DEWETRON

TRIONet3

TECHNICAL REFERENCE

EN ISO 14001

ISO 9001

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

The compact, distributable TRIONet3 accepts any two of the multi-channel TRION(3) series plug-in modules and connects to any Windows or Linux computer via USB or Ethernet. Furthermore, TRIONet3 mainframes can be interconnected using Ethernet. Because of the Ethernet interface, TRIONet3 mainframes can even be placed up to 100 meters apart from each other.

System overview

The picture below shows an overview of the device and its connections and ports.

> **INFORMATION**
>
> The amount and location of the connectors might vary from system to system and depend on the system configuration.
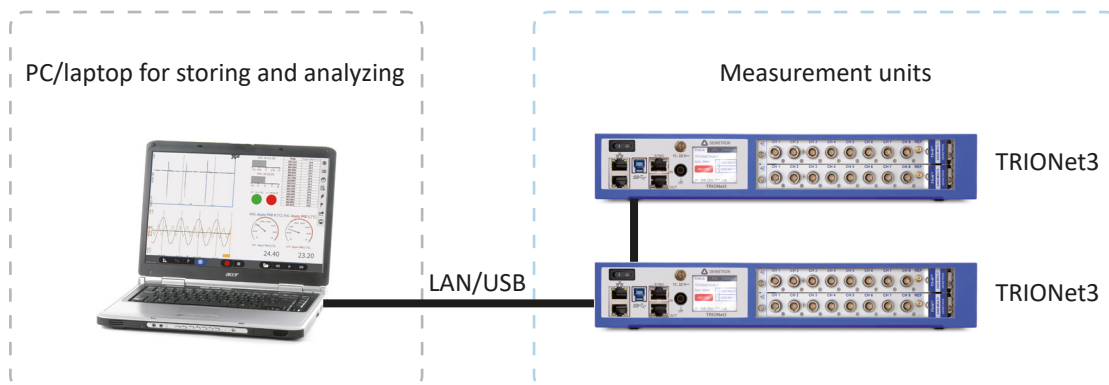

Fig. 1:   Connection overview

> **INFORMATION**
>
> The TRIONet3 has completely replaced the TRIONet3 and is fully downward compatible. The two variants can be operated together in a network without any restrictions.

PREFACE

Scope of delivery

1 x TRIONet3

1 x external AC power supply

1 x USB 3.0 cable (2 m, 6 ft)

1 x LAN cable (2 m, 6 ft)

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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 such as short-circuits, 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 DAQP/PAD/HSI/TRION/TRION3 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.

SAFETY

▸ 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-circuits 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-circuits 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 V_{AC} or >35 V_{DC}. These voltages are already high enough in order to get a perilous electric shock by touching the wiring.

▸ Unless otherwise stated, the maximum input voltage for measuring cards is 70 V_{DC} 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.

▼ SAFETY

Notices
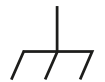
Symbols

Symbol	Description
⚠	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.
⚠ (ESD)	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)
3∿	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. 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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GENERAL INFORMATION

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Printing history

Refer to the page bottom for printing version.

System setup

Key facts

▶ Small, distributable data acquisition front-end

▶ 2 slots for user exchangeable TRION(3) series modules

▶ Touchscreen on front panel

▶ USB 3.0 or Gigabit Ethernet connection to notebook or desktop

System specifications

TRIONet3	
Data acquisition	2 slots for TRION or TRION3 acquisition modules
Quasi static channel expansion	XR via TRION-CAN or TRION-MULTI measurement board
LAN	2x 10/100/1000BASE-TX Gigabit Ethernet
LAN configuration	DHCP or Static IP
USB	USB 3.0
Synchronization	TRION-SYNC-Bus up to 100 m between nodes
System bandwidth	90 MB/s with one connected TRIONet3 (up to 50 MB/s with more than one) **INFORMATION** Refer to *Tab. 2* for more details.
Display	Status display with touchscreen
Cooling	2 temperature controlled ultra silent fans
Isolated power supply	
– Rated input voltage	10 to 32 V_{DC} (9 to 36 V_{DC})
– Power consumption	15 W without modules, totally equipped max. 85 W
– External power supply (incl.)	100 to 240 V_{AC} ~50 to 60 Hz / 90 W
Operating temperature	-20 °C to +50 °C (with pre-warmed unit)
Storage temperature	-20 °C to +70 °C
Humidity (operating)	10 % to 90 %, non condensing
	5 % to 95 % rel. humidity
Altitude (max.)	3000 m (9840 ft)
Vibration test (EN 60068-2-6)	
Shape	Sine
Frequency range	10–150 Hz
Acceleration	2 g
Sweep rate	1 oct./min.
Duration test in 3 directions	20 cycles
Shocktests; EN 60068-2-27	
Pulse form	Half-sine
Acceleration amplitude	30 g
Duration	11 ms
Direction	Test in 3 axis, 3 shocks in each axis and direction

Tab. 1:   System specifications TRIONet3

SYSTEM SETUP

TRIONet3	
Random vibration test; EN 60721-3-2; Class 2M3	
Shape	Random
Frequency range	10–200 Hz
Power spectral density	1 m/s²/Hz
Duration	30 min/axis
Dimensions (W x D x H)	Approx. 320 x 205 x 55 mm (12.6 x 8 x 2.2 in.)
Weight	Typ. 1.9 kg (4.2 lbs) without modules

Tab. 1: System specifications TRIONet3

TRION data bus bandwidth

Depending on the selected channel number, bit depth and sampling rate, TRION(3) measurement boards generate a data stream with a corresponding bandwidth. This is important to know for two reasons.

▶ Data with high bandwidth require more space on the storage medium.

▶ The system must also be capable of processing the data.

Due to the Ethernet interface, the TRIONet3 has a maximum internal bandwidth of 90 MB/s. If several TRIONet3 are connected to one Ethernet interface, the maximum data rate drops to 50 MB/s.

If this amount of data is exceeded, buffers run full and the measurement stops after a short time. To avoid this, you should consider the maximum bandwidth in advance.

The amount of data can be calculated as follows:

$$Bus\ bandwidth\ [MB/s] = \left(\left(Analog\ channels \times \frac{Resolution\ [bit]}{8}\right) + (Counter \times 8)\right) \times Sample\ rate\ [MS/s]$$

Tab. 2 shows the typical values.

TRION measurement board	Active analog channels	Resolution [bit]	Active counter channels (64-bit)	Sample rate setting [MS/s]	Bus bandwidth [MB/s]
TRION-1603-LV	6	16	0	0.25	3
TRION-1802-dLV	32	24	0	0.2	19.2
TRION-1620-ACC	6	16	0	1	12
TRION-1620-ACC	6	16	1	2	40
TRION3-1820-POWER	8	24	0	2	48
TRION3-1810M-POWER	8	16	0	10	160 NOTICE With 8 channels at 10 MS/s you exceed the max. bandwidth limit. Reduce either sample rate or channels.
TRION3-1820-MULTI	8	24	0	2	48
TRION3-1820-MULTI	8	24	1	1	32
2x TRION3-1820-MULTI	16	24	0	1	48
TRION3-1820-MULTI	8	24	2	2	80

Tab. 2: TRION data bus bandwidth values

▶ Normally, all channels in the OXYGEN are active. By simply disabling unused channels, bandwidth can be saved.

▶ Especially fast analog channels often do not need to be transmitted with the full resolution. Reduce the resolution from 24- to 16-bit to save bandwidth.

▶ Caution is advised with counters. Since these are usually transmitted with 64-bit, the limit is quickly reached.

▶ If instead of connecting the TRIONet3 in series you use a 10 GBit switch, the data rate can be increased from a total of 50 MB/s to 90 MB/s for each TRIONet3.

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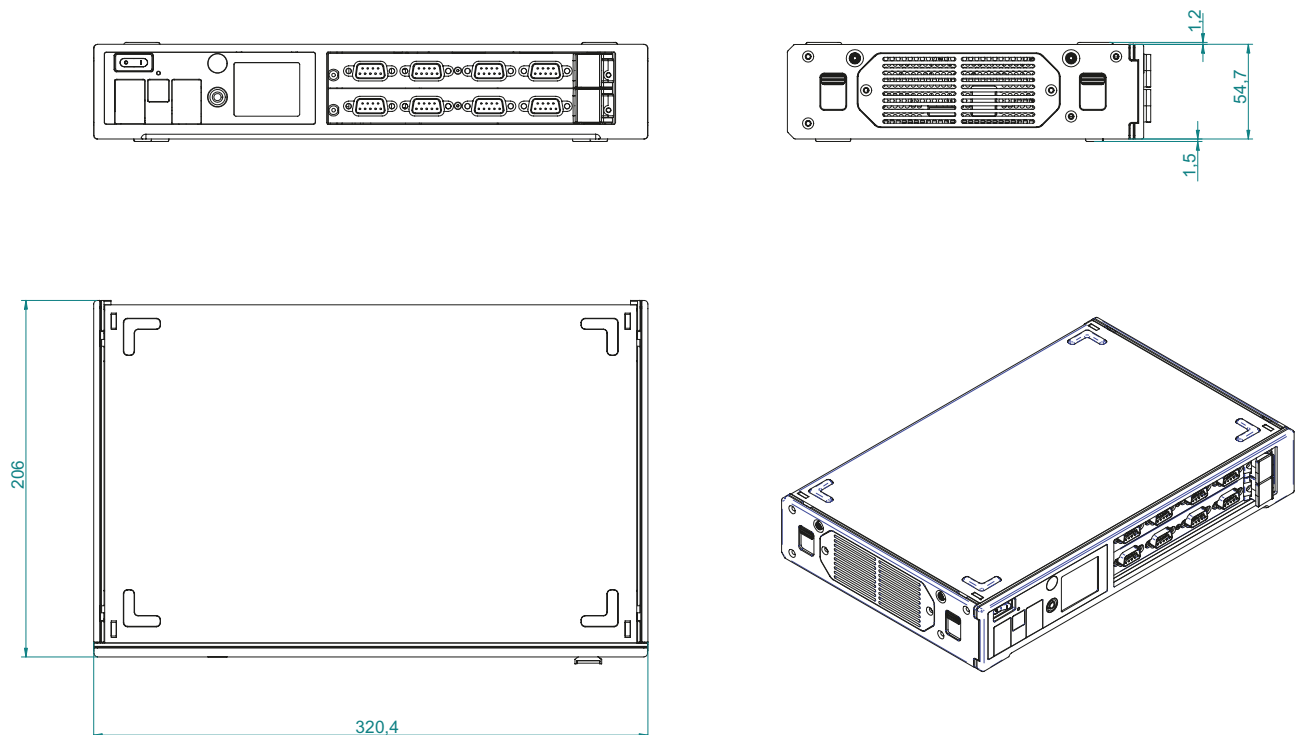
*) Dimensions in mm (1 inch = 25.4 mm)

Fig. 2:   Dimensions TRIONet3

CONNECTIONS AND PORTS

Connections and ports

Fig. 3: TRIONet3 front view
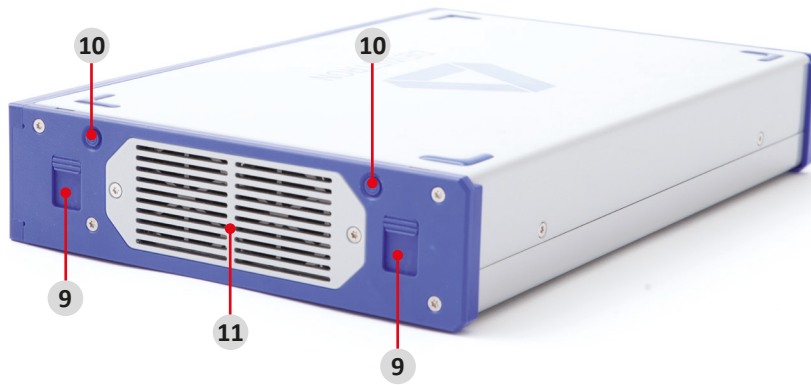
Fig. 4: TRIONet3 right side view

1. *USB 3.0 interface connector*
2. *Power supply input connector* (LEMO EGG.1B.302)
3. Power-on switch
4. *Gigabit Ethernet LAN connectors*
5. *TRION-SYNC-BUS interface*
6. *Chassis terminal*

7. *Touchscreen display*
8. *TRION(3) series module slots*
9. *Locking mechanism for stacking units*
10. *Release button for locking mechanism*
11. *Fans*

INFORMATION

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

USB 3.0 interface connector

The TRIONet3 is equipped with a USB 3.0 interface (type B) to connect to a laptop or PC. A 2 m (6 ft) USB 3.0 cable is included. The USB 3.0 interface meets the standard USB pin assignment. The USB interface connector on the TRIONet3 has one LED displaying following statuses:

GREEN (stable)	Link active
YELLOW (stable)	USB 3.0 is in use

Tab. 3:   LED indication

NOTICE

DEWETRON recommends using USB 3.0 cables with a maximum cable length of 1.8 m (6 ft) otherwise the TRIONet3 will not connect to the laptop/PC.

Power supply

The TRIONet3 is powered by an external AC/DC power supply which is included as standard accessory.

90 W AC/DC power supply	

Input
  – Rated input voltage
  – Input frequency
	100...240 V_{AC} (max. 90 ... 264 V_{AC})
	50...60 Hz

Output
  – Power
  – Voltage
	90 W total
	24 V

Protection
  – Over voltage
  – Short circuit
  – Overcurrent
	yes
	yes
	yes

Environment
  – Temperature
  – Humidity
	Operating: 0 to 40 °C / storage: -20 to 80 °C
	Operating: 20 % RH to 80 % RH / storage: 10 % RH to 90 % RH

Tab. 4:   Specifications external 90 W AC/DC power supply

Power supply pin assignment:

100 to 240 V_{AC} IN

+24 V_{DC} OUT
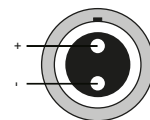
Connector type
2-pin male
LEMO EGJ.1B.302

Fig. 5:   Details external 90 W AC/DC power supply

CONNECTIONS AND PORTS

Gigabit Ethernet LAN connectors

The TRIONet3 supports Gigabit Ethernet interface ports for connecting the TRIONet3 with a laptop/PC or daisy-chaining multiple units with standard RJ45 connector. A 2 m (6 ft) Cat6 Ethernet cable is included.

The Gigabit Ethernet interface connectors on the TRIONet3 have two LEDs displaying following statuses:

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

Tab. 5: LED indication

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

TRION-SYNC-BUS interface

The TRIONet3 is equipped with two additional TRION™-SYNC-BUS interface connectors for daisy-chaining multiple TRIONet3 units. 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. 6: 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.

Optional cables

▶ TN-DCHAIN-SET-0.2

A set of two cables (data and sync) for daisy-chaining two TRIONet3 units in stacked configuration, cable length approx. 0.2 m. Other cables on request.

NOTICE
The total length of the SYNC cable between TRIONet3 units must not exceed 100 m (328 ft), otherwise the data will not synchronize.

Chassis terminal

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

Touchscreen display

The integrated touchscreen display of the TRIONet3 shows all relevant information straight on the device. To switch between the tabs, simply touch the display. The following information is shown on the display:

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*' ——— Status   Info   Net

Name of your TRIONet3 node ——— TRIONet3 Node 1

Sync status ——— Sync: Slave   2 1603-LV   ——— Installed TRION modules

Transfer/Recording status ——— Connected   1 2402-MULTI

IP address ——— IP: 192.168.0.150
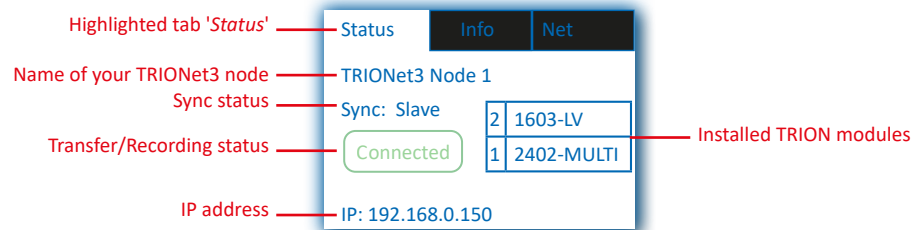
Fig. 6:   Status tab

▶ Highlighted tab 'Status':

The 'status' tab is the main screen after the device booted correctly.

▶ Name of your TRIONet3 node

The name of the TRIONet3 node is shown here and can be changed with the DEWETRON Explorer. For more information see *Touchscreen display on page 19*.

▶ Sync status

The actual sync status of the TRIONet3. The 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'

▶ Transfer/recording status

Shows the actual transfer/recording status. Following statuses are available:

– None: The device is not connected

– Connected: The device is connected to the software (OXYGEN etc.)

– Active: Measurement active

– Record: Measurement active and recording

▶ IP-adress
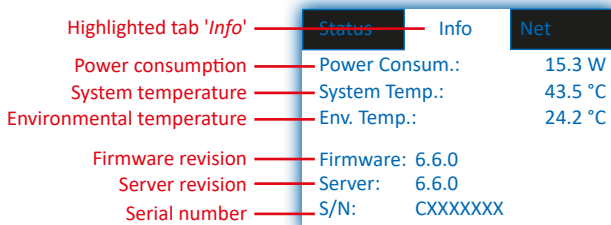
Shows the current IP address. The IP address can be set to static or DHCP.

For more information see chapter *Touchscreen display on page 19*.

CONNECTIONS AND PORTS

Info tab

The 'Info' display tab shows some internal health parameters. This is a live display with an update rate of approx. 1 s. In case of support have your firmware/server revision number ready for further instructions. To switch between tabs just tab anywhere on the screen.
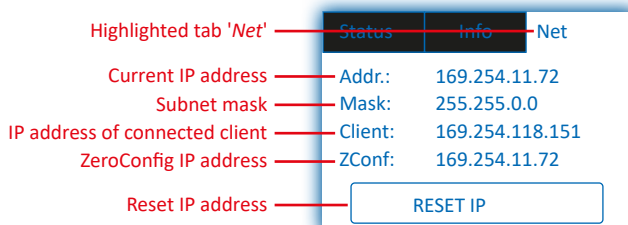
Highlighted tab '*Info*' — Status | Info | Net
Power consumption — Power Consum.:   15.3 W
System temperature — System Temp.:   43.5 °C
Environmental temperature — Env. Temp.:   24.2 °C
Firmware revision — Firmware: 6.6.0
Server revision — Server: 6.6.0
Serial number — S/N: CXXXXXXX

Fig. 7: Info tab

Net tab

The 'Net' display tab shows the network settings of the TRIONet3 device itself and the client if connected. In this tab there is also the possibility of resetting the IP address of the TRIONet3. For more information on how to change IP address and subnet mask see *Touchscreen display on page 19*.

Details regarding ZeroConf IP address can be found in *ZeroConf (Zero Configuration Networking) and link-local addresses on page 28*.
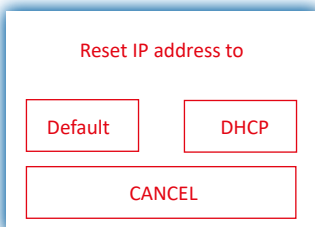
Highlighted tab '*Net*' — Status | Info | Net
Current IP address — Addr.:   169.254.11.72
Subnet mask — Mask: 255.255.0.0
IP address of connected client — Client: 169.254.118.151
ZeroConfig IP address — ZConf: 169.254.11.72
Reset IP address — RESET IP

Fig. 8: Net tab

Reset IP

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

Reset IP address to
Default   DHCP
CANCEL

Fig. 9: Reset IP

▸ Default: This will reset the IP address of the TRIONet3 to default 192.168.0.150.

▸ DHCP: Choose 'DHCP' if the TRIONet3 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 TRIONet3 will switch automatically to a fallback address called '*Link-Local IP address*'.

Refer to *ZeroConf (Zero Configuration Networking) and link-local addresses on page 28* for more details.

TRION(3) series module slots

The TRIONet3 is equipped with 2 slots for TRION(3) series modules. For more information refer to chapter *Hardware on page 22*.

Locking mechanism and release button

The TRIONet3 comes with a nifty locking mechanism if you want to stack your units. For more information, refer to *Mechanical stacking of multiple TRIONet3 on page 25*.

Fans

On the right side of the TRIONet3 two temperature-controlled ultra silent fans are installed. For more information on how to clean them, refer to *Fans on page 46*.
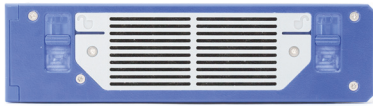
Fig. 10:   Fans

WORKING WITH THE SYSTEM

Working with the system

Hardware

TRION(3) modules compatibility

Supported modules		Not supported modules
TRION3-1600-dLV	TRION-1810-HV	TRION-FLEXRAY
TRION3-1802-dLV	TRION-1820-MULTI	TRION-MIL1553
TRION3-1810M-POWER[1]	TRION-1820-POWER	TRION-MA4
TRION3-1810-SUB-8[1]	TRION-2402-dACC	TRION-EtherCAT-1-SLAVE
TRION3-1820-POWER[1]	TRION-2402-dSTG	TRION-1628-AO
TRION3-18xx-MULTI[1]	TRION-2402-MULTI	TRION-ARINC429
TRION3-18xx-MULTI-AOUT-8[1][2]	TRION-2402-V	TRION-PSU-15W
TRION3-AOUT-8[2]	TRION-BASE	
TRION-1600-dLV	TRION-CAN	
TRION-1802-dLV	TRION-CNT	
TRION-1620-ACC	TRION-DI-48	
TRION-1620-LV	TRION-TIMING	
TRION-1603-LV	TRION-VGPS	

Tab. 7:   Supported and not supported TRION modules

[1] Consider maximum system bandwidth.   [2] Streaming output is not supported.
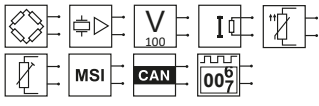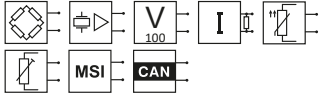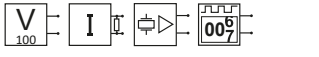
TRION series modules overview

[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
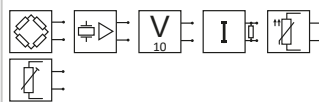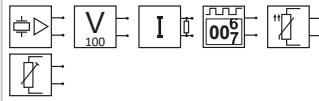
Analog modules

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
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
TRION-1603-LV		6	250 kS/s	18 bit	Yes	Safety banana[3]

Tab. 8:   TRION/TRION3 analog modules

ANALOG modules		Channels	Sample rate per channel	Resolution	Isolation	Connector type
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 TRION-1802-dLV		16 or 32	200 kS/s 100 kS/s	18 bit 24 bit	No	D-SUB
TRION3-1600-dLV TRION-1600-dLV		16 or 32	20 kS/s	16 bit	No	D-SUB

Tab. 8: TRION/TRION3 analog modules
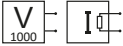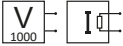
Digital modules

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		-	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		-	2 MS/s	0.01 km/h <10 cm	No	100 Hz GNSS receiver for automotive applica-tions
TRION-TIMING		-	2 MS/s	12.5 ns	No	Applies precision absolute time to measured data
TRION-CAN		4	1 MBit	-	Yes	D-SUB

Tab. 9: TRION digital modules
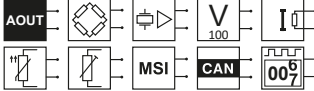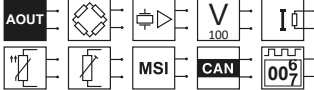
WORKING WITH THE SYSTEM

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
TRION-1810-HV[1]		4 or 8	1 MS/s	18 bit	Yes	Safety banana, CAT III 1000 V[2]
TRION3-1810-SUB-8		8	1 MS/s	16 bit	Yes	BNC, LEMO 1B

Tab. 10:   TRION/TRION3 power modules

Analog output modules

ANALOG OUTPUT modules		Channels	Sample rate per channel	Resolution	Isolation	Connector type
TRION3-1850-MULTI-AOUT		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		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

Tab. 11:   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 for TRION modules refer to the TRION series modules technical reference manual.
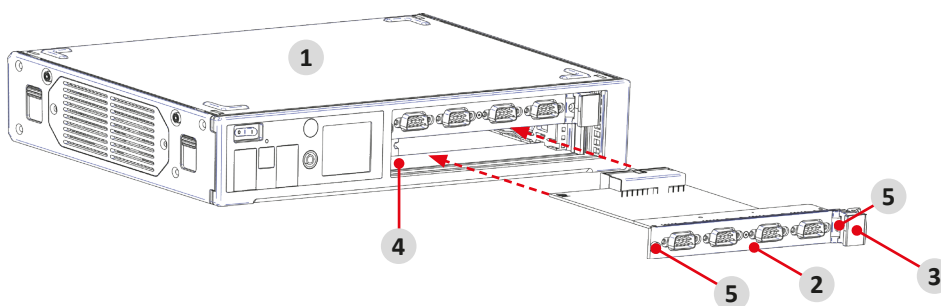
Installing a TRION module

Fig. 11:   Installing a TRION module

1. TRIONet3 chassis
2. TRION series module
3. Injector/ejector module

4. Module guides
5. Mounting screws

In order to install a TRION module into a chassis prozeed 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 TRIONet3 chassis and TRION series modules.

3. Identify a supported TRION peripheral slot.

   Some modules require a TRION STAR-slot. For more information refer to TRION series modules technical reference manual.

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

5. Place the module edges of the TRION module into the module guide at the top and bottom of the chassis.

6. Insert the TRION 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.

The TRION module is now installed into a TRIONet3 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.

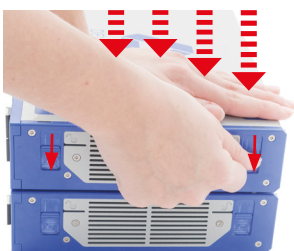The warranty is void if the modules overheat due to missing filler panels.

Mechanical stacking of multiple TRIONet3

To stack two or more TRIONet3 units proceed as follows:

1. Stack your units

2. Press down slightly the stacked instruments.

3. Push down the levers on both sides of the upper unit to lock them (4 levers in total).

4. To unlock the stacked units press the release button of the lower unit.

The TRIONet3 units are now locked or unlocked respectively.

Software

Installing TRIONet3 software on laptop/PC

To connect your TRIONet3 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 TRIONet3 before connecting it to the laptop/PC. This reference manual describes on how to install and operate your device with OXYGEN.

INFORMATION
Do not connect your TRIONet3 with your laptop/PC before installing any measurement software or drivers on your laptop/PC.

Install TRION package

The TRION package contains all necessary drivers, APIs as well as the DEWETRON Explorer which is needed for configuring your TRIONet3.

To install this package proceed as follows:

1. Execute the '**DEWETRON-TRION-Applications-x.x.exe**' on your DEWETRON Installation media USB drive or download the .zip file at _https://ccc.dewetron.com/pl/dewe2-series_ → **'DEWETRON TRION Rx.x'.**

2. Unzip, then execute the file and follow the instructions of the installer.

   NOTICE Do not connect your TRIONet3 with your laptop/PC before this package has been installed on your laptop/PC.
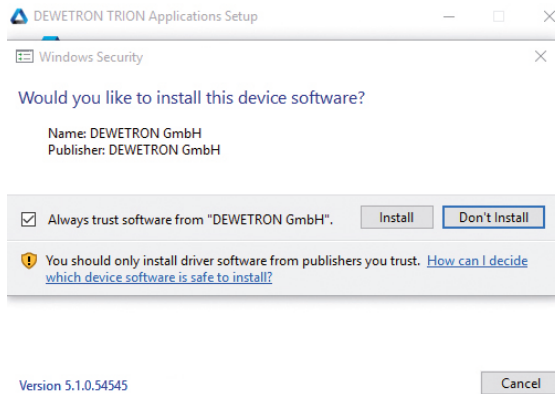
   INFORMATION Product Version 2.3.x and older: Microsoft .NET Framework 3.5 is required for this setup.
   Product Version 2.4.x and newer: Microsoft .NET Framework 3.5 is not required anymore.

3. Agree to the license terms and conditions and proceed with 'Next'.
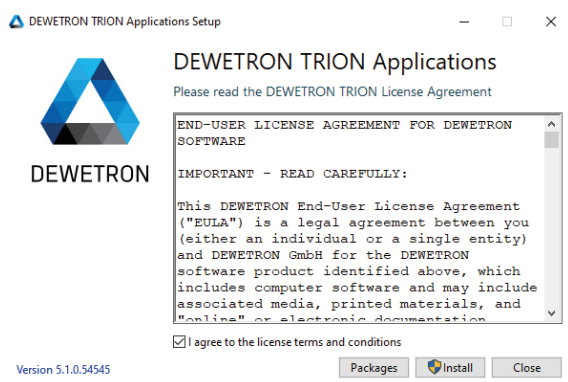
4. Hit 'Install'. Optionally check 'always trust software from DEWETRON GmbH'.

5. 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.**
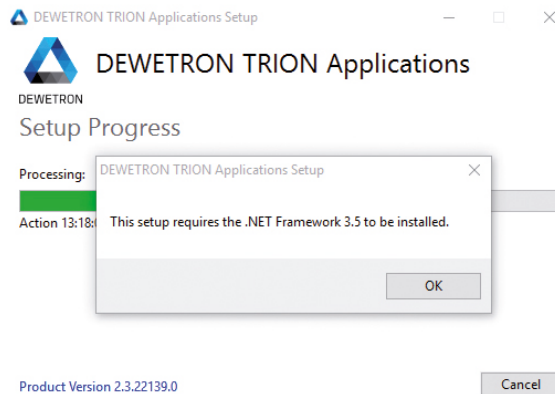

6. Setup successful. A restart is mandatory.
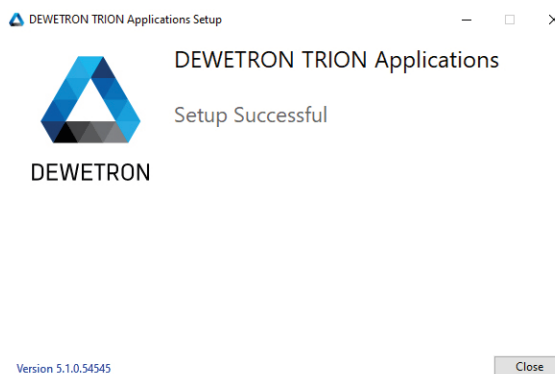
The TRION package has now been installed.

Connect TRIONet3 to laptop/PC via USB 3.0 or Gigabit Ethernet

To connect TRIONet3 to laptop/PC via USB 3.0 or Gigabit Ethernet proceed as follows:

1. Connect the TRIONet3 to the included external AC/DC power supply.

2. Switch ON the device with the '*Power-on switch*' located on the top left at the front panel.

3. After a short bootscreen animation, the status display will indicate the TRIONet3 is ready to go.

WORKING WITH THE SYSTEM

Status	Info	Net

TRIONet3 Node 1

2	1603-LV
1	2402-MULTI

IP: 192.168.0.150
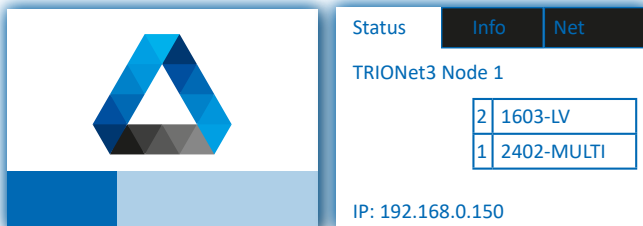
4. Now connect the TRIONet3 via desired interface to your laptop/PC.

TRIONet3 is now connected to your laptop/or PC.

ZeroConf (Zero Configuration Networking) and link-local addresses

Since product version **2.4.x** the network ease-of-use has been improved drastically. Any TRIONet3 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 TRIONet3 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 TRIONet3 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

▶ TRIONet3 with Firmware 2.4.1 or higher

▶ Laptop/PC with Windows 10 (64-bit) or Windows 11

▶ Cat6 Ethernet or USB3.0 cable

▶ Installed DEWETRON TRION Applications 6.6 or higher
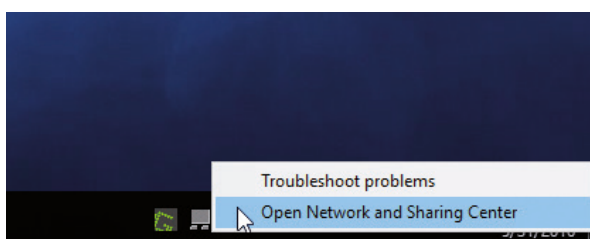

INFORMATION

ZeroConf and 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 TRIONet3 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).
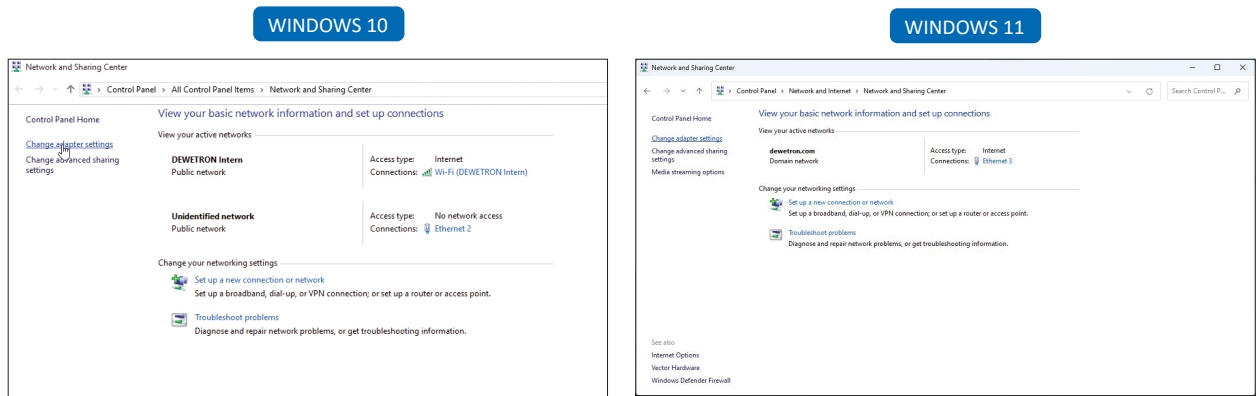
To check if the drivers have been installed correctly, proceed as follows:

1. Right click on the network icon at the bottom right of your taskbar and select '*Open Network and Sharing Center*'.

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

WINDOWS 10

WINDOWS 11

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

> **INFORMATION**
>
> 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 TRIONet3 will not connect to the laptop/PC. DEWETRON offers USB 3.0 cables for your TRIONet3 in perfect length.

If WINDOWS fails to install the ASIX AX88179 driver automatically, refer to *Manual installation of USB 3.0 to Gigabit Ethernet driver of host PC on page 32*.

ZeroConf via Cat6 Ethernet cable

If the TRIONet3 is connected via Cat6 Ethernet cable (included in the kit) to the Laptop/PC, ZeroConf will automatically assign the TRIONet3 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*' > '*DEWETRON Explorer*'.

The DEWETRON Explorer will list a '*Local System*' (which is your Laptop/PC) and the connected TRIONet3.
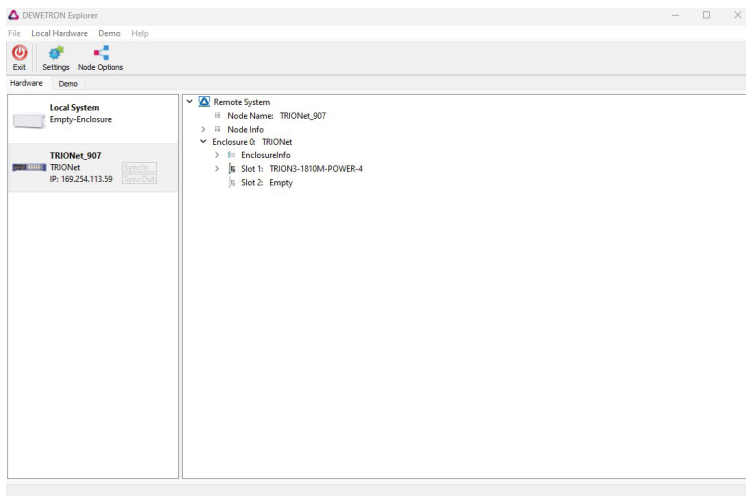
WORKING WITH THE SYSTEM

Fig. 12: Check ZeroConf status

By selecting the TRIONet3 in the DEWETRON Explorer, it will now show a '*connected*' symbol on the status display of the device. When deselecting the TRIONet3 in the DEWETRON Explorer, the '*connected*' symbol will disappear from the status display of the unit.
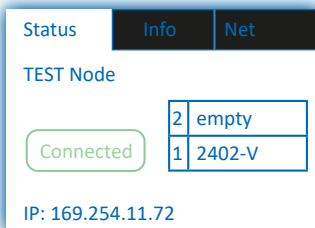

Fig. 13: Green 'Connected' symbol on the status display.

INFORMATION

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 TRIONet3 will not connect to the laptop/PC. DEWETRON offers USB 3.0 cables for your TRIONet3 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)'**.**

**Manual setup of Gigabit Ethernet connection of host PC**

To manually set up the Gigabit Ethernet connection of your host PC (static IP) proceed as follows:

1. After the TRIONet3 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*'.
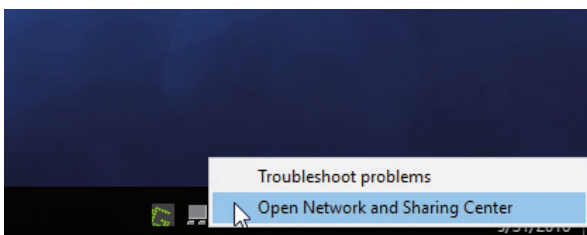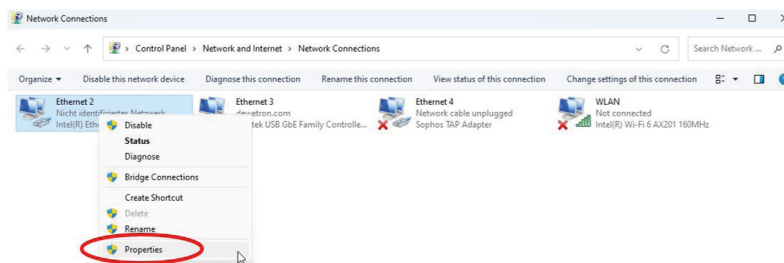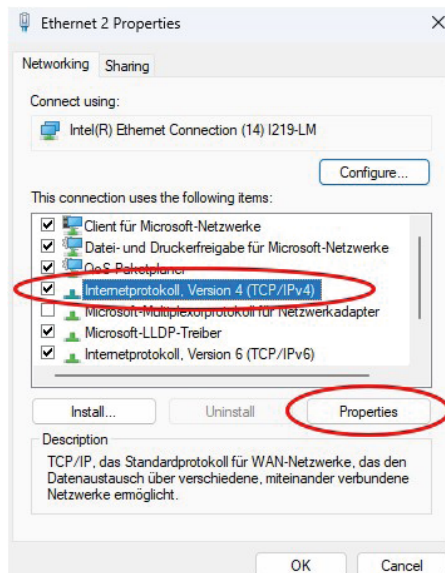
2. Click on '*Change adapter settings*' on the left.
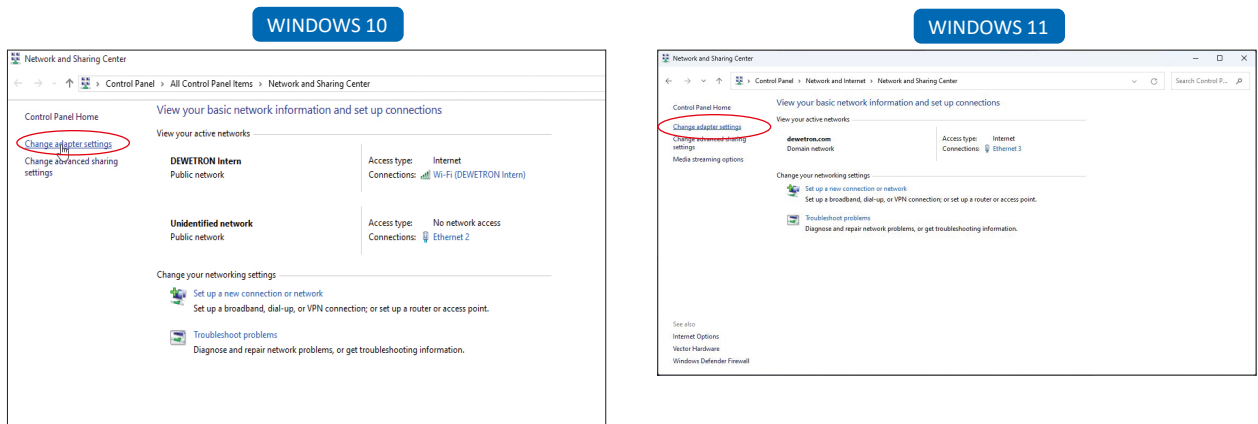
3. Right click the adapter where the TRIONet3 is connected and select 'Properties' from the menu.


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

5. Check 'Use the following IP adress:' and use an IP address within the same range as the TRIONet3 (e.g. **192.168.0.151**). The current IP address of the TRIONet3 is shown on the status display. Use the following subnet mask: **255.255.255.0**.
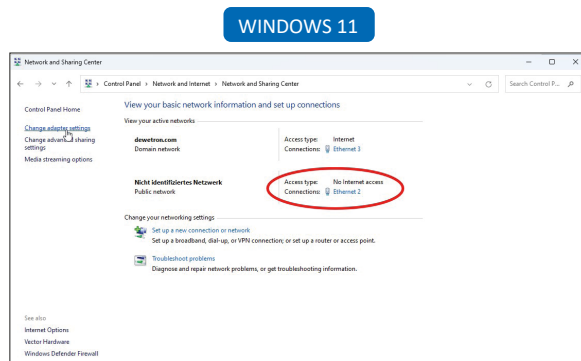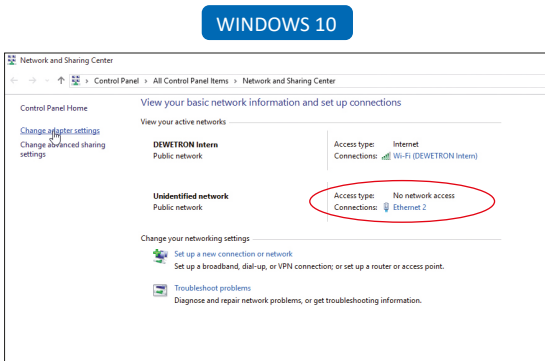
WORKING WITH THE SYSTEM

The **default IP** address of the TRIONet3 is: **192.168.0.150**. DNS servers are not required.
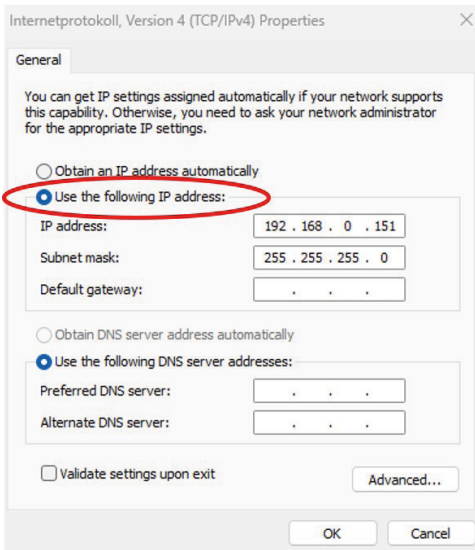
6. Close all tabs by hitting 'OK'.

A static IP address is now set to the adapter. In the '*Network and Sharing Center*' you should now see a local area network.


7. Reboot your laptop/PC.

The host PC has now been manually set up with a Gigabit Ethernet connection.

Manual installation of USB 3.0 to Gigabit Ethernet driver of host PC

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:
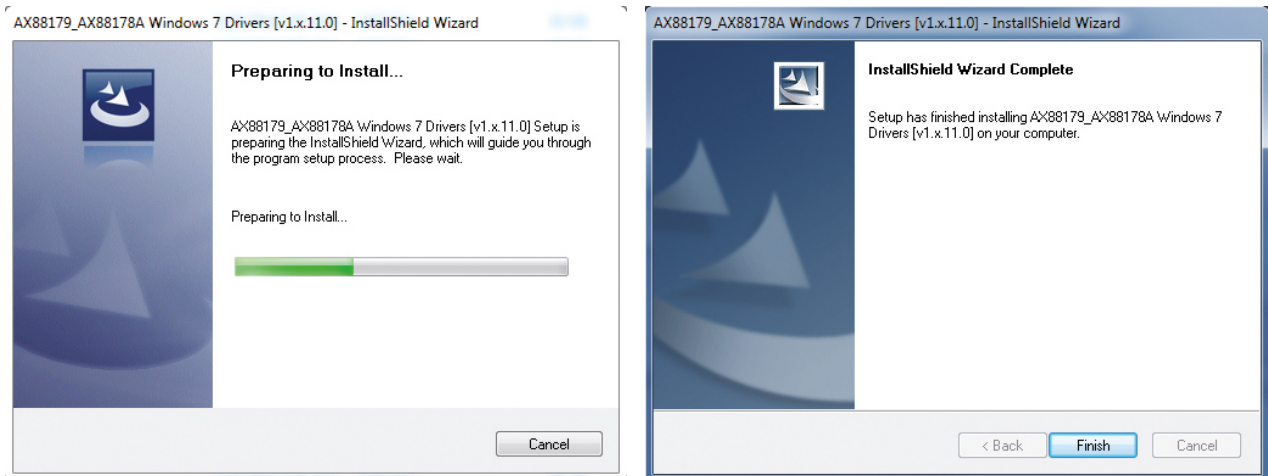
http://www.asix.com.tw/products.php?op=pItemdetail&PItemID=131;71;112

To check if the drivers have been installed correctly, proceed as follows:

1. Right click on the network icon in the bottom right of your taskbar and select '*Open Network and Sharing Center*' > '*Change adapter settings*'.

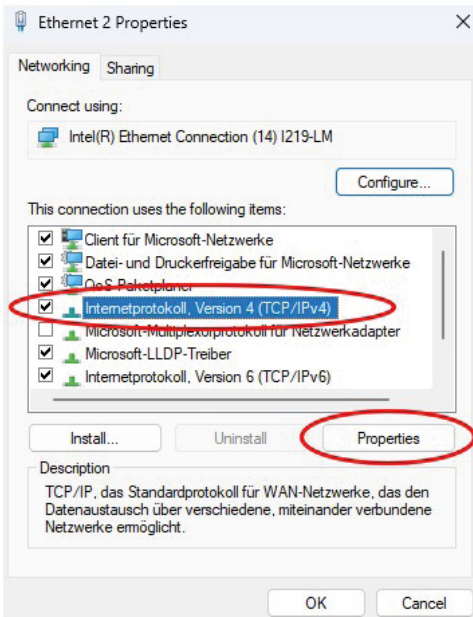2. If installed correctly the adapter has to be listed as '*ASIX AX88179 USB 3.0 to Gigabit E...*'.
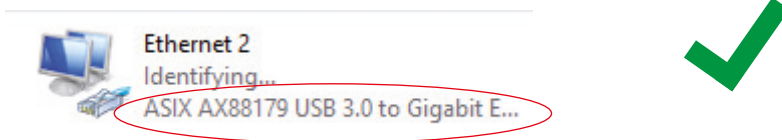
3. Right click the corresponding adapter (ASIX AX88179..) and select '*Properties*' from the menu.
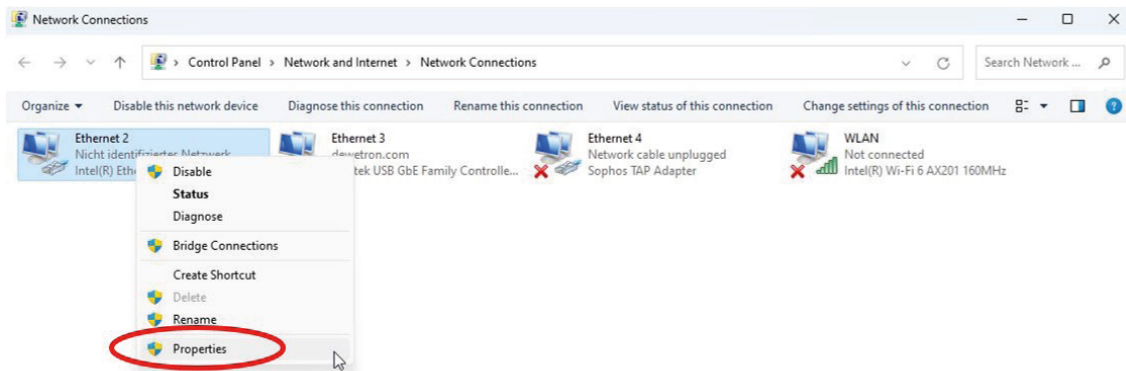
4. Select '*Internet Protocol Version 4 (TCP/IPv4)*' and click on '*Properties*' afterwards.

5. Check '*Use the following IP adress:*' and use an IP address within the same range as the TRIONet3 (e.g. **192.168.0.151**). The actual IP address of the TRIONet3 is shown on the status display.
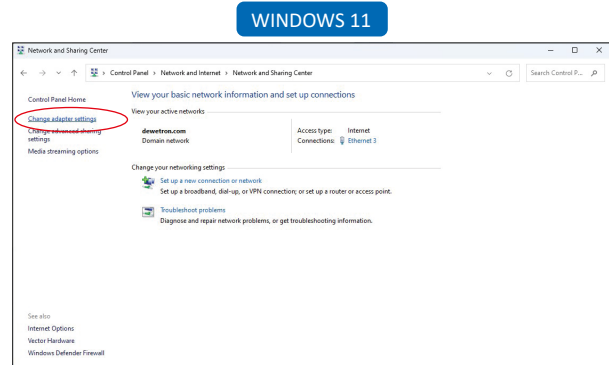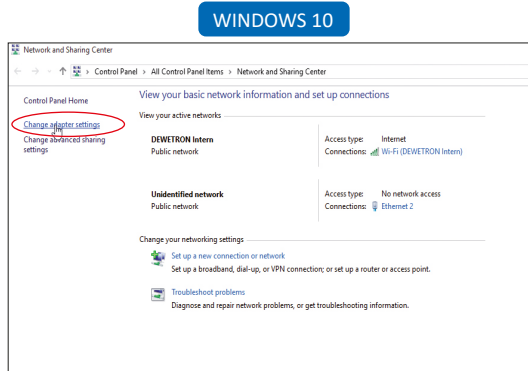
6. Use the following subnet mask: **255.255.255.0**.

The **default IP** address of the TRIONet3 is: **192.168.0.150**. DNS server are not required.
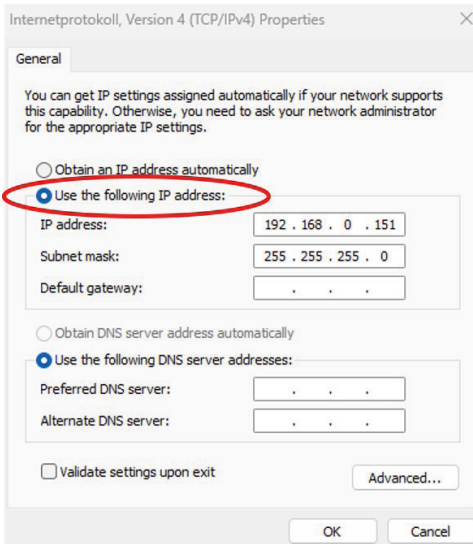
7. Close all tabs by hitting '*OK*'.

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.


8. Reboot your laptop/PC.

The host PC has now been manually set up with the USB 3.0 to Gigabit Ethernet driver.

Setup of TRIONet3 with DEWETRON Explorer

To set up the TRIONnet with the DEWETRON Explorer (static IP, DHCP, node name) proceed as follows:

1. After connecting the TRIONet3 with your laptop/PC via desired interface, start the DEWETRON Explorer which has been installed with the TRION package, usually via '*Start*' > '*All programs*' > '*DEWETRON*' > '*DEWETRON Explorer*' or just type '*DEWETRON Explorer*' in the search bar.

The DEWETRON Explorer will list a '*Local System*' (which is your laptop/PC) and the connected TRIONet3.
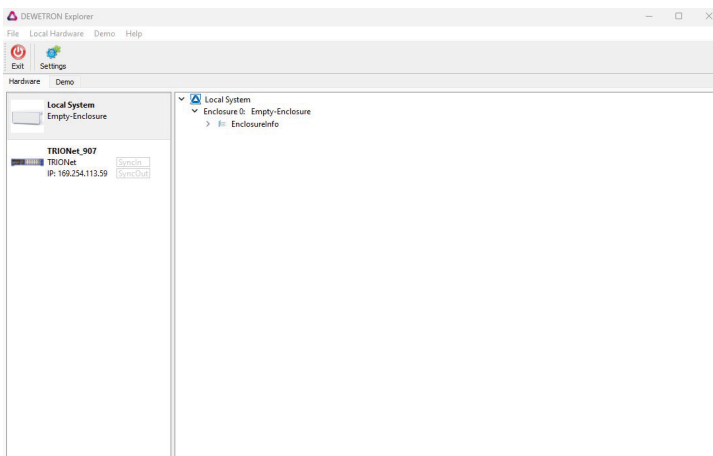

If the systems are not in the same IP address range, select the '*LocalSystem*' and click on '*Net Settings*' from the menu bar. The following screen will pop up:

WORKING WITH THE SYSTEM
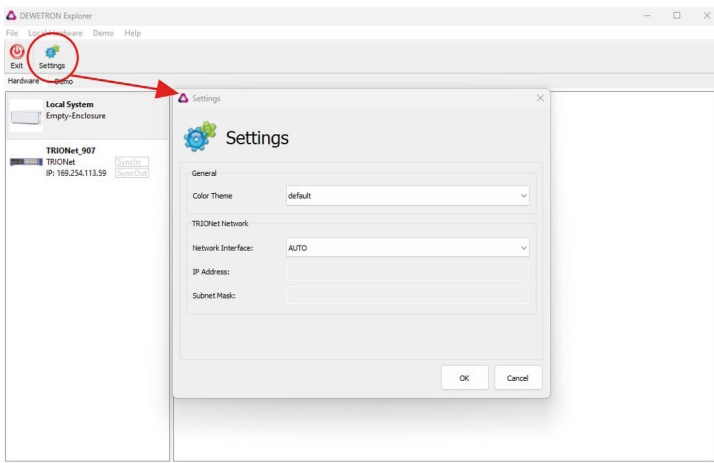
2. Choose 'AUTO' from the dropdown menu and hit '*OK*' afterwards.

The DEWETRON Explorer will scan all Ethernet adapters and choose the corresponding adapter automatically. It is also possible but not recommended to manually select the adapter.
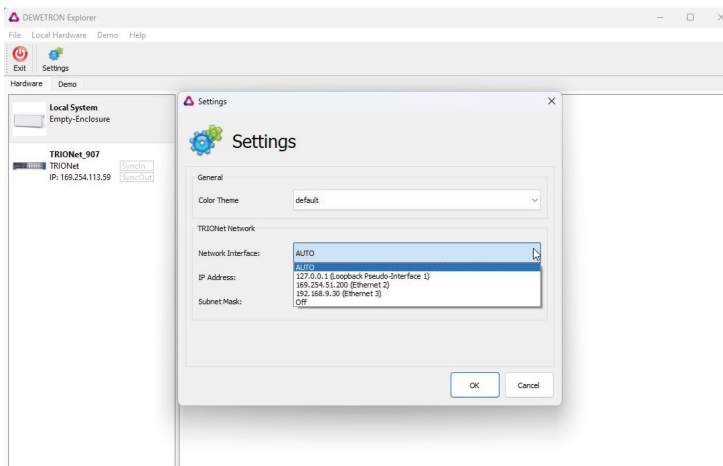

3. Now the TRIONet3 becomes active and by selecting the unit (may take a few seconds), the DEWETRON Explorer will show some information (name of chassis, installed TRION™ modules...).
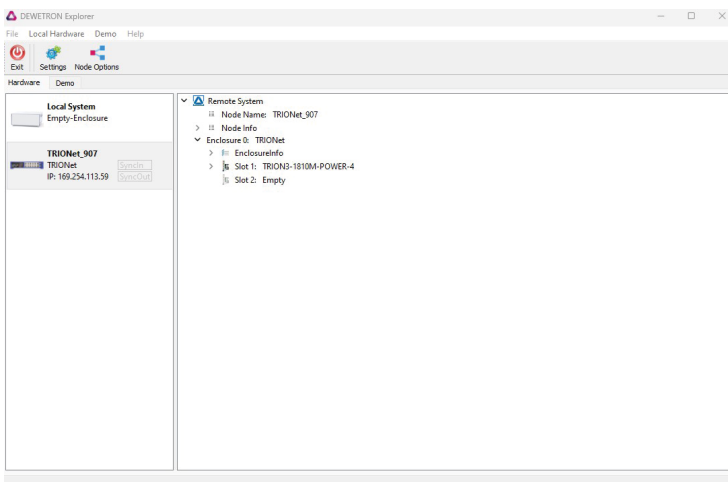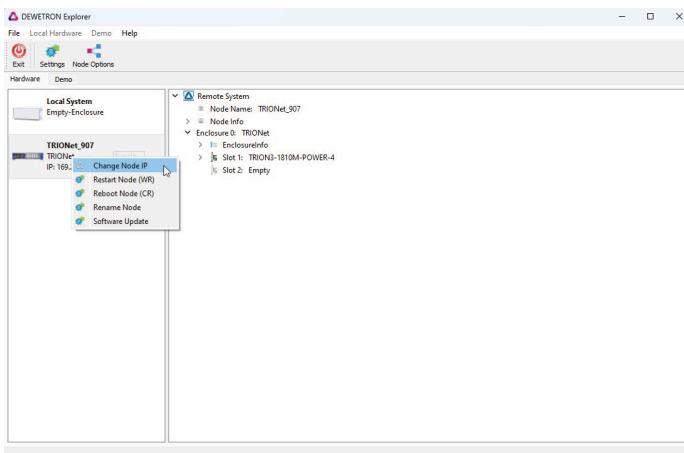
4. Also, the status display of the TRIONet3 will now show a '*connected*' symbol. When deselecting the TRIONet3 in the DEWETRON Explorer , the '*connected*' symbol will disappear from the status display of the unit.
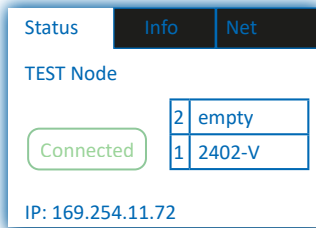
5. To change the IP address or the name of the TRIONet3 node just select and right click the unit in the DEWETRON Explorer.

6. Select '*Change Node IP*' from the menu.

7. Choose '*static*' and type in a new IP address and subnet mask and hit 'OK'.
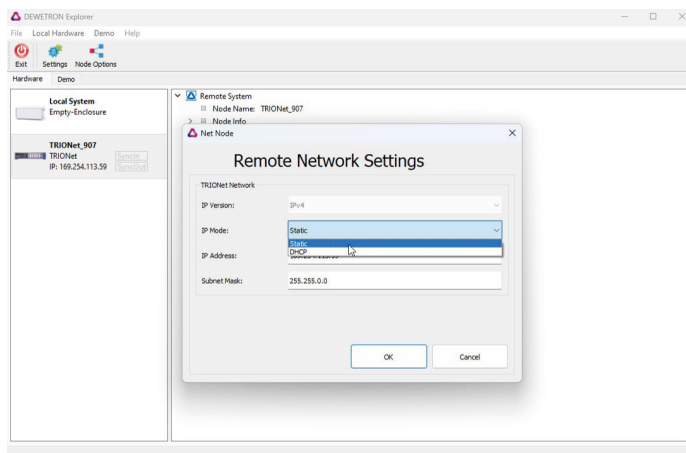
INFORMATION

Choose 'DHCP' if the TRIONet3 should be implemented in a proprietary, already existing LAN with a DHCP server up and running.

INFORMATION

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 TRIONet3.

WORKING WITH THE SYSTEM

NOTICE

DO NOT change the IP address while measuring.

8. To change the name of the Node select and right-click the system and choose 'Rename Node' from the menu.
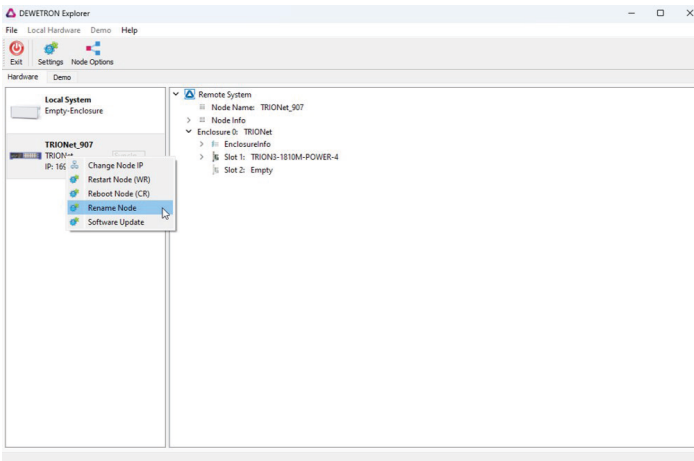
9. Type in a new name for your system and hit 'OK'. The name will also automatically update on the status display of the unit.
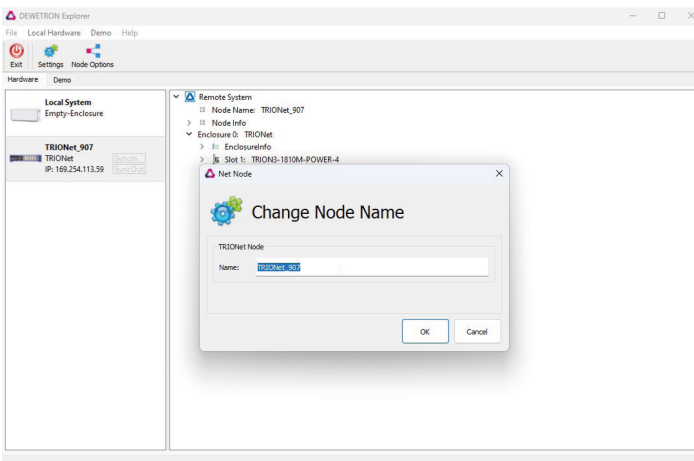
10. These options are available also by selecting the system node and clicking on 'Node Options' from the menu bar.
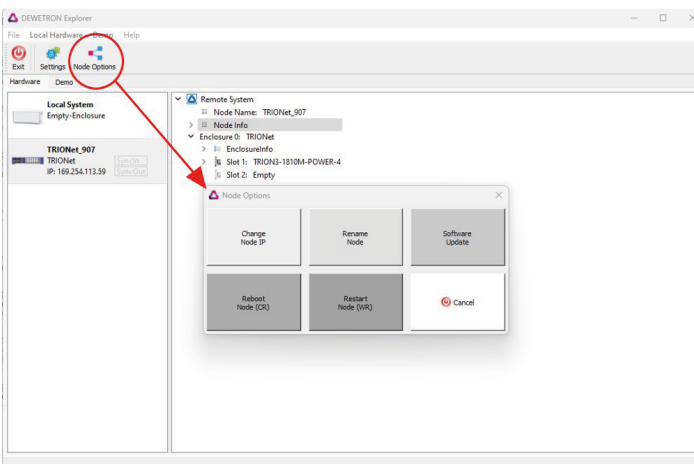
TRIONet3 has now been set up with the DEWETRON Explorer.

Installation of OXYGEN measurement software

Install the OXYGEN measurement software as follows:

1. Start the OXYGEN installation by plugging in the DEWETRON installation media USB stick shipped with your TRIO-Net3 into your computer, and execute the **"oxygen_x86_setup.exe"** or **"oxygen_x64_setup.exe"** file on the USB drive, depending on your platform.

2. Follow the instructions of the installer.

3. Agree to the license terms and conditions and proceed with 'Next'.
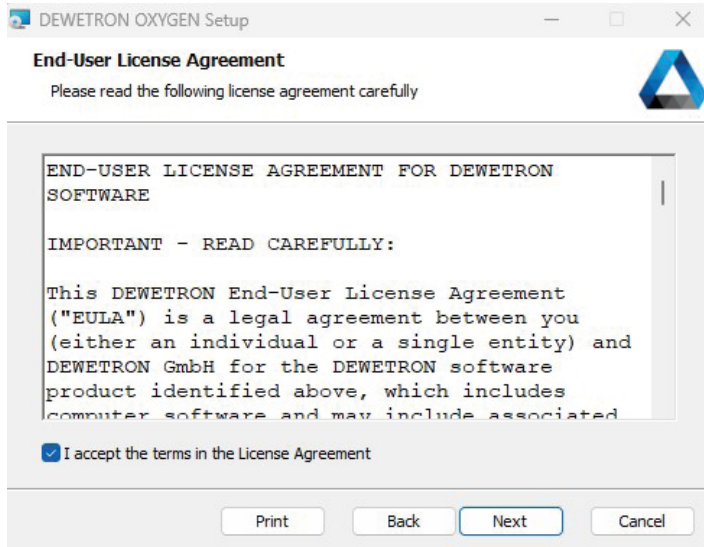
WORKING WITH THE SYSTEM

4. Select the destination location.
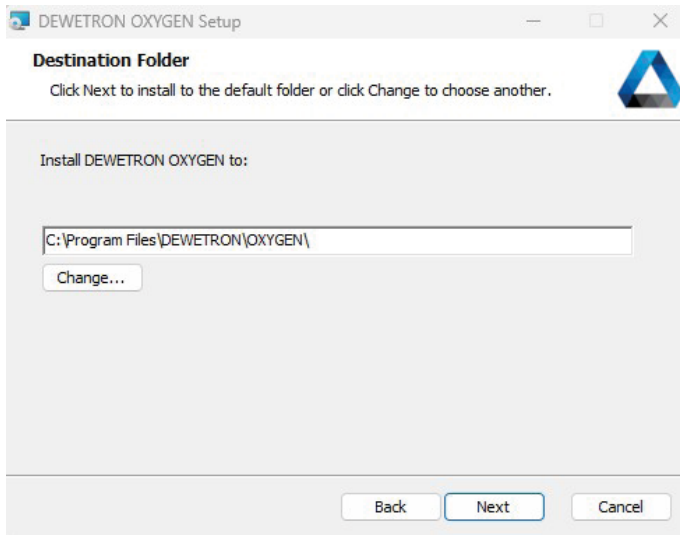
5. Select 'OXYGEN Desktop' as OXYGEN edition.
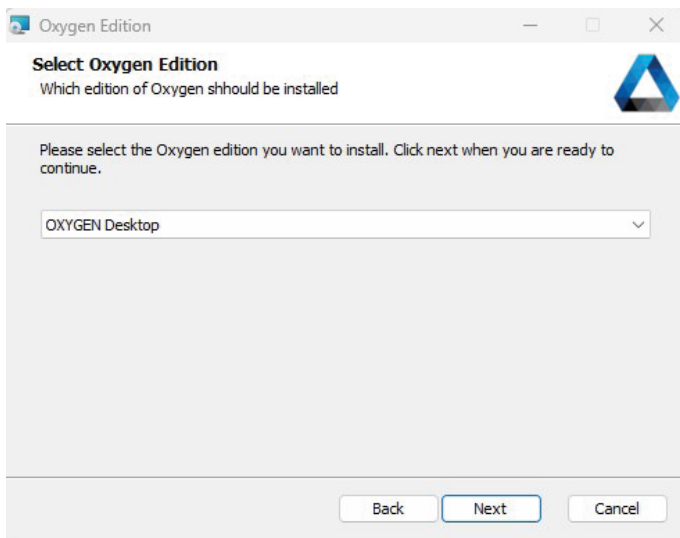
6. Start the installation.
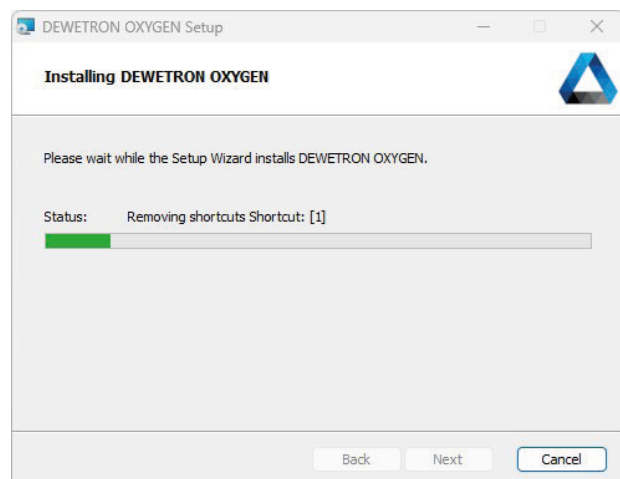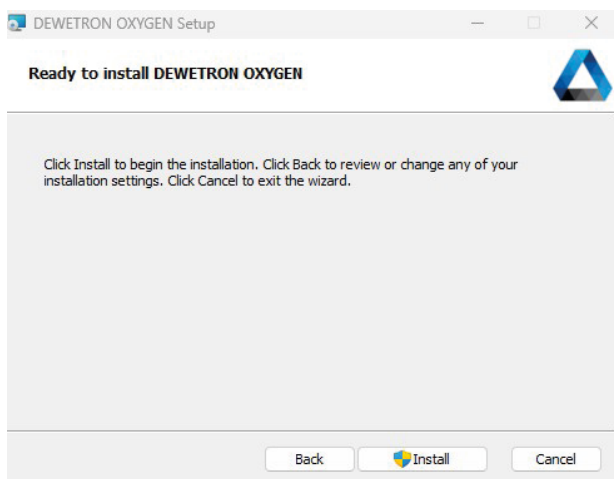
7. Finish the installation.
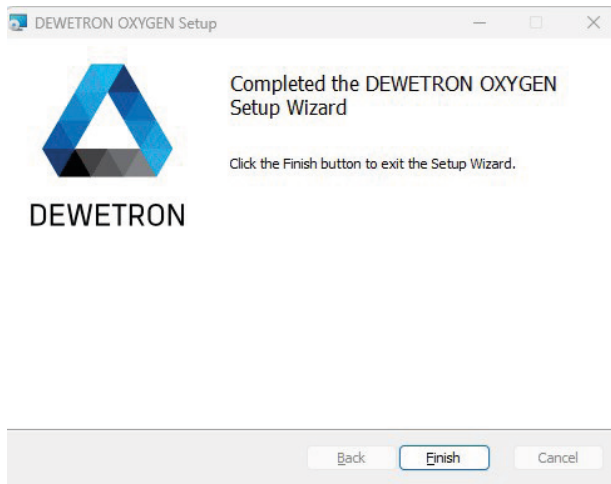
OXYGEN has now been successfully installed to your laptop/PC.

Setup of TRIONet3 in OXYGEN

Set up TRIONet3 in OXYGEN as follows:

1. After successfully connecting your TRIONet3 with the laptop/PC, run OXYGEN usually via *'Start' > 'All Programs' > 'DEWETRON' > 'OXYGEN'* or just type *'OXYGEN'* in the search bar and hit enter.

2. Allow access through the firewall.

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'*.
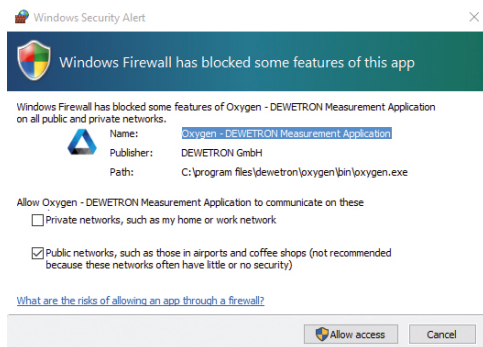
3. In OXYGEN double click the setup icon or drag it to the left side to expand to full view.
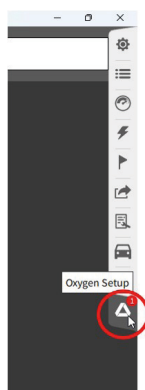
WORKING WITH THE SYSTEM

4. Select '*DAQ hardware*' from System Settings and enable '*TRION series*'.
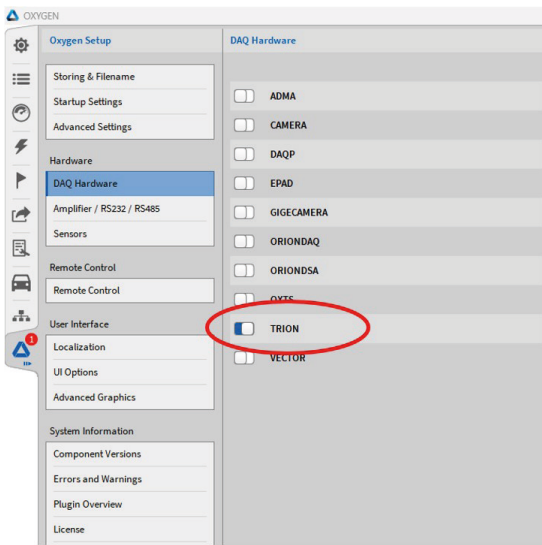
5. Switch to the NET options and select "Auto claim USB" for the automatic claim if TRIONet3 is conected via USB interface or select "Auto claim ALL" for the automatic claim of all attached TRIONet3s (USB and Ethernet).

6. Choose 'Auto' from the '*TRIONet3 Network Interfaces*' drop-down menu. This will scan all Ethernet ports and automatically detect the TRIONet3 device.
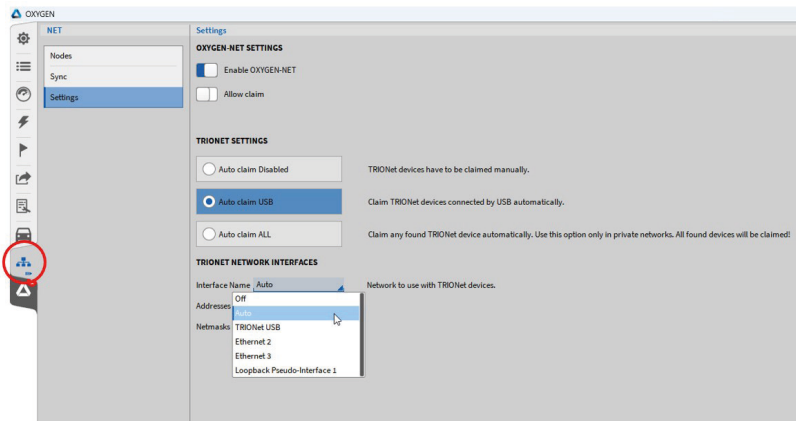
7. The IP address of the adapter is shown in the field below.

8. Switch to '*Channel list*' will display the TRIONet3 and installed modules.

If there is no TRIONet3 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 ; otherwise move to .
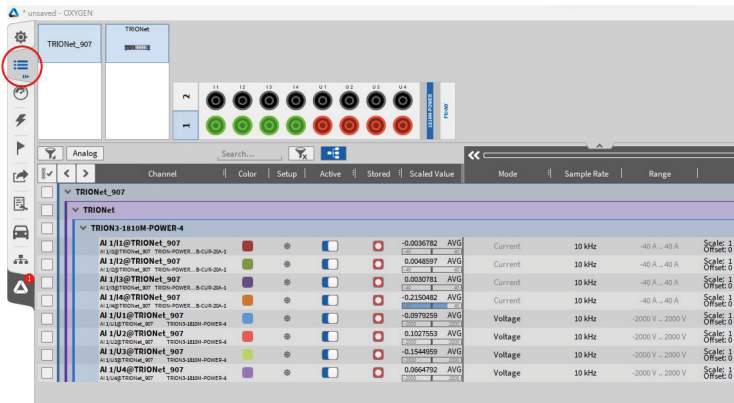
You now have successfully setup your TRIONet3 in OXYGEN.

Synchronization of multiple TRIONet3 units

The following sections describe how to daisy-chain multiple TRIONet3 units.

Synchronization setup in OXYGEN

OXYGEN automatically detects and setup all connected TRIONet3 units for synchronization. No further actions are required.
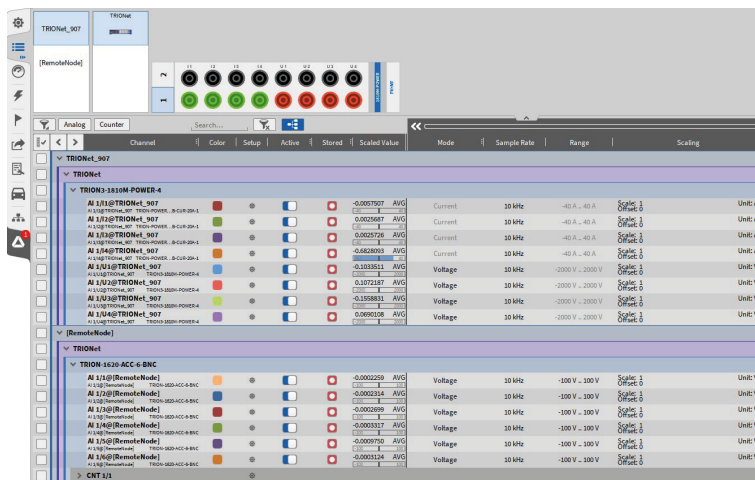
Fig. 14:   Detection of TRIONet3 units

TRION-SYNC-BUS

The TRION-SYNC-BUS (SYNC IN, SYNC OUT) is used to synchronize two or more TRIONet3 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 OUT	SYNC IN
RED (stable)	Clock detected	Clock detected / Receiving clock
GREEN (stable)	Acquisition running	Acquisition running

Tab. 12:   LED indication

WORKING WITH THE SYSTEM

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.

Connection examples

Single TRIONet3 configuration to host system

PC/laptop

LAN/USB (max. 1.8 m)

Multiple TRIONet3 configuration to host system

PC/laptop

LAN/USB (max. 1.8 m)

LAN

SYNC

SYNC (max. 100 m)
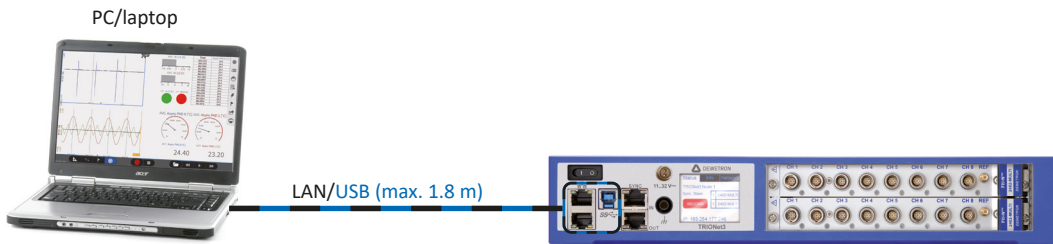
LAN (max. 100 m)
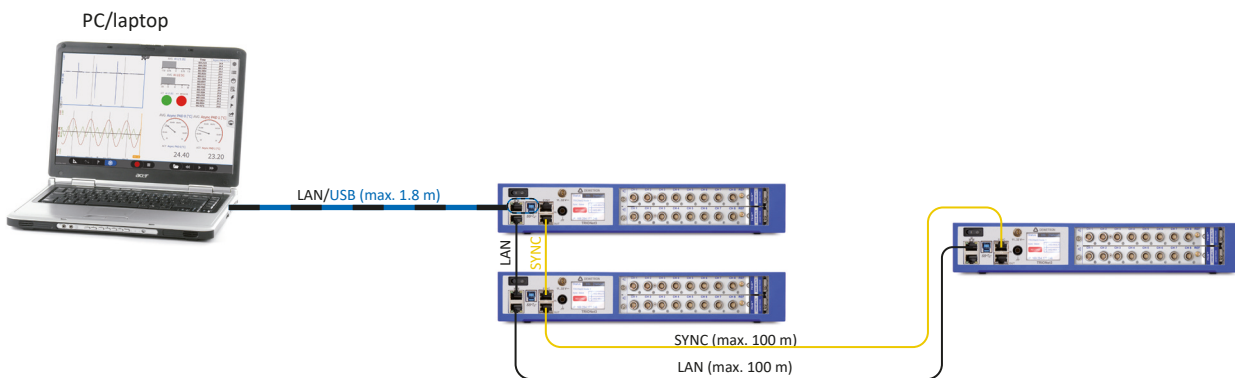
INFORMATION

Max. cable length between each TRIONet3 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)

Connecting TRIONet3 to a DEWE2/DEWE3 system

SYNC (max. 100 m)

LAN/USB max. 100 m / max. 1.8 m

max. 100 m

max. 100 m

TRION-MULTI module

Max. cable length between each TRIONet3 node:	100 m (328 ft)
Max. cable length to laptop/PC:	100 m LAN (328 ft) or 1.8 m USB

Multiple TRIONet3 configuration for high data rate

Max. cable length between each TRIONet3 node:	100 m (328 ft)
Max. cable length between TRIONet3 and switch:	100 m (328 ft)
Max. cable length between switch and computer:	depends on fiber optic cable up to 400 m (1312 ft)

Connecting XR modules to TRIONet3

With the flexibility of TRION series modules, it is possible to connect any XR modules directly to your TRIONet3. For the following examples a **TRION-CAN** module is required. A TRION-CAN module can support up to **10 XR modules**. No additional power supply is required.
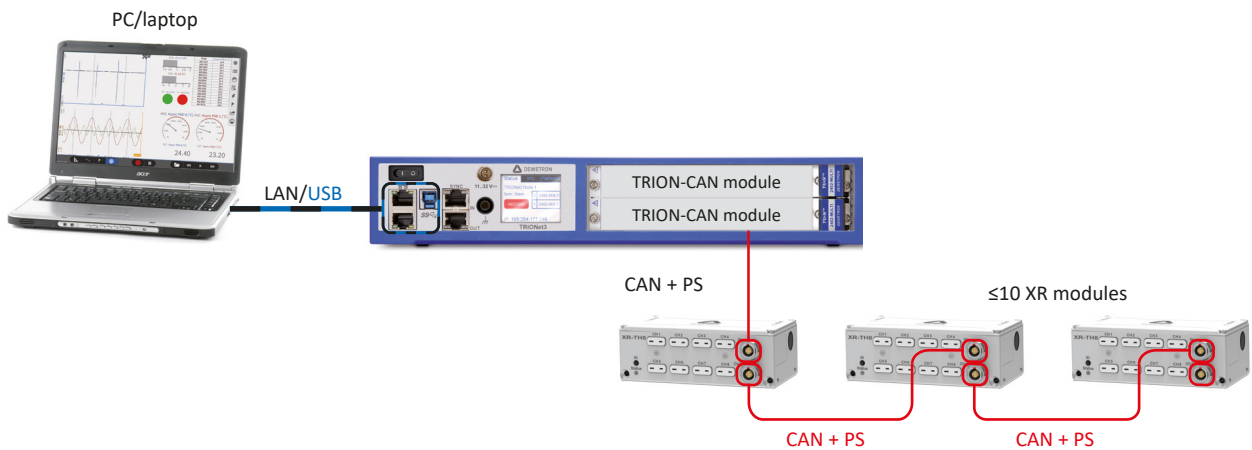
MAINTENANCE AND SERVICE

Maintenance and service

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 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.

Fans

On the right side of the TRIONet3 two temperature-controlled ultra silent fans are installed. Check the fans frequently for pollution depending on environmental conditions. To gain access to the fans unscrew the two star screws and remove the protective grille of the fans. Use a dry velocity stream of air to clean the fans and the filter-drawer.

Firmware upgrade

The next steps describe how to update the firmware files on your TRIONet3. You can choose between a remote update (requires firmware 5.0 or higher) and an update via USB flash drive. We recommend the remote update via DEWETRON Explorer.

Remote update via DEWETRON Explorer

Requirements

▶ TRIONet3 connected to your laptop/PC

▶ Firmware 5.0 or higher installed on your TRIONet3

▶ Firmware files for TRIONet3 (download at: *https://ccc.dewetron.com/pr/TRIONet3*, login required)

▶ 5 minutes of time

To start the update prcocess proceed as follows:

1. Check the firmware by tapping the Info tab on your screen on your TRIONet3.
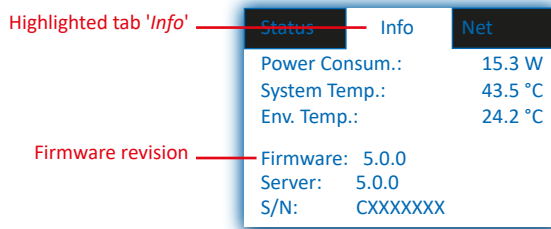
    Highlighted tab '*Info*' ——

Status	Info	Net

    Power Consum.:   15.3 W
    System Temp.:   43.5 °C
    Env. Temp.:   24.2 °C

    Firmware revision ——

    Firmware: 5.0.0
    Server: 5.0.0
    S/N: CXXXXXXX

    INFORMATION To perform a remote firmware update of your TRIONet3, firmware 5.0 or later must already be installed. If your device has an older firmware installed, you have to manually perform a firmware update with a USB drive (see *Create USB drive for firmware upgrade on page 51* and/or *Updating firmware files on existing USB drive on page 54*).

2. Go to *https://ccc.dewetron.com/pr/TRIONet3* and download the '*R5.x.x Remote Update*' archive. You have to be logged in to download the files. Login or sign up a new account by clicking the 'Register' button on the top right.

Firmware				↕
TRIONet Firmware R5.1.0: Create new USB update stick 01_TRIONet_R5.1.0_Create_USB-stick.zip (314.04 MB) **md5:** 7741073d074c3cd7fd6afa9e955c016b	Version: R5.1.0 Releasedate: 2020-03-30	OS Compatibility: - Language: -	Show notes	☐ ✎ Edit
TRIONet Firmware R5.1.0: Remote Update 03_TRIONet_R5.1.0_Update_Remote.zip (139.81 MB) **md5:** 48e631cef1f40d4d4d09a5c396d2c263	Version: R5.1.0 Releasedate: 2020-03-30	OS Compatibility: - Language: -	Show notes	☐ ✎ Edit
TRIONet Firmware R5.1.0: Update files for existing USB stick 02_TRIONet_R5.1.0_Update_existing_USB-stick.zip (291.26 MB) **md5:** 34461ef0e1b7c9cc5a85afa836103aef	Version: R5.1.0 Releasedate: 2020-03-30	OS Compatibility: - Language: -	Show notes	☐ ✎ Edit

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

    After extracting the following file should be available within the folder:

    – **update-image-TRIONet3-5.x.x.xx.swu**
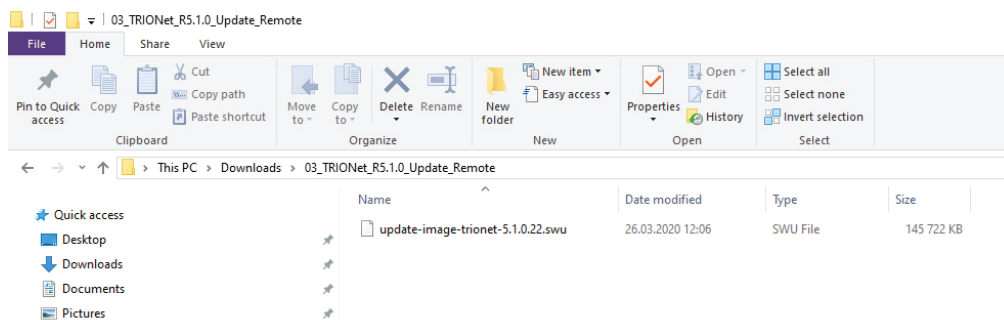
4. At this point at the latest, connect your TRIONet3 to the laptop/PC and start the DEWETRON Explorer which has been installed with the TRION package, usually via '*Start*' > '*All programs*' > '*DEWETRON*' > '*DEWETRON Explorer*' or just type '*DEWETRON Explorer*' in the search bar.

The DEWETRON Explorer will list a '*Local System*' (which is your laptop/PC) and the connected TRIONet3.
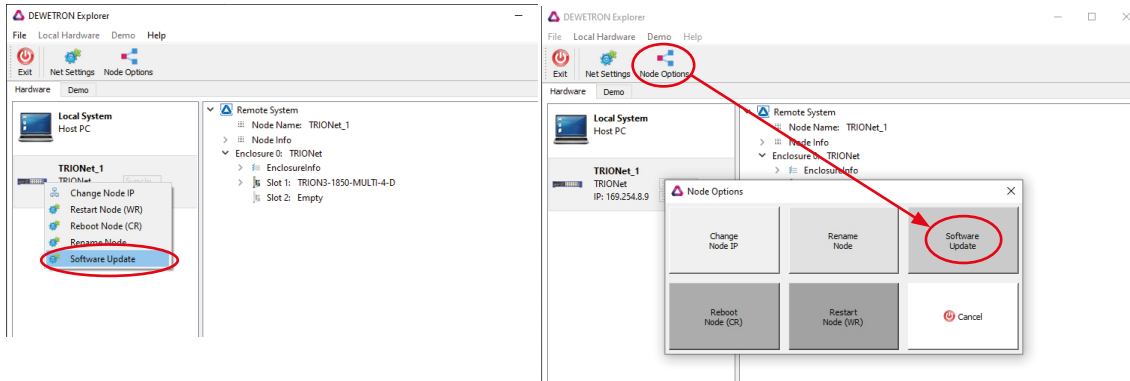
To initiate a firmware update either right-click on your TRIONet3 and hit '*Software update*' or click on '*Node Options*' and select '*Software Update*'.

5. After clicking on '*Software Update*' a browser window opens (depending on installed browser on your laptop/PC).

   This window shows the set IP address as well as the installed firmware on your TRIONet3. Furthermore, there is also a link to the latest update image file if it has not been downloaded yet.

6. To start the update procedure, simply drag and drop the **update-image-TRIONet3-5.x.x.xx.swu** file to the designated area. You can also simply click that area and browse your .swu file.
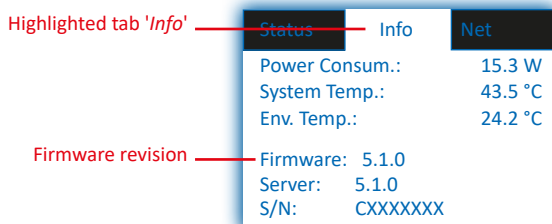
During the update process, the display will show the following message:

"Update started.

Do not power off"

7. After the update process the TRIONet3 will restart automatically. The current firmware revision is displayed on the '*Info*' tab.

    INFORMATION There will be no warning or message when updating the same firmware again.

Highlighted tab '*Info*' ─────

Firmware revision ─────

Status	Info	Net
Power Consum.:	15.3 W	
System Temp.:	43.5 °C	
Env. Temp.:	24.2 °C	
Firmware: 5.1.0		
Server: 5.1.0		
S/N: CXXXXXXX		

Firmware upgrade with USB flash drive

Requirements

▶ TRIONet3

▶ Torx T10 screwdriver

▶ USB drive (received from DEWETRON or *Create USB drive for firmware upgrade*)

▶ 10 minutes of time

To perform a firmware upgrade proceed as follows:

1. Switch of the instrument.

2. Unscrew the left side panel by removing both screws with a TORX T10 screwdriver.

3. Remove the side panel to uncover the USB ports.

4. Plugin the USB drive in the **lower, blue, USB3.0 port**. The update will not start when plugged-in in the standard USB port.

5. Switch-on the instrument. The TRIONet3 will automatically detect the new firmware and install it from the USB drive. Note that the update process may take up to 5 minutes.

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

"Update started.

Do not power off"

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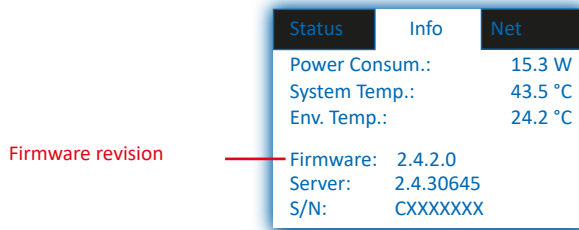
Do not power off !!"

"Upd ok - Power off

Remove USB drive"

6. Power off the device first and unplug the USB drive from the device.

7. Reassemble the side panel in reverse order of disassembly.

8. Switch-on the TRIONet3. The current firmware revision is displayed on the '*Info*' tab.

Status	Info	Net
Power Consum.:		15.3 W
System Temp.:		43.5 °C
Env. Temp.:		24.2 °C
Firmware:	2.4.2.0	
Server:	2.4.30645	
S/N:	CXXXXXXX	

Firmware revision ──── Firmware: 2.4.2.0

The firmware has now been upgraded.

Create USB drive for firmware upgrade

If you have not received a USB drive from DEWETRON with the latest firmware, follow the next steps on how to create a USB drive to upgrade the firmware of your TRIONet3.

Requirements

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

▸ Firmware package for TRIONet3 (download at: *https://ccc.dewetron.com/pr/TRIONet3*, login required)

▸ 5 to 10 minutes of time

1. Go to *https://ccc.dewetron.com/pr/TRIONet3* 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:
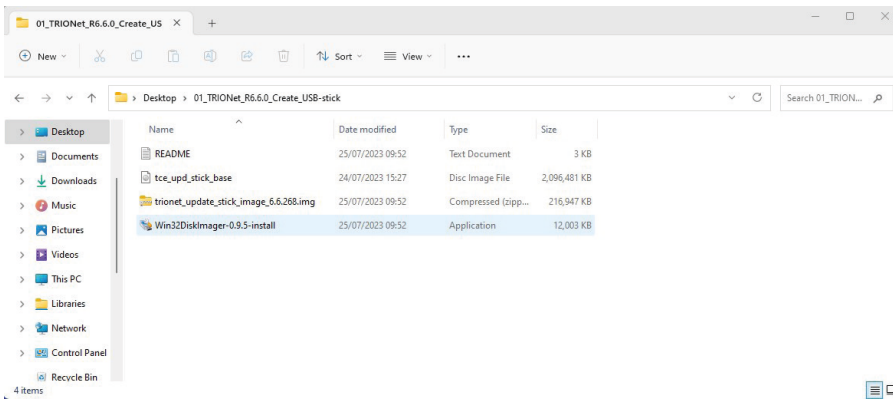
‒ **TRIONet3_update_stick_image_6.x.x.img**   ‒ **README.txt**

‒ **Win32DiskImager-0.9.5-install.exe**
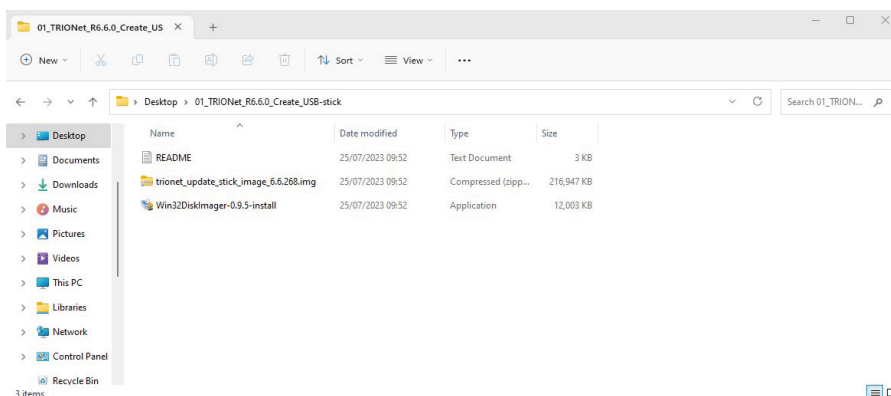
3. Extract the '*TRIONet3_create_stick_R2.x.x.zip*' in the same folder. After extracting following files should be available:

‒ **TRIONet3_update_stick_image_6.x.x.img.zip**   ‒ **Win32DiskImager-0.9.5-install.exe**

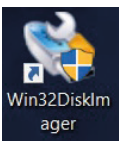‒ **tce_upd_stick_base.img**   ‒ **README.txt**

MAINTENANCE AND SERVICE

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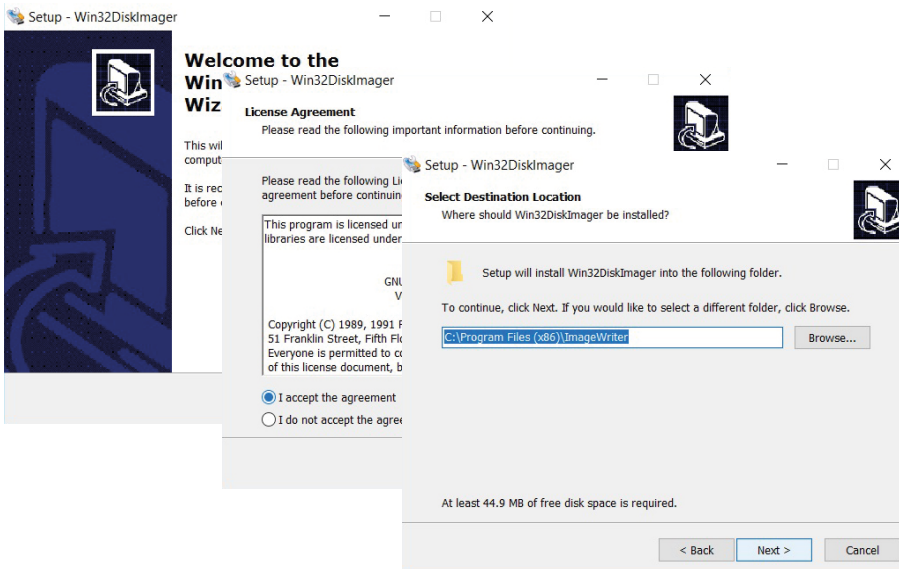

6. Plugin an empty USB drive and remember the drive letter which is automatically assigned by Windows (e.g. 'E:\').

7. Run Win32DiskImager.exe as administrator by right clicking the icon on the desktop and select '*Run as administrator*'.

8. 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 double check if the associated drive letter is selected correctly. Win32DiskImager will not list any hard drives.
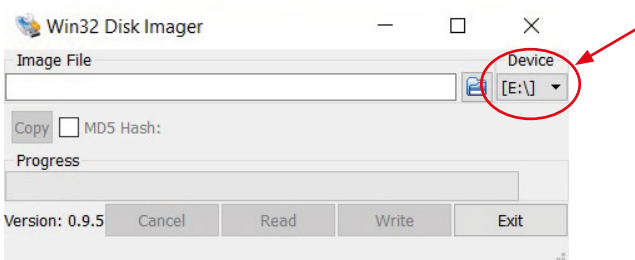
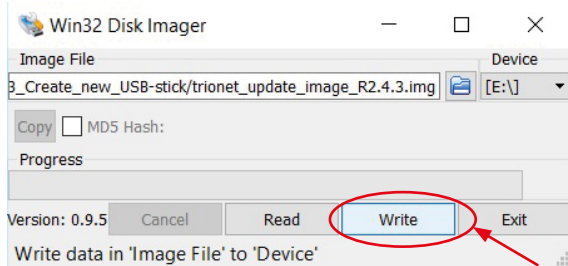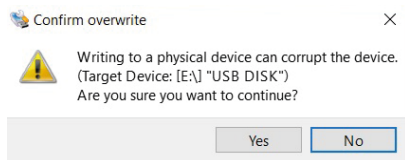**9.** Browse and select the image file which has been extracted in step 3 (*TRIONet3_update_image_R2.x.x.img*) by clicking the folder icon.
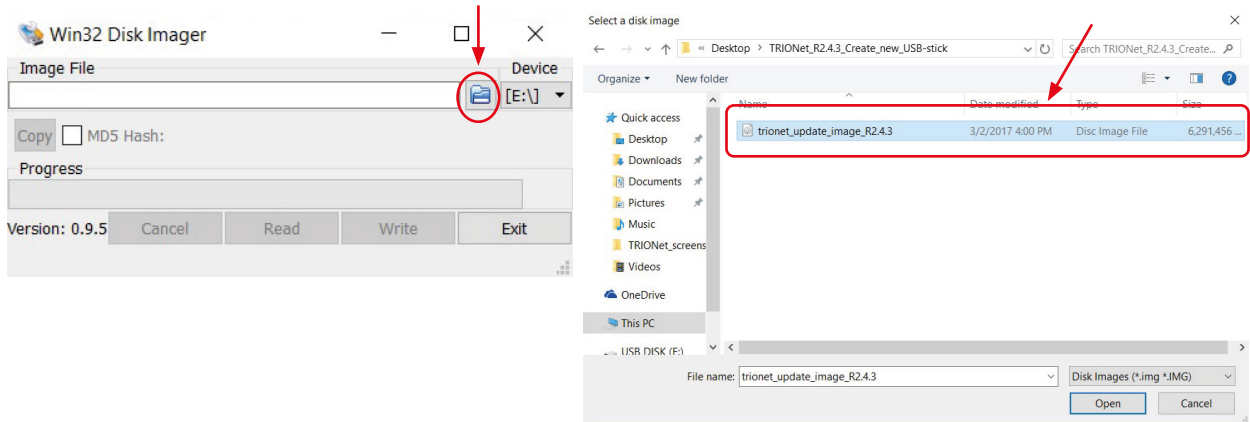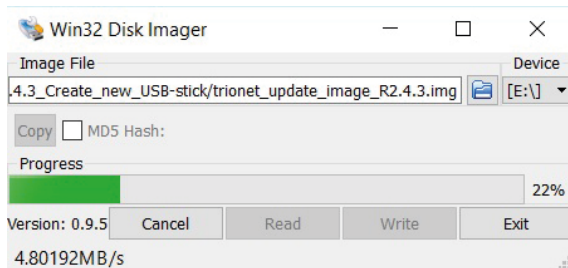

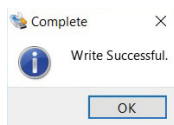**10.** Hit '*Write*' to start the progress and write the image file on the USB drive.

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

12. The writing progress starts.

13. The writing progress has been finished.

14. The following files are now on your USB drive:

> **INFORMATION** With firmware version 5.0 or newer, only the image file is written on your USB drive. All .eep and .hex files are included in the image file. In general, with firmware version 5.0 or higher it is recommended anyway to perform a remote update of the TRIONet3.

The creation of a USB drive for a firmware update of your TRIONet3 has now been successfully finished.

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 *Create USB drive for firmware upgrade on page 51*)

▶ Firmware files for TRIONet3 (download at: *https://ccc.dewetron.com/pr/TRIONet3*, login required)

▶ 5 minutes of time

1. Go to *https://ccc.dewetron.com/pr/TRIONet3* and download the '*Update files for existing USB stick*' archive. You have to be logged in to download the files. Log in or 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**

INFORMATION With firmware version 5.0 or newer, only the image file needs to be replaced. All .eep and .hex files are included in the image file. In general, with firmware version 5.0 or higher it is recommended anyway to perform a remote update of the TRIONet3.
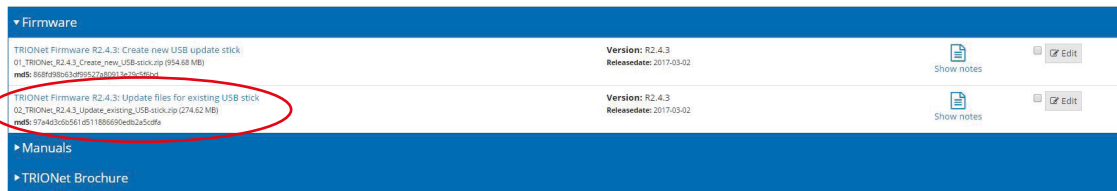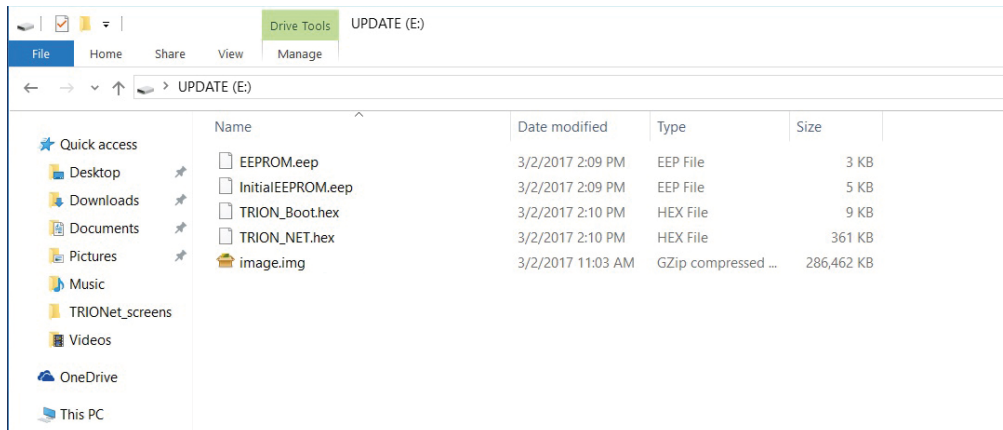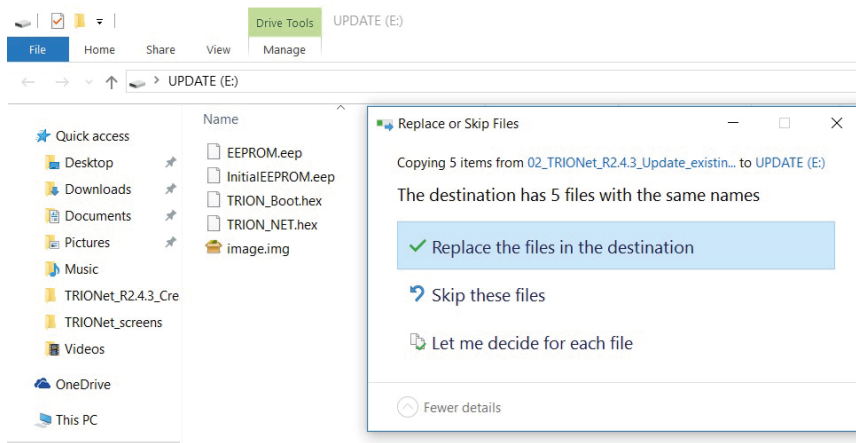
3. Copy and replace the existing files on your USB drive with the files currently downloaded and extracted.

INFORMATION The firmware update will not work if the firmware files are copied on an empty USB drive only. Refer to *Create USB drive for firmware upgrade on page 51* first.

Your USB drive has now been successfully updated.

Service and repairs

We are very sorry that your DEWETRON system is not operating properly. Our team is here to ensure that your DEWETRON product is returned to peak performance as quickly as possible.

Help us to provide you with the best support by following the RMA policy.

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

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

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

MAINTENANCE AND SERVICE

INFORMATION

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 contact your local distributor first or DEWETRON directly.

INFORMATION

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

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

Tel.:	+43 316 3070
Fax:	+43 316 3070-90
E-Mail:	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 contact:

DEWETRON Inc. (HQ USA)
2850 South County Trail, Unit 1
East Greenwich, RI 02818
USA

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

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.*

Troubleshooting

### TRIONet3 cannot 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 TRIONet3 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 adapter, do not exceed overall cable length of 1.8 meters (6 ft) and check if the adapter works properly.

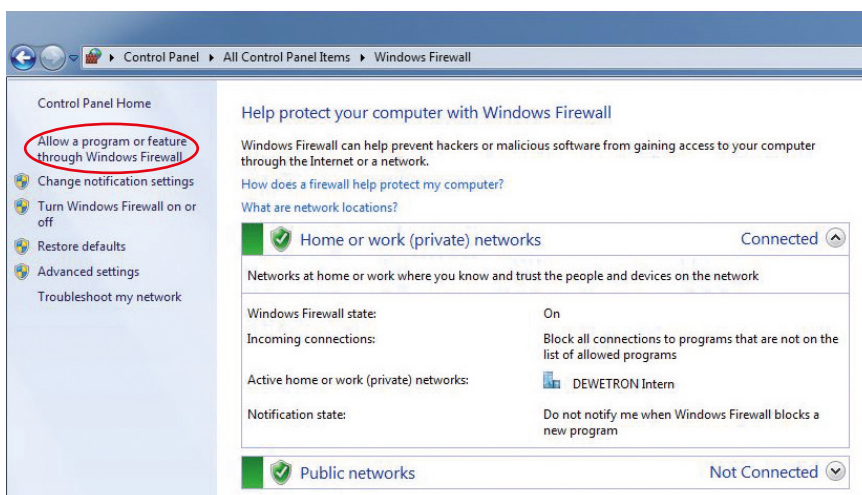### Two TRIONet3 units are daisy-chained and implemented into an existing company network. Only one TRIONet3 is found.

▶ Contact the IT-administration. Some IT infrastructures do not allow to connect more than one device to an Ethernet plug so daisy-chaining TRIONet3 units or using a network switch is not possible.

TRIONet3 cannot be found in OXYGEN/DEWETRON Explorer although the IP address is set up correctly.

▶ Check your firewall settings. Allow access for OXYGEN and DEWETRON Explorer through Windows Firewall.

▶ Click 'Start' and type 'Control Panel' in the search bar. Click on 'Windows Firewall'.
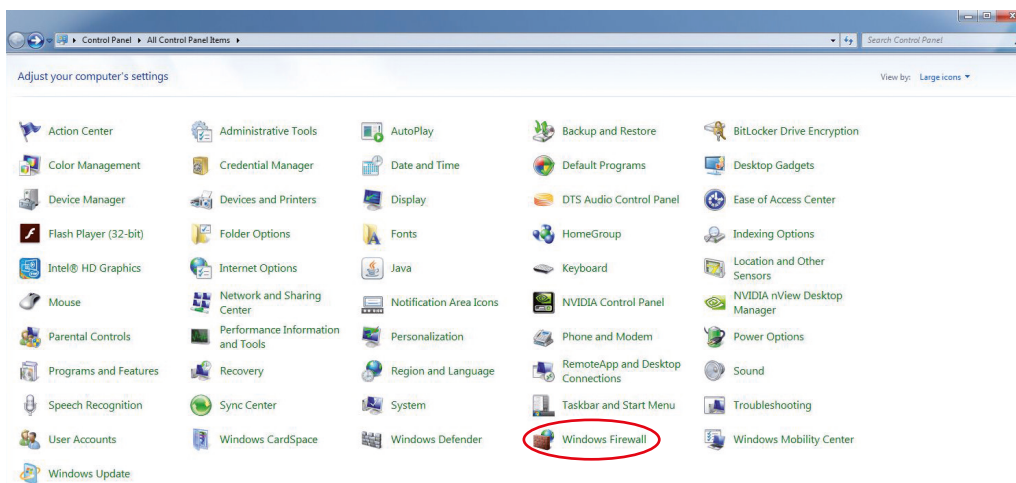
▶ Select '*Allow a program or feature through Windows Firewall*' from the left menu.
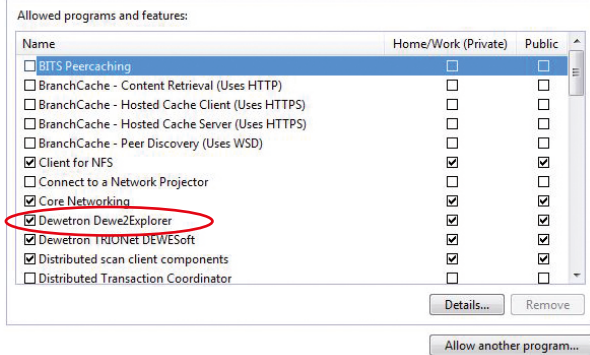
TROUBLESHOOTING

▶ Allow access to following programs:

– DEWETRON Explorer

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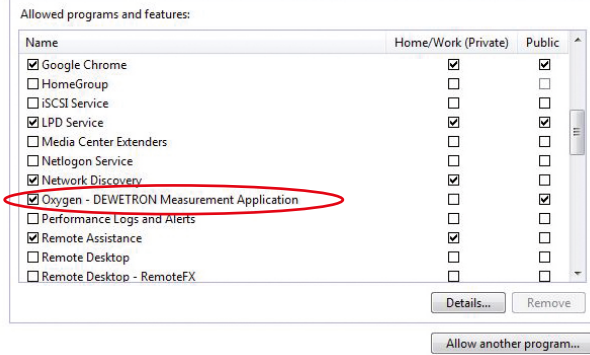
If you are using third-party firewall software please contact your IT-administration or refer to the corresponding technical reference manual.

Two or more TRIONet3 units are connected to a laptop/PC and found in DEWETRON Explorer but unfortunately measuring in OXYGEN fails.

▶ Check if there has been a demo system created in your DEWETRON Explorer and remove it. OXYGEN cannot make any differences between virtually created demo systems and physically connected instruments. The connected TRIONet3 units are awaiting a clock signal from the virtually created demo system (which will not happen) and will not run in OXYGEN.

▶ To remove a demo system start the DEWETRON Explorer and navigate to the '*Demo*' tab.

▶ Remove any created demo system by selecting it and hit the '*Remove*' button.
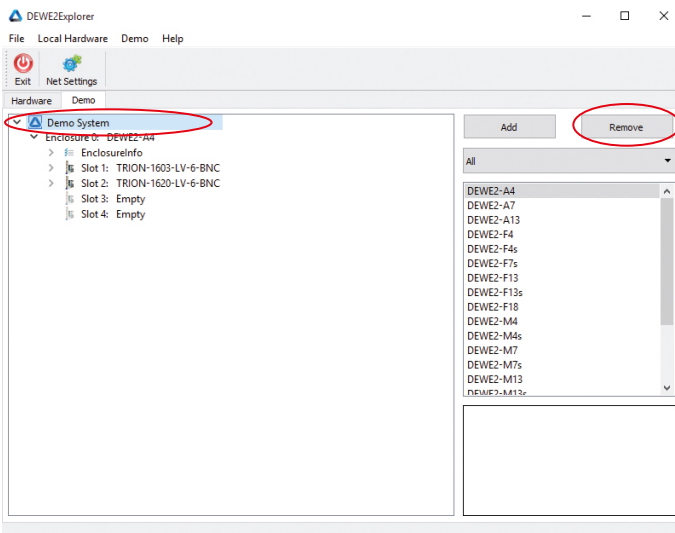
CERTIFICATE OF CONFORMITY

CE certificate of conformity

$$CE$$

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	**TRIONet3**

Kind of product	*Data acquisition front-end*

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	
	Emissions	EN 61000-6-4	EN 55011 Class A
	Immunity	EN 61000-6-2	Group standard

Graz, August 17, 2023

Place / date of the CE-marking

Ing. Thomas Propst / Manager Total Quality

CERTIFICATE OF CONFORMITY

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**

in combination with

Amplifiers	**TRION-1820-POWER-4**	**TRION-1810-HV-8**
	TRION3-1810M-POWER-4	**TRION3-SUB-8 with SUB-600V**

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