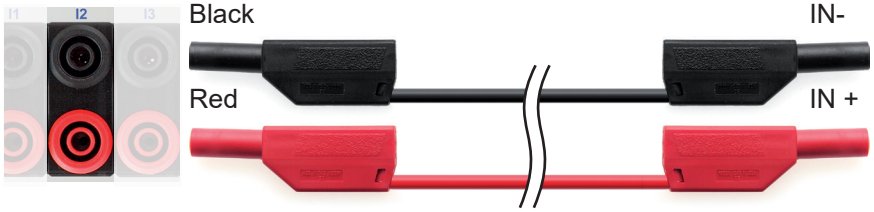
High voltage input for line voltage measurement.



Voltage measurement up to ±2000 V only with safety banana plug cords!

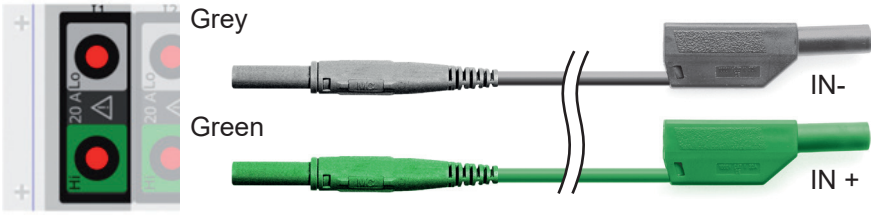
Voltage input module (TRION-SUB-xV)

This input is isolated and rated with CAT II 600 V. Modules with 5 V and 600 V are available.



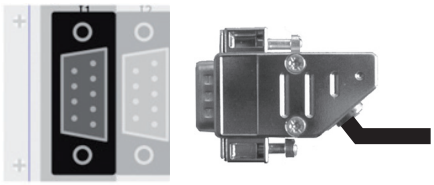
Current input module (TRION-POWER-SUB-CUR-xA-1B)

Direct current input for measuring current directly. This input is isolated and rated with CAT II 600 V. Modules with 20 A, 2 A, 1A and 0.2 A nominal current are available.



Clamp input module (TRION-POWER-SUB-dLV modules, for clamps ONLY)

NOT ISOLATED voltage input. This input can be used for isolated current clamps with voltage output.

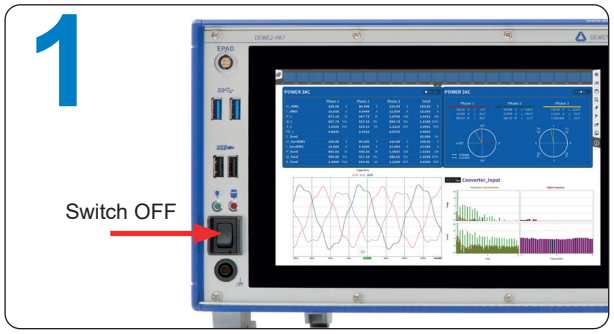


Pin 1: TEDS
Pin 2: IN+
Pin 3: n.c.
Pin 4: GND (not isolated)
Pin 5: +9 V (40 mA max.)
Pin 6: n.c.
Pin 7: IN-
Pin 8: n.c.
Pin 9: -9 V (40 mA max.)

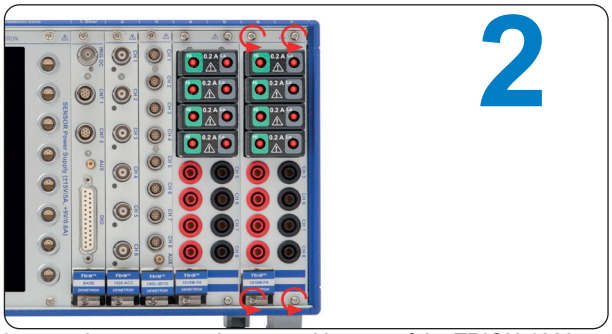
WARNING: Those modules are not isolated! Do not connect any other appliances than isolated current transducers with voltage output.

Exchanging SUB-modules

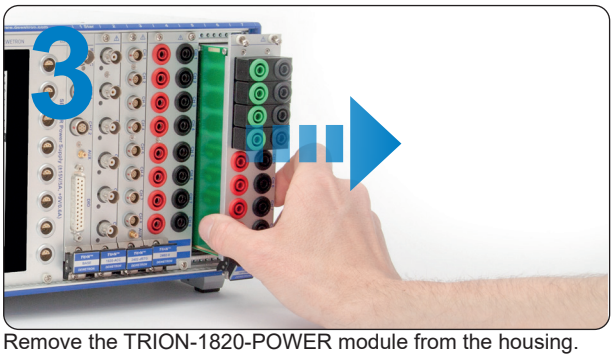
Proper ESD precautions must be taken to avoid any damage to the unit.



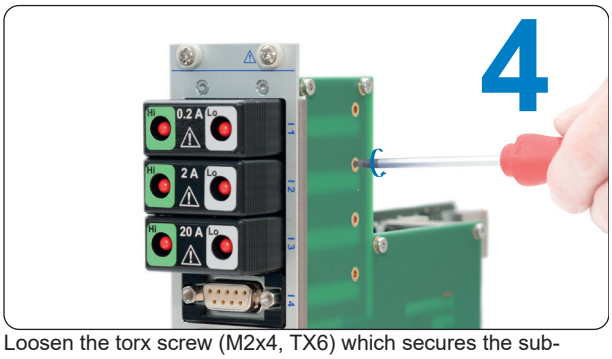
Switch off the instrument and unplug all connected cables including sensors from the TRION™ series modules.



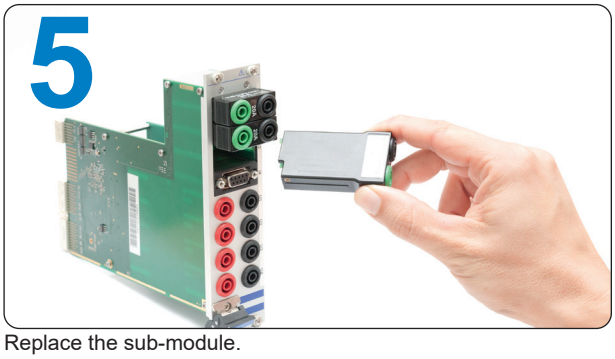
Loosen the screws at the top and bottom of the TRION-1820-POWER-4 module front panel (4x) and pull down the injector/ejector handle to release the module.



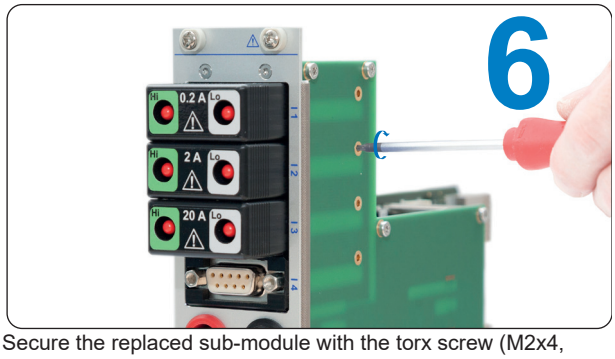
Remove the TRION-1820-POWER module from the housing.



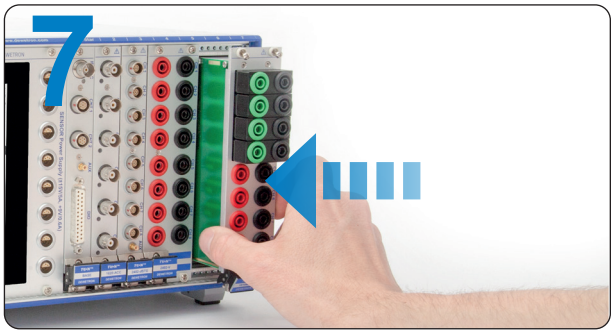
Loosen the torx screw (M2x4, TX6) which secures the sub-module of the channel you want to replace.



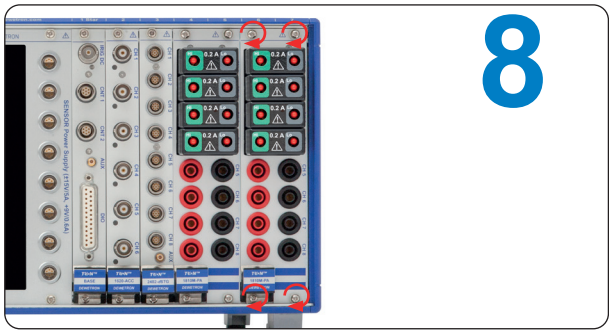
Replace the sub-module.



Secure the replaced sub-module with the torx screw (M2x4, TX6). Max. torque: 0.2 Nm



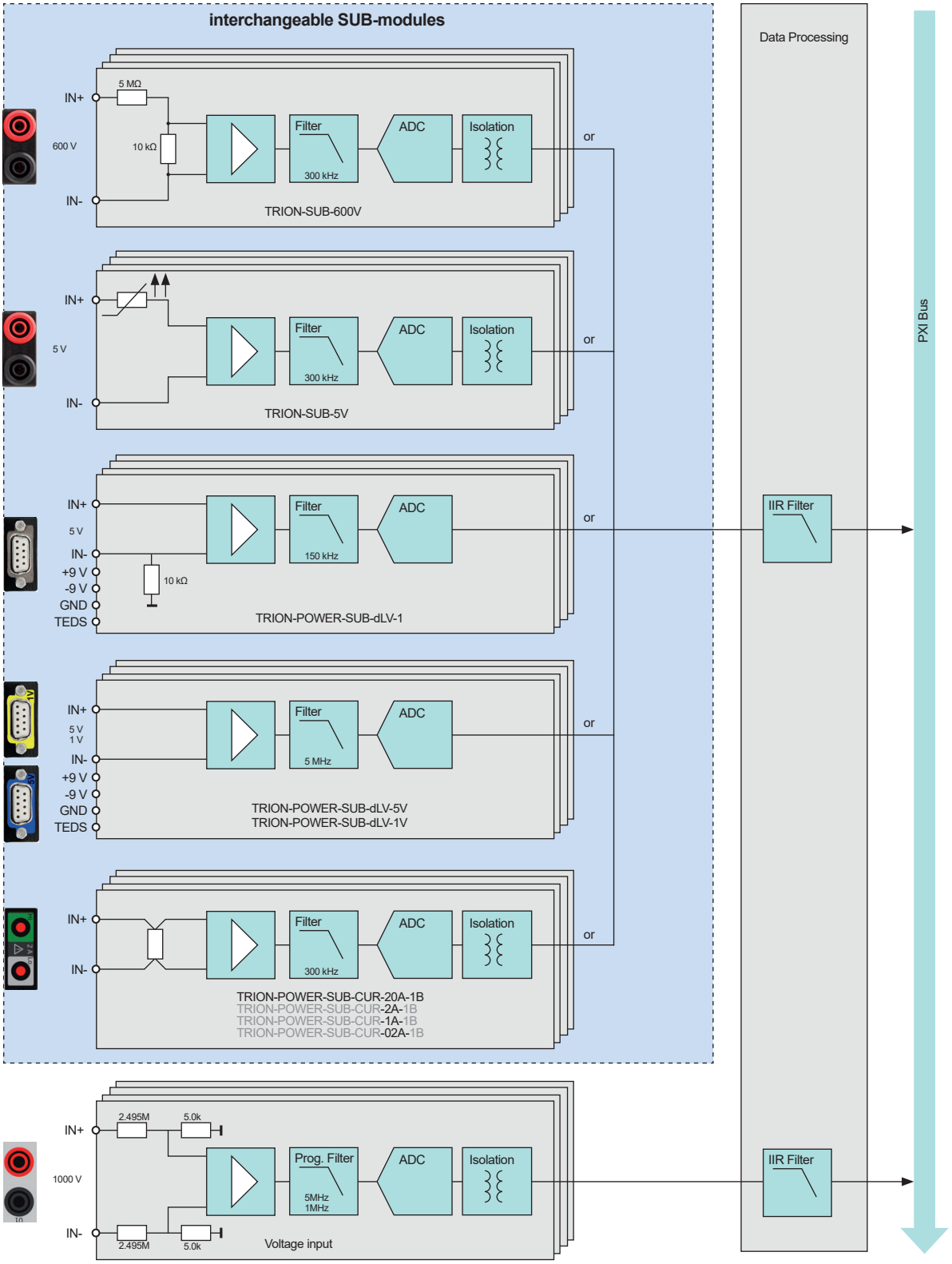
Insert the TRION-1820-POWER-4 module into the housing until a resistance appears.



Pull up the injector/ejector handle to latch the module. Tighten the screws at the top and bottom of the TRION-1820-POWER-4 module front panel (4x) to secure the module.

Block diagram

Base block diagram of the TRION-1820-POWER-4 module:



MAIN SYSTEM

The TRION-1820-POWER-4 is an ultra-compact, 4-phase power data acquisition module with flexible current or voltage inputs for use in any DEWE2/3-chassis.

Voltage input (permanently installed):

Fast sampling, high bandwidth and minimum capacity to earth are just a few outstanding performance qualities of the high voltage inputs. The high input impedance allowes high continous voltage levels with a very low temperature drift. Although small outline, the safety category is on a very high level (CAT III 1000V).

Current input (interchangeable SUB-modules):

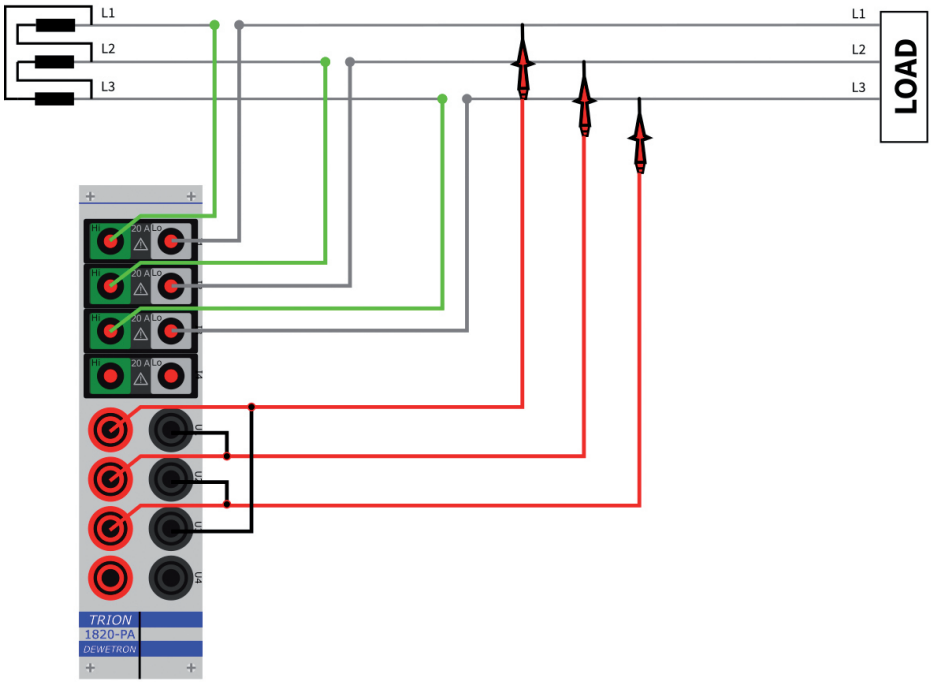
The TRION-1820-POWER-4 has 4 highly flexible voltage or current inputs. The 4 slots can be populated with four different direct current measurement modules or with three different SUBD-9 modules to connect almost any kind of current transducer. Alternatively, this connector can also be used to measure any auxiliary ±10 V signal (e.g. such as windspeed or water flow).

Voltage input (interchangeable SUB-modules)

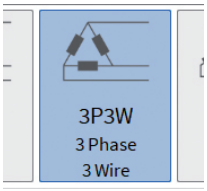
If more than 4 voltage inputs are required, the 4 slots can be also populated with our latest interchangeable voltage input sub-modules. Choose from a low-voltage, isolated 5 V or an isolated, 600 V CATII rated sub-module.

Connection examples

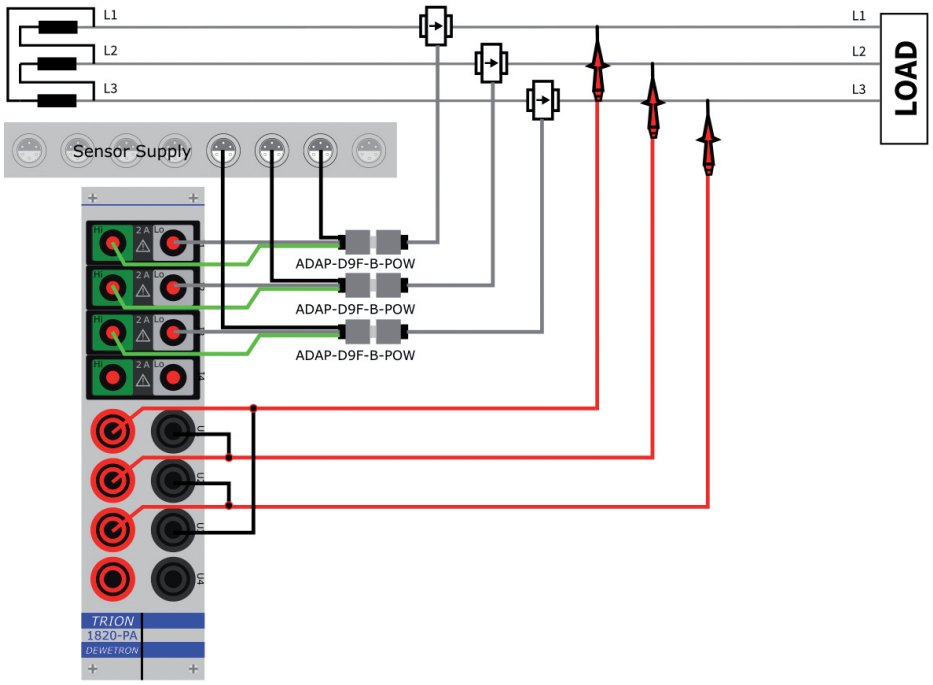
Three phase (3P3W) without neutral line



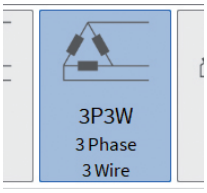
Group selection in OXYGEN Power:



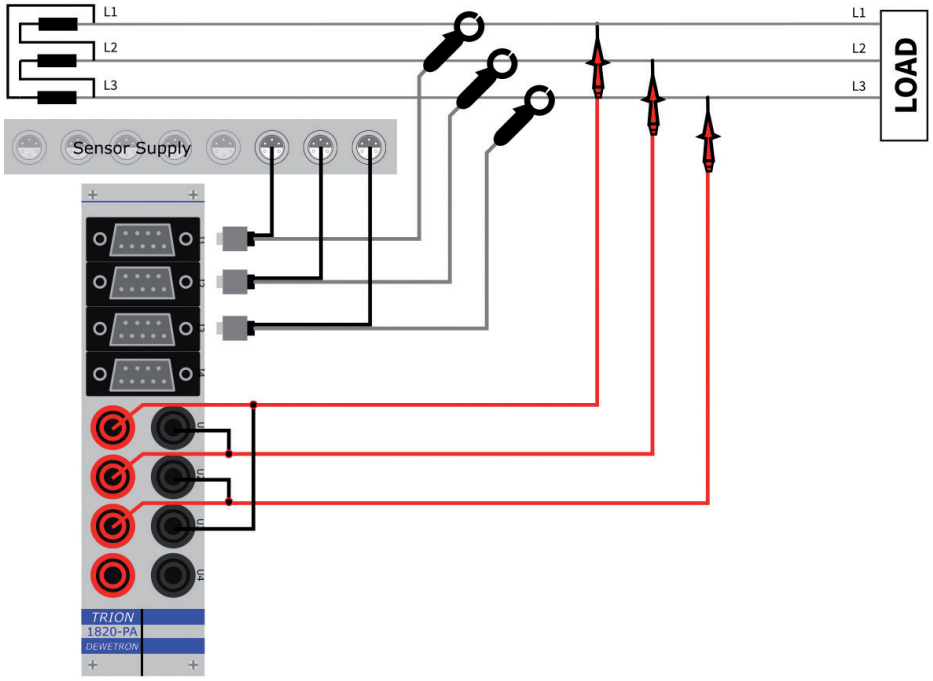
Three phase (3P3W) without neutral line, using current output transducer



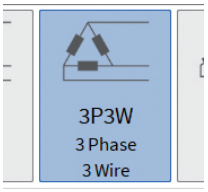
Group selection in OXYGEN Power:



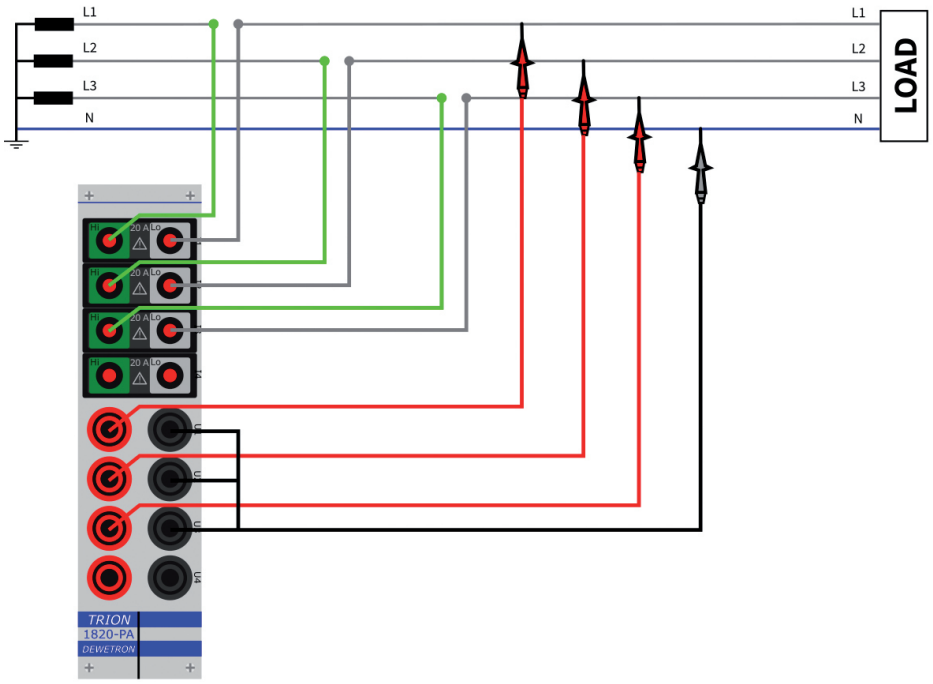
Three phase (3P3W) without neutral line, using voltage output transducers



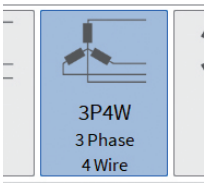
Group selection in OXYGEN Power:



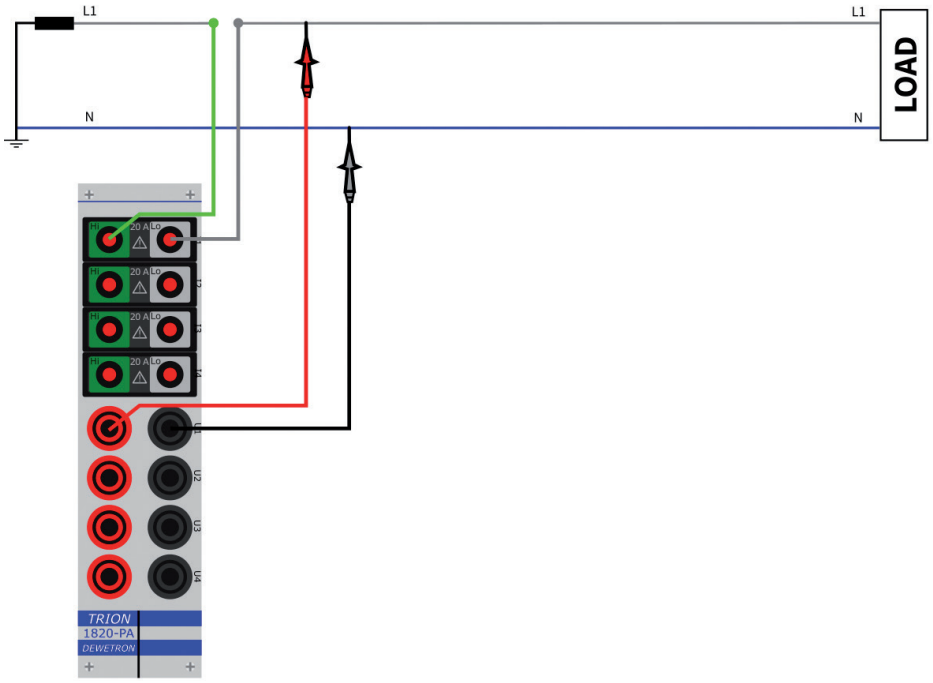
Three phase (3P4W) with neutral line



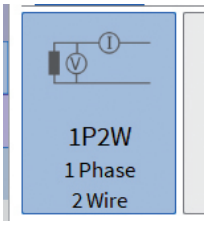
Group selection in OXYGEN Power:



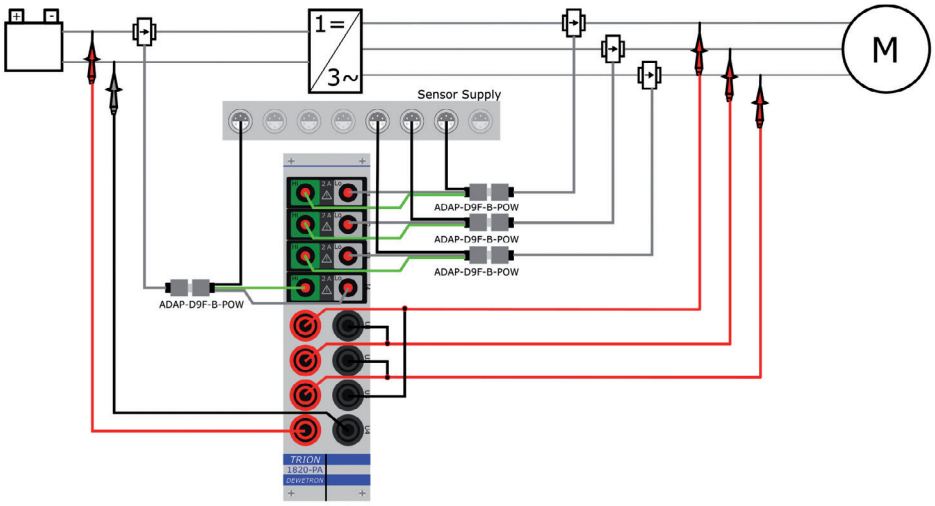
One phase (1P2W)



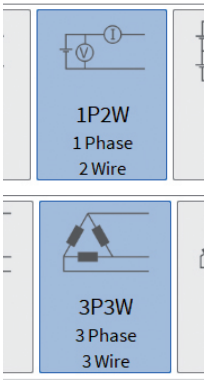
Group selection in OXYGEN Power:



Three phase and one phase (3P3W and 1P2W)



Group selection in OXYGEN Power:



Bessel/Butterworth filter characteristics for Power Analysis

The TRION family is equipped with DSP lowpass filters from 2nd to 8th order in Bessel or Butterworth configuration. The difference between these two filter types can be seen in the following figures.

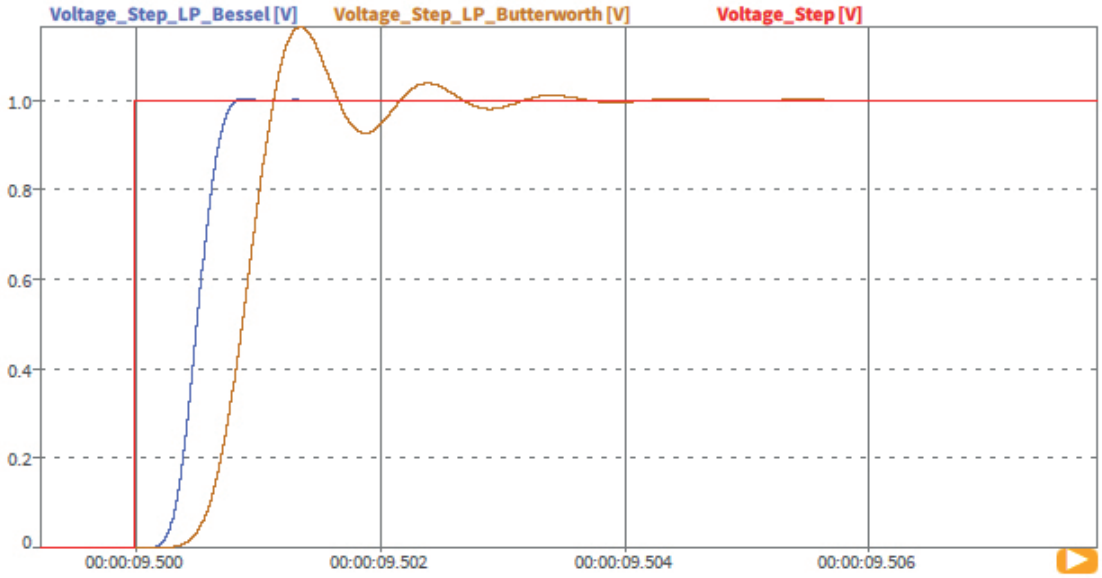


Figure 1: Step response of filter with 1000 Hz cutoff frequency and 8th order.

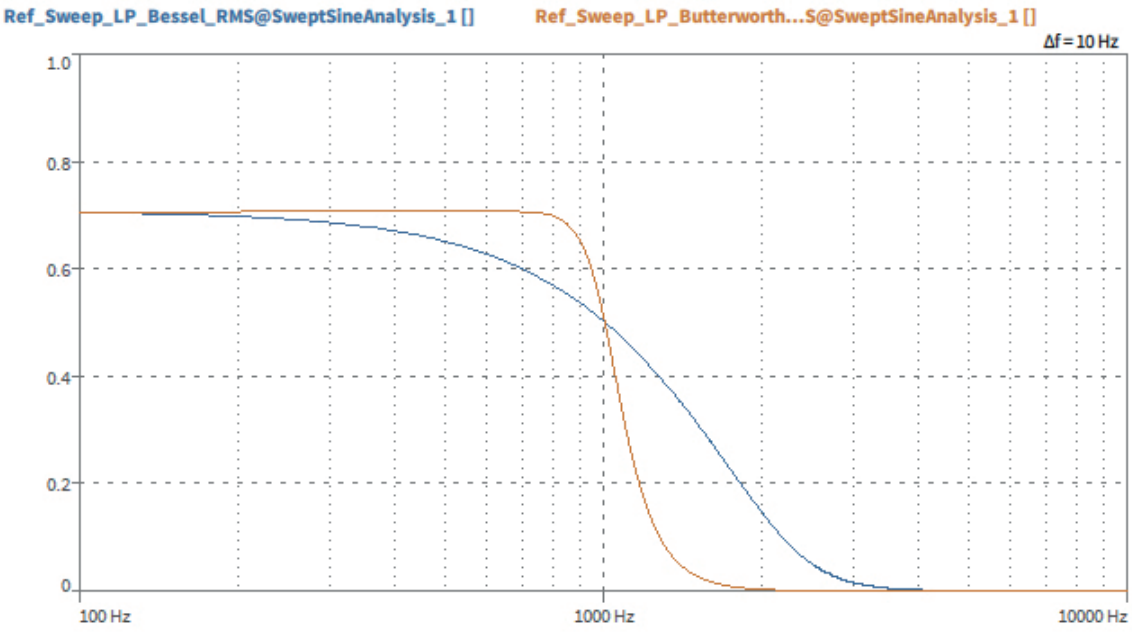


Figure 2: Frequency response of filter with 1000 Hz cutoff frequency and 8th order

	Bessel	Butterworth
Magnitude accuracy e.g. RMS-accuracy	😐	🙂
Step response reproduction e.g. PWM signal observation	🙂	😐

DEWE2-PA7 - Mixed signal power analyzer

> Modular high precision mixed signal power analyzer
> 7 slots for TRION™ acquisition modules
> Up to 12 power channels (U, I @ channel); expandable
> Integrated 9" multi-touch wide screen (1280 x 800)
> Sensor power supply (±15 V / +9 V)

System specifications

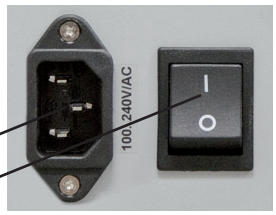
	DEWE2-PA7
Input channels	up to 12 voltage, 12 current and auxiliary inputs
Input specification	Supports all TRION™ series interface cards. Designed to operate with TRION-1820-POWER-4 series modules.
Open slots for TRION™ modules	7
High speed expansion	Prepared to connect one or more TRIONet at any time by SYNC interfaces
Quasi-static channel expansion	EPAD2 interface connector, CPAD2/3 via TRION-CAN
Sensor power supply	8 power supply connectors for connecting current clamps and transducers (±15 V / +9 V)
Main system [1)]	
PC configuration	Intel® Core™ i7 processor, 16 GB RAM 6 x USB3.0, 6 x USB2.0, 2 x LAN Ethernet, 1 x external DVI socket, 1 x RS232, 2 x PS/2, 2 x display port, AUDIO interface 64-bit Microsoft® Windows® 10 operating system (incl. 64-bit OXYGEN data acquisition software)
Data storage	1 TB HDD dedicated for data storage (upgrade to 4 TB HDD or 1 TB SSD available) 120 GB SSD for operating system and application software
Display	9“ multi-touch wide screen (1280 x 800)
Rated input voltage	100 to 240 VAC (max. 90 to 264 VAC), 400 W AC power supply
Dimensions (W x D x H) (with 19” mounting kit)	without feet: 441 x 427 x 177 mm (17.4 x 16.8 x 7 in.) 5U required (4U = unit + 1U = cooling)
Weight w/o TRION™ modules	typ. 15 kg (28.6 lbs)
Power consumption incl. modules	typ. 150 W (max. 300 W)
Environmental specification	
Operating temperature	0 to +50 °C, down to -20 °C with prewarmed unit
Storage temperature	-20 to +70 °C
Humidity	10 to 80 % non cond., 5 to 95 % rel. humidity
Max. altitude	2000 m (10000 ft)
Sine vibration[1)] (EN 60068-2-6)	Acceleration 20 m/s², Freq. 10 Hz - 150 Hz, Sweep 1 oct/min, 20 cycles
Shock[1)] (EN 60028-2-27)	Acceleration 30 g, duration 11 ms, pulse form half sine, 3 pumps/direction, 6 directions
Random vibration[1)] (EN 60721-3-2)	Class 2M2 (spectral acceleration density 1 m²/s³, frequency range 10 Hz-200 Hz, duration 30 min/direction)

[1)] Tested with SSD

Power supply

Standard AC power supply

400 W AC power supply	BEA-640
Input:	
Rated input voltage:	100 to 240 V_{AC} (max. 90 to 264 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:	max. 400 W
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)

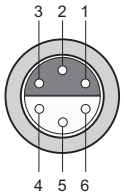


AC power supply

AC power switch

Sensor power supply

Output Power (SUM)	150 W
Output Current +15 V Line (Single/Sum)	1.5 A / 5 A
Output Current -15 V Line (Single/Sum)	1.5 A / 5 A
Output Current +9 V Line (Single/Sum)	0.6 A / 0.6 A
Output Current (Single Plug)	1.5 A



Lemo ERA.1S.306

Pin assignment
1: +15 V
2: -15 V
3: +9 V
4: DGND
5: n.c.
6: DGND

Compatible sensors/transducers (selection)

PA-IT-60/65	±15 V	
PA-IT-200/205	±15 V	
PA-IT-400/405	±15 V	
PA-IT-700	±15 V	
PA-IT-1000	±15 V	
PA-LF-310	±15 V	
SE-CUR-CLAMP-150-DC	±15 V	
SE-CUR-CLAMP-200-DC	±15 V	
SE-CUR-CLAMP-500-DC	±15 V	
SE-CUR-LFR	+9 V	

Known limitations PA-IT-1000

Due to the maximum aggregated output current of 5 A, not more than 4x PA-IT-1000 can be supplied in the absolute worst case due to the concurrency factor of the applied power system. The following applications can be met (selection) with nominal current due to a concurracy factor less than one:

> 4x 1-phase DC systems (4x PA-IT-1000 transducers)
> 4x 2-phase DC systems (8x PA-IT-1000 transducers)
> 2x 3-phase AC systems + 1x 1-phase DC system (7x PA-IT-1000 transducers)
> 1x 6-phase AC system + 1 x 1-phase DC system (7x PA-IT-1000 transducers)

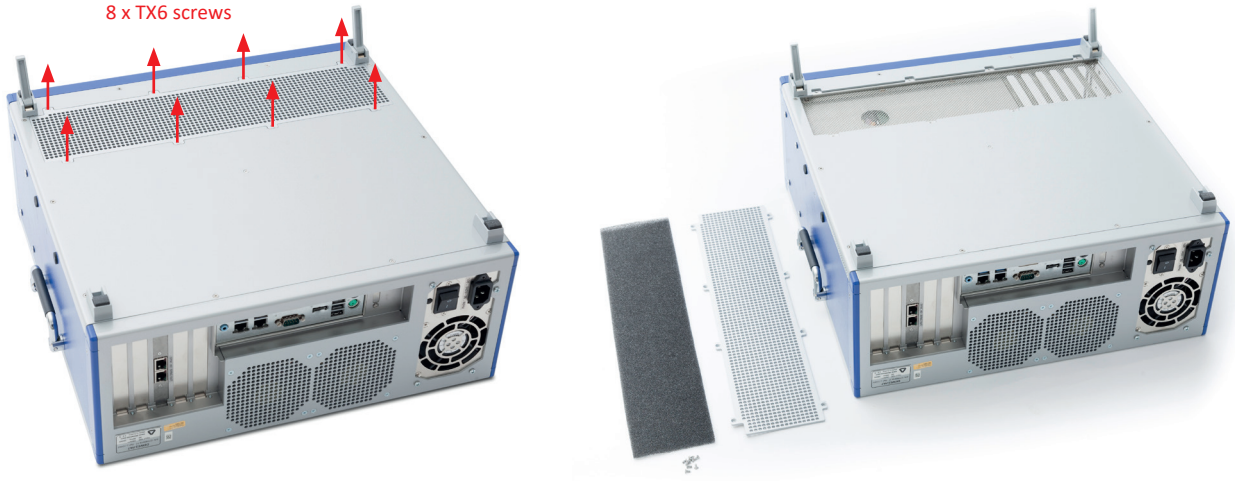
NOTE: Do not use the zero-flux transducer system without power supply. Induction of currents can damage the built-in electronics (see user manual).

NOTE: The maximum cable lenght from the transducer to the device is 5 m. Longer cable lenghts may cause a too high voltage drop.

Maintenance

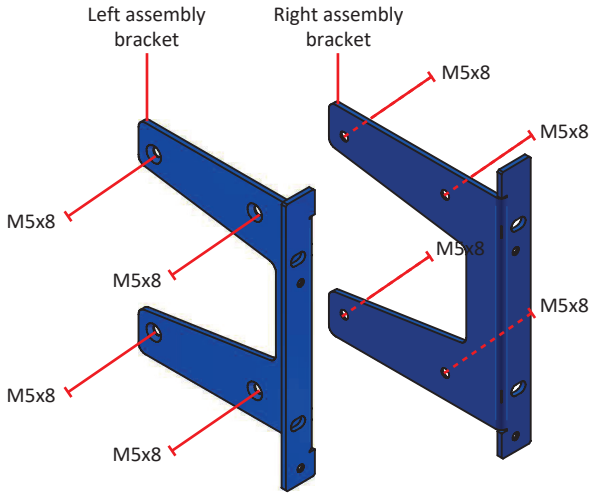
WARNING: *The DEWE2-PA7 must not be opened or disassembled except for cleaning the filter pad! The filter pad has to be checked regularly depending on environmental condition!*

Remove all 8 TX6 screws at the bottom panel and take out the louver with the filter pad.



To clean the filter pad use a dry velocity stream of air. Afterwards, make sure to reinstall the louver and filter pad.

Installing the optional 19" mounting kit



WARNING: *When installing the 19" mounting brackets, the maximum lenght for screws is 8 mm! If any screw gets lost replace it with M5x8 countersunk head screw only. Otherwise the TRION™ series cards or the powersupply could get damaged!*

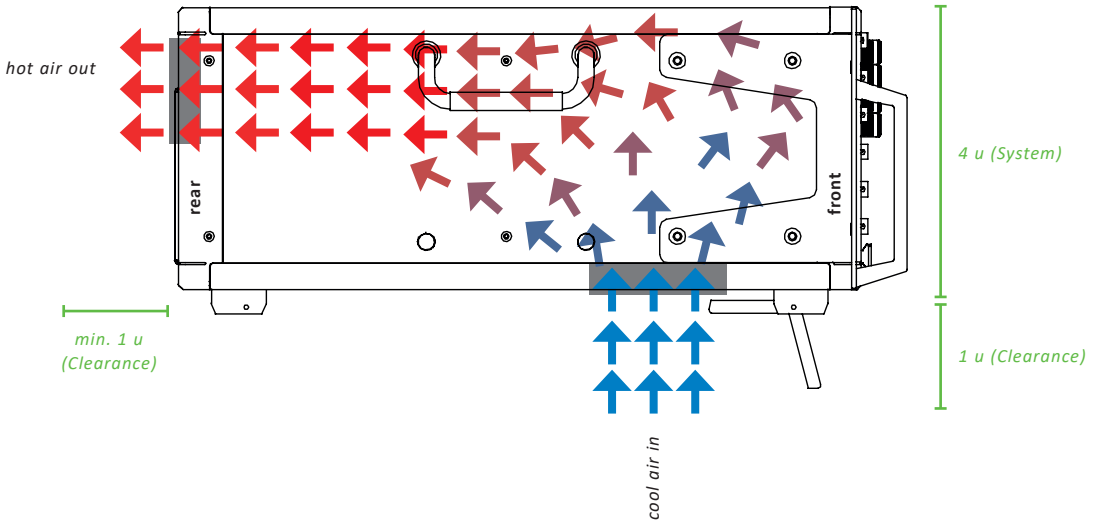
Cooling considerations

The intake vent of the DEWE2-PA7 is on the bottom of the chassis, where the cooling exhaust vent for the DEWE2-PA7 is on the rear of the chassis.

CAUTION:

Adequate clearance between the chassis and surrounding equipment or blockages must be maintained to ensure proper cooling of the chassis power supply as well as the modules plugged into the chassis!

DEWE2-PA7 side view



NOTE:

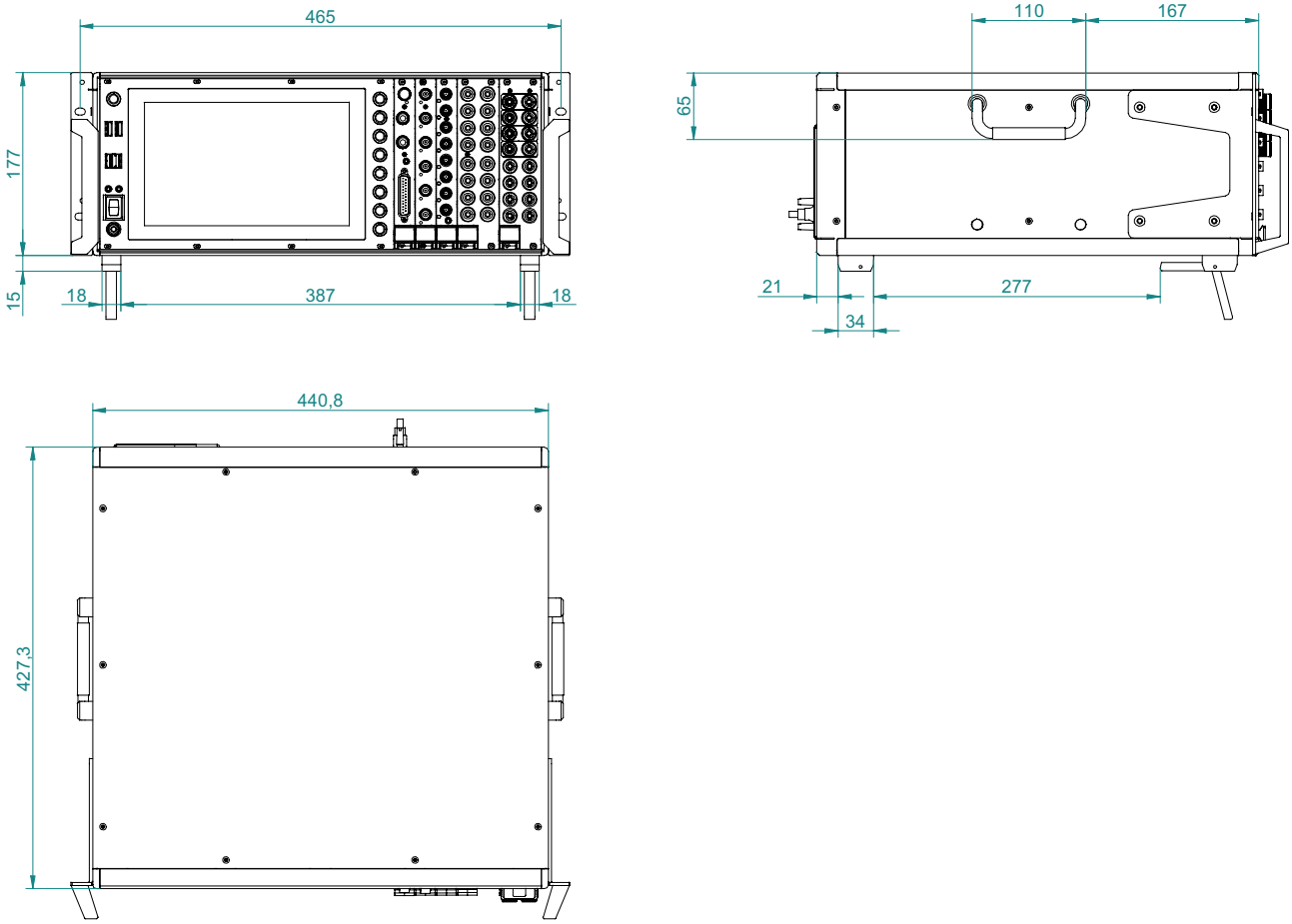
When installing the DEWE2-PA7 into a 19" cabinet please keep in mind that the unit is siphoning air from the bottom (see schematic above). Due to this circumstances 5 u are required for one system (4 u = system + 1 u = cooling)! Otherwise the system may overheat and could get damaged!

System recovery

For more information regarding a total recovery please refer to the corresponding total recovery technical reference manual shipped with your DEWE2 system.

MAIN SYSTEM

Dimensions



* Dimensions in mm
(1 inch = 25.4 mm)

CE-Certificate of Conformity

CE

Manufacturer: **DEWETRON GmbH**

Address:

Parkring 4
8074 Grambach, Austria

Tel.: +43 316 3070 0
Fax: +43 316 3070 90
e-mail: sales@dewetron.com
http://www.dewetron.com

Name of product: **DEWE2-PA7**

Kind of product: *Mixed signal power analyzer*

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

2014/35/EU
"Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits"

2014/30/EU
"Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast)"

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

LV	Safety	IEC 61010-1:2020	
EMC	Emissions	EN 61000-6-4	EN 55011 Class B
	Immunity	EN 61000-6-2	Group standard

Graz, September 18, 2017
Place / Date of the CE-marking

Ing. Thomas Propst / Manager Total Quality

NOTES