DEWETRON

DEWE3-M8s / DEWE3-M12s

VALID FOR REVISION 1.X

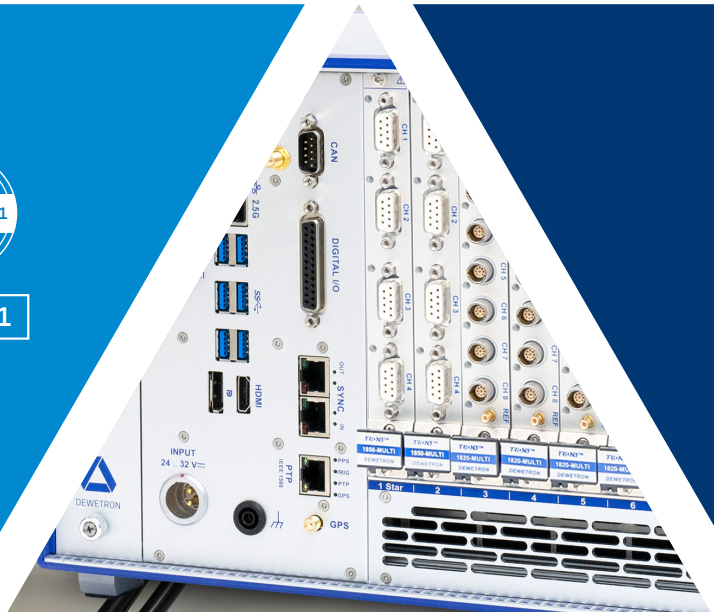
TECHNICAL REFERENCE



EN ISO 14001

ISO 9001





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Preface

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. However, this manual cannot and is not intended to replace adequate training.

This documentation contains operating as well as safety and care instructions that must be observed by the user. Faultless operation can only be guaranteed by observing these instructions.

Intended use

This product is used for measuring of different physical and/or electrical sizes (depending on model and/or configuration).

The connection is depending on the model and/or configuration and is done via safety banana plugs, BNC connectors, D-SUB connectors, SMB connectors, µdot connectors, LEMO® connectors or RJ-45 connectors.

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Safety

Safety instructions

The following section contains warning and safety instructions that must be observed by the user. Faultless operation can only be guaranteed if these instructions are observed.

General safety instructions

- 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.
- Maintenance is to be executed by qualified staff only.
- DO NOT use the system if equipment covers or shields are removed. If you assume the system is damaged, have it examined by authorized personnel only.
- 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).
- Reinstall filler panels of unused TRION slots to guarantee proper cooling of the installed modules. The warranty is void if the modules overheat due to missing filler panels.
- 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.
- The warranty is void if damages caused by disregarding this manual. For consequential damages NO liability will be assumed.
- The warranty is 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 TRION modules.
- Prevent using metal bare wires as there is a risk of short-circuit 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 refer to the specifications.
- Make sure that your hands, shoes, clothes and as well as the floor, the system or measuring leads, integrated circuits etc. are dry.
- Use measurement leads or measurement accessories aligned to the specification of the system only. Fire hazard in case of overload.
- 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.
- The measuring systems are not designed for use at humans and animals.
- Contact a professional if you have doubts about the method of operation, safety or the connection of the system.
- Handle the product with care. Shocks, hits and dropping it even from an already lower level may damage your system. For exact values refer to the enclosed specifications.
- Also consider the detailed technical reference manual as well as the security advices of the connected systems.

Electrical safety instructions

- 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, 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).
- Note the characteristics and indicators on the system to avoid fire or electric shocks. Before connecting the system, carefully read and understand 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 or the main power switch separates the system from the power supply. Do not block the power cord or main switch, since it has to be accessible for the users.
- 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).
- Supply overvoltage category is II.
- The system must be connected and operated to an earthed wall socket at the AC mains power supply only (except for DC systems).
- 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.
- 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.
- Maximum input voltage for measuring cards are 70 VDC and 46.7 V_{PEAK}
- The electrical installations and equipments in industrial facilities must be observed by the security regulations and insurance institutions.

Ambient safety notices

- This 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.
- 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.
- 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 etc.
- DO NOT use the system in rooms with flammable gases, fumes or dust or in adverse environmental conditions.
- 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 use of the measuring system in schools and other training facilities must be observed by skilled personnel.

Safety notices during operation

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

Standards and norms

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 welltried”, 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.

Typographic conventions

Safety and warning notices

WARNING



Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION



Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

Notices

NOTICE

This text indicates situations or operation errors which could result in property damage or data loss.

INFORMATION

This text indicates important information or operating instructions. Not observing these instructions could inhibit or impede you from successfully completing the tasks described in this documentation.

Symbols



Denotes a warning that alerts you to take precautions to avoid injury. When this symbol is shown on the product, refer to the technical reference manual (ISO 7000-4034; 2004-01).



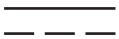
Indicates hazardous voltages.



Observe precautions for handling electrostatic sensitive devices.



Indicates the chassis terminal (IEC 60417-5020; 2002-10).



Direct current (IEC 60417-5031; 2002-10)



Alternate current (IEC 60417-5032; 2002-10)



Both direct and alternating current (IEC 60417-5033; 2002-10)



Three-phase alternating current (IEC 60417-5032-1; 2002-10)



Protective conductor terminal (IEC 60417-5019; 2006-08)



Equipment protected throughout by double insulation or reinforced insulation (IEC 60417-5172; 2003-02)

On (power) (IEC 60417-5007; 2002-10)



Off (power) (IEC 60417-5008; 2002-10)

General information

Environmental considerations

The following information refers to the environmental impact of the product and the product end-of-life handling. Observe the following guidelines when recycling a DEWETRON system:

- System and components recycling



The production of these components has 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 of Electrical and Electronic Equipment (WEEE). Further information about recycling can be found 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.

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.

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.

Legal information

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8074 Grambach
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System setup

Key facts

- Designed for automotive application
- Compact and flexible configuration
- Powerful computer integrated for online data processing
- Battery support for stand-alone operation

System specification

		DEWE3-M8s	DEWE3-M12s
General			
Input channels		Up to 64 high-speed channels (100 S/s to 5 MS/s)	Up to 96 high-speed channels (100 S/s to 5 MS/s)
Input specification		Supports all TRION/TRION3 (high-speed) series interface modules. Optimized to operate with high-speed TRION3 series modules.	
Open slots for TRION(3) modules		8	12
High-speed channel expansion		Combine multiple DEWE3-M8s via OXYGEN-NET	Combine multiple DEWE3-M12s via OXYGEN-NET
Low-speed channel expansion (100 Hz)		XR modules	
Data storage		3 removable drive bays equipped with – 1 TB SSD-PCIe (2 TB optional) – 512 GB SSD for operating system (1 TB optional)	
Gapless storing rate		800 MB/s	
Power supply			
Input		– Isolated power supply with wide range input from 11..32 V_{DC} (max. 10..36 V_{DC}) – USP function with battery charger and 2 integrated battery bays (batteries optional) – 2 separate power inputs that can be used mutually as a backup power supply – External AC power supply included	
Batteries (optional)		2x Lithium-ion 28.8 V/81 Wh	
System			
Computer		Intel Core i7, 16 GB RAM[1)]	
Connectivity		1x interface for external monitor, 1x DisplayPort, 1x Gbit Ethernet, 1x 2.5 Gbit Ethernet, 6x USB 3.2, 1x Wi-Fi Antenna, 1x EPAD, 1x TRION-SYNC, 1x digital IN/OUT	
Operating system		Windows 10, Windows 11, Linux is optional	
MTBF[2)]	without fans	35,883 h	27,785 h
	with fans (5-year maintenance)	28,178 h	21,683 h
Dimensions (w x d x h)		339 x 281 x 239 mm (13.3 x 11.1 x 9.4 in)	461 x 281 x 239 mm (18.1 x 11.1 x 9.4 in)
Weight w/o TRION modules		Typ. 9.1 kg (20.06 lbs)	Typ. 12 kg
Environmental specifications			
Operating temperature		0 °C to +50 °C, down to -20 °C with pre-warmed unit	
Storage temperature		-20 °C to +70 °C	
Humidity		10 % to 80 %, non condensing; 5 % to 95 % rel. humidity	

Tab. 1: System specifications DEWE3-M8s/M12s

	DEWE3-M8s	DEWE3-M12s
Shock and vibration tests		
Sine vibration test; EN 60068-2-6:2008		
Shape	Sine	
Frequency range	10–150 Hz	
Acceleration	2g	
Sweep rate	1 oct/min	
Duration test in 3 directions	20 cycles	
Random vibration test; EN IEC 60721-3-2:2018; Class 2M4		
Spectral acceleration density	1.0 $(m/s^2)^2/Hz$ @ 10..20 Hz frequency range	
	0.5 $(m/s^2)^2/Hz$ @ 500..2000 Hz frequency range	
Duration	30 minutes/direction	
Shocktests; EN 60068-2-27:2009		
Pulse form	Half-sine	
Acceleration amplitude	15g	
Duration	11 ms	
Direction	3 bumps each direction, 6 directions in total	

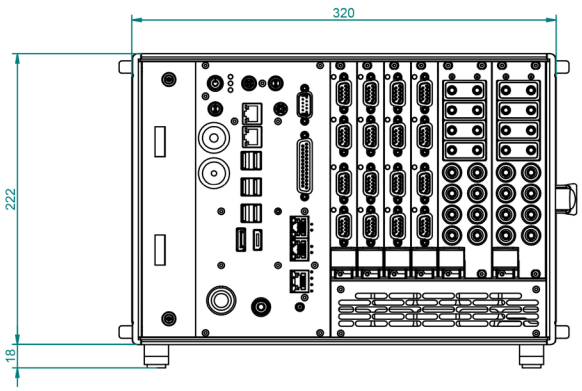
Tab. 1: System specifications DEWE3-M8s/M12s

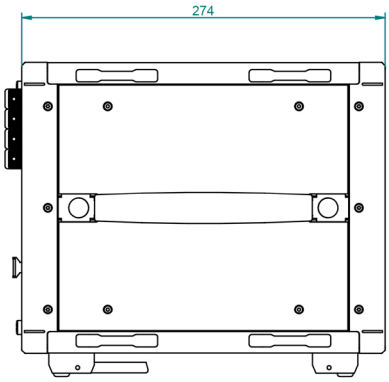
[1] RAM upgrade option RAM-16G-32G recommended for

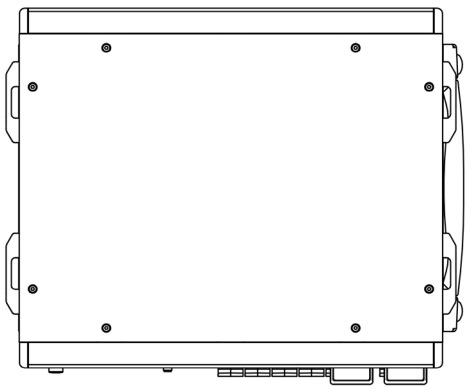
- Systems with 4 or more TRION3-1810M-POWER modules – each channel sampling at 10 MS/s
- Systems with 10 or more TRION3-1820-MULTI-8-L0B modules – each channel sampling with 2 MS/s
- 450 MB/s or more data transfer rate

[2] Meantime between failure

Dimensions*

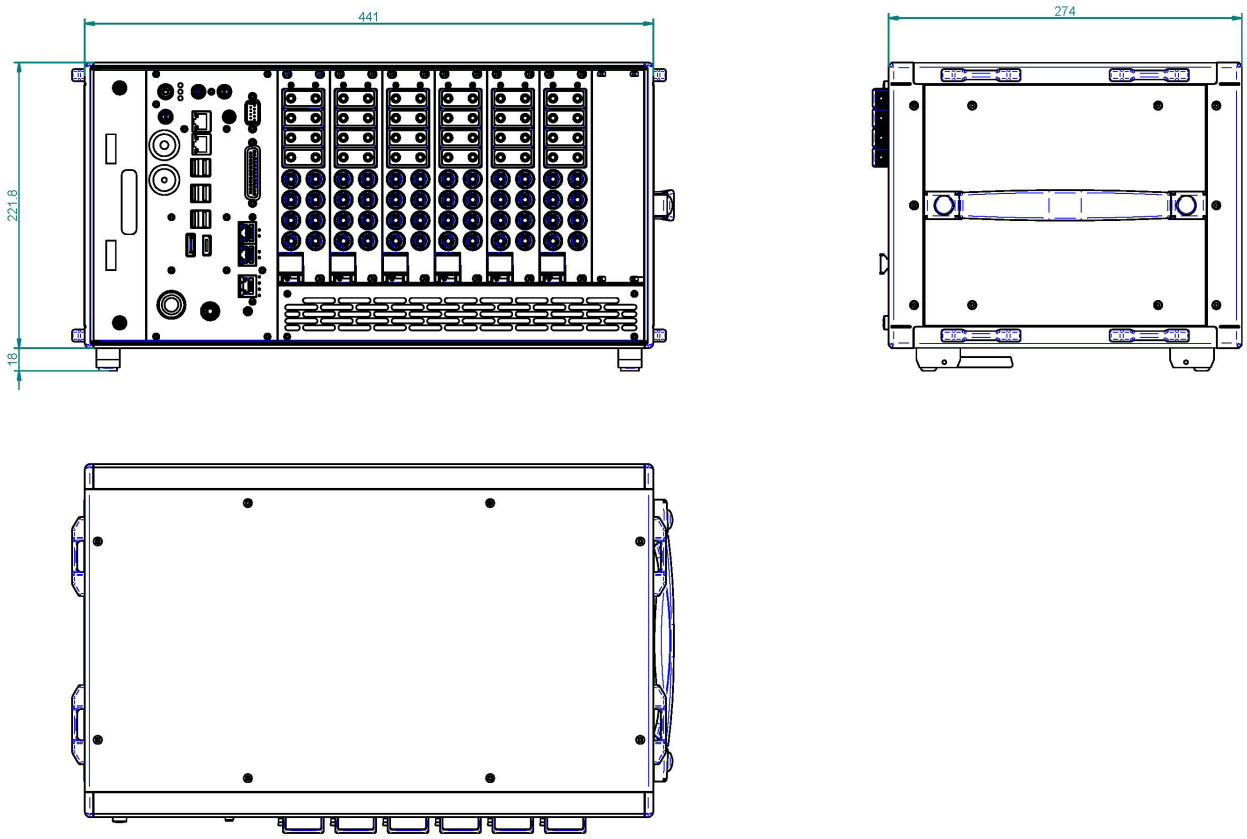






*) Dimensions in mm (1 inch = 25.4 mm)

Fig. 1: Dimensions DEWE3-M8s



*) Dimensions in mm (1 inch = 25.4 mm)

Fig. 2: Dimensions DEWE3-M12s

Block diagram

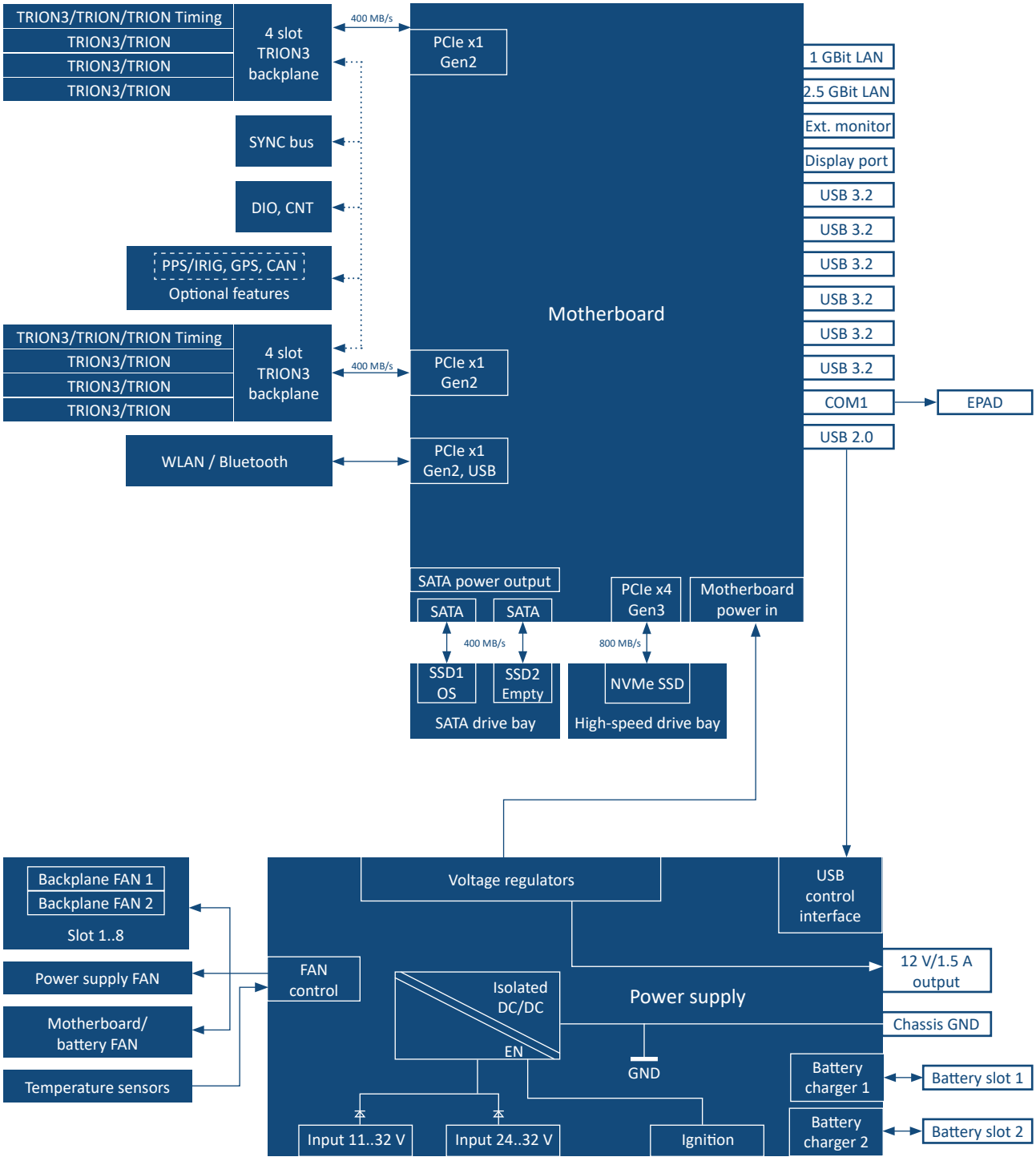


Fig. 3: Block diagram DEWE3-M8s

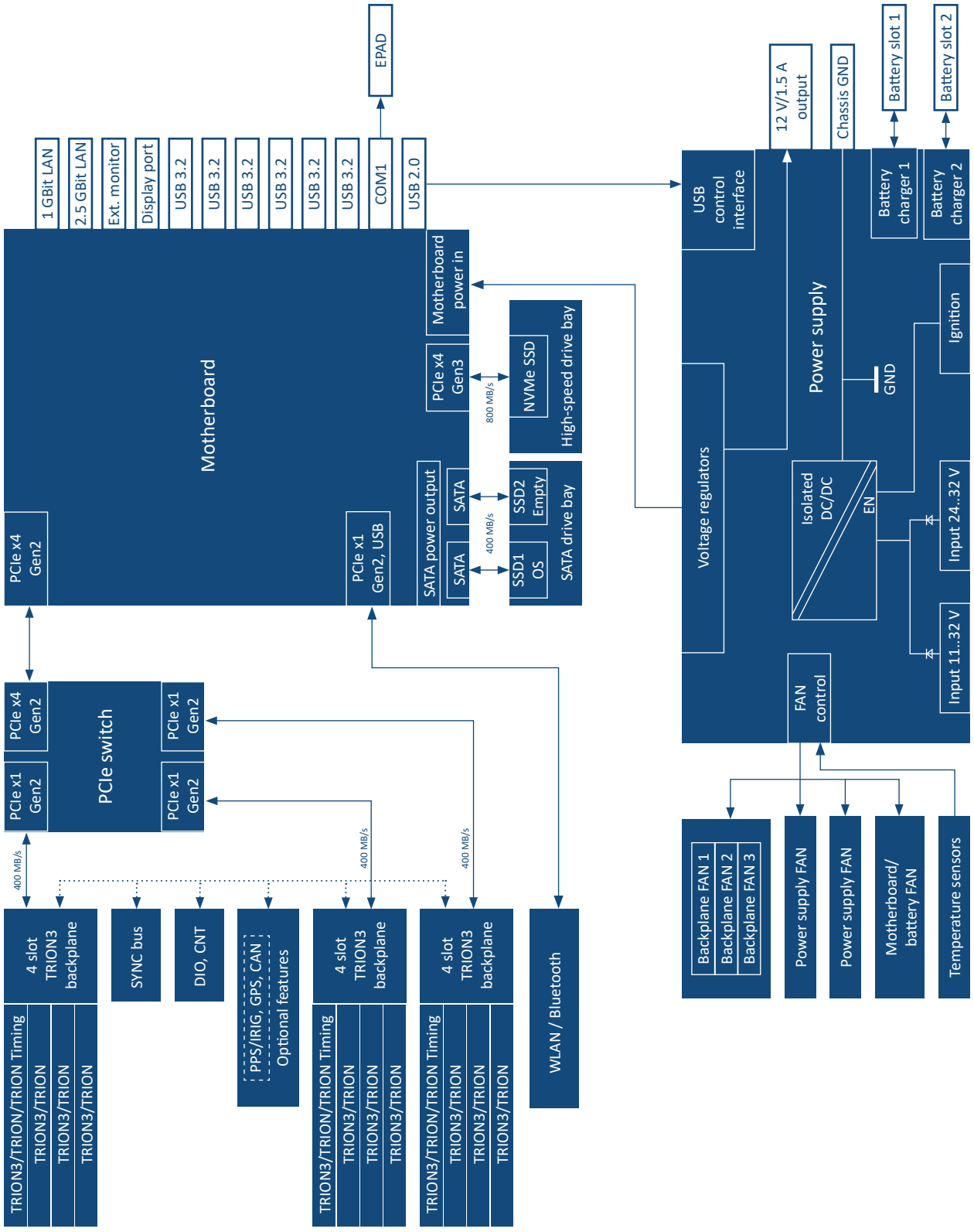


Fig. 4: Block diagram M12s

Connections and ports

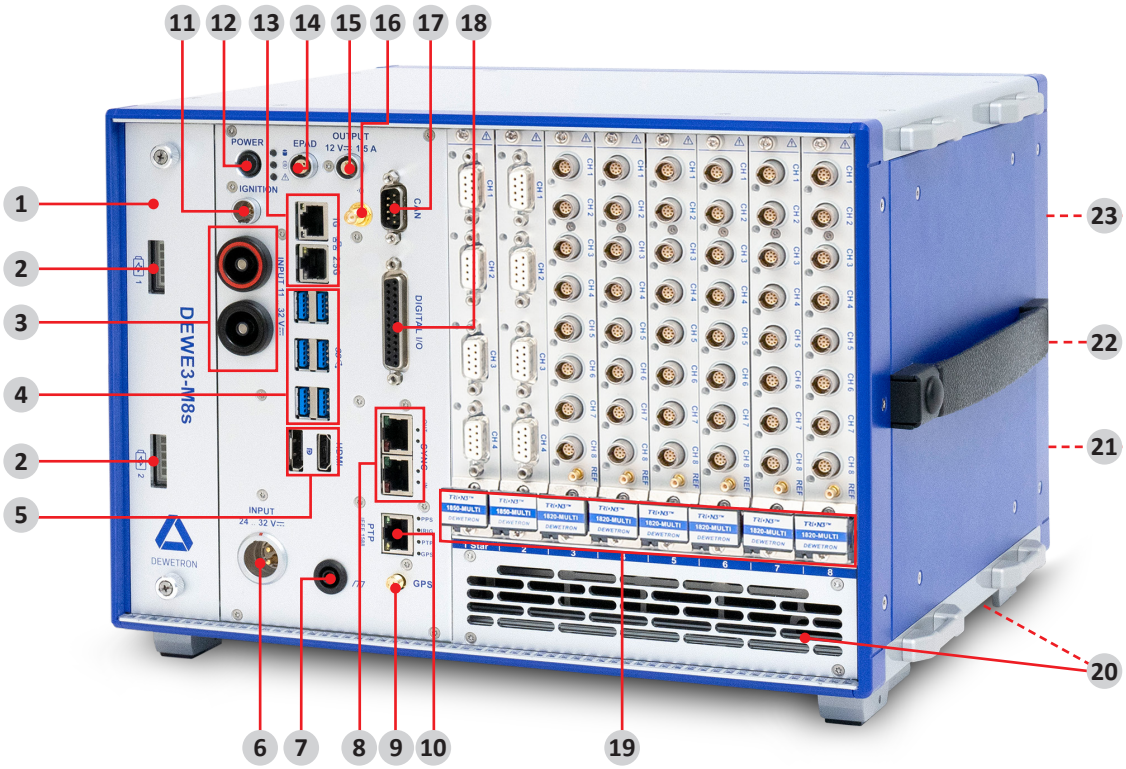


Fig. 5: Connections and ports DEWE3-M8s/M12s

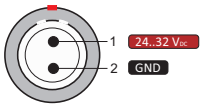
1. Battery bay
2. Battery (optional)
3. Power supply input 11..32 V (red +, black ground)
4. USB 3.2 interface connectors
5. Connectors for external monitor
6. Power supply input 24..32 V
7. Chassis terminal (ground connection)
8. SYNC I/O interface (TRION SYNC-BUS)
9. GPS antenna (optional)[1)]
10. PTP/IEEE 1588 (optional)[1)]
11. Ignition connector
12. Power on/off push button and status LEDs
13. Gigabit Ethernet LAN connectors
14. EPAD connector (LEMO)
15. Power supply output for accessories 12 V
16. Wi-fi antenna
17. CAN interface (D-SUB-9) (optional)[1)]
18. Digital I/O connector (D-SUB-25)
19. 8 or 12 TRION/TRION3 series module slots[2)]
20. Intake vents with filter pads (on front and bottom)
21. Exhaust air (on backside)
22. SSD drive bays (on backside)
23. Nameplate (on backside)

1) The interfaces are available on every device, but are only functional if the corresponding option has been purchased.

2) DEWE3-M8s: 8 slots; DEWE3-M12s: 12 slots

Power supply

Power supply input 24..32 V



The DEWE3-M8s/M12s is delivered with a standard external AC/DC power supply (100–240 V_{AC} IN).

Fig. 7: Pin assignment for power supply input connector 24..32 V

Internal DC power supply

Internal DC power supply for DEWE3-M8s

450 W DC power supply	
Input	
– Rated input voltage	11..32 V_{DC} (max. 10..36 V_{DC})
– Input frequency	DC
– Power	450 W
– Connector	2-pin male LEMO EGJ.3B.302

Tab. 2: Specifications internal 450 W DC power supply

Internal DC power supply for DEWE3-M12s

550 W DC power supply	
Input	
– Rated input voltage	11..32 V_{DC} (max. 10..36 V_{DC})
– Input frequency	DC
– Power	550 W
– Connector	2-pin male LEMO EGJ.3B.302

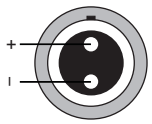
Tab. 3: Specifications internal 450 W DC power supply

External AC/DC power supply

External AC/DC power supply for DEWE3-M8s



Power supply pin assignment:



Connector type
2-pin male
LEMO FGJ.3B.302.CLLD92

Fig. 8: External AC/DC power supply for DEWE3-M8s

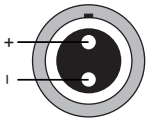
450 W AC/DC power supply	
Input	
– Rated input voltage	100 .. 240 V_{AC} (max. 90 .. 264 V_{AC})
– Input frequency	50 .. 60 Hz
– Current	max. 7 A
Output	
– Voltage	24 V_{DC}
– Current	18.75 A (max. load)
– Output power	max. 450 W

Tab. 4: Specifications external 450 W AC/DC power supply

External AC/DC power supply for DEWE3-M12s



Power supply pin assignment:



Connector type
2-pin male
FGJ.3B.302.CYMD11

Fig. 9: External AC/DC power supply for DEWE3-M12s

600 W AC/DC power supply	
Input	
– Rated input voltage	100 .. 240 V_{AC} (max. 90 .. 264 V_{AC})
– Input frequency	50 .. 60 Hz
– Current	max. 7 A
Output	
– Voltage	24 V_{DC}
– Current	25 A (max. load)
– Output power	max. 600 W

Tab. 5: Specifications external 600 W AC/DC power supply

Power supply input 11..32 V



At low input voltages, a higher current is required to operate the system. This input is designed for currents up to 50 A. The required cable POW-CBL-KBT6ARN-OE-2 is available as an option.

The two inputs (24..32 V **(7)** and 11..32 V **(3)**) can be used together to enable a back-up of the input voltage.

INFORMATION

The mating connector is automatically locked.

Example

The device is supplied with 12 V from the car (input socket 11..32 V) **(2)**. After a successful test drive, the device is reconnected to the external power supply unit (input socket 24..32 V **(6)**). The device is then supplied by the external

power supply unit and does not put any further strain on the car's battery.

Power supply output for accessories 12 V

Accessories are supplied with 12 V_{DC} via an LEMO EGG.1B.302 connector. It is fused with an 1.5 A self-recovering fuse.

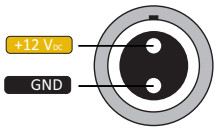


Fig. 10: Pin assignment for accessoies power supply output

Mating connector:

- LEMO FGG.1B.302.CLAD52Z (for cable diameter 4.1 to 5.0 mm)
- LEMO FGG.1B.302.CLAD62Z (for cable diameter 5.1 to 6.0 mm)

Power on/off push button and status LEDs

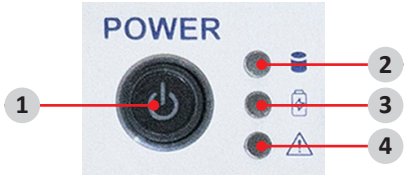


Fig. 11: Power on/off push button and status LEDs

1. Power on/off push button
2. SSD activity
3. Battery status LED
4. System status LED

Power on/off push button

The power on/off push button at the front of the system is used to switch the system on and off. It only works if the main power switch **(11)** on the rear of the instrument is switched to position 'I'.

When the mainboard is switched on, the on/off button lights up blue. To switch the system on, press the button. To shut it down, press the button again; to immediately switch it off, press the button for longer than 4 seconds.

SSD activity LED

The SSD activity LED illuminates whenever the solid state drive or is being read from or written to.

NOTICE

To avoid data loss, do not remove the battery or disconnect the device from the power supply while the operating system is still accessing files on the drive.

Battery status LED

The battery status LED displays the following statuses:

Color/mode	Status
GREEN (solid)	Batteries fully charged
GREEN (flashing)	Batteries charging
YELLOW (solid)	Discharging batteries
YELLOW (flashing)	Charging suspended

Color/mode	Status
RED (solid)	Batteries critically low
RED (flashing)	Batteries low warning
NONE (off)	No battery installed

Tab. 6: Battery status LED indication

System status LED

Colour	Status	Comment
GREEN (solid)	System powered	Wait until the light goes off before removing TRION(3) boards.
GREEN (flashing)	Motherboard start failed	Motherboard startup failure, remove all power and try again. Contact support if it still persists.
YELLOW (flashing)	Motherboard shutdown failed	Motherboard shutdown failure, motherboard still running after the power button was pressed. A program might prevent the shutdown of Windows.
RED (solid)	Battery error status	One or both batteries signal an error. Remove and reinsert the batteries. Remove battery if problem persists.
RED (solid)	Critical system state	Critical Problem appeared, shutdown the system and remove all power (external and batteries), Contact support if problem persists.

Tab. 7: System status LED indication

NOTICE

Do not remove TRION3/TRION measurement boards until the system status LED has gone out. Disregarding this can damage the device or the card. Do not remove or install cards while the LED is lit.

Buzzer

The built-in buzzer indicates the following statuses:

Beep	Status
1x beep tone	Low battery alarm
2x beep tone	Critical battery alarm
3x beep tone	Critical system alarm

Tab. 8: Buzzer

Ignition connector

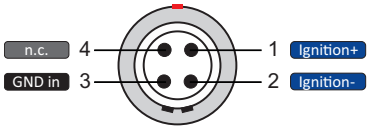


Fig. 12: Ignition connector

If connected to a vehicle, the ignition function can be used to prevent the measuring device from discharging the vehicle's battery if the engine is not started.

To do this, the ignition+ pin (1) must be connected to the vehicle's ignition signal line and the ignition- pin (2) to the vehicle ground, which is also connected to pin (3).

Mating connector and cable is available separately (item no. POW-CBL-1B304F-B-2).

INFORMATION

Starting the measuring system with the function is currently not supported.

Battery bay

The DEWE3-M8s/M12s has 2 slots for smart battery packs. The batteries are available as an option and must be ordered separately (item no. BAT-28V-81WH). For more information about the batteries, refer to *Battery (optional) on page 22*.

Battery (optional)



The device can optionally be equipped with up to 2 intelligent rechargeable batteries (BAT-28V-81WH option), whose charge status can be displayed without a separate device. The 5-segment LCD charge level indicator is always active unless the battery is in switch-off mode.

The batteries are hot swappable. Under normal conditions, the system can be operated with a single battery. This allows operation without interruption if the batteries are replaced one after the other.

NOTICE

Only use original batteries or replacements from DEWETRON to avoid damages (Li-ion; item code BAT-28V-81WH).

For externally charging the batteries a charger is also available (item no. BAT-28V-CHARGER-1).

LCD indicator	Status
	Between 1 and 20 % charge, 1 LCD segment is filled
	21–40 % charge, 2 LCD segments are filled
	41–60 % charge, 3 LCD segments are filled
	61–80 % charge, 4 LCD segments are filled
	81–100 % charge, all 5 LCD segments are filled

Tab. 9: Battery status

The LCD charge level indicator will also flash the most significant segment during charge. An intelligent battery controller, integrated in our DEWETRON systems, takes care of the charging and discharging process in order to ensure maximum battery performance and life time.

NOTICE

The DEWE3-M8s/M12s is designed to minimize the load on the batteries when the device is switched off. Nevertheless, it is recommended to remove the batteries from the slot if the device is not used for longer than one month.

For more information on how to exchange the batteries refer to *Installing/removing a battery on page 37*.

Sync and digital interfaces

Overview

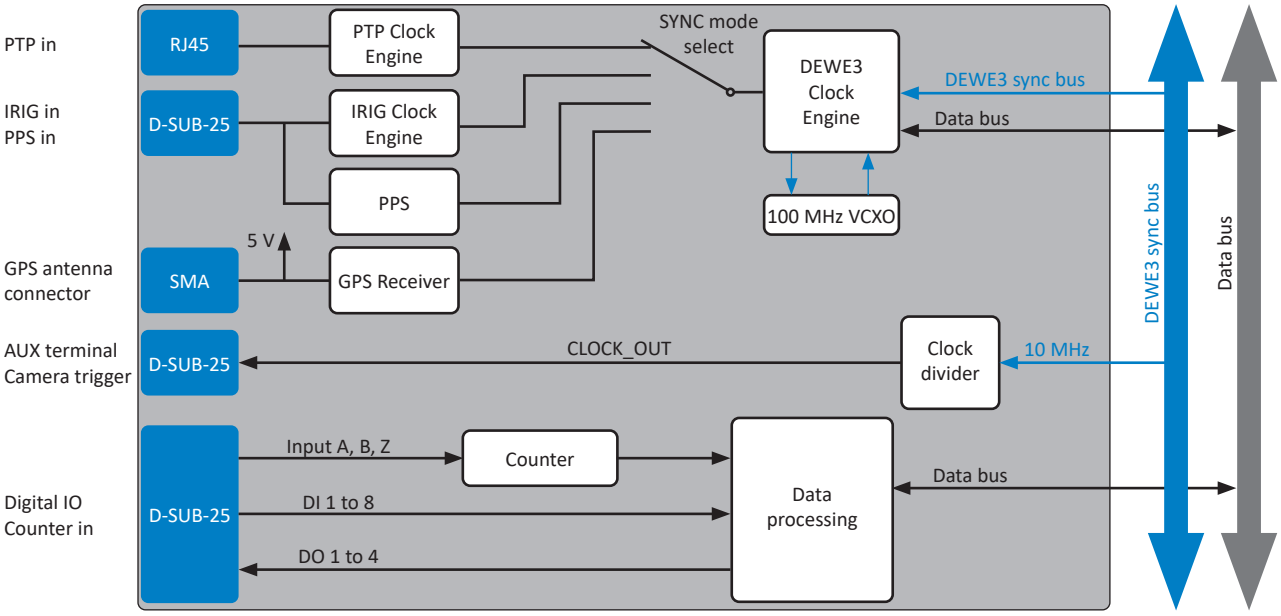


Fig. 13: Signal routing

Active sync LEDs

Active mode LEDs	
	The 4 LEDs indicate the active synchronization source and the current synchronization status by flashing the respective LED.

Tab. 10: Active sync LEDs

SYNC I/O interface (TRION SYNC-BUS)

The TRION SYNC-BUS allows an easy high-speed channel expansion with TRIONet front-ends or distributed high channel-count systems featuring OXYGEN with the OXY-OPT-NET software option. SYNC cables are not included an have to be ordered separately.

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

Tab. 11: LED indication

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.

GPS antenna (optional)

The DEWE3-OPT-GPS function is an optional feature and provides the following synchronization input modes:

GPS specifications		
	Synchronization input modes	GPS
	Supported GNSS signals	GPS/Glonass/BeiDou/QZSS
	PPS accuracy	100 ns
	Refresh rate	1 Hz
	Position accuracy (horizontal CEP)	**INFORMATION** CEP 50 %, 24 h static, roof antenna
	– Autonomous	<2.5 m
	– Differential	<2.5 m
	Input connector GPS	SMA for GPS antenna

Tab. 12: GPS specifications

PTP/IEEE 1588 (optional)

The DEWE3-OPT-IRIG/PTP function is an optional feature and provides the following synchronization modes:

- PTP/IEEE 1588
- gPTP (IEEE 802.1 AS)
- IRIG

PTP/IEEE 1588 specifications		
	Profile	gPTP (IEEE 802.1 AS), PTP (end-to-end)
	IP mode	Multicast, Unicast
	Protocol	UDP / IPv4
	Delay mechanism	End-to-end
	IP address method	DHCP
	Connector	RJ-45 Ethernet plug for 10 / 100 Mbit Ethernet connection; only for synchronization, no data transfer possible
	Programmable correction limit	10 ns to 500 ms
	PTP output	10 ns to 500 ms

Tab. 13: PTP/IEEE 1588 specifications

IRIG input specifications		
Supported codes	IRIG code A or B; DC (A007, B007)	
Compatibility (DC code)	DC level shift (edge detection); TTL / CMOS compatible	
	Low: <0.8 V	High: >2 V

Tab. 14: IRIG input specifications

Digital I/O connector (D-SUB-25)

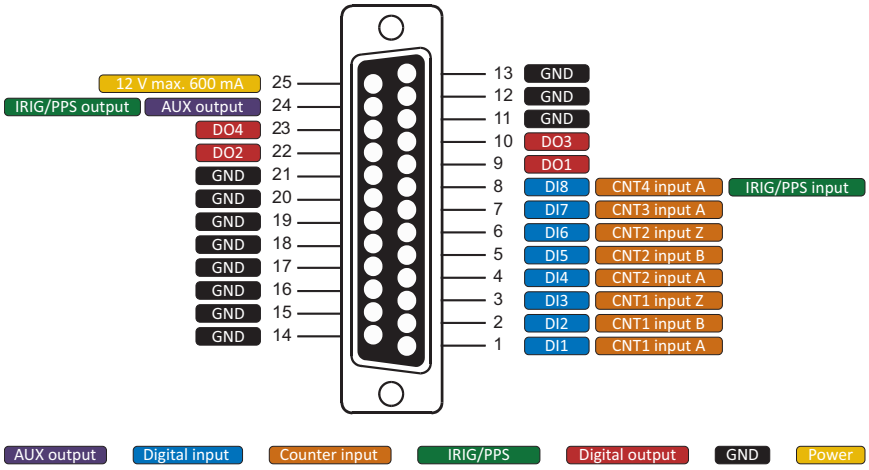


Fig. 14: Pin assignment D-SUB-25 connector

NOTICE

Combined load at D-SUB-9 socket CAN and D-SUB-25 socket digital I/O max. 600 mA at 12 V.

Digital I/O connector specifications		
Digital IN	Digital input	8 CMOS/TTL compatible digital inputs; weak pull-up via 100 kΩ
	Overvoltage protection	±30 V_{DC}, 50 V_{PEAK} (100 ms)
	Counter	4 counter channels; TTL input; shared with digital inputs
	Counter modes	
	– Waveform timing	Period, frequency, pulse width duty cycle and edge separation
	– Sensor modes	Encoder (angle and linear)
	– Event counting	Basic event count. gated count., up/down count. and encoder mode (X1, X2 and X4)
	Counter resolution	32-bit
	Counter time base	100 MHz
	Time base accuracy	Typ. 2 ppm; max. 10 ppm
	Max. input frequency	10 MHz
	Sensor power supply	12 V (600 mA)
Digital OUT	Digital output	4 DO; TTL
	Output indication	LED (green = high; off = low)
	Maximum current	25 mA continuously
	Power-on default	Low
Connector		D-SUB-25 socket

Tab. 15: Digital I/O connector specifications

AUX terminal

AUX specifications		
	Functionality	Frequency output (camera trigger), PPS output, IRIG Code B DC (B007) output
	Compatibility (output)	LVTTL, 10 mA
	Overvoltage protection	±20 V_{DC}
	Power-on default	Low
	Connection	Pin 24 on digital I/O connector

Tab. 16: AUX specifications

The auxiliary terminal can be used as programmable frequency output for synchronizing external hardware. The output can be set in the Sync Setup of The Measurement Settings via SYNCHRONIZATION OUTPUT → Connector “AUX” → Frequency (AUX):

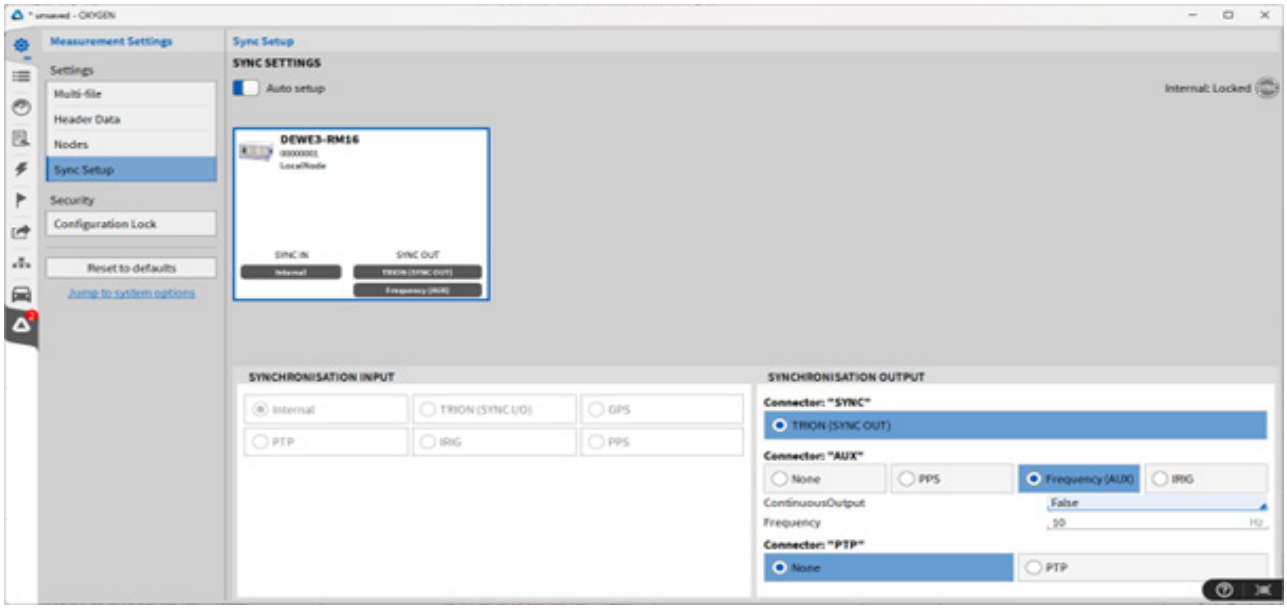


Fig. 15: Output settings

PPS terminal

PPS specifications			
	Supported codes	PPS	
	Compatibility (DC code)	DC level shift (edge detection); TTL/CMOS compatible	
		Low: <0.8 V	High: >2 V
	Connection	Pin 8 on digital I/O connector	

Tab. 17: PPS specifications

Advanced counter

The supports an advanced counter via the pins 1–8 of the digital I/O connector shown in *Fig. 14*. For information regarding advanced counters refer to Functional description of advanced counter on page 189 of the TRION(3) series modules manual.

Counter and digital I/O

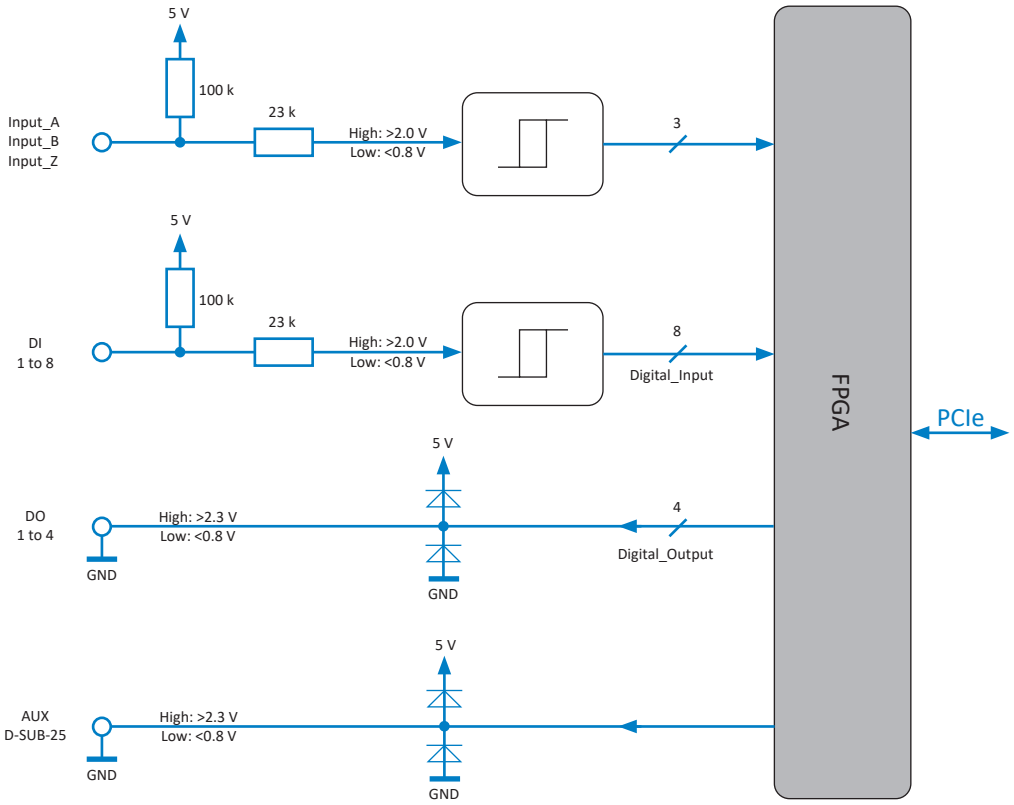


Fig. 16: Counter and digital I/O

CAN interface (D-SUB-9) (optional)

The DEWE3-OPT-CAN function is an optional feature and provides the following synchronization input modes:

CAN specifications		
	Input channels	1 D-SUB-9 connector, not isolated
	Specification	CAN 2.0B
	Physical layer	Highspeed
	Listen-only mode	Supported
	Termination	Programmable: high impedance or 120
	Common mode range	-2 V to +7 V
	Bus pin fault protection	±36 V_{DC}
	ESD protection	IEC 61000-4-2: ±8 kV air discharge, ±4 kV contact discharge
	CAN transceiver	SN65HVD266D
	Sensor power supply (per module)	5 V (100 mA) and 12 V (600 mA)
	CAN output	Optional OXYGEN feature; requires software license OXY-OPT-CAN-OUT

Tab. 18: GPS specifications

NOTICE

Combined load at D-SUB-9 socket CAN and D-SUB-25 socket digital I/O max. 600 mA at 12 V.

Connection

The measurement is carried out via D-SUB cord. The CAN bus is not isolated.



Fig. 17: D-SUB-9 CAN connector pin assignment

High-speed CAN

The high-speed CAN is a differential bus where complementary signals are sent over two wires. The voltage difference between the two wires defines the logical state of the bus. The differential CAN receiver monitors this voltage difference and outputs the bus state with a single-ended output signal.

The high-speed CAN bus topology as well as the possible cable lengths and the recommended termination resistors are specified in the standards ISO-11898 and CiA 102.

The highspeed CAN bus supports bit rates of up to 1 Mbit/s (or >125 kbit/s).

The schematic below will give you an overview of the highspeed CAN bus topology and the termination resistor placement.

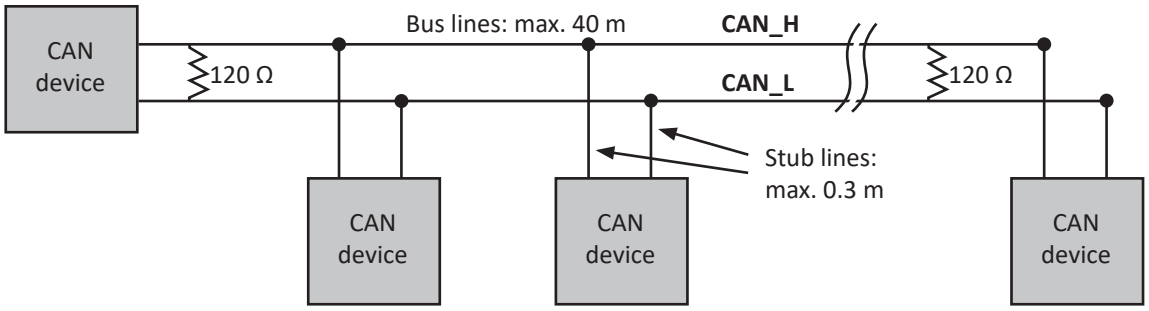


Fig. 18: Highspeed CAN

Cable lengths for high-speed CAN bus

The cabling characteristics and the desired bit transmission rate affect the allowable cable length.
ISO-11898 standard specifies a maximum bus length of 40 m and a maximum stub length of 0.3 m with a maximum of 30 nodes for a bitrate of 1 Mbit/s. However, with careful design, users can have longer cables, longer stub lengths, and many more nodes to a bus. A large number of nodes requires a transceiver with high input impedance and each node should be analyzed for signal integrity problems.

Characteristics of two-wire differential bus:

- Impedance: 108 Ω min., 120 Ω nominal, 132 Ω max.
- Length-related resistance: 70 mΩ/m nominal
- Nominal specific propagation delay: 5 ns/m nominal

For further information see ISO-11898 and CiA 102 specifications.

Termination

CAN_H and CAN_L are transmission lines. If the transmission line is not terminated, each signal line causes reflections which can cause communication failures therefore both ends of the cable have to be terminated. If multiple devices are connected only the devices at the ends of the cable need to be terminated. Recommended termination resistors in a highspeed CAN bus topology (according to ISO-11898): 120 Ω.

The TRION-CAN module offers a programmable termination resistance, either high impedance or 120 Ω.

Optional accessory

TRION-CBL-D9-OE-05-00

High quality cable from D-SUB-9 socket to open end, 5 m.

TRION-CBL-D9-CPAD-01-00

High-quality cable from D-SUB-9 socket to CPAD, 1 m.

USB 3.2 interface connectors

The device is equipped with 6 USB 3.2 interface connectors on the front side. All of them meet standard USB pin assignments.

Connectors for external monitor

The DEWE3-M8s/M12s supports a maximum of 2 screens at the same time.

Chassis terminal



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

Gigabit Ethernet LAN connectors

The DEWE3-M8s/M12s supports Gigabit Ethernet interface ports for connecting the DEWE3-M8s/M12s with a laptop/PC or daisy-chaining multiple units with standard RJ45 connector. The Gigabit Ethernet interface connectors on the DEWE3-M8s/M12s have two LEDs displaying following statuses:

1G LAN

Color/mode	Status
YELLOW (flashing)	Link active
ORANGE (stable)	1 Gbit speed is in use

2.5G LAN

Color/mode	Status
YELLOW (flashing)	Link active
ORANGE (stable)	2.5 Gbit speed is in use
GREEN (stable)	1 Gbit speed is in use

Tab. 19: Ethernet LED indication

NOTICE

The total length of the Ethernet cable must not exceed 100 m (328 ft) between two units.

EPAD connector (LEMO)

To connect DEWETRON EPAD2 modules to the system, a LEMO EGG.1B.304 socket is provided. Shield is connected on the housing.

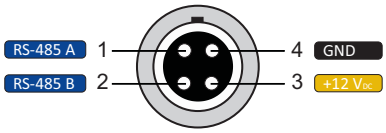


Fig. 19: Pin assignment EPAD2 connector

TRION/TRION3 series module slots

The DEWE3-M8s features 8 and the DEWE3-M12 features 12 slots for TRION/TRION3 series modules. For details refer to *DEWE3/TRION(3) hardware compatibility on page 32*.

Intake vents with filter pads

There are two intake vents with filter pads located at the bottom of the instrument and each fixed with 3 Torx M3x6 screws. For information on how to clean/exchange the filter pads refer to *Cleaning the system on page 46*.

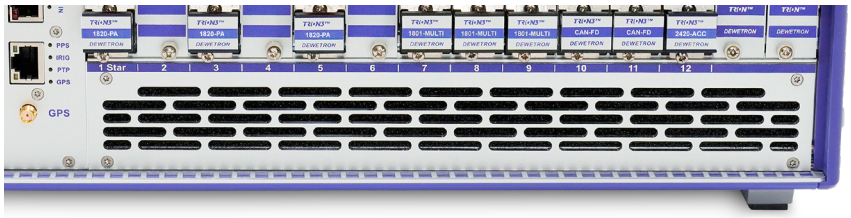


Fig. 20: Intake vents with filter pads

SSD drive bays

The DEWE3-M8s/M12s is equipped with 3 removable drive bays (1 dual and 1 single drive bay) for a pre-installed 1 TB SSD (400 MB/s) dedicated for data storage, as well as a 512 GB SSD for operating system and application software. Additionally, there is a third drive bay to enhance the storage capacity. The following storage capacity upgrades are available:

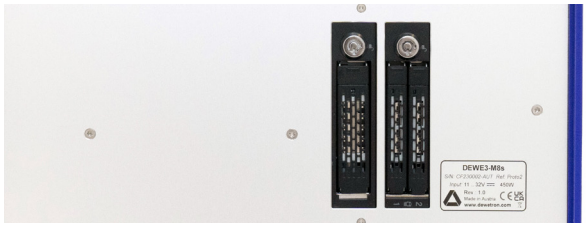


Fig. 21: Drive bays on backside

Option SSD-PCIe-1T-2T

Upgrade from 1 TB to 2 TB industrial grade, PCIe attached solid state disk.

NOTICE

Information for systems with SSD drives: Wait for 40 seconds after big files were deleted. The HDD activity LED is lit to indicate that the SSD is deleting the file and TRIM/garbage collection is in progress. Wait until the process is finished before you start to write the next file.

Nameplate

The nameplate is located on the backside of the device. It indicates the product name and serial number, information about the power properties and manufacturer as well as the available optional functions.

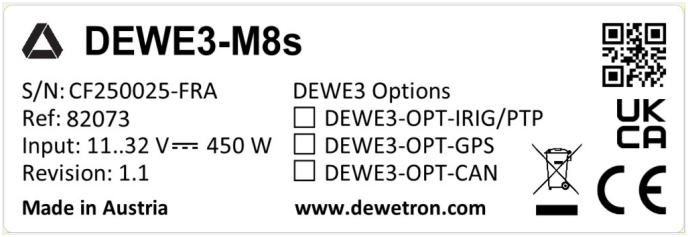


Fig. 22: Nameplate

Options and accessoires

Chassis controller options	
DEWE3-OPT-CAN	Optional CAN port on front plate
DEWE3-OPT-IRIG/PTP	Optional IRIG/PTP sync available on front plate
DEWE3-OPT-GPS	Optional GPS sync available on front plate including a GPS antenna

Upgrades	
OPT-LINUX	Linux Ubuntu option for DEWE3 systems
OPT-NO-GPS	Optionally remove GPS connector or when equipping the system with DEWE3-OPT-DIO/-CAN/-GPS/-IRIG/PTP
OPT-NO-WIFI	Deliver system without WiFi module
OPT-SECURE-BOOT	Windows secure boot option (DoD-ready) for a new DEWETRON system
SSD-PCIe-1T-2T	Upgrade from 1 TB to 2 TB industrial grade, PCIe attached solid state disk

Cables	
POW-CBL-KBT6ARN-OE-2	6 mm safety sockets with 10 mm2 cable, open end, length 2 m, needed if system is used with voltages below 24 V
POW-CBL-1B304F-B-2	Ignition control cable, FGJ.1B.304 to 2 male 4 mm banana plugs, length 2 m

Batteries and chargers	
BAT-28V-CHARGER-1	Desktop battery charger for 1 28.8 V battery, incl. external AC adaptor
BAT-28V-81WH	Lithium-ion battery, 28.8 V, 81 Wh, max. 12 A, weight 520 g
DW2-CLAMP-DC-POWER-8	External power supply box for up to 8 current transducers; input: 9 .. 36 $V_{DC;}$ external 115/230 V_{AC} power supply included; current transducer connection: 8 Lemo sockets with ±15 V and +9 V power supply for current transducers; compatible to DEWE2/3 systems

Working with the system

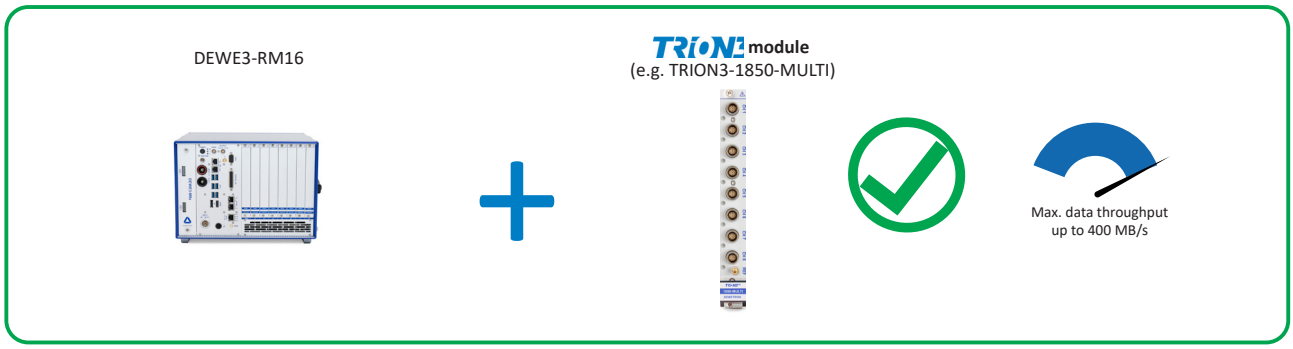
Hardware

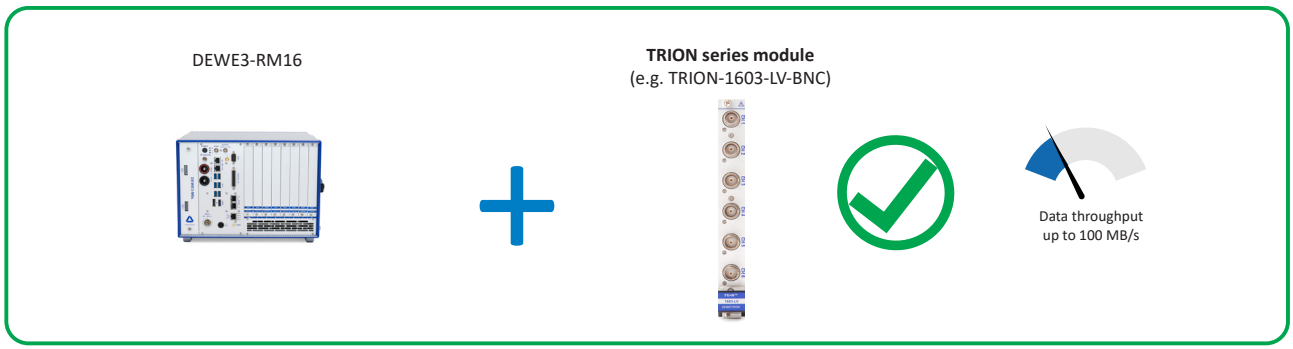
DEWE3/TRION(3) hardware compatibility

In 2019, DEWETRON introduced a new family of data acquisition systems, the DEWE3 and TRION3 express series.

The DEWE3 chassis feature a PXIe hybrid backplane and supports any TRION3™ series modules. It is also backward compatible and does support all TRION™ series modules from previous generation.

The illustrations below will give you an overview of the hardware compatibility and its limitations:





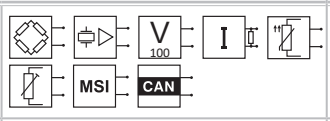
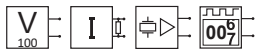
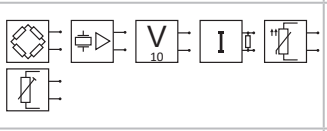
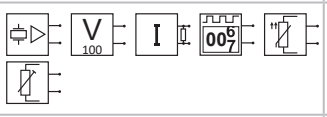
TRION series modules overview

[1] Some versions of this module occupy 2 TRION slots
[2] CAT III 1000 V only applicable for 1000 V inputs; SUB-600V has CAT II 600 V / CAT III 300 V

Analog modules

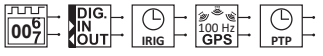
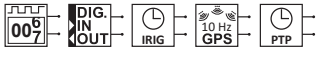
ANALOG modules	Channels	Sample rate per channel	Resolution	Isolation	Connector type
TRION3-1820-MULTI TRION3-1850-MULTI TRION-1820-MULTI	4 or 8	1850: 5 MS/s 1820: 2 MS/s	24 bit >2 MS/s: 18 bit	yes	D-SUB or LEMO 0B
TRION3-2402-ACC TRION3-2420-ACC	6	2402: 200 kS/s 2420: 2 MS/s	24 bit	yes	BNC
TRION3-2402-LV TRION3-2420-LV	6	2402: 200 kS/s 2420: 2 MS/s	24 bit	yes	BNC

Tab. 20: TRION/TRION3 analog modules

ANALOG modules		Channels	Sample rate per channel	Resolution	Isolation	Connector type
TRION-2402-MULTI		4 or 8	200 kS/s	24 bit	yes	D-SUB, LEMO 0B
TRION-1620-ACC		6	2 MS/s	24 bit >1 MS/s: 16 bit	yes	LEMO 1B, BNC
TRION-1620-LV		6	2 MS/s	24 bit >1 MS/s: 16 bit	yes	LEMO 1B, BNC
TRION3-1810-HV[1)] TRION-1810-HV[1)]		4 or 8	1 MS/s	18 bit	yes	Safety banana, CAT III 1000 V[2)]
TRION3-1810-SUB-8 TRION3-1810M-SUB-8		8	1 MS/s 10 MS/s	16 bit	yes	BNC, LEMO 1B
TRION-1603-LV		6	250 kS/s	18 bit	yes	Safety banana[3)]
TRION-2402-dSTG[1)]		6–8	200 kS/s	24 bit	no	LEMO 1B, LEMO 0B, D-SUB, RJ-45
TRION-2402-dACC		6–8	200 kS/s	24 bit	no	SMB, BNC
TRION3-1802-dLV		16 or 32	200 kS/s 100 kS/s	18 bit 24 bit	no	D-SUB
TRION3-1600-dLV		16 or 32	20 kS/s	16 bit	no	D-SUB

Tab. 20: TRION/TRION3 analog modules

Digital modules

DIGITAL modules		Channels	Sample rate per channel	Resolution	Isolation	Features
TRION-CNT		6	800 kS/s	80 MHz	yes	6 channel advanced counter
TRION-DI-48		48	2 MS/s	500 ns	yes	48 high-speed digital IN
TRION-BASE		-	2 MS/s	80 MHz	no	Basic IO card with simple IRIG sync and 2 counter
TRION-VGPS-V3		-	2 MS/s	0.01 km/h <10 cm	no	100 Hz GNSS receiver for automotive applications
TRION-TIMING-V3		-	2 MS/s	12.5 ns	no	Applies precision absolute time to measured data
TRION3-CAN-FD		4	up to 8 MBit	-	yes	D-SUB
TRION-ARINC	-	4 or 16	-	-	no	Decoding of ARINC 429 signals, export of decoded signals

Tab. 21: TRION digital modules

DIGITAL modules		Channels	Sample rate per channel	Resolution	Isolation	Features
TRION-MIL1533	-	1 or 4	-	-	no	Decoding of MIL-STD 1553 signals, export of decoded signals
TRION-EtherCAT-1-SLAVE		100	500 S/s	-	no	Measurement data output
TRION-PROFINET-IO-DEVICE		100	500 S/s	-	no	Measurement data output

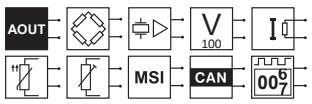
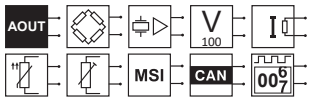
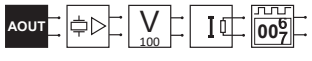
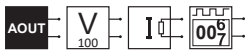
Tab. 21: TRION digital modules

Power modules

POWER modules		Channels	Sample rate per channel	Resolution	Isolation	Connector type
TRION3-1810M-POWER[1)]		8 (4 U / 4 I)	10 MS/s	24-bit	yes	Safety banana, D-SUB
TRION3-1820-POWER[1)] TRION-1820-POWER[1)]		8 (4 U / 4 I)	2 MS/s	24-bit	yes	Safety banana, D-SUB

Tab. 22: TRION/TRION3 power modules

Analog output modules

ANALOG OUTPUT modules		Channels	Sample rate per channel	Resolution	Isolation	Connector type
TRION3-1850-MULTI-AOUT-8		IN: 8 OUT: 8	IN: 5 MS/s OUT: 2.5 MS/s	IN: 24-bit OUT: 32-bit	IN: yes OUT: yes	IN: LEMO 0B OUT: D-SUB, BNC
TRION3-1820-MULTI-AOUT-8		IN: 8 OUT: 8	IN: 2 MS/s OUT: 2.5 MS/s	IN: 24-bit OUT: 32-bit	IN: yes OUT: yes	IN: LEMO 0B OUT: D-SUB, BNC
TRION3-AOUT-8		OUT: 8	2.5 MS/s	up to 32-bit	yes	OUT: D-SUB, BNC
TRION3-2402-ACC-AOUT		IN: 6 OUT: 8	IN: 2 MS/s OUT: 2.5 MS/s	IN: 24 bit OUT: 32 bit	IN: yes OUT: yes	IN: BNC OUT: D-SUB, BNC
TRION3-2402-LV-AOUT		IN: 6 OUT: 8	IN: 2 MS/s OUT: 2.5 MS/s	IN: 24 bit OUT: 32 bit	IN: yes OUT: yes	IN: BNC OUT: D-SUB, BNC

Tab. 23: TRION3 analog output modules

INFORMATION

The TRION-TIMING module has to be installed in the STAR-slot for TRION modules. For further information regarding the STAR-slot refer to the TRION series modules technical reference manual.

INFORMATION

Some digital modules (e.g. TRION-M1553) require additional -12 V_{DC} voltage which is not supported with DC powered DEWE3 instruments by default. Ask your local dealer or factory for more information.

Installing a TRION module

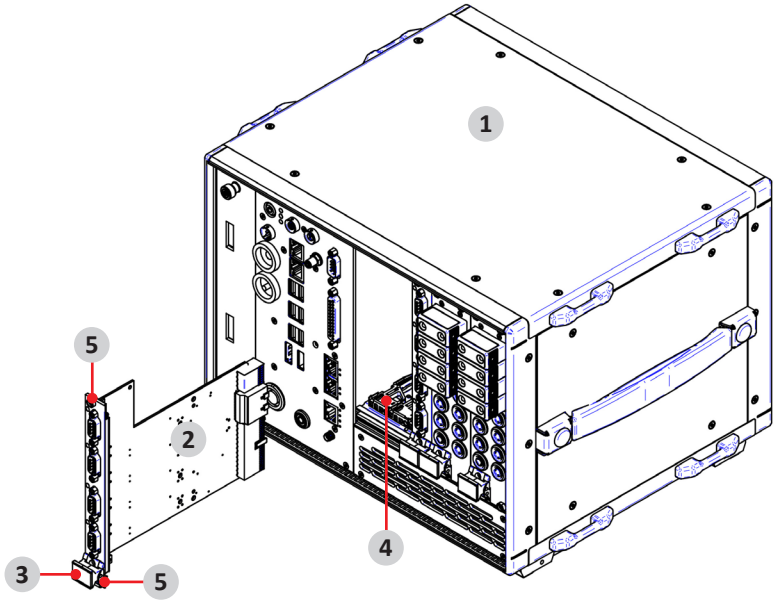


Fig. 23: Installing a TRION module (symbolic image)

1. DEWE3 chassis
2. TRION(3) series module
3. Injector/ejector module
4. Module guides
5. Mounting screws

In order to install a TRION module into a chassis proceed as follows:

1. Take proper ESD precautions to avoid any damage to the unit.
2. Power off and unplug all connected cables including sensors from the DEWE3 chassis and TRION/TRION3 series-modules.

   NOTICE Do not remove TRION3/TRION measurement boards until the system status LED has gone out (see *System status LED on page 21*).
3. Identify a supported TRION/TRION3 peripheral slot. Some modules require a TRION STAR-slot.
4. Remove the filler panel of an unused TRION/TRION3 peripheral or STAR-slot.
5. Place the module edges of the TRION/TRION3 module into the module guide at the top and bottom of the chassis.
6. Insert the TRION/TRION3 module to the rear of the chassis until a resistance appears.
7. Pull up on the injector/ejector handle to latch the device.
8. Secure the installed TRION front panel to the chassis by using the mounting screws.
9. The TRION/TRION3 module is now installed into a DEWE3 chassis.

NOTICE

Unused TRION slots must always be covered. Make sure to reinstall the filler panels to unused TRION slots to guarantee proper cooling of the installed modules.

The warranty is void if the modules overheat due to missing filler panels.

STAR-slot for TRION timing/sync modules

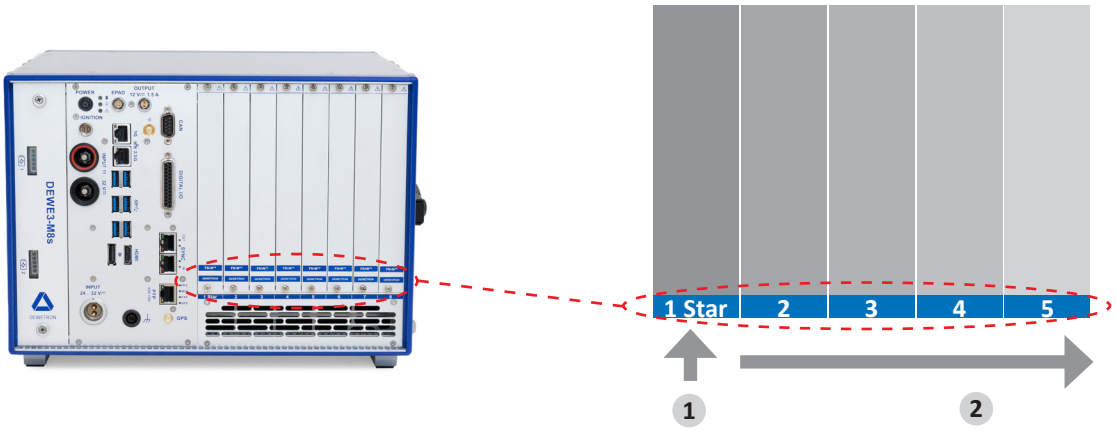


Fig. 24: STAR-slot for TRION timing/sync modules

1. TRION system timing slot

2. TRION peripheral slot

The TRION system timing slot is either slot “1” or labeled as “STAR”. Timing/Sync/GPS modules have to be installed in this slot, but it also accepts any other TRION(3) modules.

INFORMATION

If the system is equipped with a TRION-BASE, TRION-TIMING or TRION-VGPS-20/-100 module, it has to be installed in the “star slot”. This is the only slot a module is able to override the system 10 MHz clock with its PPS-synced 10 MHz, and thus providing the system with a timebase of higher accuracy.

Ejecting an SSD drive bay

The drive bays are located on the back side of the device.



Fig. 25: Dual SSD drive bay on back side

In order to eject an SSD proceed as follows:

1. Shut down the device and wait until it is switched off (green indicator LED goes off).

2. If the drive is locked, unlock it with the supplied keys by turning the security key lock.

3. Press the drive tray ejection button.

4. Flip the cover of the tray to the side until it is detached from the bay.

5. Pull out the tray with the drive and unscrew the 4 M3x4 screws.

6. Remove or add the desired drive.

7. Retighten the 4 M3x4 screws.

INFORMATION Use the included M3x4 screws only.

8. Insert the drive tray again.

The installing/removing procedure of the drive is now completed.

Installing/removing a battery

The DEWE3-M8s is equipped with 2 smart battery packs which can be exchanged during operation. To replace a battery proceed as follows:

NOTICE

In principle, the batteries are hot-swappable and can be replaced during operation. However, we strongly recommend connecting the device to an external power source to avoid any possible loss of data.

1. Open the covering plate of the battery compartment by loosining the 2 fixing screws.



2. Pull out the battery to replace and insert a new one.



NOTICE If the device is not connected to an external power source, only one battery can be replaced at a time.

3. Reinstall the covering plate and tighten the fixing screws again.

The battery exchanging procedure is now finished.

Cooling considerations

The DEWE3-Mxs comes with an easy accessible fan cartridge with a total of 4 (DEWE3-M8s) or 6 (DEWE3-M12s) ultra-silent, temperature-controlled fans (details see *Block diagram on page 15*). The intake vents of the DEWE3-M8s/M12s are at the front and bottom of the chassis, whereas the exhaust vent is located at the rear of the chassis.

NOTICE

Adequate clearance between the chassis and surrounding equipment or blockages must be maintained to ensure proper cooling of the internals of the chassis.

As a benchtop instrument, the cool air travels through the front and bottom of the chassis, thus automatically lowers fan speed.

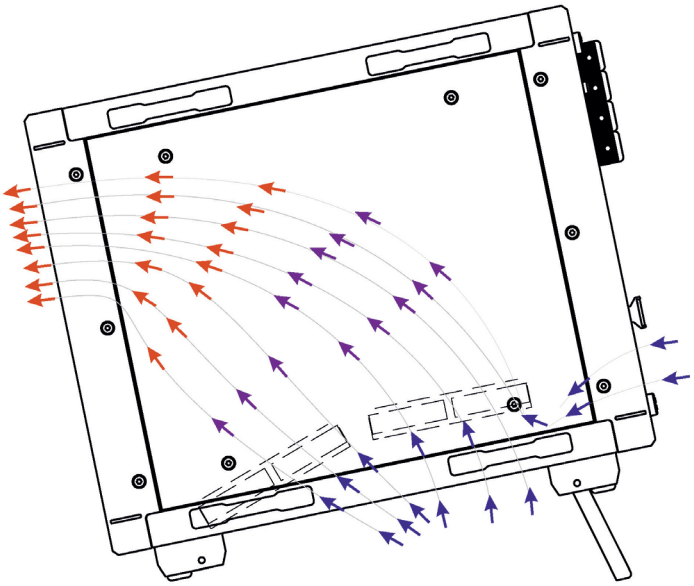


Fig. 26: Cooling concept for benchtop instrument use

System recovery

For more information regarding a total recovery refer to the corresponding total recovery technical reference manual shipped with your DEWE3 system.

Software

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

For a more detailed explanation of the OXYGEN software refer to the OXYGEN Technical Reference Manual, which is available at *https://ccc.dewetron.com/pl/oxygen*.

Starting OXYGEN

When starting OXYGEN, the measurement screen is displayed. OXYGEN will instantly start to acquire data but will not store it yet. *Fig. 27* shows an overview of the measurement screen and some important buttons and menu tabs.



Fig. 27: Measurement screen

1. Software mode indicator
2. Design mode
3. Record
4. Stop
5. Open data file
6. Data channel list menu
7. Instruments menu
8. Export menu

Connecting and setting up signals and sensors

It is possible to directly measure ±10 V or to use MSIs to expand the input signal possibilities:

Open the Data Channel List by double clicking/tapping on the menu tab on the right side or by swiping it over the whole measurement screen, seen in *Fig. 28*.

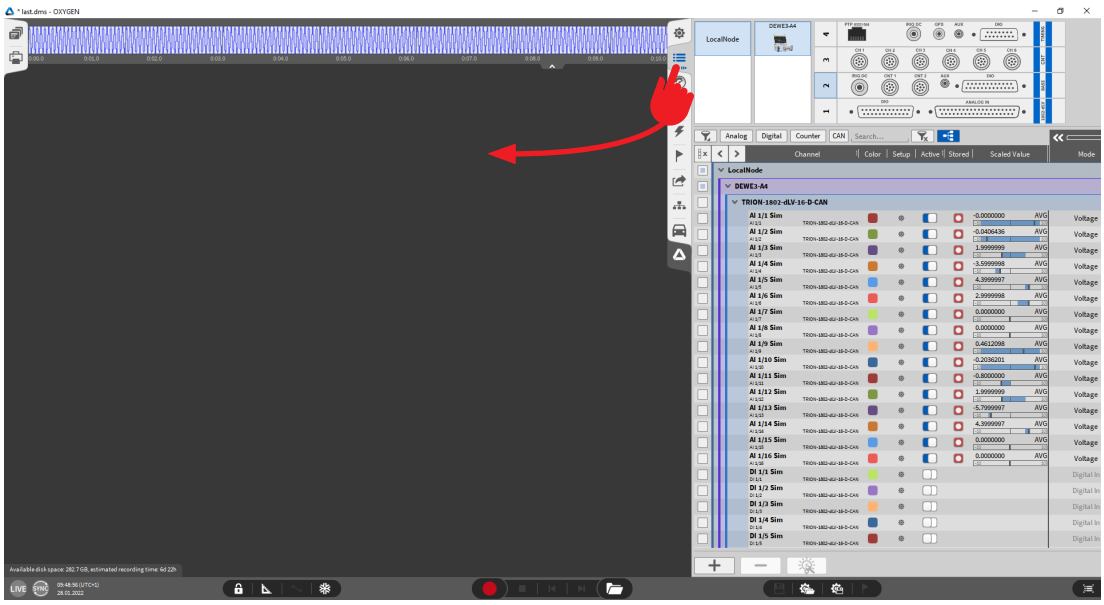


Fig. 28: Expanding data channel list

Changing channel settings

The next step is to change the channel settings:

1. Click on the channel name in the list to enter a new name.
2. Alternatively, the channel settings will also open by clicking on the gear button (see *Fig. 29*).

There different settings are available

- Sensor scaling (unit and scaling or sensitivity factor)
- Table scaling for a non-linear scaling

All settings are automatically saved when entered and do not have to be saved separately.

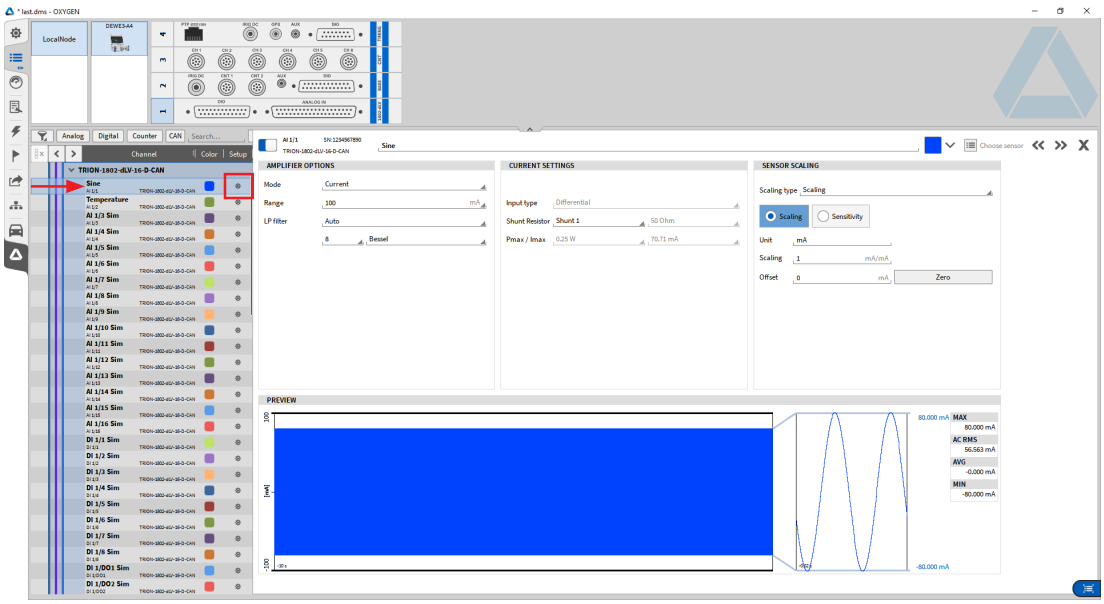


Fig. 29: Changing channel settings

Designing the measurement screen

After the channel settings are done, design the measurement screen to your needs:

1. Double-click/tap on the menu tab or swipe the menu to the right.
2. Click or tap on the *Instrument* menu tab and drag and drop a recorder on the measurement screen.

   More instruments can be added and adjusted like this, when being in *Design Mode* (see 2 in *Fig. 27*).
3. Click on the *Data Channel* menu tab and add the signal by selecting the instrument and the signal to be shown or by drag and dropping the signal into the instrument.
4. Disable the *Design Mode*.

The design of the measurement screen is now finished.

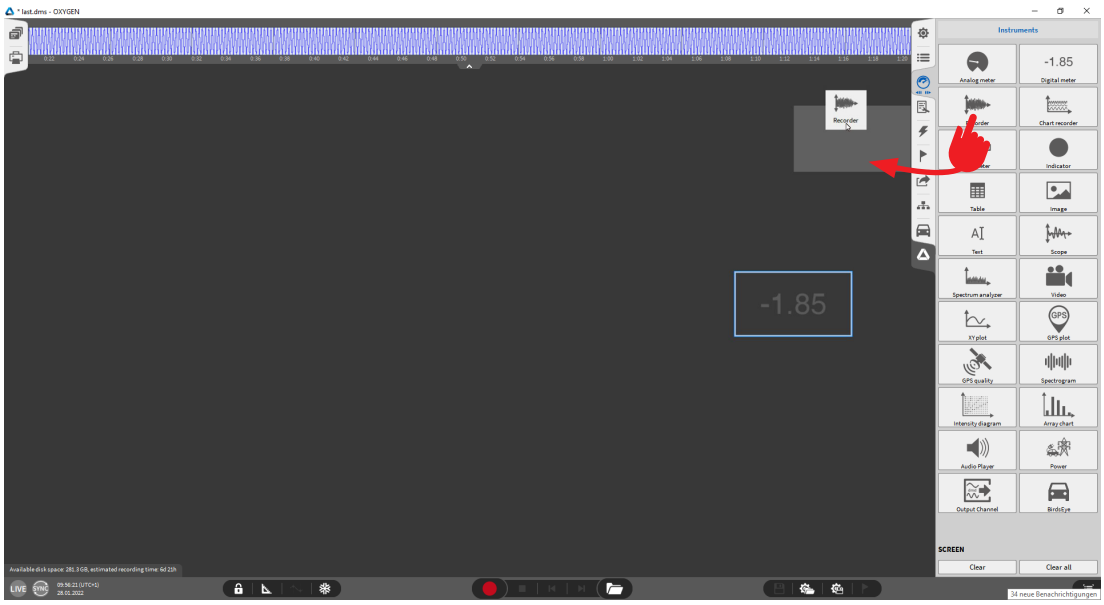


Fig. 30: Designing the measurement screen

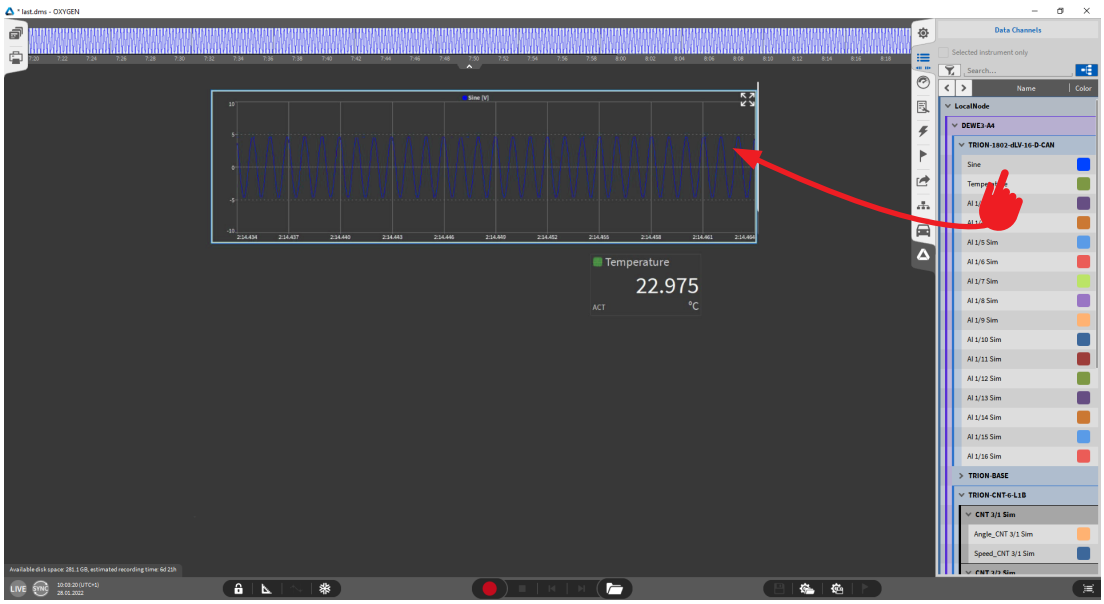


Fig. 31: Selecting instrument and signal

Recording

To start the recording proceed as follows.

1. Click on the record button.

   The red border and the REC indicator seen *Fig. 32* in the lower left corner displays, that the recording is going on.

2. Click on the Stop button to stop the recording.

The recording process is now finished.

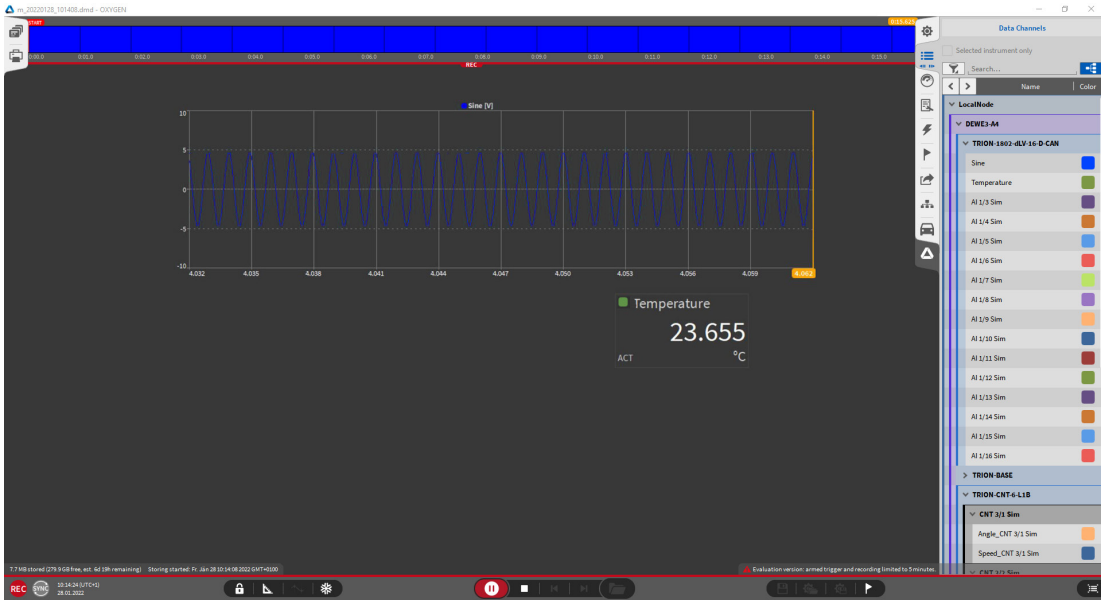


Fig. 32: Recording

Opening datafile and export

To open a datafile, proceed as follows:

1. Click on the file button, and select the corresponding file (see *Fig. 33*).

   The green border and PLAY indicator in the lower left corner indicate that a file is loaded for post-processing (see *Fig. 34*).

2. To export the data, click or tap on the *Export Settings* menu tab.

3. Select the desired format and the channels to be exported.
4. Click on the export button seen in *Fig. 34*.

The exporting process is now finished.

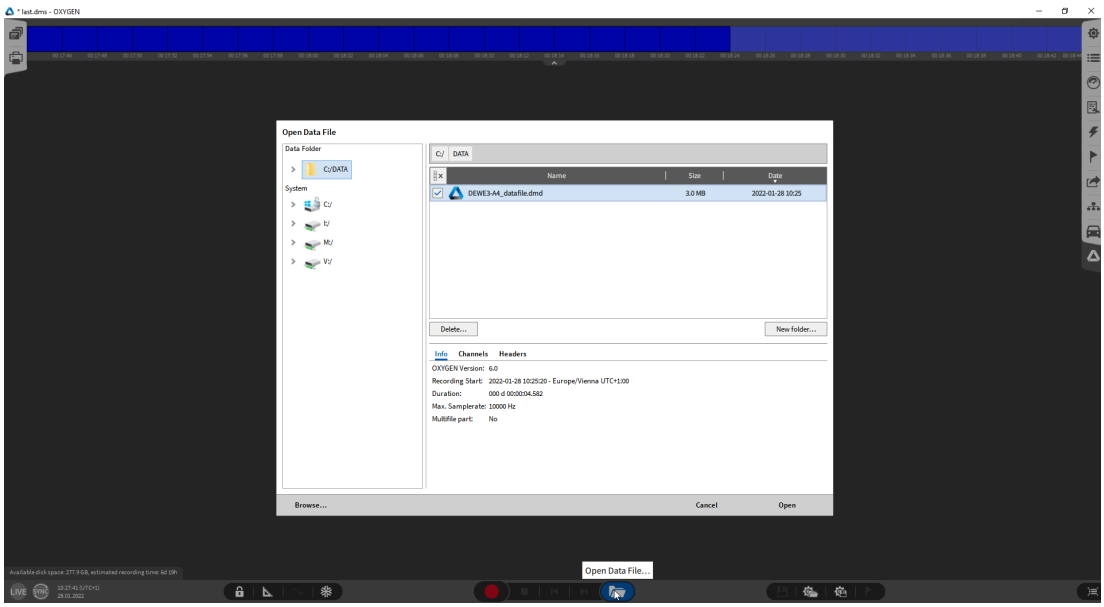


Fig. 33: Opening data file



Fig. 34: Exporting data file for post-processing

Synchronization

The TRION-SYNC-BUS (SYNC IN, SYNC OUT) is used to synchronize two or more DEWE3 systems with up to 100 m distancebetween each node. The TRION-SYNC-BUS consists of two RJ-45 sockets. One socket is used as synchronization output (OUT), while the other is used as synchronization input (IN).

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.

LED indication	SYNC OUT	SYNC I/O
RED (stable)	Clock detected	Clock detected / receiving clock
Green (stable)	Acquisition running	Acquisition running

Tab. 24: LED indication

Network with multiple systems

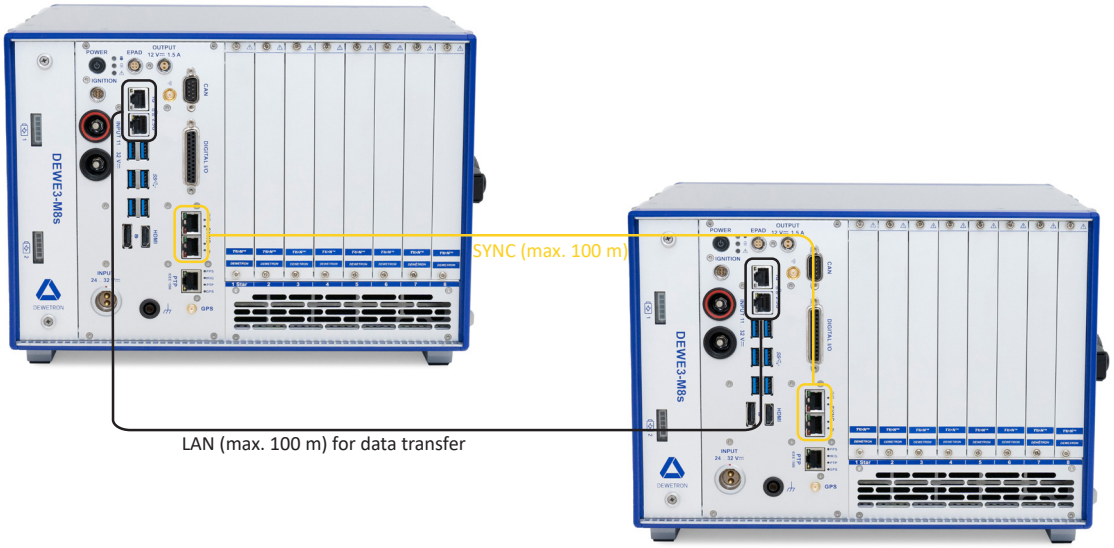


Fig. 35: Network with multiple systems

Synchronization via TRION-SYNC-BUS

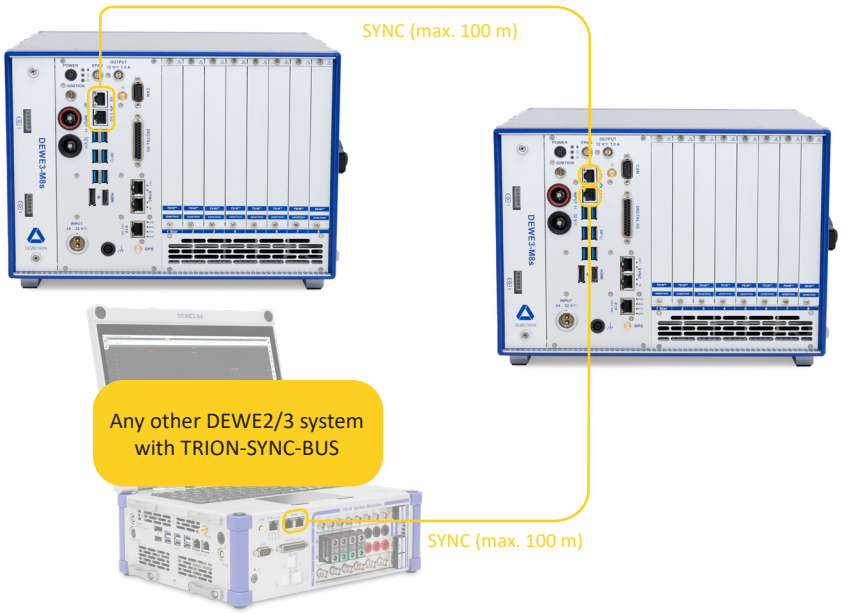


Fig. 36: Synchronization via TRION-SYNC-BUS

Channel expansion with TRIONet3

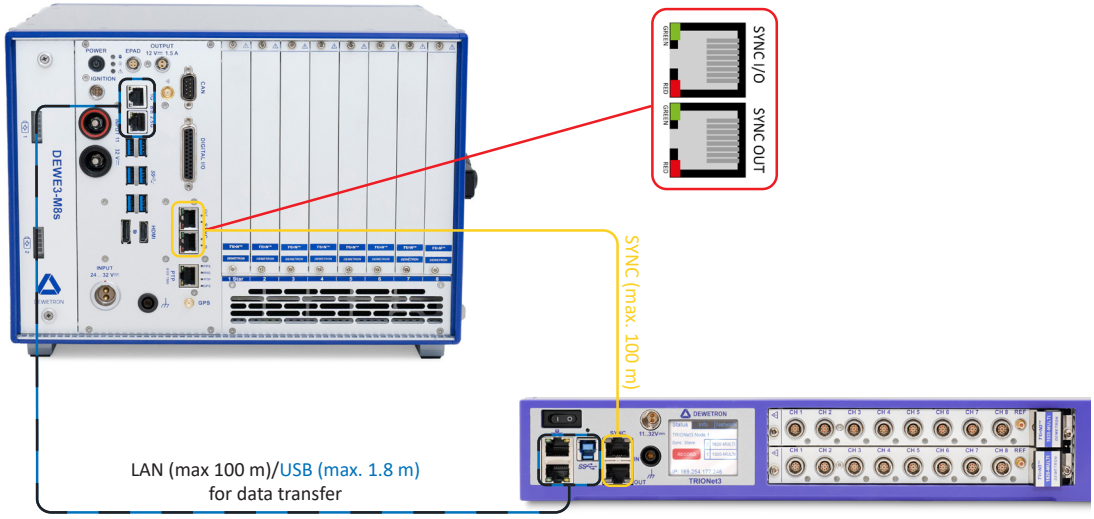


Fig. 37: Channel expansion with TRIONet3

Absolute time synchronization

With this option, the DEWE3-M8s/M12s can operate synchronized with other measurement devices with an absolute time reference.

PTP sync / IRIG sync

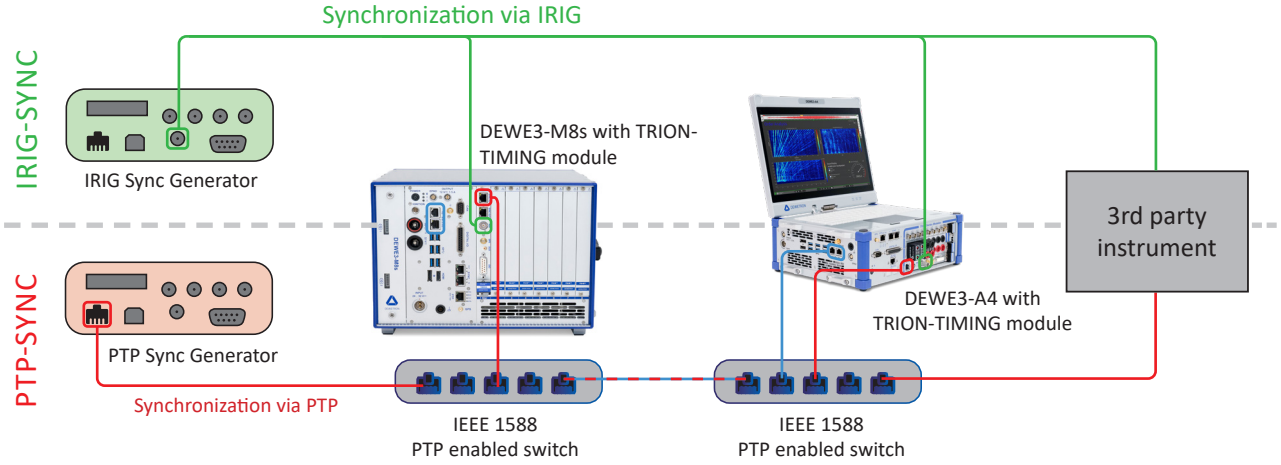


Fig. 38: PTP sync / IRIG sync

GPS sync

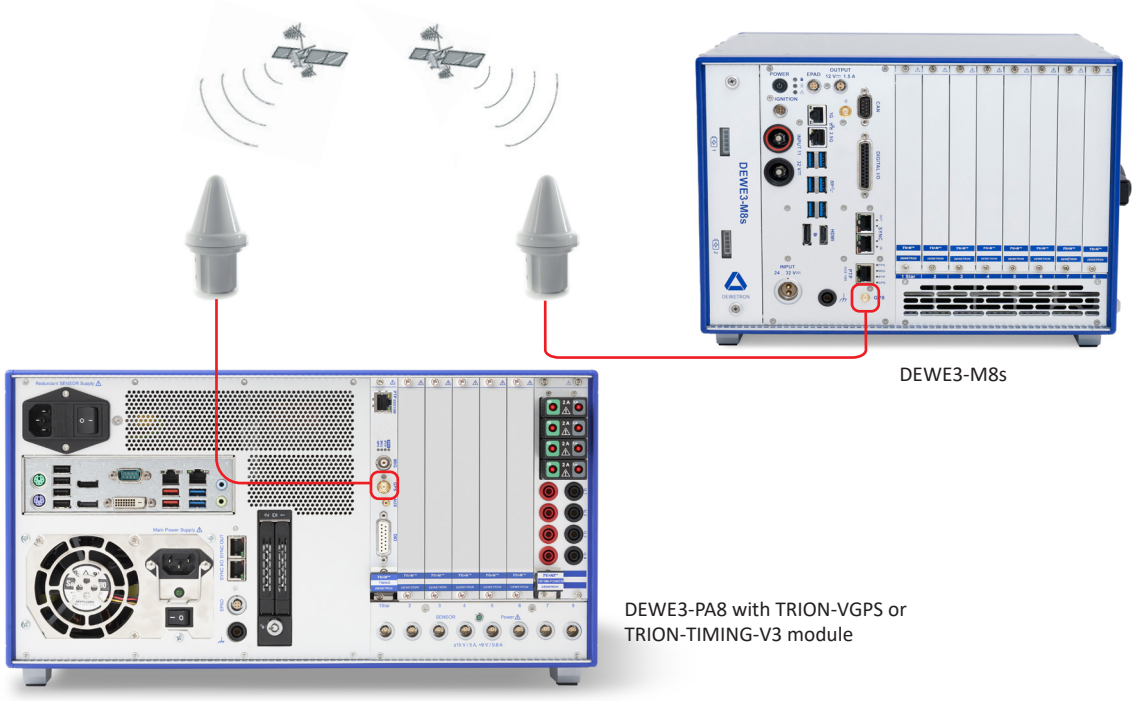


Fig. 39: GPS sync

Data transfer (independent from synchronization)

The network topology is the responsibility of the customer. Any topology supported by the operating system can be used. In theory, the normal company network can also be used. However, DEWETRON recommends the use of a separate network which is only used for data transmission. For data rates beyond 100 Mbyte/s a 10 Gbit option is available which can transfer up to 1 Gbyte/s of data.

INFORMATION

Networked data acquisition (claiming multiple, distributed DEWETRON measurement systems) requires software option OXYGEN-Net (OXY-OPT-NET). This option works with absolute time synchronization as well as with TRION-SYNC-BUS.

Maintenance and service

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

Service intervals

Intervals may vary. Depending on environmental conditions, runtime, etc.

Actions	On demand	At least once a year	Every 5 years
Clean dust from chassis exterior/ interior	Depending on environmental conditions	x	-
Clean filters	Depending on environmental conditions	x	-
Calibrate TRION modules	-	x	-
Change CPU fan	-	-	x
Change chassis fan	-	-	x
Change CMOS battery	-	-	x
Change SSD	Depending on SSD health status	-	x

Fig. 40: Service intervals

DEWETRON offers various service and upgrade plans including cleaning/exchanging fans/power supply/CPU cooler (if required), BIOS, firmware and driver updates as well as reliabilty upgrades and full functionality check. Ask DEWETRON or your local distributor for further information and pricing.

Cleaning the system

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

  Do not use harsh chemical cleaning agents.

NOTICE



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.

WARNING





Risk of injury

Disconnect all cables before servicing the unit.

Cleaning the filter pad

Requirements

- TORX T10 screw driver

WARNING



Do not attempt to remove filter covering plate when in operation.

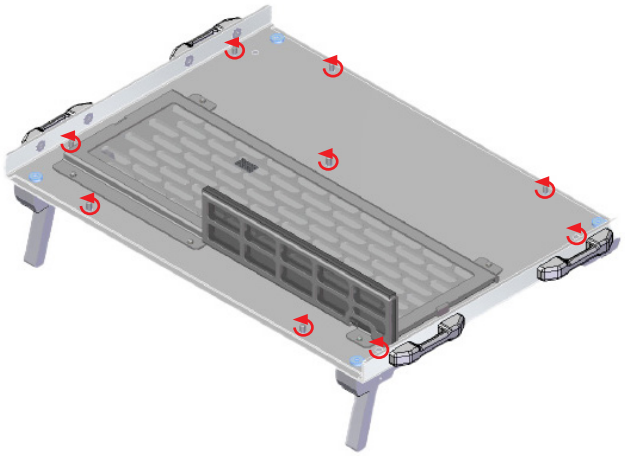
Power off the instrument and disconnect the device from the power supply first.

Any voltage over 50 V connected to the modules must also be terminated.

Procedure for DEWE3-M8s

In order to clean the filter pads proceed as follows:

1. Switch-off the instrument and disconnect any high-voltage sensors/connectors.
2. Loosen the 9 screws of the bottom plate at the bottom of the system using a TORX T10 screwdriver.



3. Remove the bottom plate.
4. Clean the filterpads with a dry velocity stream of air.
5. Remount the bottom plate by retightening the 9 screws using a TORX T10 screwdriver.

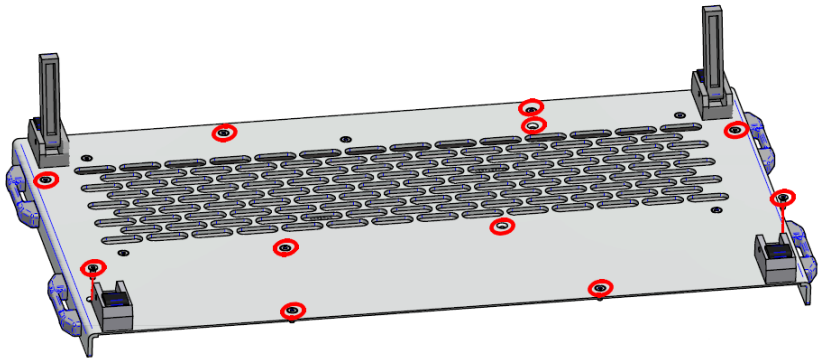
   NOTICE Do not switch on the instrument before the bottom plate has not been fully reattached.

The filter pad cleaning procedure is now finished.

Procedure for DEWE3-M12s

In order to clean the filter pads proceed as follows:

1. Switch-off the instrument and disconnect any high-voltage sensors/connectors.
2. Loosen the 11 screws of the bottom plate at the bottom of the system using a TORX T10 screwdriver.



3. Remove the bottom plate.
4. Clean the filterpads with a dry velocity stream of air.
5. Remount the bottom plate by retightening the 11 screws using a TORX T10 screwdriver.

   NOTICE Do not switch on the instrument before the bottom plate has not been fully reattached.

The filter pad cleaning procedure is now finished.

Replacing the filter pad

Requirements

- TORX T10 screw driver
- Spare filter pads

WARNING

Do not attempt to remove filter covering plate when in operation.

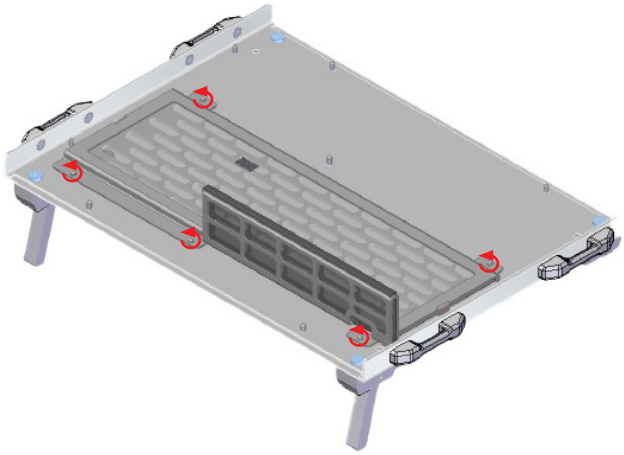
Power off the instrument and disconnect the device from the power supply first.

Any voltage over 50 V connected to the modules must also be terminated.

Procedure for DEWE3-M8s

In order to replace the filter pads proceed as follows:

1. Carry out steps 1–3 as described in *Procedure for DEWE3-M8s* above.
2. Loosen the 5 fixing screws of the filter pad unit on the bottom plate using a TORX T10 screwdriver.



3. Take out the filter pad unit and replace the filter pads with new ones.
4. Remount the filter pad unit by tightening the 5 fixing screws.
5. Remount the bottom plate by retightening the 9 screws.

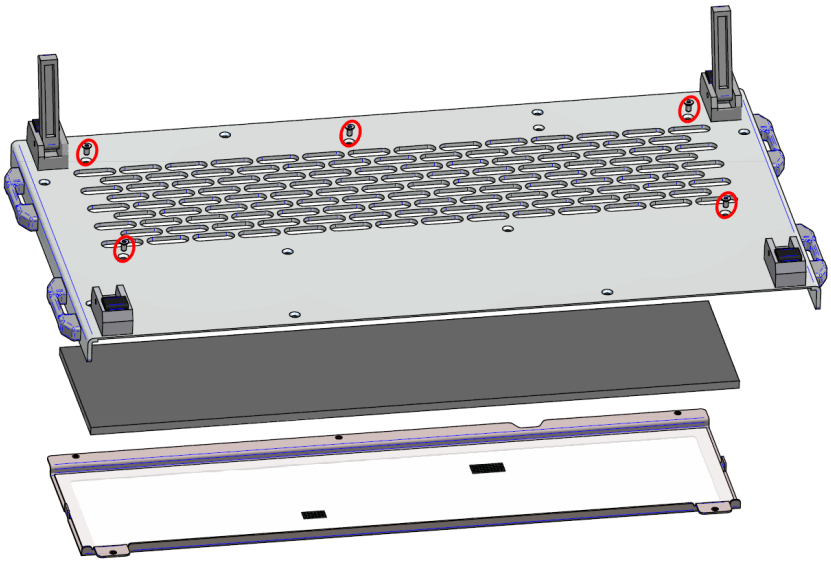
   NOTICE Do not switch on the instrument before the bottom plate has not been fully reattached.

The filter pad replacement procedure is now finished.

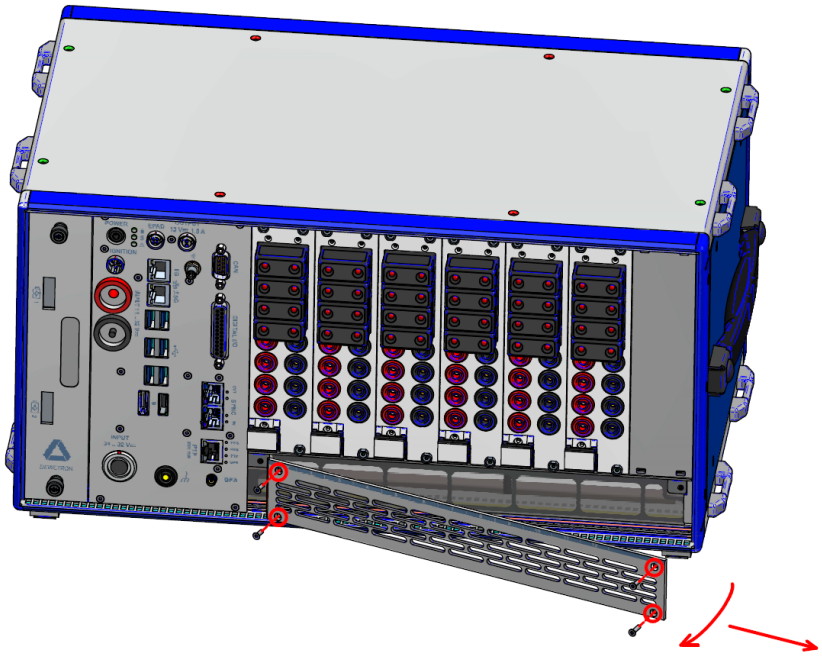
Procedure for DEWE3-M12s

In order to replace the filter pads proceed as follows:

1. Carry out steps 1–3 as described in *Procedure for DEWE3-M12s* above.
2. Loosen the 5 fixing screws of the filter pad unit on the bottom plate using a TORX T10 screwdriver.



3. Take out the filter pad unit and replace the filter pads with new ones.
4. Remount the filter pad unit by tightening its 5 fixing screws.
5. Remount the bottom plate by retightening its 11 screws.
6. Remove the ventilation grille on the front of the unit by loosening its 4 screws.



7. Take out the filter pad and replace it with a new one.
8. Remount the ventilation grille.

NOTICE Do not switch on the instrument before the bottom plate has not been fully reattached.

The filter pad replacement procedure is now finished.

Updates

Software updates

NOTICE

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 information is 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 and antivirus/security software

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

System recovery

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

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.

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 visit https://www.dewetron.com/academy.

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 contact your local distributor first or DEWETRON directly.

For Asia and Europe contact:

DEWETRON GmbH
Parkring 4
8074 Grambach
AUSTRIA

For the Americas contact:

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E-Mail: support@dewetron.com
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The telephone hotline is available
Monday to Friday between
08:00 and 17:00 CET (GMT +1:00).

Tel.: +1 401 284 3750
Toll-free: +1 866 598 3393
Fax: +1 401 284 3750
Email: support@dewetron.com
Web: http://www.dewetron.com

The telephone hotline is available
Monday to Friday between
08:00 and 16:30 EST

Service and repairs

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. For information regarding service and repairs please contact your local distributor first or DEWETRON directly.

INFORMATION

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

Letter of volatility

The data storage capacity of the DEWE3-M8s/M12s can be extended by the SSD-PCIe-1T-2T option to 2 TB (industrial grade, PCIe attached solid state disk). The following chart corresponds to the memory types that are used within the DEWE3-M8s/M12s systems.

Volatile memory

Type	Size	User modifiable	Function	Process to delete
Innodisk M4SS, DDR4 SODIMM	16 GB module[1] (16x 1 GB chips)	Yes	RAM	Power off
Intel i7 11850HE, cache	24 MB	No	Cache	Power off
Chassis Controller DDR3	512 MB	Yes	Buffer for measurement data	Power off

Tab. 25: Volatile memory

Non-volatile memory

Type	Size	User modifiable	Function	Process to delete
Innodisk 3MG2-P or WD-S100T2B0A[1] Solid State Drive	512 GB + cache or 1 TB + cache[1]	Yes	Main drive for operating system, programs and drivers	Remove drive or DoD 5220.22-M wiping
NVMe PCIe Solid State Drive	1 TB + cache	Yes	Data drive	Remove drive or DoD 5220.22-M wiping
BIOS Chip EEPROM	16 MB	Yes	BIOS Settings, firmware	Factory reset[2]
Flash[3]	32 MB	Read only, yes under certain circumstances	Chassis controller firmware	DEWETRON Explorer firmware update
EEPROM	8 kB	No	PTP configuration	n.a.

Tab. 26: Non-volatile memory

1) Depending on system configuration

2) Factory reset:
1. Enter BIOS
2. Select Advanced, Trusted Computing, Pending operation, Clear TPM.
3. Select Security, select Secure Boot, restore Factory keys
4. Select Save & Exit and choose Restore Defaults and confirm it.
5. Select Save Changes and Reset to complete Factory reset.

3) 2x flash for DEWE3-M8s, 3x flash for DEWE3-M12s

Certificates

CE certificate of conformity DEWE3-M8s

CE

Manufacturer	DEWETRON GmbH
Address	Parkring 4 8074 Grambach, Austria Tel.: +43 316 3070-0 Fax: +43 316 3070-90 Email: sales@dewetron.com http://www.dewetron.com
Name of product	**DEWE3-M8s**
Kind of product	*Data acquisition instrument*

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 harmonization 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:

LVEMC			
	Safety	IEC 61010-1:2010/AMD1:2016 pol. deg. 2 and IEC 61010-2-030:2017	
	Emissions	EN 61000-6-4	EN 55011 Class A
	Immunity	EN 61000-6-2	Group standard

Graz, November 30, 2023

Place / Date of the CE-marking

Ing. Thomas Propst / Manager Total Quality

CE certificate of conformity DEWE3-M12s

CE

Manufacturer	DEWETRON GmbH
Address	Parkring 4 8074 Grambach, Austria Tel.: +43 316 3070-0 Fax: +43 316 3070-90 Email: sales@dewetron.com http://www.dewetron.com
Name of product	**DEWE3-M12s**
Kind of product	*Data acquisition instrument*

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 harmonization 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:

LVEMC			
	Safety	EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019 pol. deg. 2 and EN IEC 61010-2-030:2021 + A11:2021	
	Emissions	EN 61000-6-4	EN 55011 Class A
	Immunity	EN 61000-6-2	Group standard

Graz, August 10, 2026

Place / Date of the CE-marking

Ing. Thomas Propst / Manager Total Quality

Conformity to IEC 61000-4-30

Manufacturer	DEWETRON GmbH
Address	Parkring 4 8074 Grambach, Austria Tel.: +43 316 3070-0 Fax: +43 316 3070-90 Email: sales@dewetron.com http://www.dewetron.com

This certificate has been issued as a result of an assessment of the performance of the models listed below as to their conformity with the requirements of IEC 61000-4-30:2008 Class A, Electromagnetic compatibility (EMC) Part 4-30: Testing and measurement techniques – Power quality measurement methods.

Instruments	**DEWE2 series (all devices)**	**TRIONet**
	DEWE3 series (all devices)	**TRIONet3**
	LITE[PA]	
	in combination with	
Amplifiers	**TRION(3)-1820-POWER-4**	**TRION(3)-1810-HV-8**
	TRION3-1810M-POWER-4	**TRION3-SUB-8 with SUB-600V**
	LITE[PA] module	
	and	
Software	**OXYGEN with OPT-POWER-BASIC and OPT-POWER-ADV since version 2.3**	

Standard	Parameter	IEC section	Referring to	Class	Comment
IEC 61000-4-30	Power frequency	5.1	-	A	a)
	Magnitude of supply voltage	5.2	-	A	a)
	Flicker	5.3	61000-4-15	A	b)
	Supply voltage unbalance	5.7	-	A	a)
	Voltage harmonics	5.8	61000-4-7	A	c), d)
	Voltage interharmonics	5.9	61000-4-7	A	d)

General notice: no synchronisation to UTC 10 minute tick

a) 10/12 period values only with setting “Max. update rate” = 190 ms

b) For U_din in range of 60 V to 690 V

c) Only with grouping setting = “Type 1”; no smoothing with LP filter

d) For nominal value of 5 A, use SUB-CUR-20A; for currents above use external current sensor

On the basis of the evidence presented, the above products conform to the requirements of IEC 61000-4-30:2008 (Edition 2) Class A, Electromagnetic compatibility (EMC) Part 4-30: Testing and measurement techniques – Power quality measurement methods:



Graz, August 10, 2023

Place / date of issue

Ing. Thomas Propst / Manager Total Quality