DEWETRON

DEWE-50-TRIONet-16

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 25 years of DEWETRON expertise in measurement engineering.

ISO9001

EN ISO 14001

CUSTOMIZED MODULAR COMPETENT COMMITTED APPROVED

Thank you!

Thank you very much for your investment in DEWETRON's unique data acquisition systems. These are top-quality instruments which are designed to provide you years of reliable service. This guide has been prepared to help you get the most from your investment, starting from the day you take it out of the box, and extending for years into the future.

This guide includes important startup notes, as well as safety notes and information about keeping your DEWETRON system in good working condition over time.

We strongly suggest that you read this entire manual, especially the safety and care sections, as well as to avoid damaging your DEWETRON system.

What is the DEWE-50-TRIONet-16?

DEWE-50-TRIONet-16 is desigend to be used with DAQP as well as TRION™ series modules in a single housing and is a compact test and measurement solution that enables synchronous high-speed data acquisition across great distances and distributed locations. It communicates via Ethernet or USB-bus and is operable intuitively with OXYGEN or in familiar environments such as DEWESoft 7 or any other established programming language.

The compact, distributable DEWE-50-TRIONet-16 accepts any two of the multi-channel TRION series plug-in modules and comes with a preinstalled TRION-1802-dLV-32 module. The DEWE-50-TRIONet-16 connects to any Windows computer via either USB or Ethernet – and DEWE-50-TRIONet-16 mainframes can be interconnected using Ethernet. Because of the Ethernet interface, DEWE-50-TRIONet-16 mainframes can be placed up to 100 meters apart from each other.

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: +1 877 431 5166
Fax: +1 401 284 3755
Email: support@dewamerica.com
Web: http://www.dewetron.us

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

Service/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.

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.

DEWETRON GmbH (DEWETRON) shall not be liable for any errors contained in this document. DEWETRON MAKES NO WARRANTIES OF ANY KIND WITH REGARD TO THIS DOCUMENT, WHETHER EXPRESS OR IMPLIED. DEWETRON SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. DEWETRON shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory, in connection with the furnishing of this document or the use of the information in this document.

Warranty Information

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

Restricted Rights Legend

Use austrian law for duplication or disclosure.

DEWETRON 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 TRION™ 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.
- 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

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 2002/96/EC 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.

DEWE-50-TRIONet-16

> Small, distributable data acquisition front-end

> 2 slots for user exchangeable TRION™ series modules
(1x preinstalled module, 1x free slot available)

> Up to 16 channels with isolation
(in conjunction with DAQP/HSI/PAD series modules)

> USB 3.0 or Gigabit ethernet connection to notebook or desktop

> Touchscreen on front panel

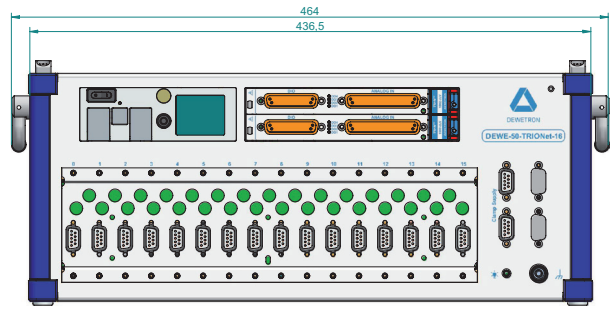
System specifications

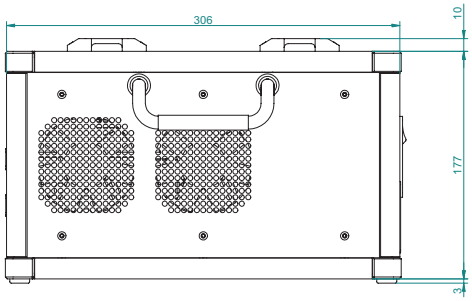
	DEWE-50-TRIONet-16	
Data acquisition (TRION™ modules)	2 slots for TRION™ acquisition modules (1 preinstalled TRION-1802-dLV-32 module, 1 free slot available)	
Data acquisition (DAQP modules)	16 slots for DAQP/HSI/PAD modules	
Power supply: Rated input voltage:	 100 to 240 V_{AC} (max. 90 to 264 V_{AC}), 100 W AC power supply	
Operating temperature:	0 °C to +40 °C, down to -20 °C with prewarmed unit	
Storage temperature:	-20 °C to +70 °C	
Humidity (operating):	10 % to 80 %, non condensing 5 % to 95 % rel. humidity	
Altitude:	up to 2000 m	
Sine vibration test[1]: EN 60068-2-6	Shape Frequency range Acceleration Sweep rate Duration Test in 3 directions	Sine 10 - 150 Hz 20 m/s² 1 oct./min. 20 Cycles
Random vibration test[1]: EN 60721-3-2 Class 2M2	Shape Frequency range Spectral acceleration density Duration	Random 10 - 200 Hz 1 m²/s³ 30 Minutes/direction
Shocktests[1]: EN 60068-2-27	Shape Acceleration amplitude Duration 3 pumps each direction, 6 directions in total	Half-sine 15 g 11 ms
Dimensions (W x H x D):	464 x 190 x 306 mm (18.26 x 7.48 x 12.04 in.) 5U required (4U = unit + 1U = cooling)	
Weight w/o DAQP/HSI/PAD modules:	9 kg (19.84 lbs)	

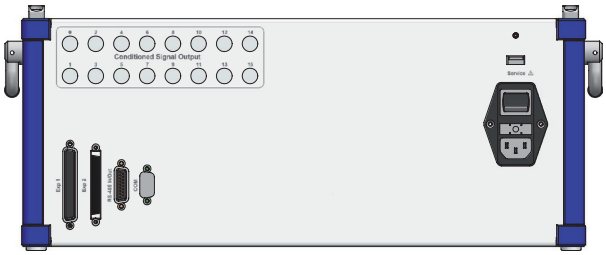
[1] Tested with SSD

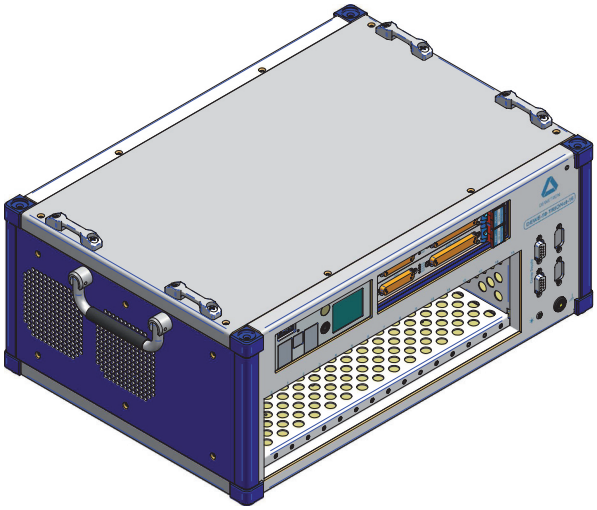
MAIN SYSTEM

Dimensions





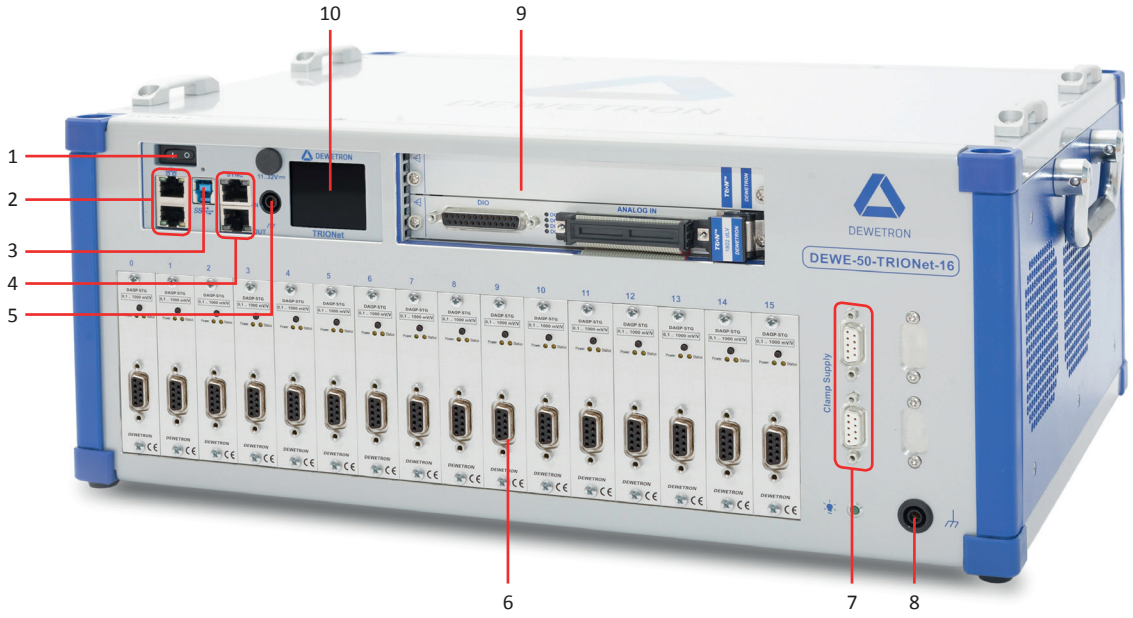




Dimensions in mm
(1 inch = 25.4 mm)

DEWE-50-TRIONet-16 at a glance

DEWE-50-TRIONet-16 front view



DEWE-50-TRIONet-16 right side view

1 Power on/off switch
2 Gigabit Ethernet interface
3 USB 3.0 interface connector (type B)
4 TRION™-SYNC-BUS interface
5 Ground connection
6 DAQP Module slots
7 Power supply for current clamps (optional)
8 Chassis terminal
9 TRION™ series module slots
10 Touch screen display
11 RS-485 In/Out
12 RS-232 interface connetor (COM)
13 Power supply input connector
14 Main power on/off switch
15 USB connector for service and firmware update
16 Conditioned signal output

1 Power on/off switch

The power on/off switch is used to switch on the system. It only works if the main power switch (**14**) is switched to position 'I'.

2 Gigabit Ethernet LAN connectors

The DEWE-50-TRIONet-16 supports Gigabit Ethernet interface ports for connecting the DEWE-50-TRIONet-16 with a Laptop/PC or daisy-chaining multiple units with standard RJ45 connector. 2 m (6 ft) Cat6 Ethernet cable included.

LED indication
The Gigabit Ethernet interface connectors on the DEWE-50-TRIONet-16 have two LEDs displaying following statuses:

GREEN (stable)	Link active
YELLOW (stable)	1Gb speed is in use

WARNING: *The total length of the Ethernet cable **must not** exceed 100 m (328 ft) between two units!*

3 USB 3.0 interface connector (Universal Serial Bus)

The DEWE-50-TRIONet-16 is equipped with a USB 3.0 interface (type B) to connect to a Laptop or PC.
2 m (6 ft) USB 3.0 cable included. The USB 3.0 interface meets standard USB pin assignment.

LED indication
The USB interface connector on the DEWE-50-TRIONet-16 has one LED displaying following statuses:

GREEN (stable)	Link active
YELLOW (stable)	USB3.0 is in use

Optional cables:

> **USB 3.1 Type-C to type-A adapter**
> This USB adapter enables the connection between the DEWE-50-TRIONet-16 and a PC or laptop equipped with a USB Type-C™ port. The coaxial conductors allow an interference-free data transfer with up to 10 Gbps. Adapter length approx. 0.1 m.

WARNING: *DEWETRON recommends using USB 3.0 cables with a maximum cable length of 1.8 m (6 ft) otherwise the DEWE-50-TRIONet-16 won't connect to the Laptop/PC!*

4 TRION™-SYNC-BUS interface

The DEWE-50-TRIONet-16 is equipped with two additional TRION™-SYNC-BUS interface connectors for daisy-chaining multiple DEWE-50-TRIONet-16 units. SYNC cables are not included an have to be ordered separately.

LED indication:

	SYNC OUT	SYNC IN
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.

Optional cables:

> **TN-DCHAIN-SET-0.2**
> A set of two cables (data and sync) for daisy-chaining two DEWE-50-TRIONet-16 units in stacked configuration, cable length approx. 0.2 m.

Other cables on request.

WARNING: *The total length of the SYNC cable between DEWE-50-TRIONet-16 units **must not** exceed 100 m (328 ft), otherwise the data won't synchronize!*

5 Ground connection

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

6 Slots for DAQP/HSI/PAD series modules

The DEWE-50-TRIONet-16 supports 16 slots for DAQP/HSI/PAD modules. DAQP/HSI/PAD modules can be changed easily by the user.

7 Power supply for current clamps (optional)

Not supported with the standard instrument. Further information please refer to customer information.

8 Chassis terminal

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

9 TRION™ series module slots

Slots for 2x TRION™ series modules. The DEWE-50-TRIONet-16 already comes with a preinstalled TRION-1802-dLV-32 module.

Supported modules:

Name
TRION-2402-MULTI
TRION-1802-dLV-32
TRION-1600-dLV-32
TRION-1620-ACC
TRION-1620-LV
TRION-2402-V
TRION-1603-LV
TRION-2402-dSTG
TRION-2402-dACC
TRION-CNT
TRION-DI-48
TRION-BASE
TRION-TIMING
TRION-CAN
TRION-VGPS

Not supported modules:

Name
TRION-FLEXRAY
TRION-A429
TRION-M1553
TRION-MA4
TRION-1628-AO-2

More details of TRION™ series modules please find in the *TRION™ series modules technical reference manual*.

NOTE: The DEWE-50-TRIONet-16 already comes with a preinstalled TRION-1802-dLV-32 module.

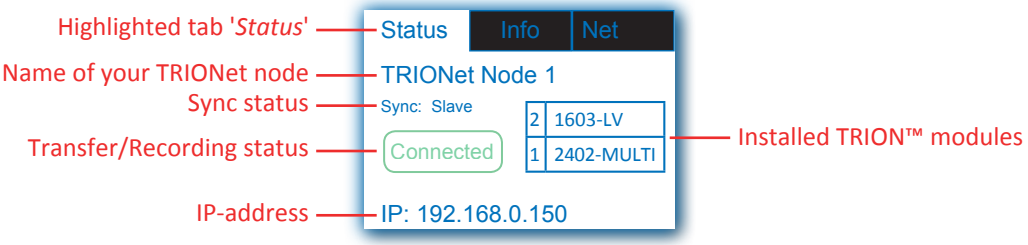
10 Touch screen display

The integrated touch screen display of the DEWE-50-TRIONet-16 shows all relevant information straight on the device. To switch between the tabs, simply touch the display.

Following displays are shown:

STATUS TAB:

The status tab follows the boot screen animation and shows information about TRION hardware, sync status, IP-address and transfer/recording status. To switch between tabs just tab anywhere on the screen.



> Highlighted tab 'Status': *The 'status' tab is the main screen after the device booted correctly.*

> Name of your TRIONet node: *The name of the DEWE-50-TRIONet-16 node is shown here and can be changed with the DEWE2 Explorer. More information see chapter 'Configuring your DEWE-50-TRIONet-16'.*

> Sync status: *The actual sync status of the DEWE-50-TRIONet-16. Following statuses are available:*

- *none:* *Standalone device*
- *Sync: Master:* *The device is set as master*
- *Sync: Slave:* *The device is set as 'slave-end' or 'slave-mid'*

More information in chapter 'Cascading and synchronizing DEWE-50-TRIONet-16'

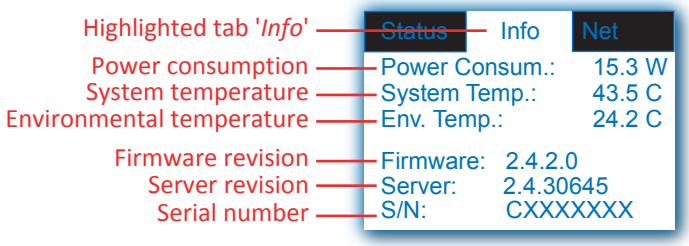
> Transfer/recording status: *Shows the actual tranfer/recording status. Following statuses are available:*

- *none:* *The device is not connected*
- *Connected:* *The device is connected to the software (Oxygen, DS7,...)*
- *Active:* *Measurement active*
- *Record:* *Measurement active and recording*

> IP-adress*:* *Shows the current IP-address.* The IP-address can be set to static or DHCP. More information see chapter *'Configuring your DEWE-50-TRIONet-16'.*

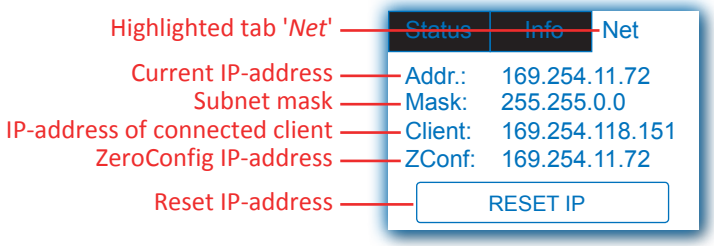
INFO TAB:

The 'Info' display tab shows some internal health parameters. This is a live display with an update rate of approx. 1 sec. In case of support please have your firmware/server revision number ready for further instructions. To switch between tabs just tab anywhere on the screen.



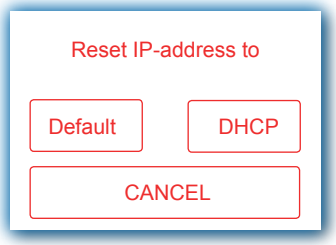
NET TAB:

The 'Net' display tab shows the network settings of the DEWE-50-TRIONet-16 device itself and the client if connected.
In this tab there is also the possibility of resetting the IP-address of the DEWE-50-TRIONet-16.
Information on how to change IP-address and subnet mask please see chapter
'*Configuring your DEWE-50-TRIONet-16 with DEWE2 Eplorer*'.
Information regarding ZeroConf IP-address please see chapter
'*ZeroConf (Zero Configuration Networking) & Link-local addresses*'.



RESET IP:

If '*RESET IP*' is pressed, the following screen will display:

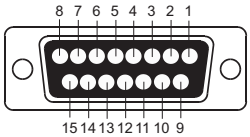


> Default: This will reset the IP-address of the system to default **192.168.0.150**.

> DHCP: Choose 'DHCP' if the DEWE-50-TRIONet-16 should be implemented in a proprietary, already existing LAN with a DHCP server up and running. The DHCP lookup may take a few minutes. If the DHCP lookup failed, the DEWE-50-TRIONet-16 will switch automatically to a fallback address called '*Link-Local IP-address*'. Please refer to chapter '*ZeroConf (Zero Configuration Networking) & Link-local addresses*' for more information.

11 RS-485 In/Out (EPAD)

To connect DEWETRON EPAD modules to the system.

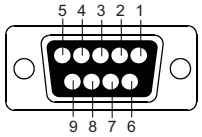


15-pin female SUB-D connector

Pin assignment
1: RS-485 A
2: RS-485 B
14: GND (power supply EPAD modules)
15: +12 V (power supply EPAD modules)
all remaining pins are not connected!

12 RS-232 Interface (to PC COM port)

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



9-pin female SUB-D connector

Pin assignment

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

13 Power supply input connector

Input range: 100 .. 240 V_{AC} (power cord included)
More details see chapter '*Power supply*'.

14 Main power switch

The main power switch separates the system from the grid. The Power on/off switch (**1**) only works if the main power switch (**14**) is switched to position 'I'.

15 USB connector for service and firmware update

On the rear panel of the system there is a USB connector for service and firmware updates. Information on how to perform a firmware update of your system, please refer to chapter 'Maintenance' > 'Firmware update' in this document.

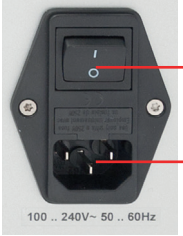
16 Conditioned signal output (±5 V / ±10 V, optional)

On the rear panel of the system there are 16 BNC sockets which are configured as ±5 V or ±10 V output of conditioned signals.

Power supply

The DEWE-50-TRIONet-16 is powered by an internal AC/DC power supply.

100 W AC/DC power supply	SPS100P-D3
Input:	
Rated input voltage:	100 to 240 V_{AC} (max. 90 to 264 V_{AC})
Input frequency:	47 to 63 Hz
Max. input current:	<3 A @ 100 V_{AC} input, full load condition
Output:	
Output power:	max. 100 W
Output voltages:	+12 V (max. 4.9 A) -12 V (max. 4.9 A)
Protection:	
Overvoltage protection:	13.8 ~ 17.5 V
Short circuit:	shutdown, auto recovery after fault has been removed



Main power switch

Power supply input connector

32-bit 64-bit WINDOWS 7
32-bit 64-bit WINDOWS 10

Connecting your DEWE-50-TRIONet-16 to your Laptop/PC

To connect your system to a Laptop or PC, you can either use USB 3.0 or Gigabit Ethernet. To do so, you have to install measurement software of your choice as well as all drivers for the system before connecting it to the Laptop/PC. This reference manual describes on how to install and operate your device with OXYGEN and DEWESoft™ 7.x.

WARNING: *DO NOT CONNECT YOUR DEWE-50-TRIONet-16 WITH YOUR LAPTOP/PC BEFORE INSTALLING ANY MEASUREMENT SOFTWARE OR DRIVERS ON YOUR LAPTOP/PC!*

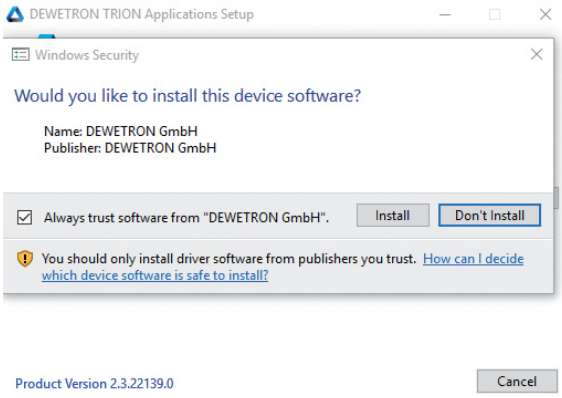
1. Install TRION package

The TRION package contains all necessary drivers, APIs as well as the DEWE2 Explorer which is needed for configuring your DEWE-50-TRIONet-16. To install this package execute the '***DEWETRON-TRION-Applications-x64.exe***' on your DEWETRON Installation media USB drive and follow the instructions of the installer.

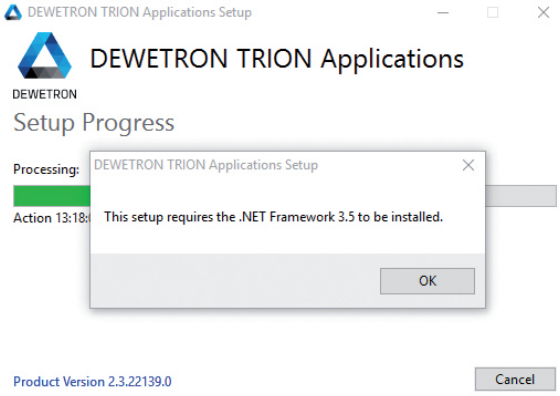
WARNING: *DO NOT CONNECT YOUR DEWE-50-TRIONET-16 WITH YOUR LAPTOP/PC **BEFORE** THIS PACKAGE HAS BEEN INSTALLED ON YOUR LAPTOP/PC!*

NOTE: ***Product Version 2.3.x and older**: Microsoft .NET Framework 3.5 **is required** for this setup!*
***Product Version 2.4.x and newer:** Microsoft .NET Framework 3.5 **is not required** anymore!*

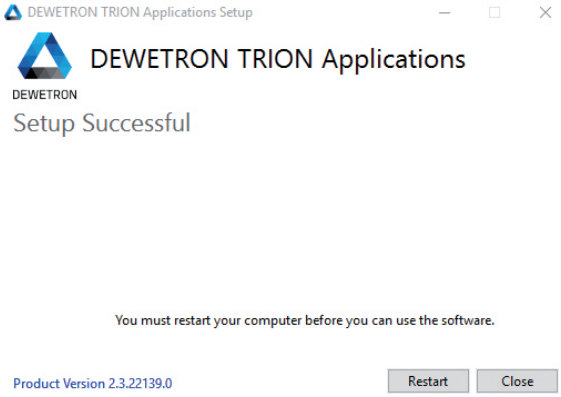
Agree to the license terms and conditions and proceed with 'Install'.



Hit 'Install'. Optionally check 'always trust software from DEWETRON GmbH'.



If .NET Framework 3.5 is not installed on your computer the warning shown above will be displayed. When hitting 'OK' the installation will abort and perform a rollback and a restart.
.NET Framework 3.5 has to be installed manually.
*Since Product Version **2.4.x**: .NET Framework **is not required** anymore.*

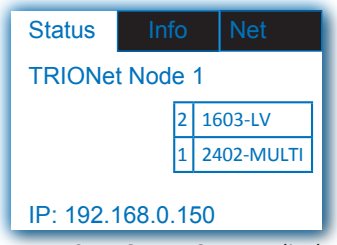


Setup successful. A restart is mandatory.

2. Connect the DEWE-50-TRIONet-16 to your Laptop/PC via USB3.0 or Gigabit Ethernet

First of all connect the DEWE-50-TRIONet-16 to the included external AC/DC power supply. Switch ON the device with the '*Power-on switch*' located on the top left at the front panel. After a short bootscreen animation, the status display will indicate the DEWE-50-TRIONet-16 is ready to go.

DEWE-50-TRIONet-16 bootscreen animation after switching on the device



DEWE-50-TRIONet-16 status display

Now connect the DEWE-50-TRIONet-16 via desired interface to your Laptop/PC.

2.1 ZeroConf (Zero Configuration Networking) & Link-local addresses

Since Product version **2.4.x** the network ease-of-use has been improved drastically. Any DEWE-50-TRIONet-16 is able to communicate automatically with a Laptop/PC by connecting them with a crossover Ethernet or USB 3.0 cable.

ZeroConf or rather *Link-local addresses* allow devices to automatically have an IP address on a network if they haven't been manually configured or automatically configured by a special server on the network (DHCP).

Link-local addresses for IPv4 are defined in the address block 169.254.0.0/16 (169.254.1.0 to 169.254.254.255)

Before an address is chosen from that range, the DEWE-50-TRIONet-16 sends out a special message (using ARP) to the connected Laptop/PC on the network (assuming that it also haven't been assigned an address manually or automatically) to find out if 169.254.1.1 is free. If it is, then the DEWE-50-TRIONet-16 assigns that address to its network card. If that address is already in use by another device on the same network, then it tries the next IP 169.254.1.2 and so on, until it finds a free address.

Requirements:

> DEWE-50-TRIONet-16 with Firmware 2.4.1 or higher

> Laptop/PC with Windows 7 (32- or 64-bit) or Windows 10 (64-bit)

> Cat6 Ethernet or USB3.0 cable

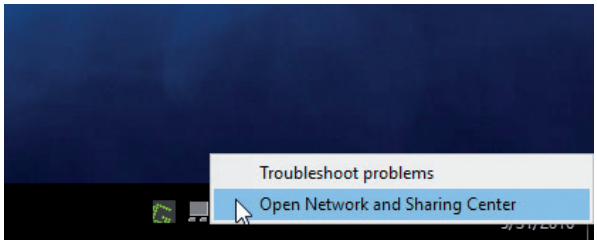
> Installed DEWETRON TRION Applications 2.4.1 or higher

NOTE: ZeroConf & Link-local addresses are normally only used to assign IP addresses to network interfaces when no external, stateful mechanism of address configuration exists, such as the Dynamic Host Configuration Protocol (DHCP), or when another primary configuration method has failed. It is always recommended to assign a static IP-address or use a DHCP. The following chapters will demonstrate on how to assign a static IP-address or using DHCP.

ZeroConf via USB3.0

If the DEWE-50-TRIONet-16 is connected via USB 3.0 cable (included in the kit) to the Laptop/PC, WINDOWS will automatically detect a new hardware and install the corresponding USB 3.0 to Ethernet adapter driver (ASIX AX88179). To check if the drivers have been installed correctly, right click on the network icon at the bottom right of your taskbar and select '*Open Network and Sharing Center*'.

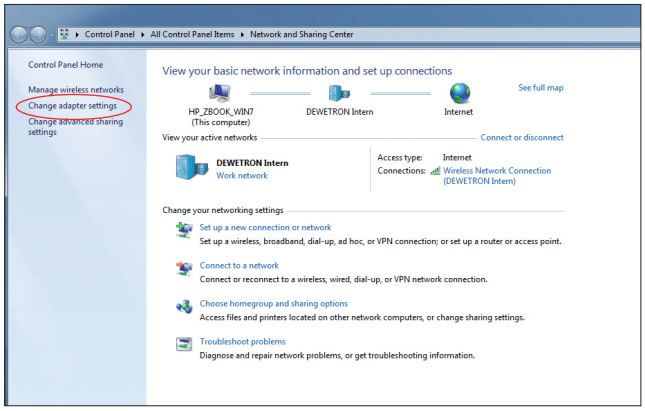
WINDOWS 7 + WINDOWS 10



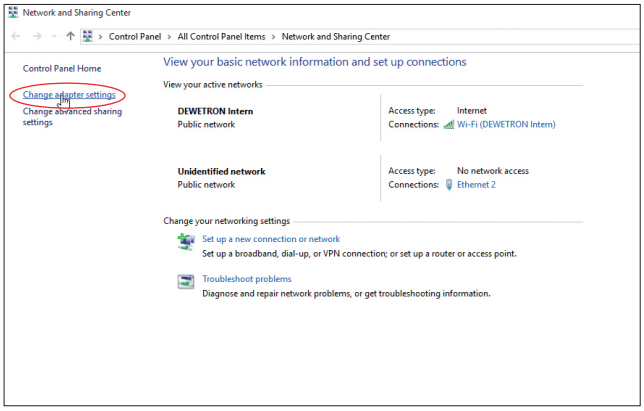
Right-click on network icon and select 'Open Network and Sharing Center'

Click on '*Change adapter settings*' on the left.

WINDOWS 7

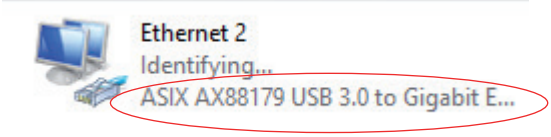


WINDOWS 10

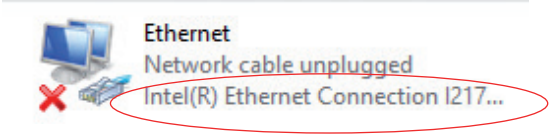


If installed correctly the adapter has to be listed as '*ASIX AX88179 USB 3.0 to Gigabit E...*'.

WINDOWS 7 + WINDOWS 10



WINDOWS 7 + WINDOWS 10



WARNING: *Make sure to use the USB 3.0 cable provided with your system! If the original cable gets lost, replace it with a cable of the same length or less than 2 meters (< 6 ft.)! The total length of the cable **must not** exceed 2 m (6 ft.), otherwise the DEWE-50-TRIONet-16 won't connect to the Laptop/PC! DEWETRON offers USB 3.0 cables for your DEWE-50-TRIONet-16 in perfect length.*

If WINDOWS fails to install the ASIX AX88179 driver automatically, please refer to chapter '*2.4 Manually USB 3.0 to Gigabit Ethernet driver installation of host PC (static IP)*'.

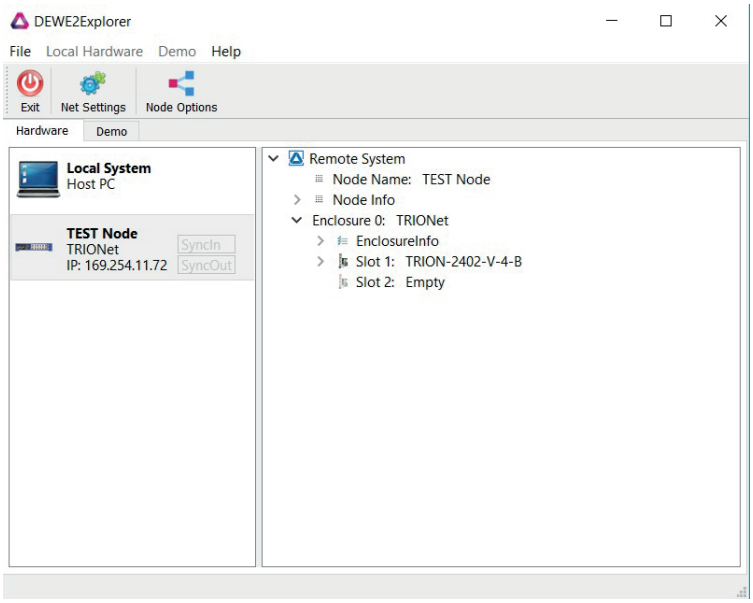
ZeroConf via Cat6 Ethernet cable

If the DEWE-50-TRIONet-16 is connected via Cat6 Ethernet cable (included in the kit) to the Laptop/PC, ZeroConf will automatically assign the DEWE-50-TRIONet-16 as well as the Laptop/PC with an IP-address of the address block 169.254.0.0/16 (169.254.1.0 to 169.254.254.255). ***No driver installation required. The two devices are ready to communicate.***

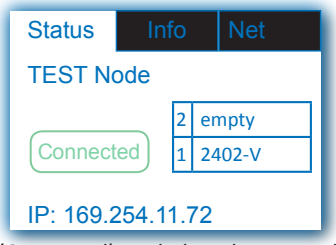
Check ZeroConf status

To check if the devices are communicating correctly, simply start the DEWE2Explorer which has been installed with the TRION package, usually via '*Start' > 'All programs' > 'DEWETRON' > 'DEWE2Explorer*' or just type '*DEWE2Explorer*' in the search bar.

The DEWE2Explorer will list a '*Local System*' (which is your Laptop/PC) and the connected DEWE-50-TRIONet-16.



By selecting the DEWE-50-TRIONet-16 in the DEWE2Explorer, it will now show a '*connected*' symbol on the status display of the device. When deselecting the DEWE-50-TRIONet-16 in the DEWE2 Explorer, the '*connected*' symbol will disappear from the status display of the unit.

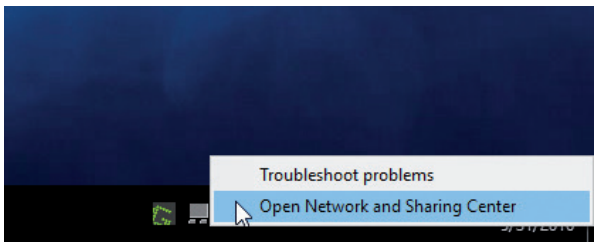


Green 'Connected' symbol on the status display.

2.2 Manually setting up Gigabit Ethernet connection of host PC (static IP)

After the DEWE-50-TRIONet-16 has been connected via Gigabit Ethernet cable (included in the kit) to the Laptop/PC, right click on the network icon at the bottom right of your taskbar and select '*Open Network and Sharing Center*'.

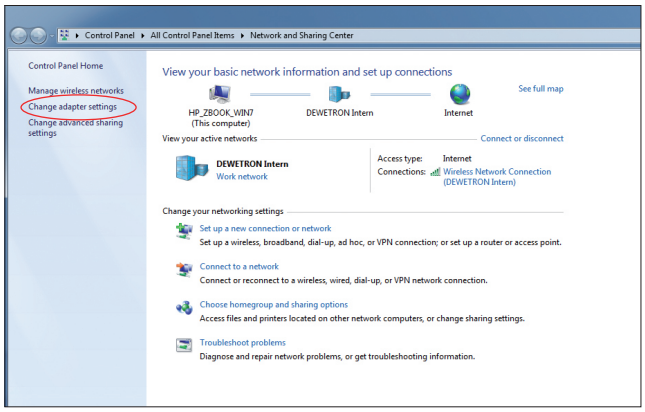
WINDOWS 7 + WINDOWS 10



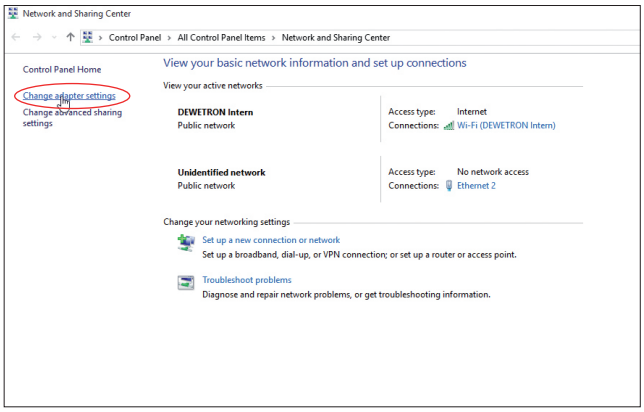
Right-click on network icon and select 'Open Network and Sharing Center'

Click on '*Change adapter settings*' on the left.

WINDOWS 7

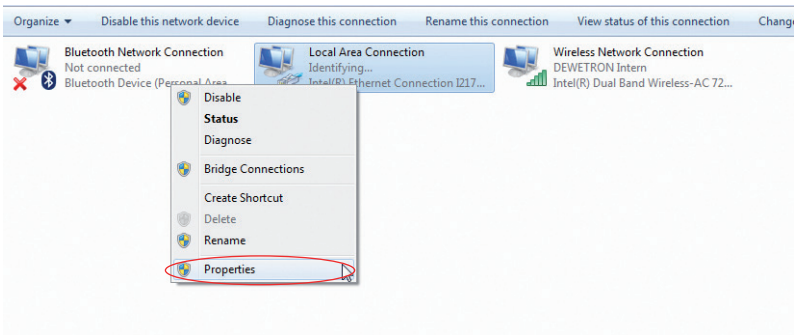


WINDOWS 10



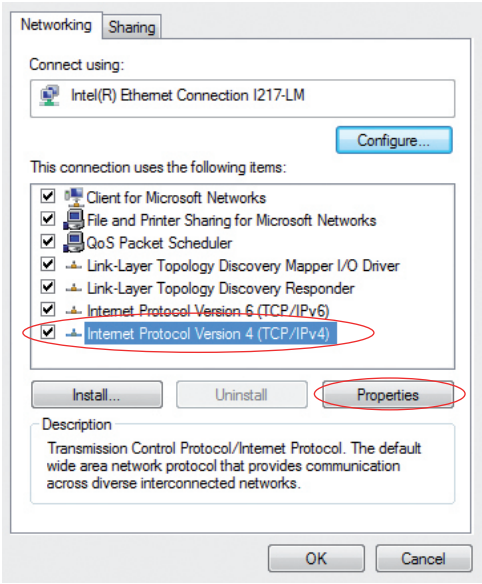
Right click the adapter where the DEWE-50-TRIONet-16 is connected and select 'Properties' from the menu.

WINDOWS 7 + WINDOWS 10



Select '*Internet Protocol Version 4 (TCP/IPv4)*' and click on '*Properties*' afterwards.

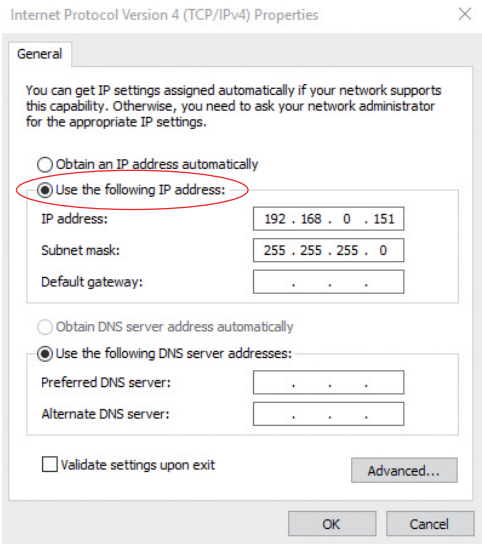
WINDOWS 7 + WINDOWS 10



Check 'Use the following IP adress:' and use an IP address within the same range as the DEWE-50-TRIONet-16 (e.g. **192.168.0.151**). The current IP address of the DEWE-50-TRIONet-16 is shown on the status display. Use the following subnet mask: **255.255.255.0**.

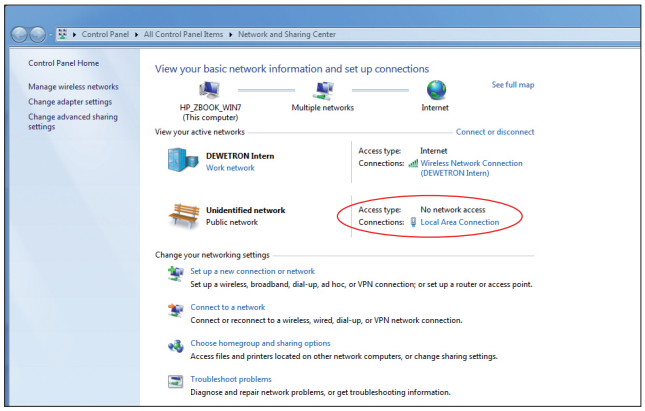
The **default IP** address of the DEWE-50-TRIONet-16 is: **192.168.0.150**. DNS servers are not required.

WINDOWS 7 + WINDOWS 10

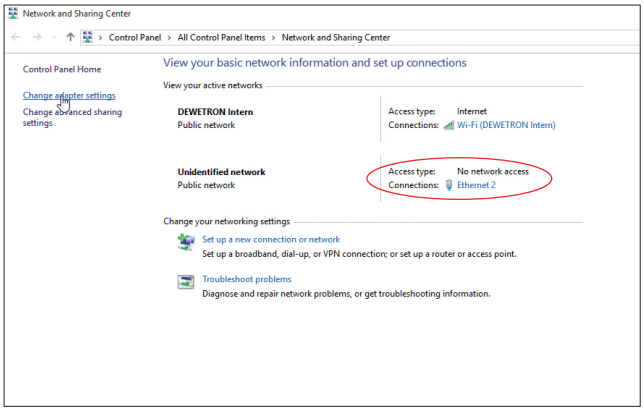


Close all tabs by hitting 'OK'. Now we have set a static IP address to our adapter. In the '*Network and Sharing Center*' you should now see a local area network.

WINDOWS 7



WINDOWS 10



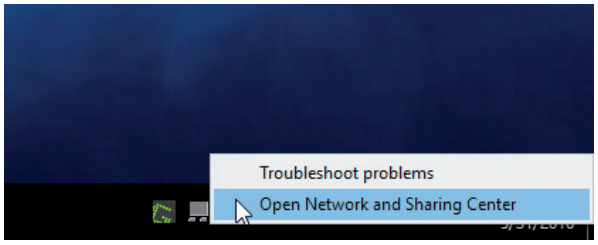
Reboot your Laptop/PC.

2.3 Manually setting up USB 3.0 connection of host PC

After the DEWE-50-TRIONet-16 has been connected via USB 3.0 cable (included in the kit) to the Laptop/PC, WINDOWS will automatically detect a new hardware and install the corresponding USB 3.0 to Ethernet adapter driver (ASIX AX88179) ***when connected to the internet***.

To check if the drivers have been installed correctly, right click on the network icon at the bottom right of your taskbar and select '*Open Network and Sharing Center*'.

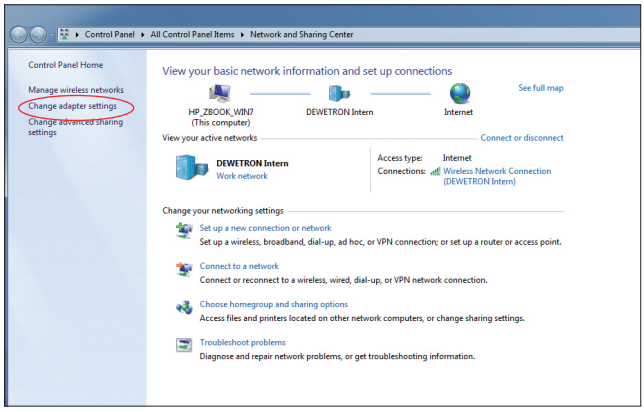
WINDOWS 7 + WINDOWS 10



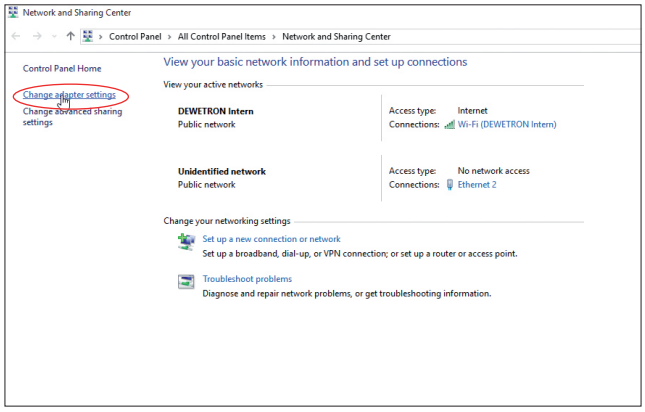
Right-click on network icon and select 'Open Network and Sharing Center'

Click on '*Change adapter settings*' on the left.

WINDOWS 7

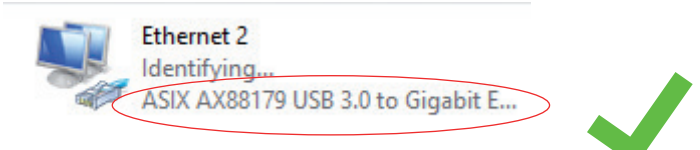


WINDOWS 10

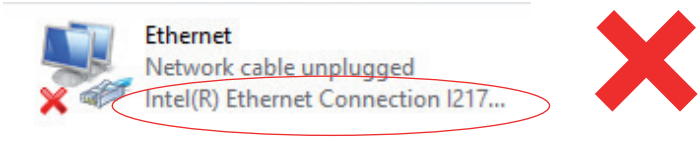


If installed correctly the adapter has to be listed as '*ASIX AX88179 USB 3.0 to Gigabit E...*'.

WINDOWS 7 + WINDOWS 10



WINDOWS 7 + WINDOWS 10

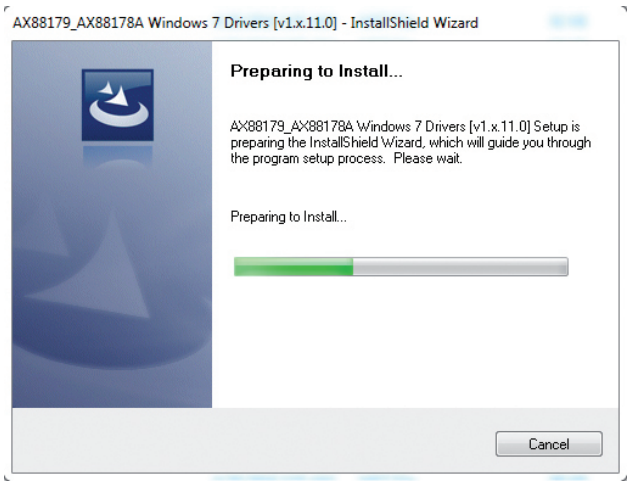


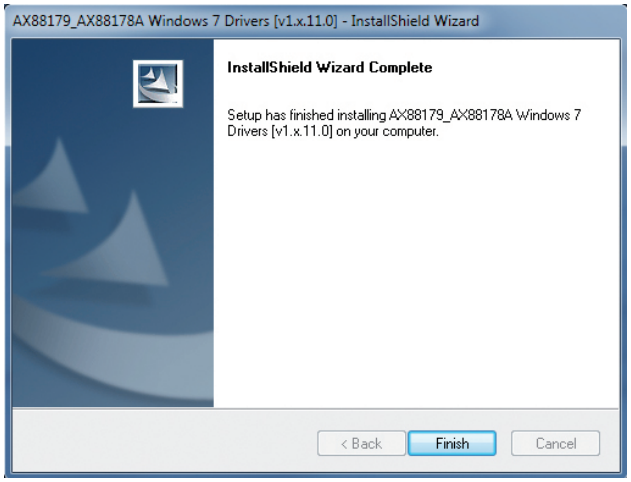
WARNING: *Make sure to use the USB 3.0 cable provided with your system! If the original cable gets lost, replace it with a cable of the same length or less than 2 meters (< 6 ft.)! The total length of the cable **must not** exceed 2 m (6 ft.), otherwise the DEWE-50-TRIONet-16 won't connect to the Laptop/PC! DEWETRON offers USB 3.0 cables for your DEWE-50-TRIONet-16 in perfect length.*

- **2.4 Manually USB 3.0 to Gigabit Ethernet driver installation of host PC (static IP)**

If WINDOWS fails to install the ASIX AX88179 driver automatically, you can do it manually by starting the '***setup.exe***' in the '***AX88179_178A_Winx_v1.x.10.0_Drivers_Setup_v3.0.2.0***' folder on your DEWETRON Install media USB drive and follow the instructions of the installer. The driver can be also found via:
http://www.asix.com.tw/products.php?op=pItemdetail&PItemID=131;71;112

WINDOWS 7 + WINDOWS 10

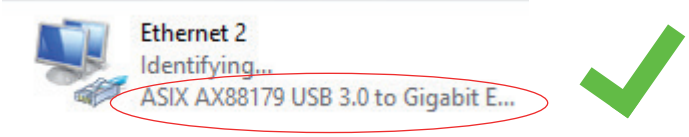




To check if the drivers have been installed correctly, right click on the network icon in the bottom right of your taskbar and select '*Open Network and Sharing Center*' > '*Change adapter settings*'.

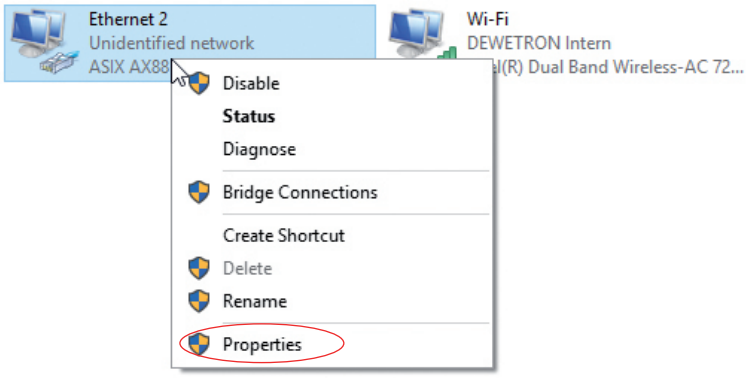
If installed correctly the adapter has to be listed as '*ASIX AX88179 USB 3.0 to Gigabit E...*'.

WINDOWS 7 + WINDOWS 10



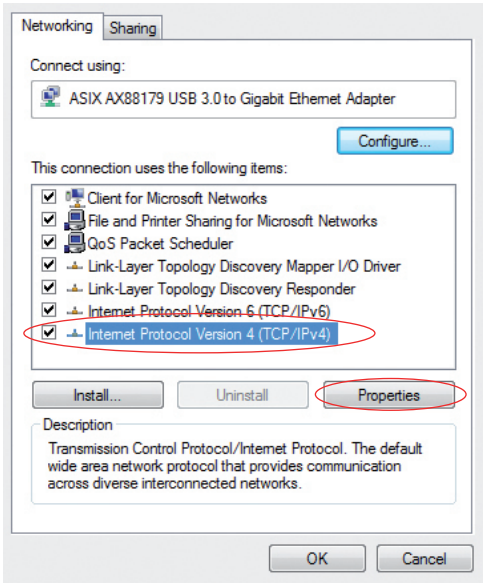
Right click the corresponding adapter (ASIX AX88179..) and select '*Properties*' from the menu.

WINDOWS 7 + WINDOWS 10



Select '*Internet Protocol Version 4 (TCP/IPv4)*' and click on '*Properties*' afterwards.

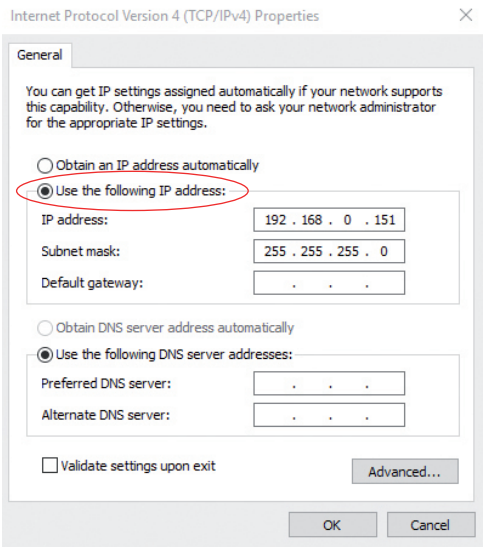
WINDOWS 7 + WINDOWS 10



Check '*Use the following IP adress:*' and use an IP address within the same range as the DEWE-50-TRIONet-16 (e.g. **192.168.0.151**). The actual IP address of the DEWE-50-TRIONet-16 is shown on the status display. Use the following subnet mask: **255.255.255.0**.

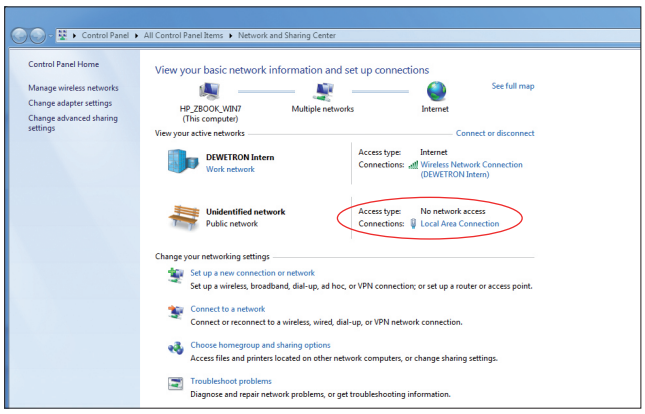
The **default IP** address of the DEWE-50-TRIONet-16 is: **192.168.0.150**. DNS server are not required.

WINDOWS 7 + **WINDOWS 10**

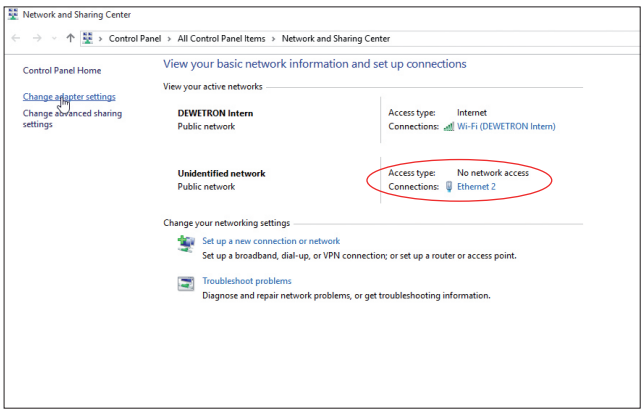


Close all tabs by hitting '*OK*'. Now we have set a static IP address to our adapter. In the '*Network and Sharing Center*' you should now see a local area network.

WINDOWS 7



WINDOWS 10

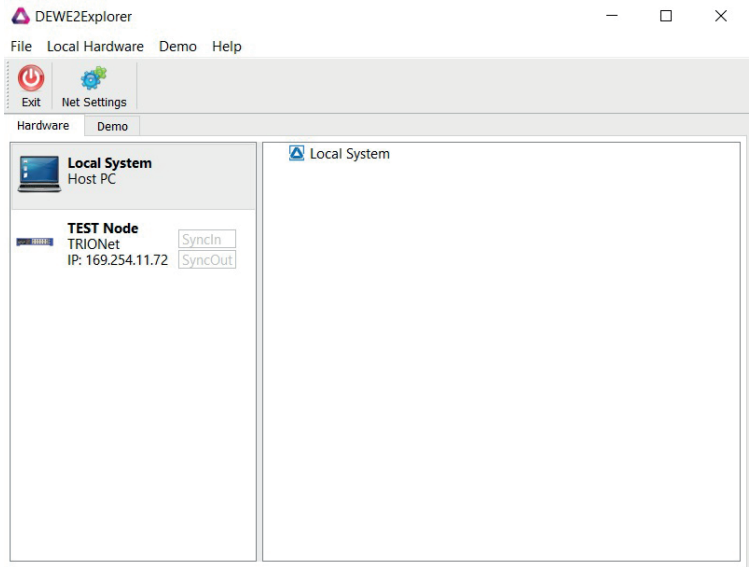


Reboot your Laptop/PC.

3. Setting up your DEWE-50-TRIONet-16 with DEWE2 Explorer (static IP, DHCP, name, ...)

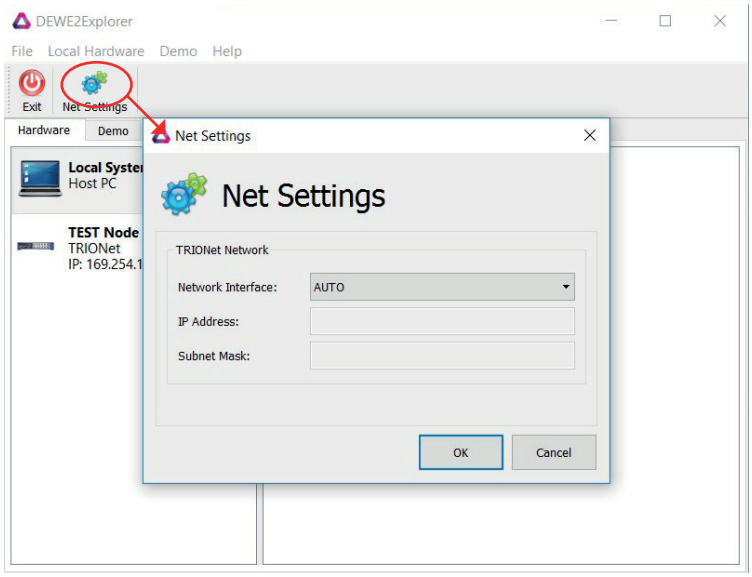
After connecting the DEWE-50-TRIONet-16 with your Laptop/PC via desired interface, start the DEWE2 Explorer which has been installed with the TRION package, usually via '*Start' > 'All programs' > 'DEWETRON' > 'DEWE2Explorer*' or just type '*DEWE2Explorer*' in the search bar.

The DEWE2 Explorer will list a '*Local System*' (which is your Laptop/PC) and the connected DEWE-50-TRIONet-16.



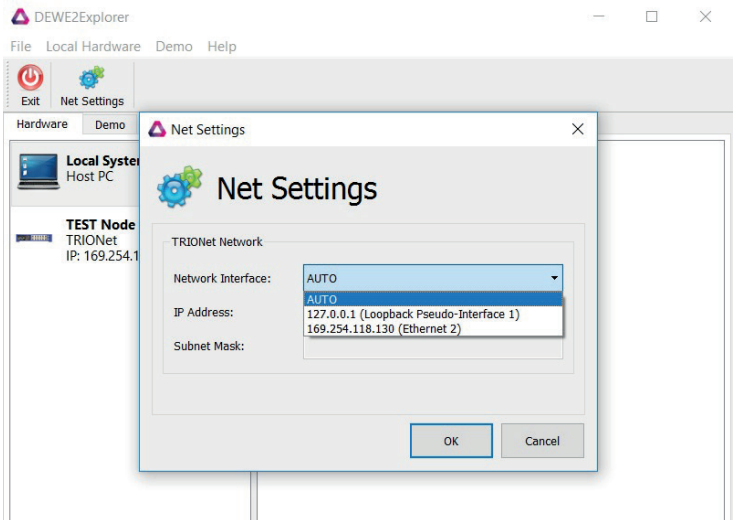
DEWE2Explorer with 'LocalSystem' and DEWE-50-TRIONet-16

If the systems are not in the same IP-address range, select the '*LocalSystem*' and klick on '*Net Settings*' from the menu bar. The following screen will pop up:



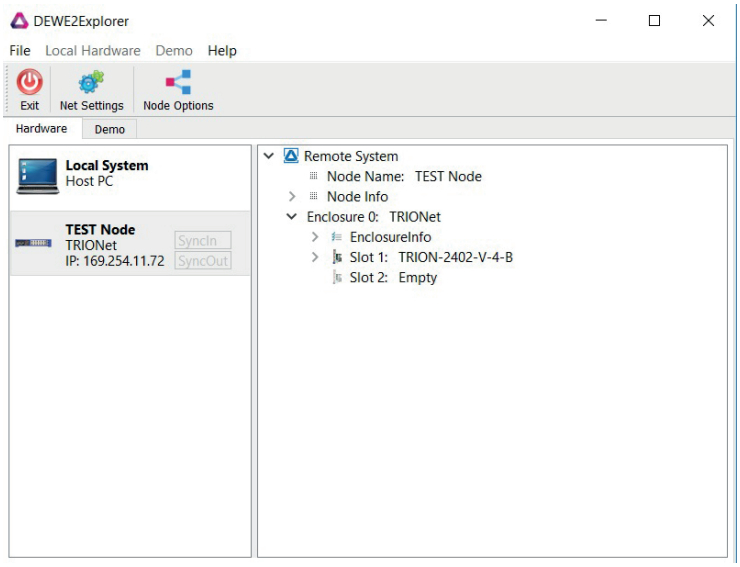
Select the 'LocalSystem' and click on 'Net Settings' from the menu bar.

Choose 'AUTO' from the dropdown menu and hit '*OK*' afterwards. The DEWE2Explorer will scan all Ethernet adapters and choose the corresponding adapter automatically. It is also possible but not recommended to manually select the adapter.



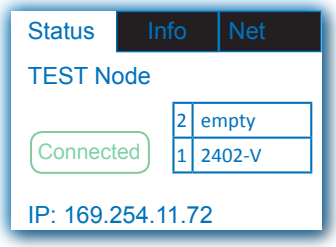
Choose 'AUTO' from the dropdown menu.

Now the DEWE-50-TRIONet-16 becomes active and by selecting the unit (may take a few seconds), the DEWE2 Explorer will show some information (name of chassis, installed TRION™ modules...)

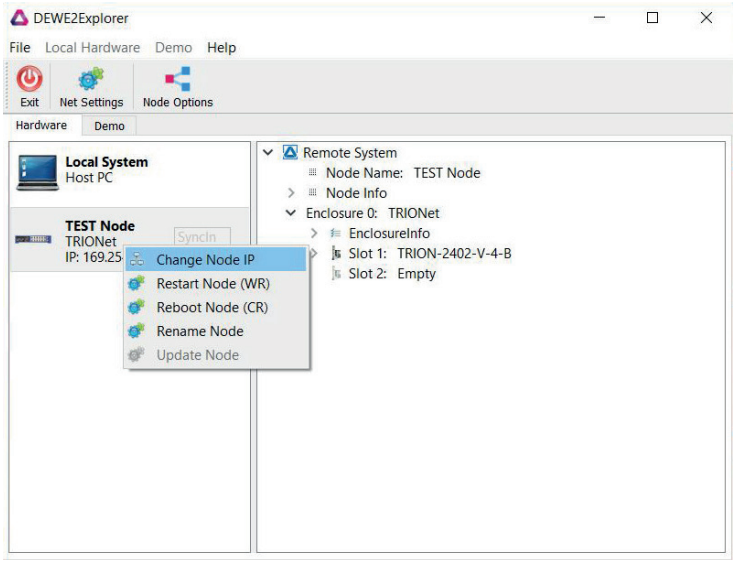


Select DEWE-50-TRIONet-16 to show information

Also, the status display of the DEWE-50-TRIONet-16 will now show a '*connected*' symbol. When deselecting the DEWE-50-TRIONet-16 in the DEWE2 Explorer, the '*connected*' symbol will disappear from the status display of the unit.

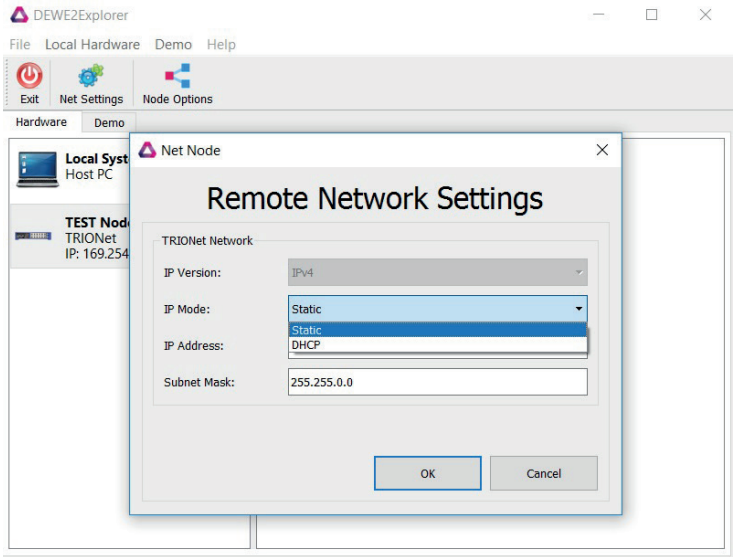


To change the IP-address or the name of the DEWE-50-TRIONet-16 node just select and right click the unit in the DEWE2 Explorer.



DEWE-50-TRIONet-16 Node menu

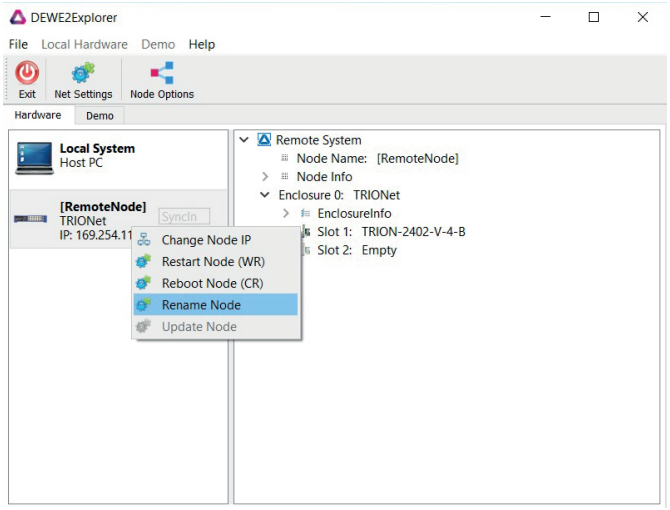
Select '*Change Node IP*' from the menu.
Choose '*static*' and type in a new IP-address and subnet mask and hit 'OK'.



Select 'Static' as 'IP Mode' and type in your new IP-address.

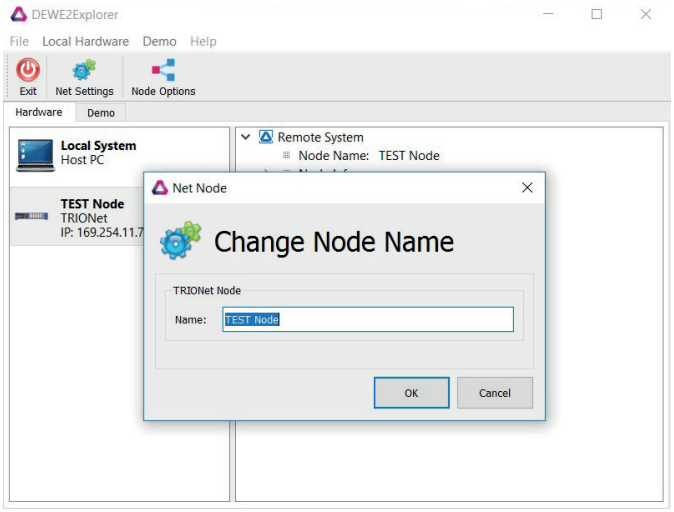
NOTE:	*Choose 'DHCP' if the DEWE-50-TRIONet-16 should be implemented in a proprietary, already existing LAN with a DHCP server up and running.*
NOTE:	*By changing the IP-address make sure to stay in the same IP-address range as your Laptop/PC otherwise the connection will get lost and you have to modify your adapter settings again. The current IP-address is always shown on the status display of the DEWE-50-TRIONet-16.*
WARNING:	*DO NOT change the IP-address while measuring!*

To change the name of the Node select and right click the DEWE-50-TRIONet-16 and choose '*Rename Node*' from the menu.



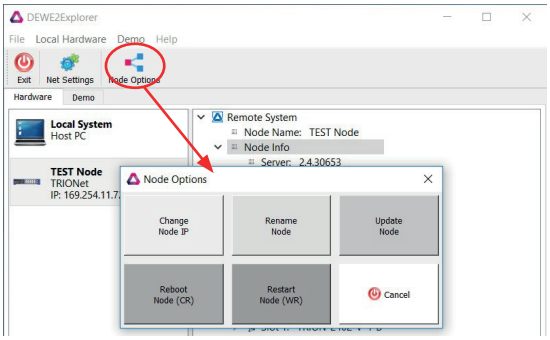
Select 'Rename Node' from the menu

Type in a new name for your DEWE-50-TRIONet-16 Node and hit '*OK*'. The name will also automatically update on the status display of the unit.



Type in your node name

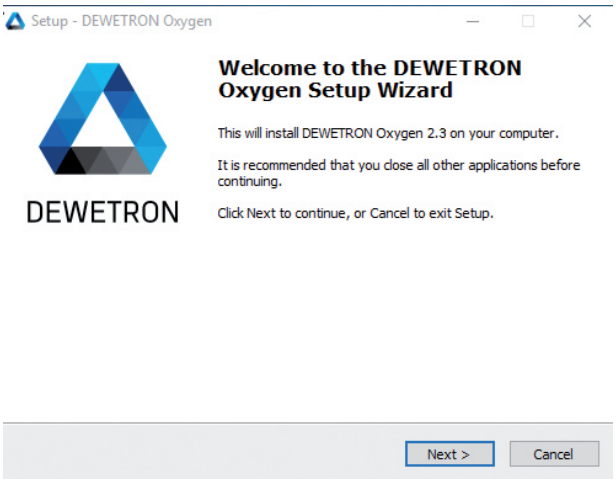
These options are available also by selecting the DEWE-50-TRIONet-16 node and clicking on '*Node Options*' from the menu bar.

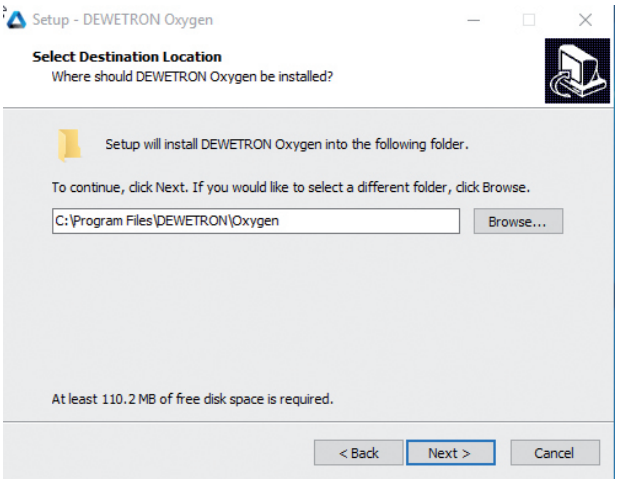


4. Installation of the measurement software

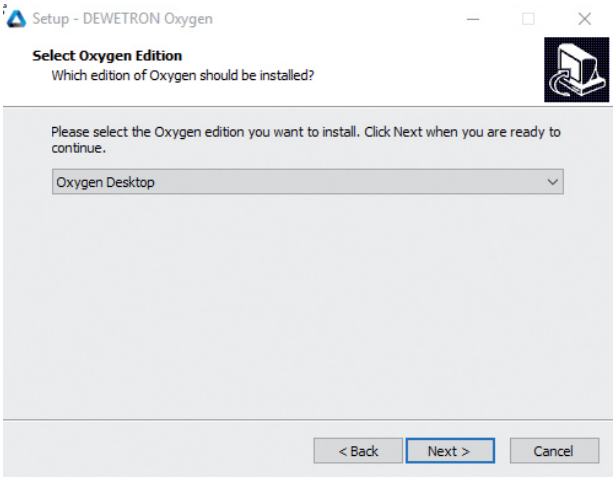
4.1 OXYGEN installation

Start the OXYGEN installation by plugging in the DEWETRON Installation media USB stick shipped with your DEWE-50-TRIONet-16 into your computer, and execute the ***"oxygen_x86_setup.exe" or "oxygen_x64_setup.exe"*** file on the USB drive, depending on your platform. Follow the instructions of the installer.

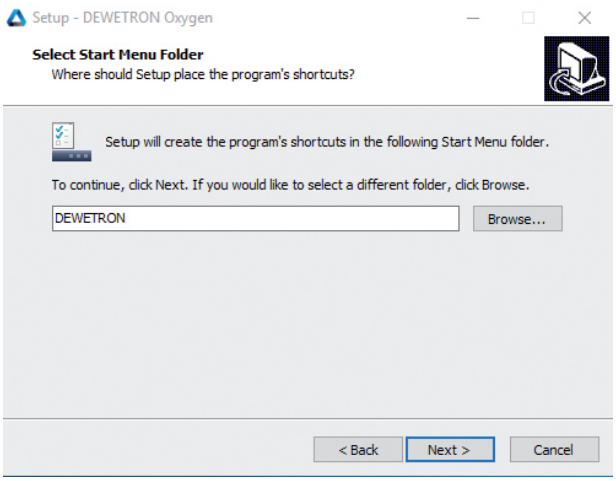




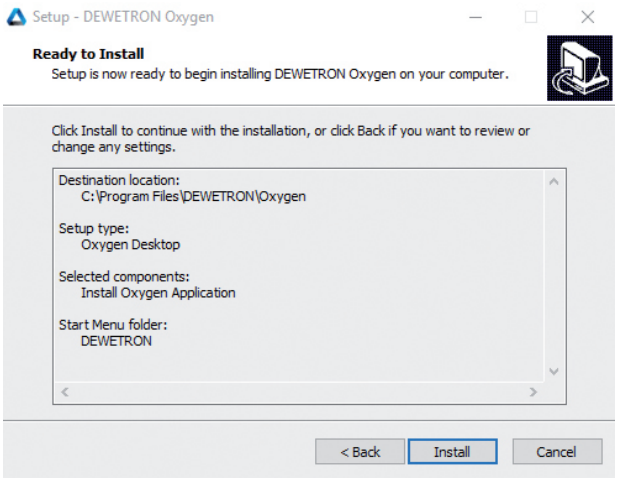
Select the destination location

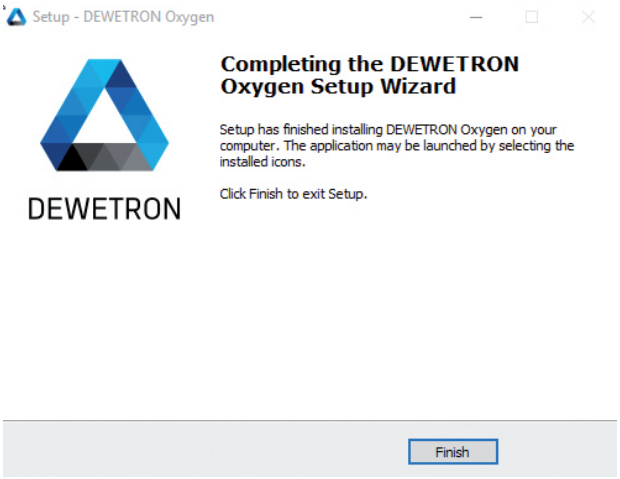


Select 'Oxygen Desktop' as Oxygen Edition



Select the start menu folder

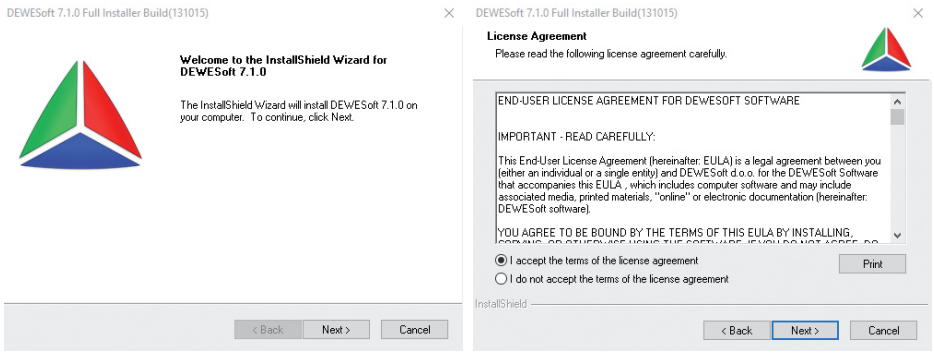




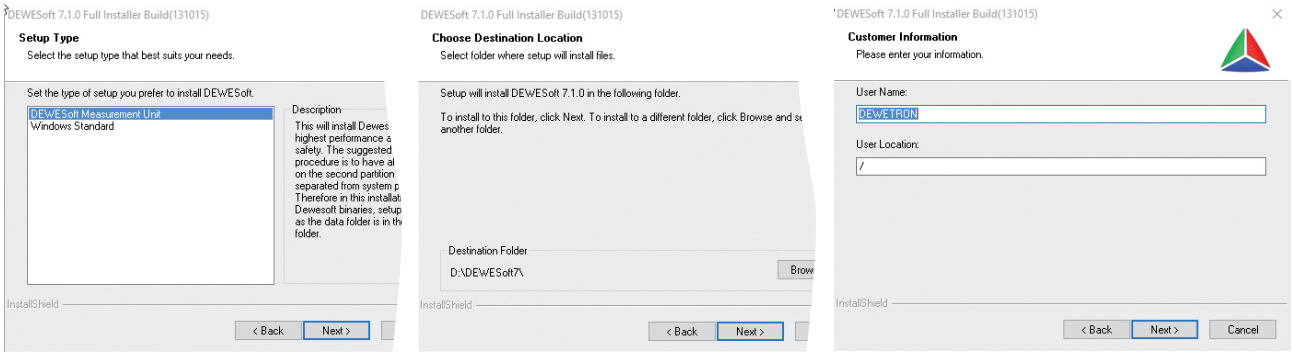
4.2 DEWESoft™ installation

Plugin the DEWETRON Installation media USB stick shipped with your DEWE-50-TRIONet-16 into the computer, and start the ***"DEWESoft_FULLInstaller_7_1_x.exe"*** file on the USB drive. Follow the instructions of the installer.

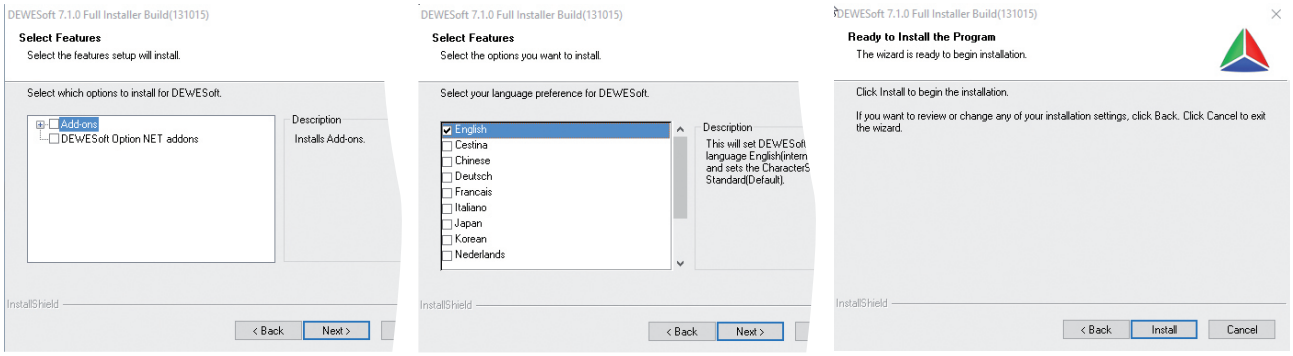
The install shield wizard will simplify the installing procedure.



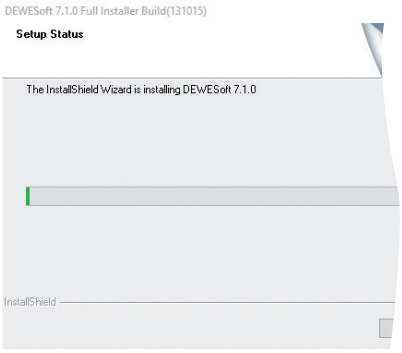
Select the needed options you want to install and enter your information.

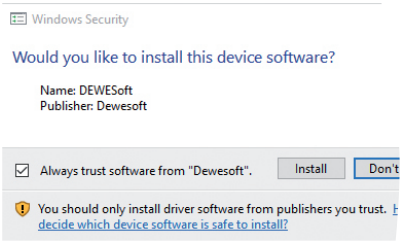


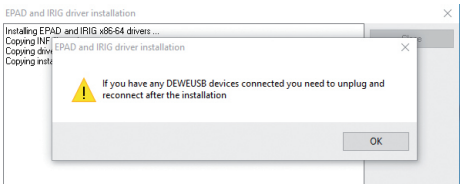
Select the features you want to install and start the installation.

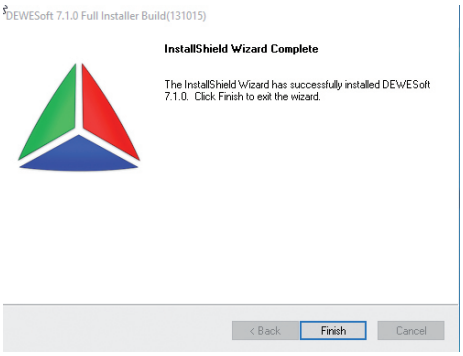


In some cases a Windows Security prompt displays during installation. To proceed faster hit the checkbox "*always trust software from 'Dewesoft™'*" and continue with "*Install*". Please also make sure to disconnect any other DEWEUSB devices during installation.







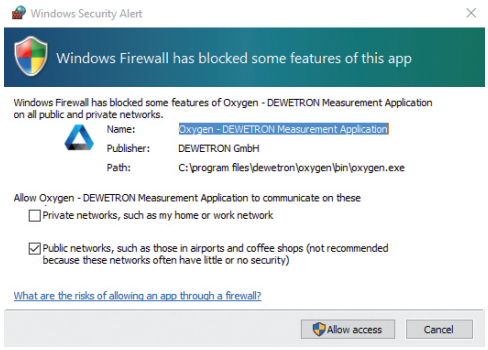


Now DEWESoft™ is installed on your computer. The software creates some directories on your harddisk.

You can start the software in the Windows start menu or use the icon created on your desktop. For more information about the DEWESoft™ installation please refer to the *DEWESoft Software Users Manual*.

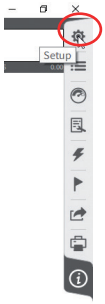
Setup DEWE-50-TRIONet-16 in OXYGEN

After successfully connecting your DEWE-50-TRIONet-16 with the Laptop/PC, run OXYGEN usually via '*Start' > 'All Programs' > 'DEWETRON' > 'OXYGEN*' or just type '*OXYGEN*' in the search bar and hit enter. When you first start OXYGEN in some cases a Windows Firewall prompt will pop up blocking the software. Make sure to allow access through the firewall by clicking on '*Allow access*'.



Allow access through the firewall

In OXYGEN double click the setup icon or drag it to the left side to expand to full view.

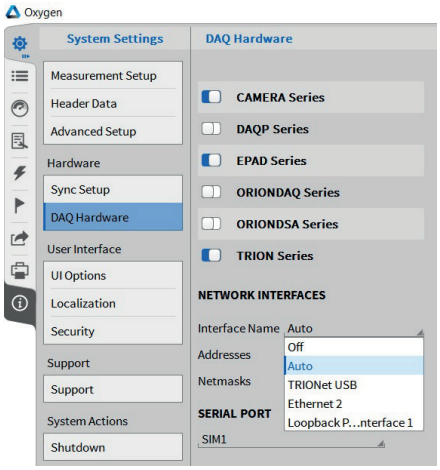


Double click 'Setup' in OXYGEN

Select '*DAQ hardware*' from System Settings and enable '*TRION series*'.

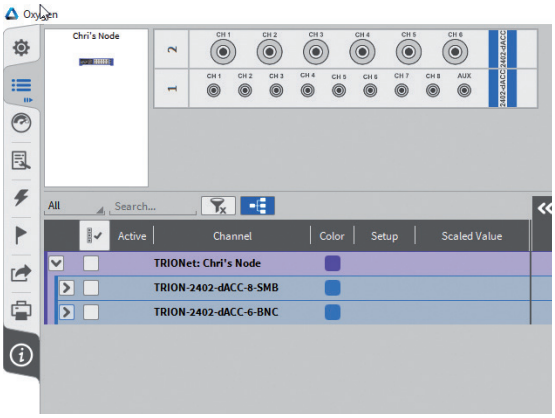
'DAQ hardware' in System Settings

Choose 'Auto' from the '*Network Interfaces*' drop-down menu. This will scan all ethernet ports and automatically detect the DEWE-50-TRIONet-16 device.



Select 'Auto'

The IP-address of the adapter is shown in the field below.
Now switching to '*Channel list*' will display the DEWE-50-TRIONet-16 and installed modules.
If there is no DEWE-50-TRIONet-16 shown in 'Channel list', the unit is not setup correctly or there is any other issue with the connection. Make sure you have precisely followed the instructions described in chapter '*Connecting your DEWE-50-TRIONet-16 to your Laptop/PC*' otherwise move to chapter '*Troubleshooting*'.



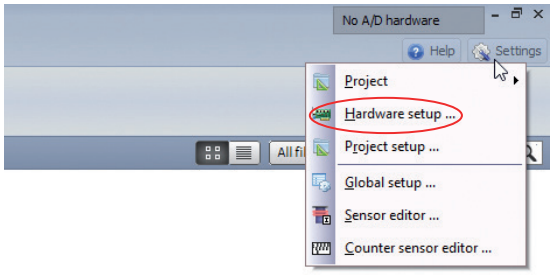
Channel list in OXYGEN

You now have successfully setup your DEWE-50-TRIONet-16 in OXYGEN.

Setup DEWE-50-TRIONet-16 in DEWESoft 7.x

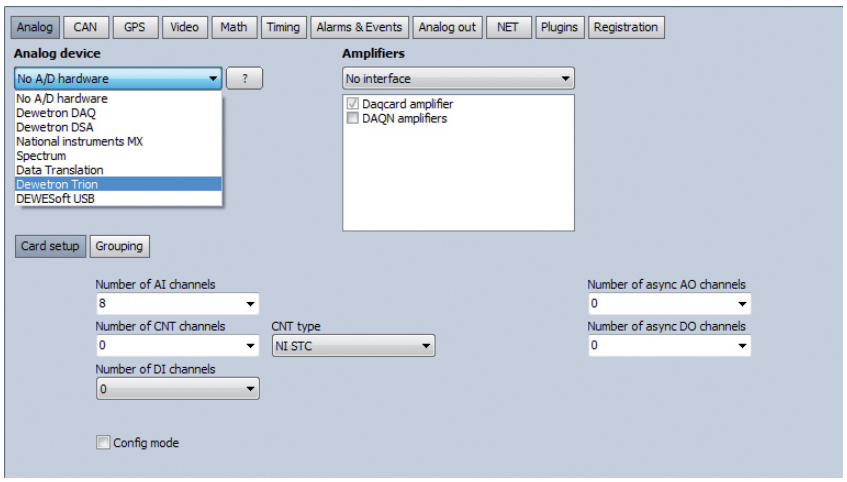
After successfully connecting your DEWE-50-TRIONet-16 with the Laptop/PC, run DEWESoft™ usually via '*Start' > 'All Programs' > 'DEWESoft' > 'DEWESoft 7.x*' or just type '*DEWESoft*' in the search bar and hit enter.

In DEWESoft™ 7.x click on '*Settings*' > '*Hardware setup*'.



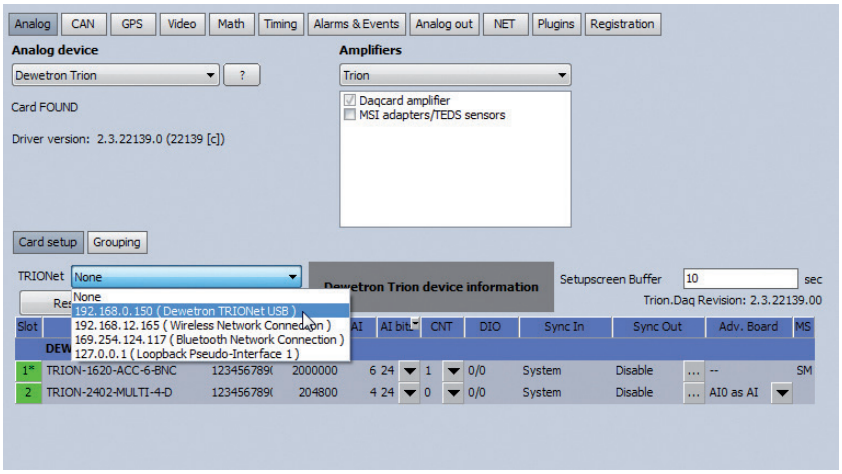
Click on 'Settings' > 'Hardware setup'

In the 'Analog' Tab choose 'Dewetron TRION' as your analog device.



Select 'Dewetron Trion' from the dropdown menu

Choose the corresponding adapter from the dropdown menu and click the 'Rescan' button. The IP-address of the adapter has to be in the address range of your DEWE-50-TRIONet-16. Now your DEWE-50-TRIONet-16 with the installed cards will display.

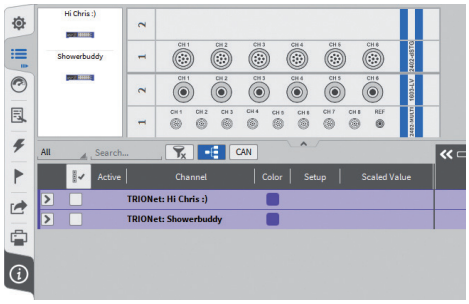


Choose the corresponding adapter from the drop-down menu and click the 'Rescan' button

Synchronization settings (daisy-chaining multiple DEWE-50-TRIONet-16 units)

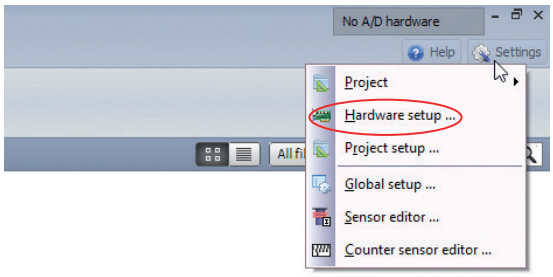
Synchronization setup in OXYGEN

OXYGEN automatically detects and setup all connected DEWE-50-TRIONet-16 units for synchronization. No further actions are required.

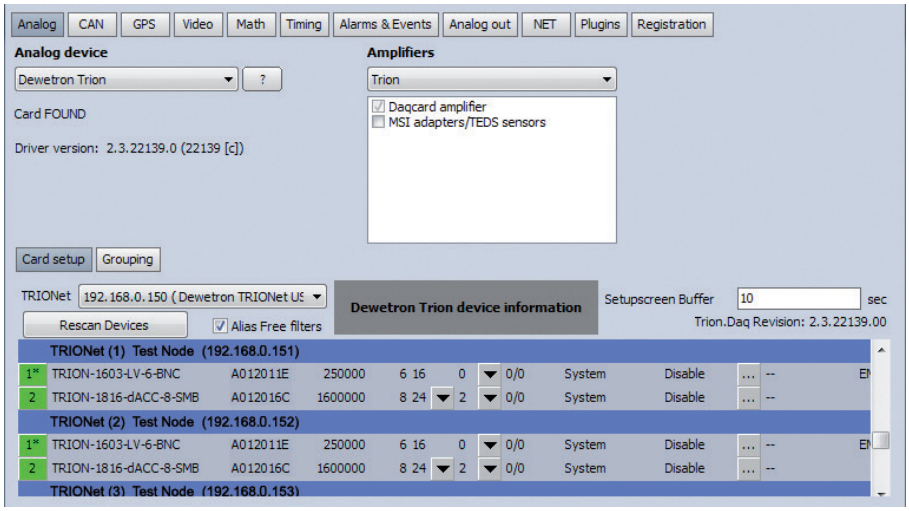


Synchronization setup in DEWESoft 7.x

If more than one DEWE-50-TRIONet-16 is connected to a Laptop/PC running DEWESoft 7.x some special settings are required to run them synchronized. DEWESoft will list all connected DEWE-50-TRIONet-16 units in '*Hardware setup*'. Go to '*Settings*' > '*Hardware setup*'.



Click on 'Settings' > 'Hardware setup'



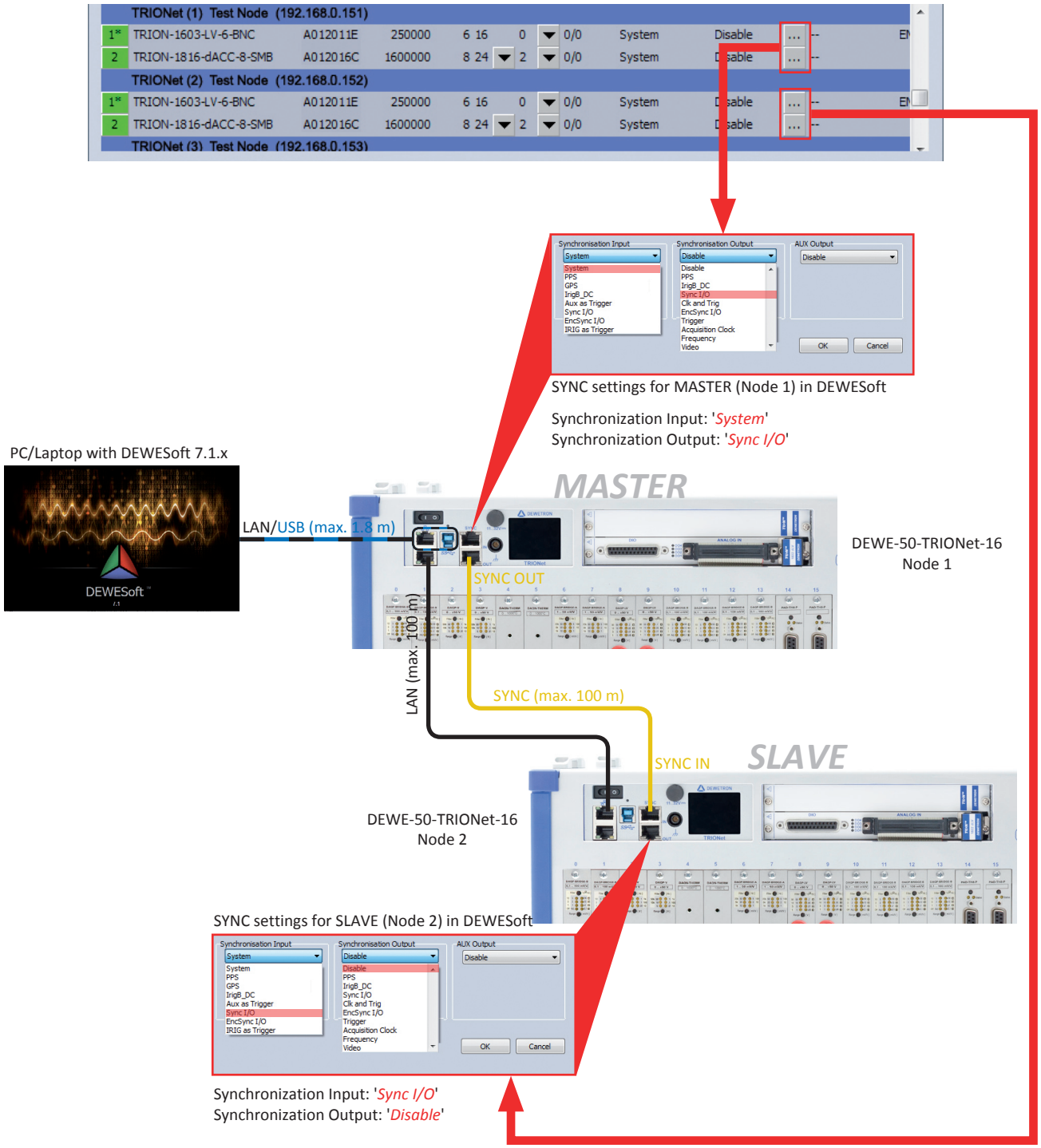
Connected DEWE-50-TRIONet-16 units

Depending on the synchronization, the synchronization input as well as the synchronization output of the units have to be defined. The following example will give you an idea on how to setup daisy-chained DEWE-50-TRIONet-16 units in DEWESoft 7.x.

Synchronization example with DEWESoft 7.x

The connections shown in this example (SYNC/LAN/USB) are exact representations and can be used as reference!

In this example, mutiple TRIONet units are connected and needed to be synchronized to a Laptop/PC running DEWESoft™. The TRIONet connected directly to the Laptop/PC via LAN/USB is always the 'MASTER' unit.
Connect the **MASTER** unit via **SYNC OUT** to the **SLAVE** unit via **SYNC IN**. In DEWESoft™ go to '*Settings*' > '*Hardware setup*' and click on the grey box with the three dots on each, the master and the slave unit, to open the SYNC settings.



Synchronization settings explained

This chapter will give a detailed explanation of the synchronization options in DEWESoft™ and will describe the function of the LEDs of the TRION-SYNC-BUS.

With this option the internal 10 MHz clock is used as the clock source in this particular DEWE-50-TRIONet-16 system.

The TRION-SYNC-BUS (SYNC IN, SYNC OUT) is used to synchronize two or more DEWE-50-TRIONet-16 units with up to 100 m distance between each node. The 10 Mhz clock signal, along with acquisition control signals, is transmitted via the RJ-45 connection. The TRION-SYNC-BUS consists of two RJ-45 sockets. One socket being a synchronization IN, whilst the other one can be used as synchronization OUT.


SYNC IN


SYNC OUT

LED indication:

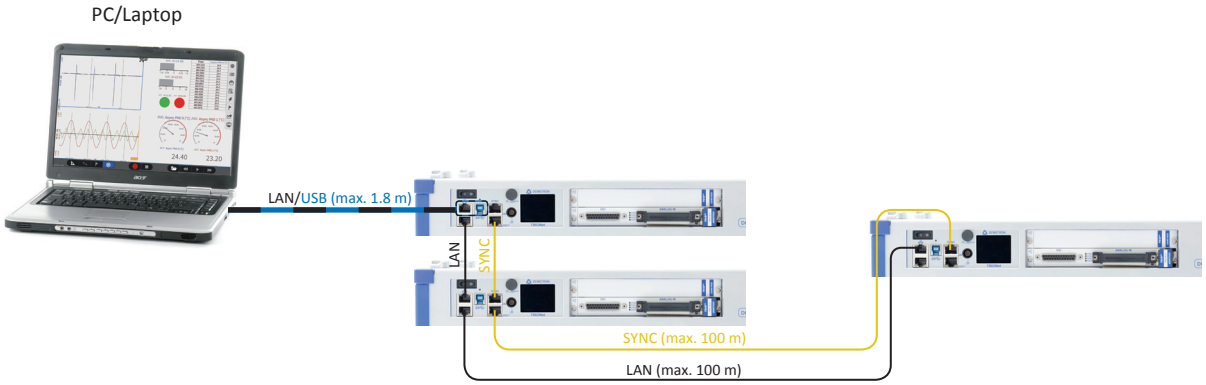
	SYNC OUT	SYNC IN
RED (stable)	Clock detected	Clock detected / Receiving clock
GREEN (stable)	Acquisition running	Acquisition running

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.

Synchronization examples

Single DEWE-50-TRIONet-16 configuration

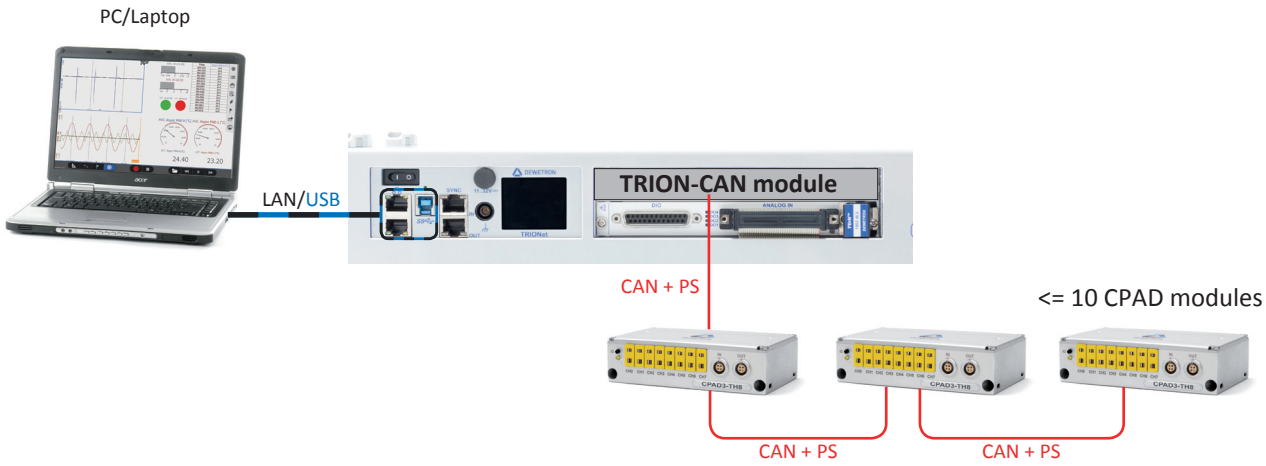
Multiple DEWE-50-TRIONet-16 configuration

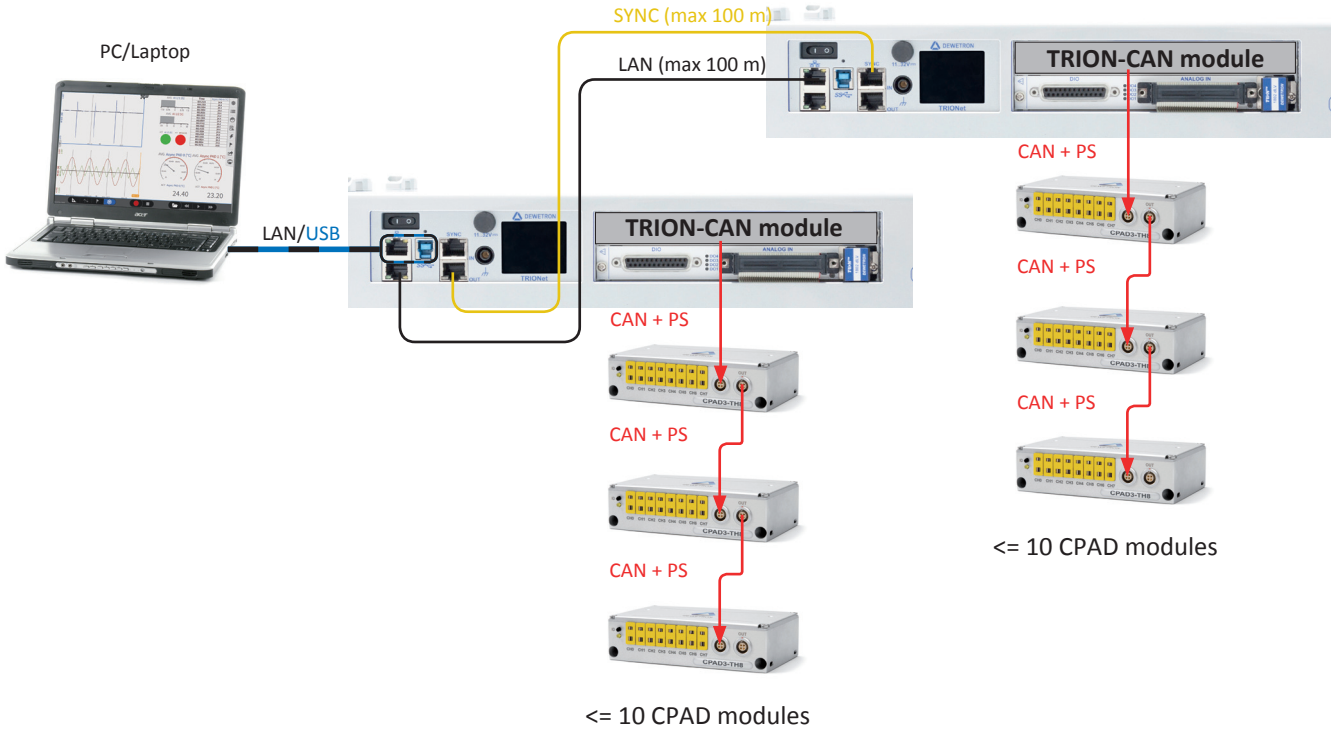


Max. cable length between each TRIONet node:	*100 m SYNC (328 ft)* *100 m LAN (328 ft)*
Max. cable length to Laptop/PC:	*100 m LAN (328 ft)* *1.8 m USB (6 ft)*

Connect CPAD2/3 modules to your DEWE-50-TRIONet-16

With the flexibility of TRION series modules, it is possible to connect any CPAD2/CPAD3 modules directly to your DEWE-50-TRIONet-16. For the following examples a **TRION-CAN** module is required. A TRION-CAN module can support up to **10 CPAD2/CPAD3 modules**. No additional power supply is required.





Connect EPAD/EPAD2 modules to your DEWE-50-TRIONet-16

With the DEWE-50-TRIONet-16 you can directly hook up any EPAD/EPAD2 module via RS-485 interface. No additional power supply is required. The RS-485 interface connector is located on the rear panel of the system.

Maintenance

Firmware update

In this chapter we will describe on how to perform a firmware update of your DEWE-50-TRIONet-16.

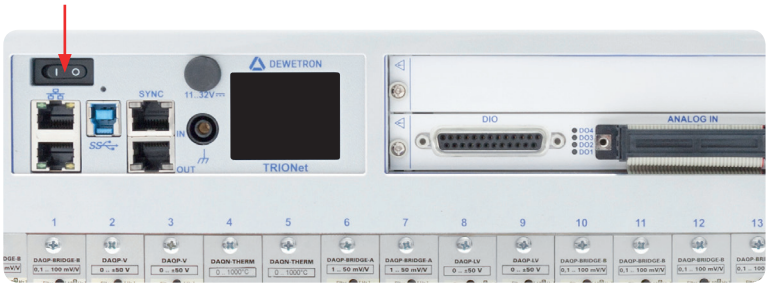
Requirements:

> DEWE-50-TRIONet-16

> USB drive (received from DEWETRON or self-created USB drive)

> 10 minutes of time

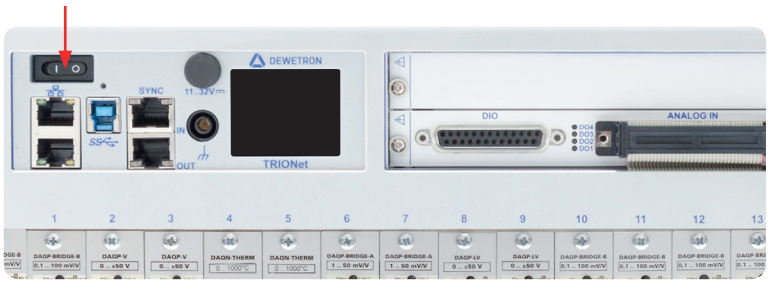
1 Switch-off the instrument.



2 Remove the rubber gasket on the rear and plugin the USB drive.

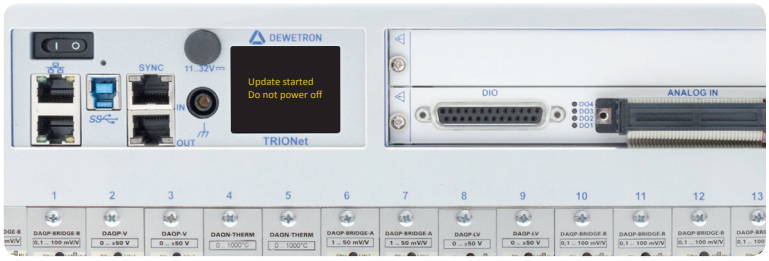
3

Switch-on the instrument. The DEWE-50-TRIONet-16 will automatically detect the new firmware and install it from the USB drive.

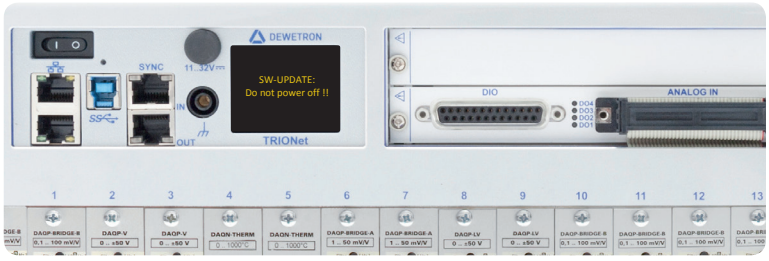


During the update process, the display will show following messages:

"Update started. Do not power off"

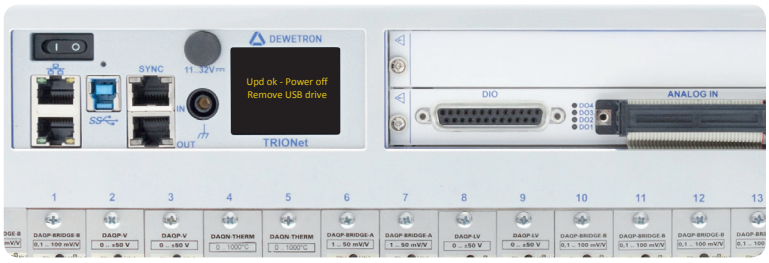


"SW-UPDATE: Do not power off !!"

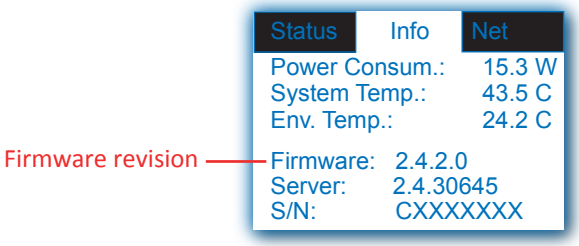


The update process may take up to 5 minutes.

"Upd ok - Power off Remove USB drive"



Power off the device first and unplug the USB drive from the device. Reassemble the sidepanel in reverse order of disassembly. Switch-on the DEWE-50-TRIONet-16. The current firmware revision is displayed on the '*Info*' tab.



Create USB drive for firmware update

If you haven't received an USB drive from DEWETRON with the latest firmware, please follow the next steps on how to create a USB drive to update the firmware of your DEWE-50-TRIONet-16.

Requirements:

> USB drive (min. size **8 GB**, ***existing files on the USB drive will be deleted***)

> Firmware package for TRIONet (download at: *https://ccc.dewetron.com/pr/trionet*, login required)

> 5 to 10 minutes of time

1

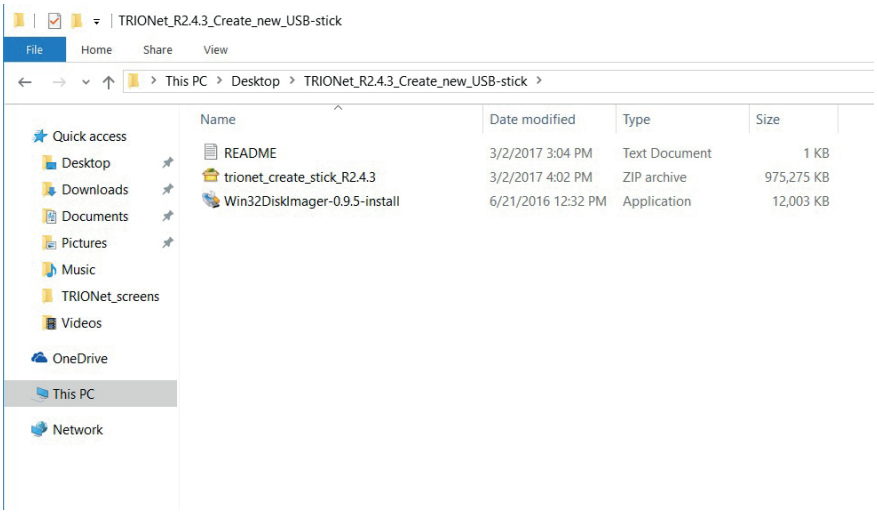
Go to *https://ccc.dewetron.com/pr/trionet* and download the '*Create new USB update stick*' archive. You have to be logged in to download the firmware. Sign up a new account by clicking the 'Register' button on the top right.

2

Extract the downloaded archive using *7zip* or similar file extractor software. It is recommended to extract the archive at the desktop.

After extracting following files should be available within the folder:

> ***trionet_create_stick_R2.x.x.zip***
> ***win32DiskImager-x.x.x-install.exe***
> ***README.txt***

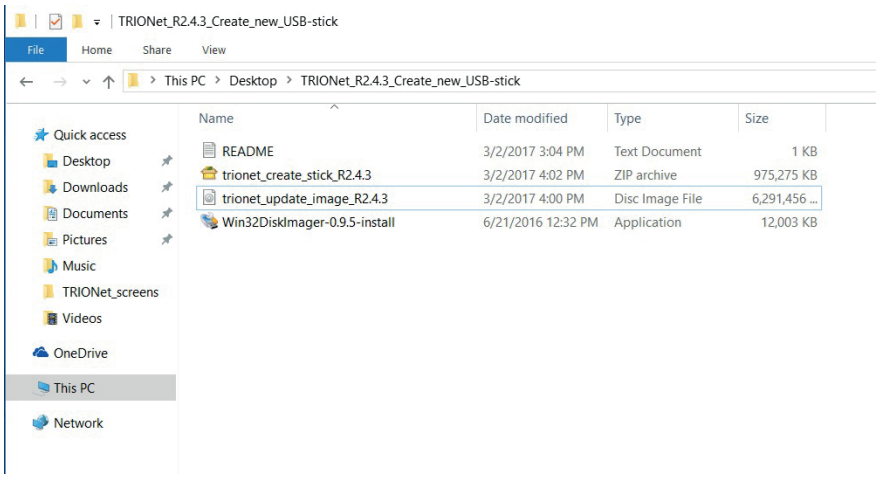


3

Extract the '*trionet_create_stick_R2.x.x.zip*' in the same folder

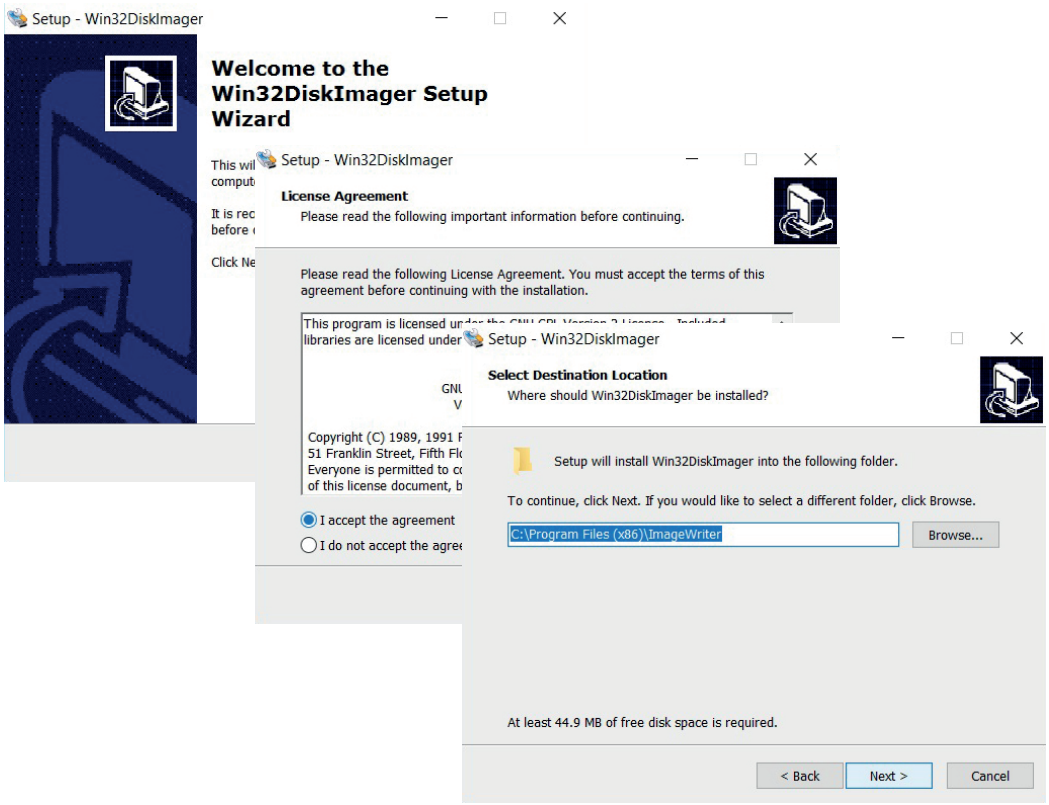
After extracting following files should be available:

> ***trionet_create_stick_R2.x.x.zip***
> ***trionet_update_image_R2.x.x.img***
> ***win32DiskImager-x.x.x-install.exe***
> ***README.txt***

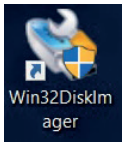


4

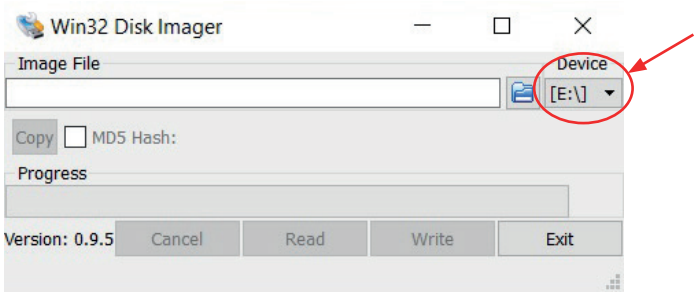
Run Win32DiskImager-x.x.x-install.exe (if not already installed). The install wizard will guide you through the installation process.



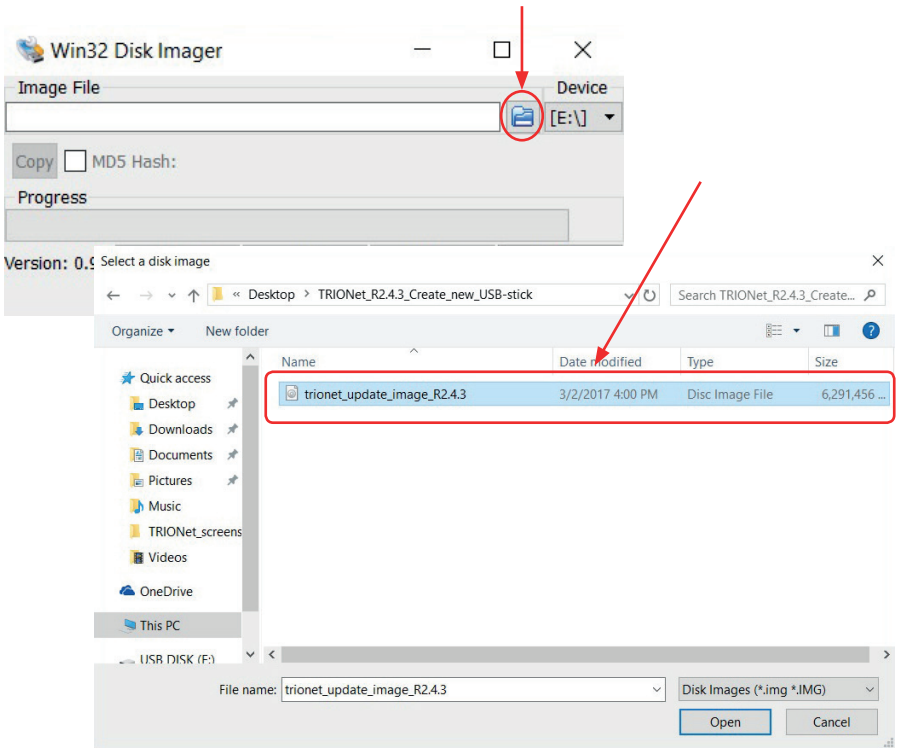
5 Plugin an empty USB drive and remember the drive letter which is automatically assigned by Windows (e.g. 'E:\'). Run Win32DiskImager.exe as administrator by right clicking the icon on the desktop and select '*Run as administrator*'.



6 Choose the USB drive by selecting the associated drive letter from the '*Device*' dropdown menu (e.g. 'E:\'). Usually Win32DiskImager automatically detects plugged-in USB drives but please double check if the associated drive letter is selected correctly. Win32DiskImager will not list any harddrives.

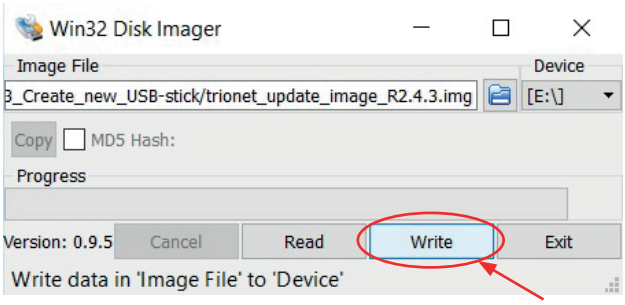


7 Browse and select the image file which has been extracted in step 3 (***trionet_update_image_R2.x.x.img***) by clicking the folder icon.

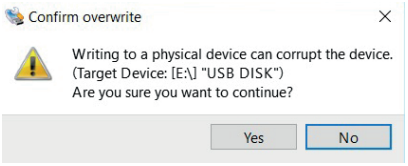


8

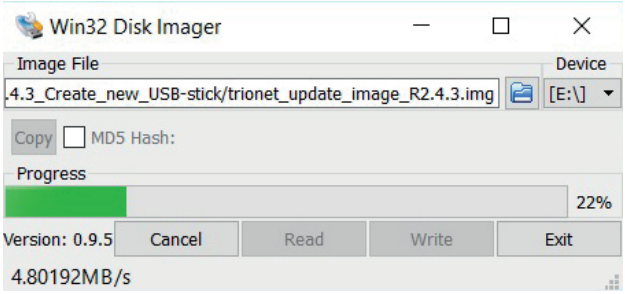
Hit '*Write*' to start the progress and write the image file on the USB drive.



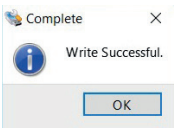
Check the target device and confirm overwrite by clicking '*Yes*'.



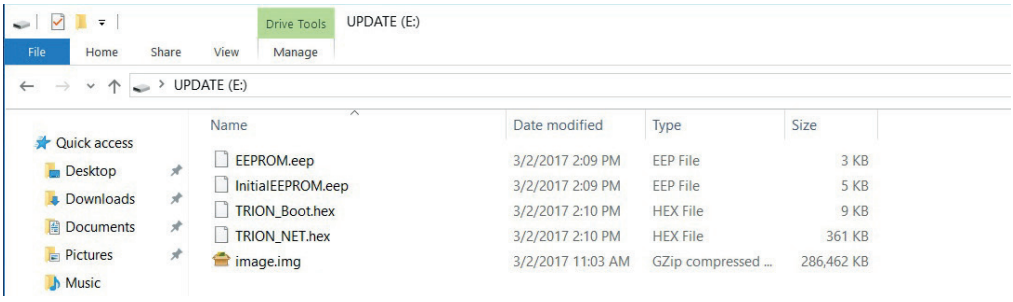
Writing progress starts...



Write successful!



Following files are on your USB drive:



Congratulations! You now have successfully created a USB drive for firmware update of your DEWE-50-TRIONet-16.

Updating firmware files on existing USB drive

The next steps will describe on how to update the firmware files on your DEWETRON or self created USB drive.

Requirements:

> USB drive (DEWETRON factory default or created USB drive as described in chapter '*Create USB drive for firmware update*')

> Firmware files for TRIONet (download at: *https://ccc.dewetron.com/pr/trionet*, login required)

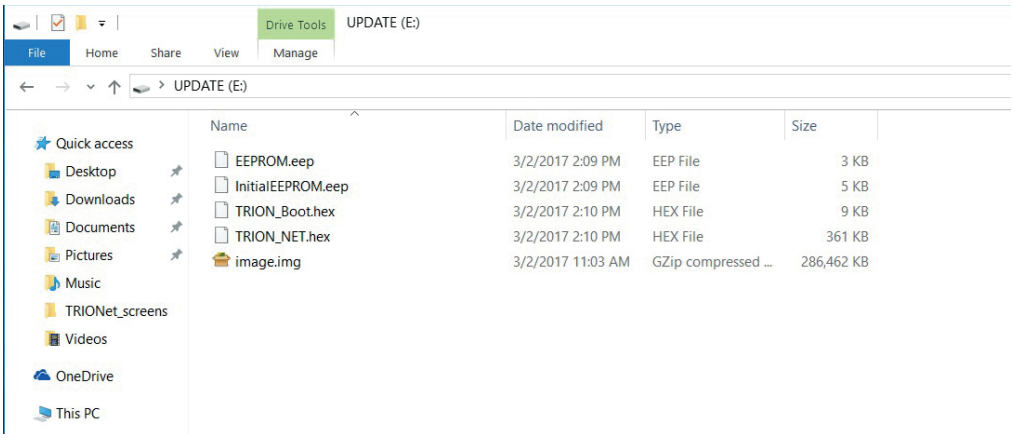
> 5 minutes of time

1 Go to *https://ccc.dewetron.com/pr/trionet* and download the '*Update files for existing USB stick*' archive. You have to be logged in to download the files. Sign up a new account by clicking the 'Register' button on the top right.

2 Extract the downloaded archive using *7zip* or similar file extractor software. It is recommended to extract the archive at the desktop.

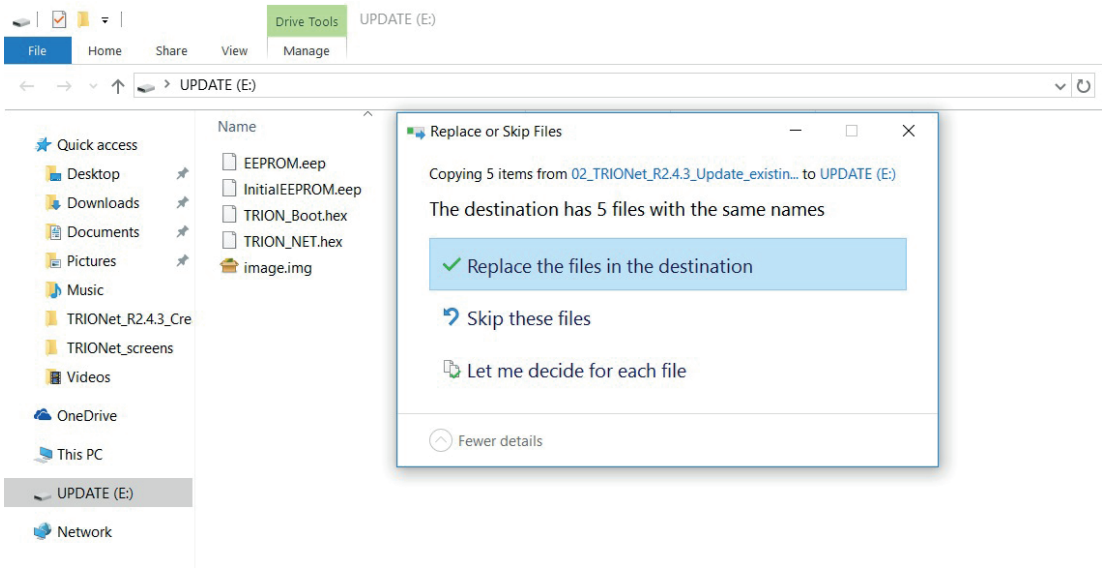
After extracting following files should be available within the folder:

> ***EEPROM.eep***
> ***InitialEEPROM.eep***
> ***TRION_Boot.hex***
> ***TRION_NET.hex***
> ***image.img***



3 Copy & Replace the existing files on your USB drive with the files currently downloaded and extracted. Your USB drive has been successfully updated.

WARNING: *The firmware update won't work if the firmware files are copied on an empty USB drive only. Please refer to '**Create an USB drive for firmware update**' first.*



Troubleshooting

DEWE-50-TRIONet-16 can't be detected if connected to Laptop/PC with USB 3.0 at all.

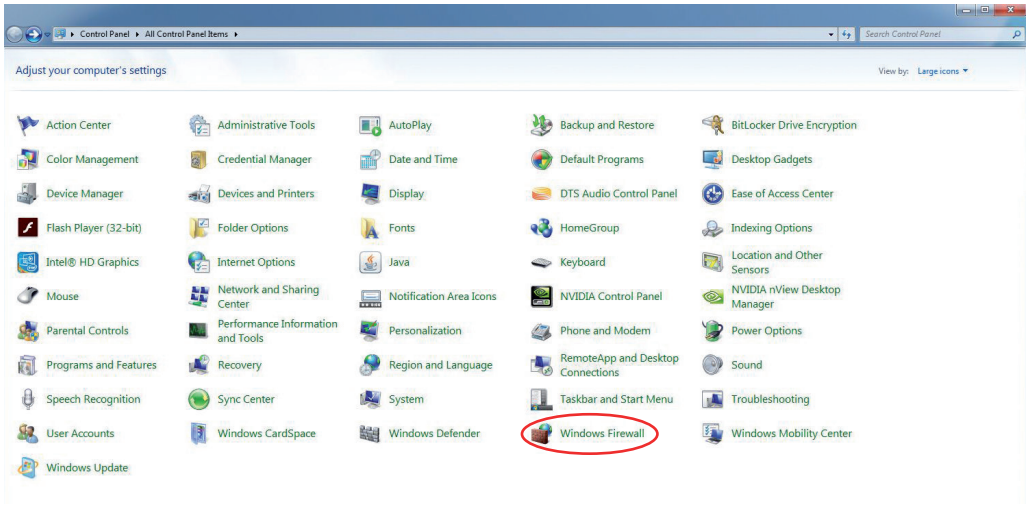
> Check your USB cable for damages.
> Check if plugged-in properly into DEWE-50-TRIONet-16 as well as Laptop/PC.
> Check overall cable length. The cable length must not exceed 1.8 m (6 ft)! If you are using a USB 3.0 Type-C adaptor, do not exceed overall cable length of 1.8 meters (6 ft) and check if the adaptor works properly.

Two DEWE-50-TRIONet-16 units are daisy-chained and implemented into an existing company network. Only one DEWE-50-TRIONet-16 is found. What can I do?

> Contact the IT-administration. Some IT infrastructures do not allow to connect more than one device to an ethernet plug so daisy-chaining DEWE-50-TRIONet-16 units or using a network switch is not possible.

DEWE-50-TRIONet-16 can't be found in OXYGEN/DEWE2 Explorer although the IP-address is setup correctly.

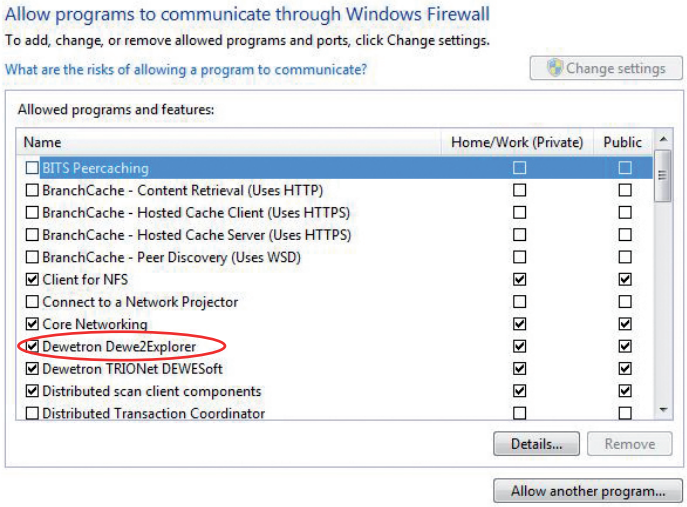
> Check your firewall settings. Allow access for OXYGEN and DEWE2 Explorer through Windows Firewall. Click 'Start' and type 'Control Panel' in the search bar. Click on 'Windows Firewall'.

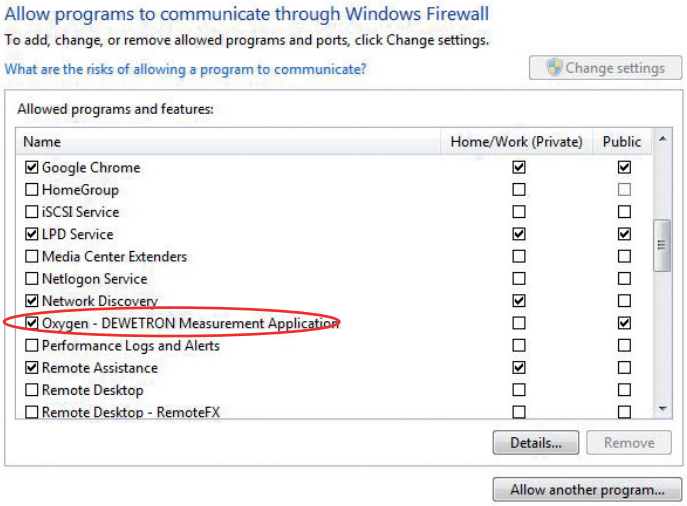


Select '*Allow a program or feature through Windows Firewall*' from the left menu.

Allow access to following programs:

- Dewetron DEWE2Explorer
- Oxygen - DEWETRON Measurement Application

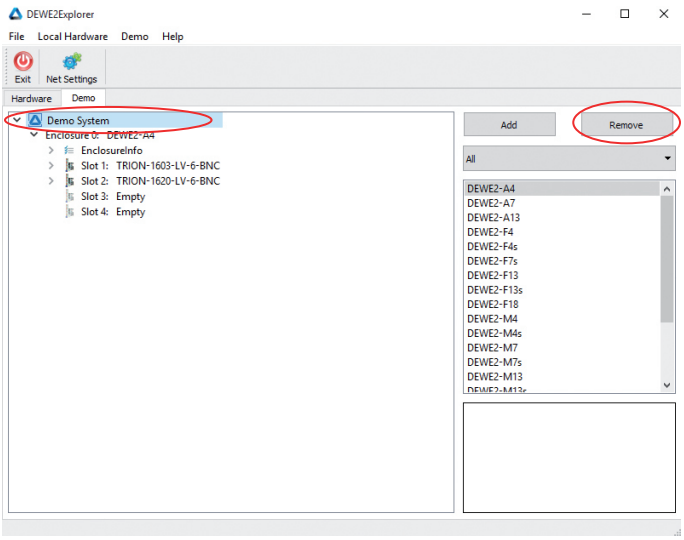




If you are using third-party firewall software please contact your IT-administration or refer to the corresponding technical reference manual.

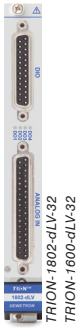
Two or more DEWE-50-TRIONet-16 units are connected to a Laptop/PC and found in DEWE2Explorer but unfortunately measuring in Oxygen fails.

> Check if there has been a demo system created in your DEWE2Explorer and remove it. Oxygen can't make any differences between virtually created demo systems and physically connected instruments. The connected DEWE-50-TRIONet-16 units are awaiting a clock signal from the virtually created demo system (which will not happen) and won't run in OXYGEN.
> To remove a demo system start the DEWE2 Explorer and navigate to the '*Demo*' tab.
> Remove any created demo system by selecting it and hit the '*Remove*' button.



Notes

Multi-function module with voltage inputs, digital I/Os, counter and CAN



- Channels: 32 single ended or 16 differential, synchronous channels
- Sampling: TRION-1802-dLV-32: 18 bit; 200 kS/s per channel
  TRION-1600-dLV-32: 16 bit; 20 kS/s per channel
- Input types: 5 V/10 V
- Features: 2x Counter; CAN bus; RS-485; 8x DI; 4x DO; 2x Alarm Out

Module specifications

TRION-1802/1600-dLV series specifications					
Configuration	TRION-1802-dLV-32	32 channels single ended or 16 channels fully differential			
	TRION-1802-dLV-32-CAN	32 channels single ended or 16 channels fully differential + CAN			
	TRION-1600-dLV-32	32 channels single ended or 16 channels fully differential			
	TRION-1600-dLV-32-CAN	32 channels single ended or 16 channels fully differential + CAN			
Sampling Rate / Resolution					
TRION-1802-dLV-32					
High speed mode	>50 to 200 kS/s,	18-bit			
Over Sampling mode	100 S/s to 50 kS/s,	24-bit			
TRION-1600-dLV-32	100 S/s to 20 kS/s,	16-bit			
Data Transfer					
TRION-1802-dLV-32	16-bit / 24-bit / 32-bit				
TRION-1600-dLV-32	16-bit				
ADC type	18-bit SAR[2] (Successive Approximation Register)				
Data rate DMA transfer	32 analog channels: max 28 MB/s; 2x counter: max. 6 MB/s				
Input ranges Voltage	±5 V; ±10 V				
Input noise	0 to 10 Hz:	10 μV_{PP}			
	full bandwidth:	1.35 mV_{PP}			
Input impedance	1 MΩ single ended, 2 MΩ differential				
Input bias current	<25 pA				
Input coupling	DC				
Accuracy[1] Voltage	DC to 1 kHz	±0.02 % of reading ± 0.01 % of range ±20 µV			
	>1 kHz to 5 kHz	±0.5 % of reading ± 0.01 % of range ±20 µV			
	>5 kHz to 10 kHz[2]	±1 % of reading ± 0.01 % of range ±20 µV			
Gain drift	typical 10 ppm/°C max. 20 ppm/°C				
Offset drift	typical 0.3 µV/°C + 10 ppm of range, max 15 µV/°C + 20 ppm of range/°C				
Signal-to-noise ratio, Spurious free SNR, Effective number of Bits, V_{PP}	10 V range				
	SNR		SFDR	ENOB	V_{PP}
Sample rate	[dB]		[dB]	[Bit]	[mV_{PP}]
0.1 kS/s	127		130	20.8	0.015
1 kS/s	118		130	19.3	0.055
10 kS/s	109		130	17.8	0.22
20 kS/s	106		130	17.3	0.33
50 kS/s[2]	102[2]		130[2]	16.7	0.52[2]
100 kS/s[2]	99[2]		130[2]	16.2	0.66[2]
200 kS/s[2]	96[2]		125[2]	15.7	1.00[2]
Linearity	<20 ppm				
Input configuration	differential or single ended with GND Sense				
Typical CMRR in differential mode	>70 dB @ 1 kHz				
Low pass Filter (-3 dB, IIR)	1 Hz, 30 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz, 10 kHz, 30 kHz, 60 kHz				
Characteristic	Bessel or Butterworth				
Filter order	2^{nd}, 4^{th}, 6^{th}, 8^{th}				
Analog antialiasing filter	3^{rd} order Butterworth				
Bandwidth (-3 dB, deactivated IIR filter)	70 kHz 3^{rd} order Butterworth filter				
Crosstalk fin 1 kHz [10 kHz]	>108 dB				
Channel to channel phase mismatch	<30 nsec				
Board to board phase mismatch	<30 nsec				
Common mode input voltage range	±12.5 V				
Overvoltage protection (IN+, IN-, Sense)	±50 V_{DC}				

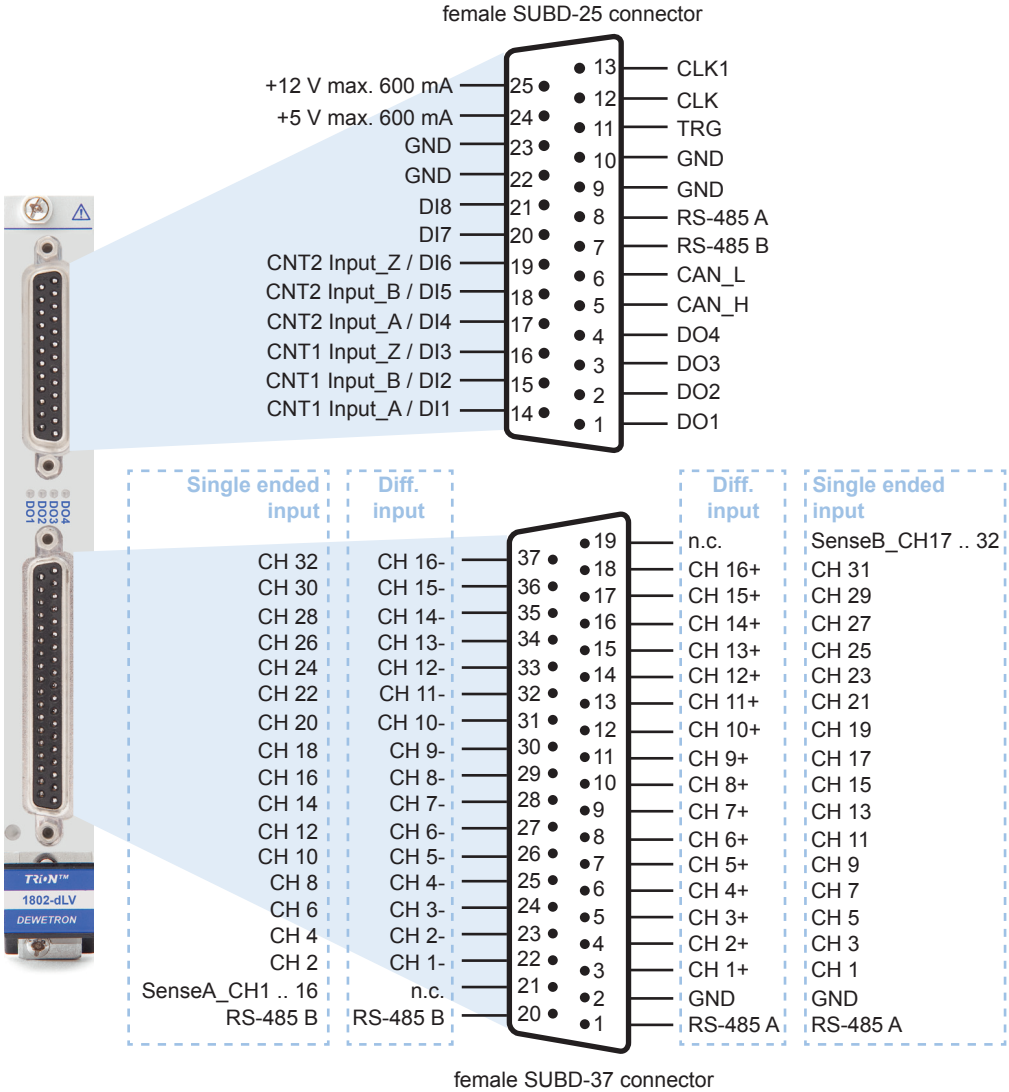
continued on next page ...

TRION-1802/1600-dLV-32

Digital IN specification	
Digital Input	8 CMOS/TTL compatible digital inputs; weak pullup via 100 kΩ
Overvoltage protection	±30 V permanent, 50 V_{PEAK} (for 100 ms)
Counter	2 counter channels; TTL input; shared with digital inputs
Counter modes	
Event counting	Basic event counting, gated counting, up/down counting and encoder mode (X1, X2 and X4)
Waveform timing	Period, frequency, pulse width duty cycle and edge separation
Sensor modes	Encoder (angle and linear)
Interfaces	
CAN bus	1 CAN Bus; not isolated; routed to SUBD-25
CAN specification	CAN 2.0B
CAN Physical Layer	High Speed
CAN Bus fault protection	±36 V
Termination	Programmable: High impedance or 120 Ω
RS485	1 RS485 interface dedicated to DAQP and HSI series modules
General specification	
Sensor power supply (per module)	5 V (600 mA) and 12 V (600 mA)
ESD protection	IEC61000-4-2: ±8 kV air discharge, ±4 kV contact discharge
Power consumption	Voltage mode: 6 W; IEPE® mode: 7.5 W

[1] 1 year accuracy 23 °C ±5 °C
[2] TRION-1802-dLV-32 only

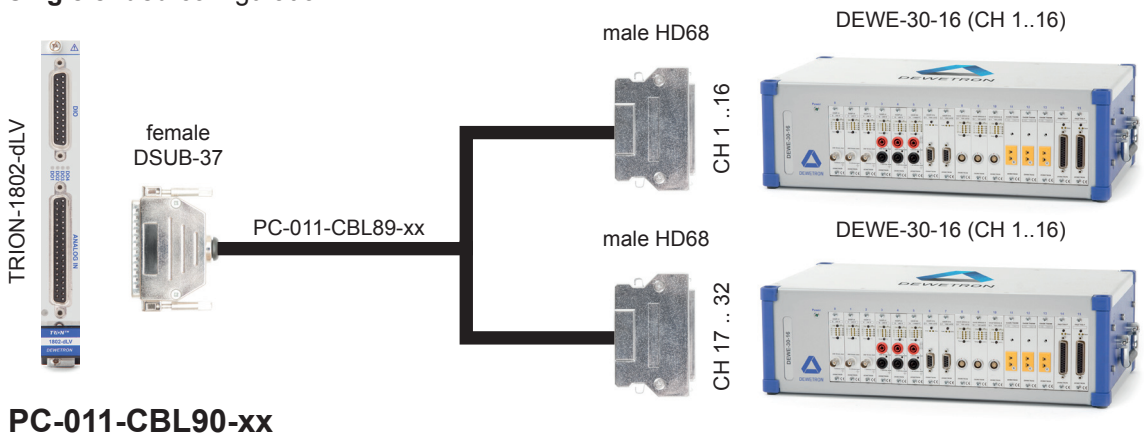
TRION-1802/1600-dLV-32 Module



Optional accessory

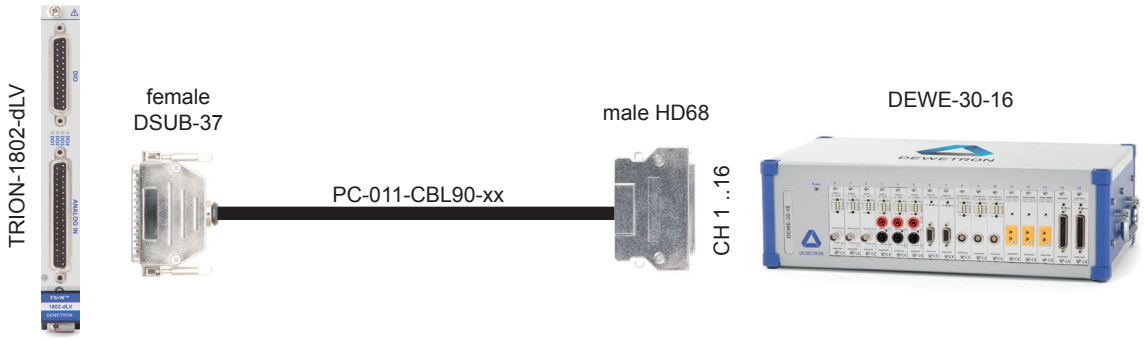
PC-011-CBL89-xx

Cable for connecting 32 channels of two DEWE-30-16 racks to a TRION-1802-dLV module in **single ended** configuration.



PC-011-CBL90-xx

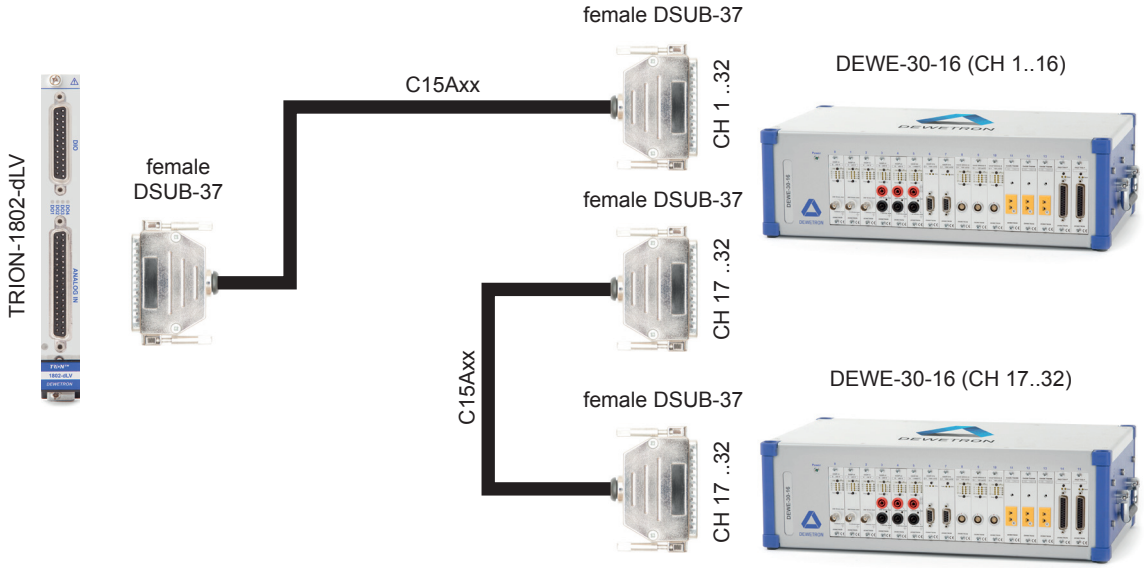
Cable for connecting 16 channels of a DEWE-30-16 rack to a TRION-1802-dLV module in **differential** configuration.



existing racks

C15Axx

Cable for connecting 16 or 32 channels to a TRION-1802-dLV module in **single ended** configuration. Two C15Axx cables are required for 32 channels.



new racks in 2018

LED function

Status LED

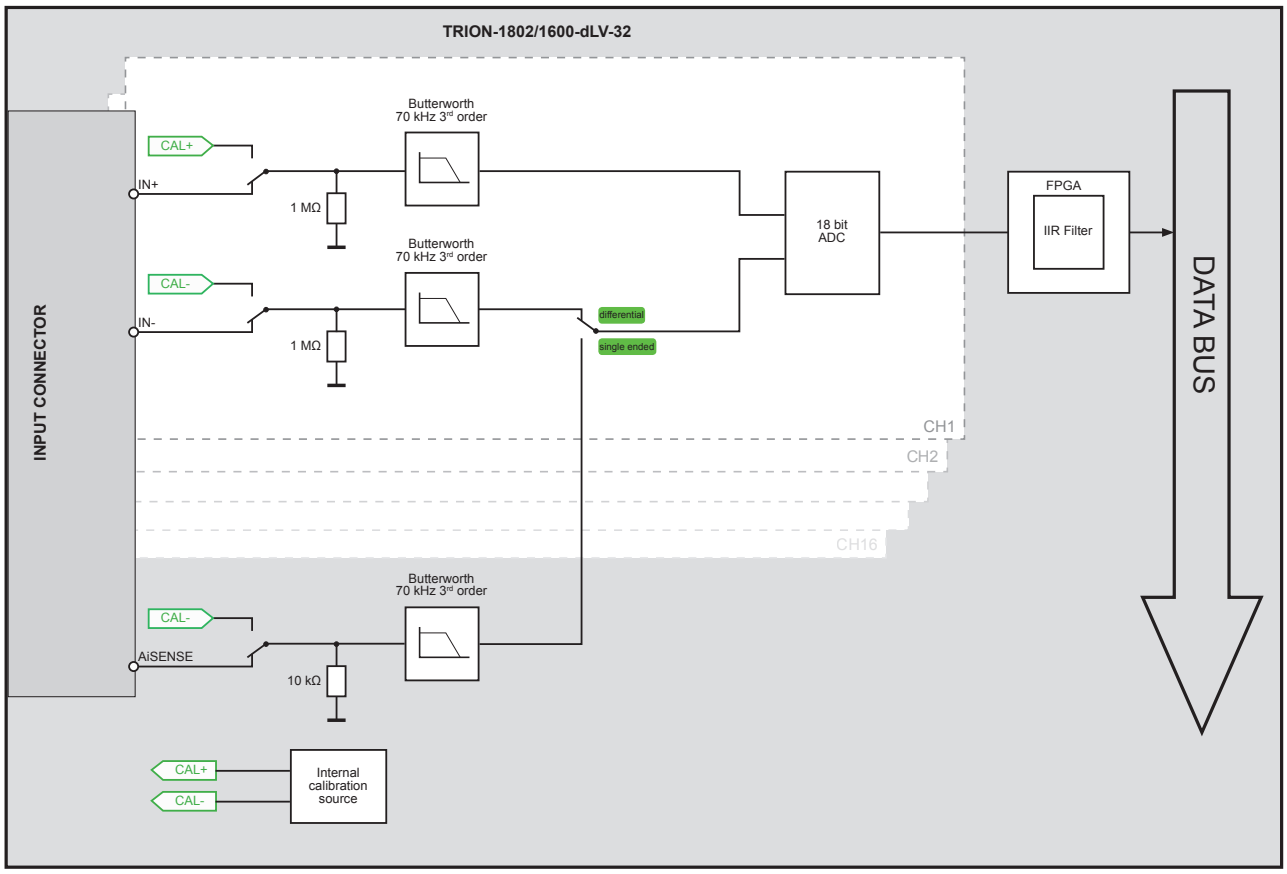
Green: Normal operation
Off: Board not initialized.

DO LED

Green: DO is active (output is 5V)
Off: DO is deactivated (output is 0V)

Block diagram

Base block diagram of the TRION-1802/1600-dLV-32 module:



The TRION-1802/1600-dLV series is a highly accurate, 18-bit voltage digitizer. Each channel has its own AD converter. Please refer to chapter “TRION-16xx sample system architecture” for more details about bandwidth and filtering.

TRION-1802/1600-dLV-32 function overview

Short

The short function switches IN+ to IN- via the calibration circuit. It can be used to check the offset of the input amplifier.

Auto Zero

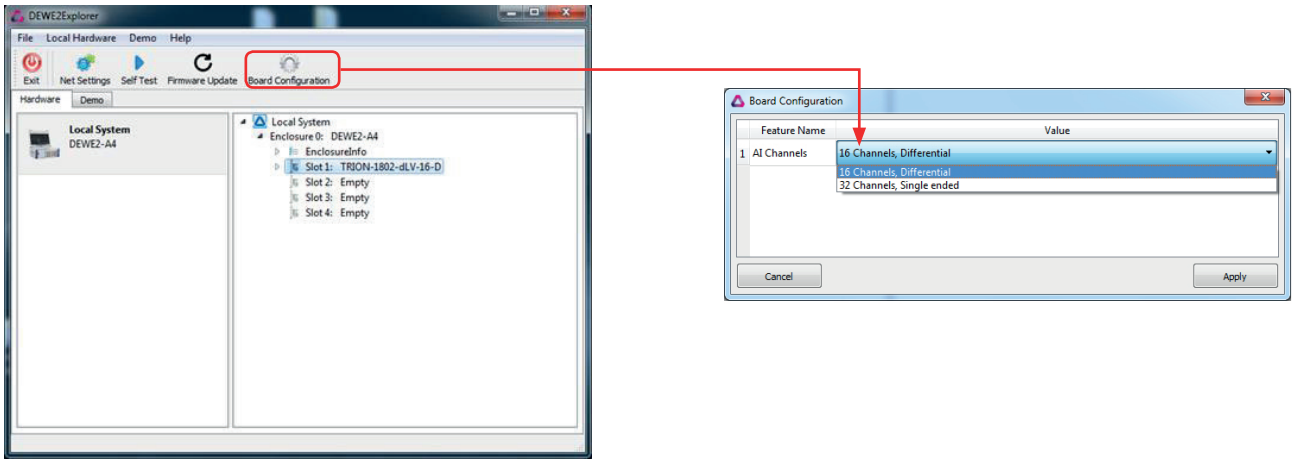
Uses the short function to compensate the input offset. This allows eliminating long-term offset drifts as well as compensating environmental temperature related offsets.

Self Test

The TRION-1802/1600-dLV series has an integrated special self-test circuit. It consists of a programmable high precision voltage source on the first channel and a relay matrix. It is used to check the analog input path of the voltage amplifier by applying 0 V and 90 % of the input range to the input. During the board self test, which is available in the DEWE2 Explorer, this test is performed for all ranges and channels automatically.

Single ended / differential mode

Use DEWE2 Explorer to setup the TRION-1802/1600-dLV series board as 16 channel differential or 32 channel single ended. The information is stored on the board.



Counter functions

Supported counter functions are:

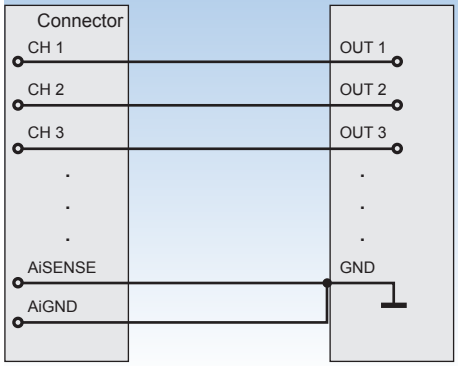
- Simple event counting
- Period measurement
- Pulse width
- Frequency
- Duty cycle

For detailed information about this functions please refer to the chapter "Functional description of advanced counter" of the TRION-CNT module.

Signal connection

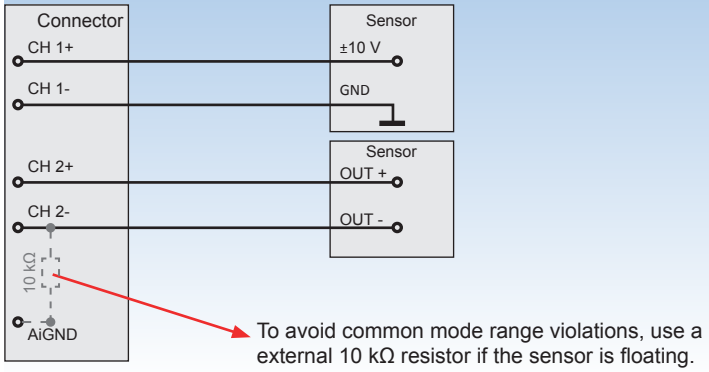
Single ended

This is recommended to use with DEWE-30 series instruments or any other multichannel output device with common ground.

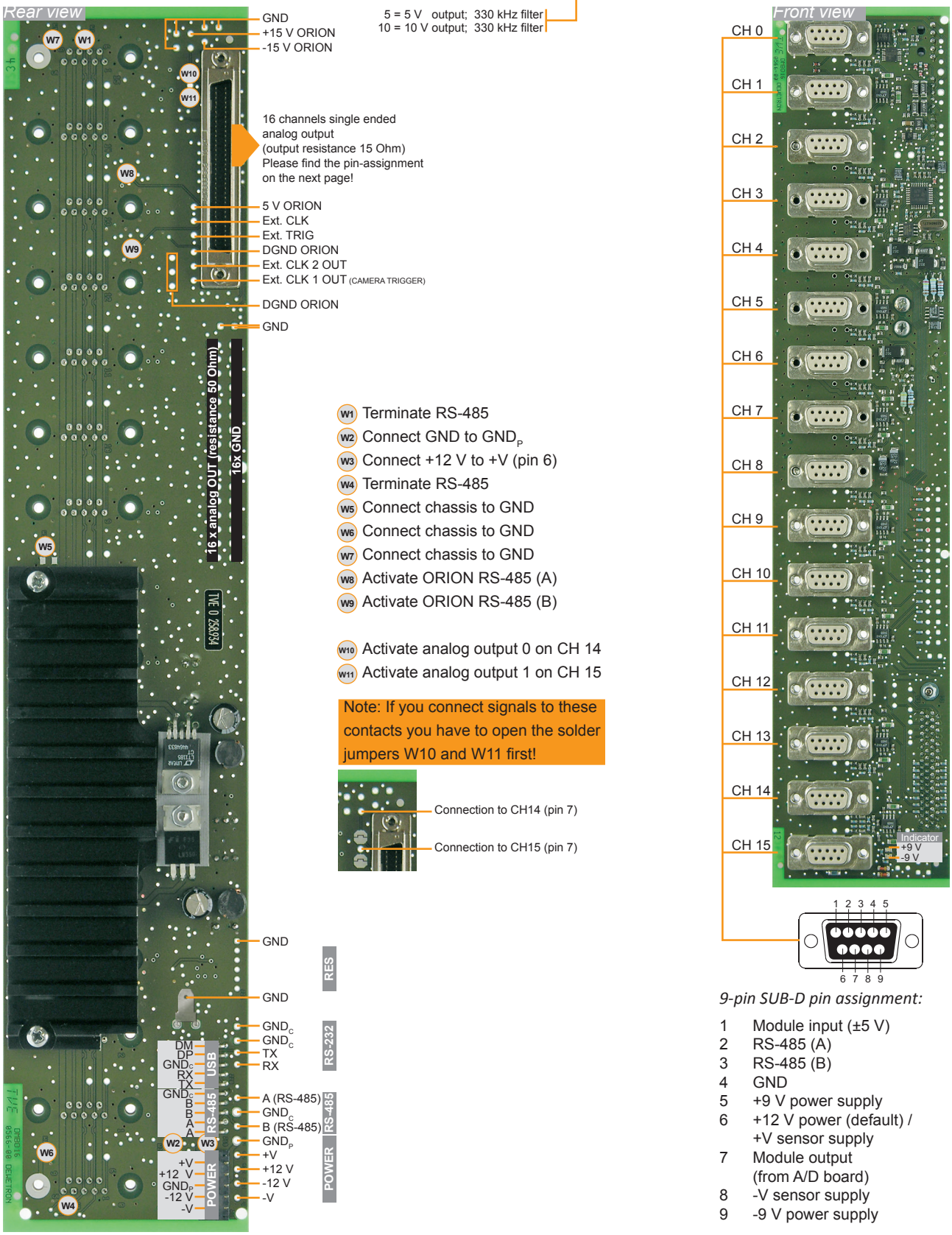


Differential input

This is recommended to use with multiple separated sensors without common ground or differential output.



16 slot DEWE-MOTHERBOARD DAQ-MOTH-16-DE-x



9-pin SUB-D pin assignment:

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

The 16 slot DEWE-MOTHERBOARD receives the ±12 V_{DC} power supply via a DC/DC converter from the internal power supply.

INTERNAL WIRING

Notes

CE-Certificate of Conformity

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:

DEWE-50-TRIONet-16

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 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 61010-1:2011	
EMC	**Emissions**	EN 61000-6-4	EN 55011 Class B
	Immunity	EN 61000-6-2	Group standard

Graz, September 22, 2017

Place / Date of the CE-marking

Ing. Thomas Propst / Manager Total Quality

NOTES