



DEWETRON

---

▼

# TRIONet

## TECHNICAL REFERENCE MANUAL

---

▼

### WELCOME TO THE WORLD OF DEWETRON!

Congratulations on your new device! It will supply you with accurate, complete and reproducible measurement results for your decision making.

Look forward to the easy handling and the flexible and modular use of your DEWETRON product and draw upon more than 30 years of DEWETRON expertise in measurement engineering.



ISO9001



# THE MEASURABLE DIFFERENCE.

Copyright © DEWETRON GmbH

This document contains information which is protected by copyright. All rights are reserved. Reproduction, adaptation, or translation without prior written permission is prohibited, except as allowed under the copyright laws.

All trademarks and registered trademarks are acknowledged to be the property of their owners.

## 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 TRIONet accepts any two of the multi-channel TRION series plug-in modules and connects to any Windows computer via USB or Ethernet. Furthermore, TRIONet mainframes can be interconnected using Ethernet. Because of the Ethernet interface, TRIONet 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.

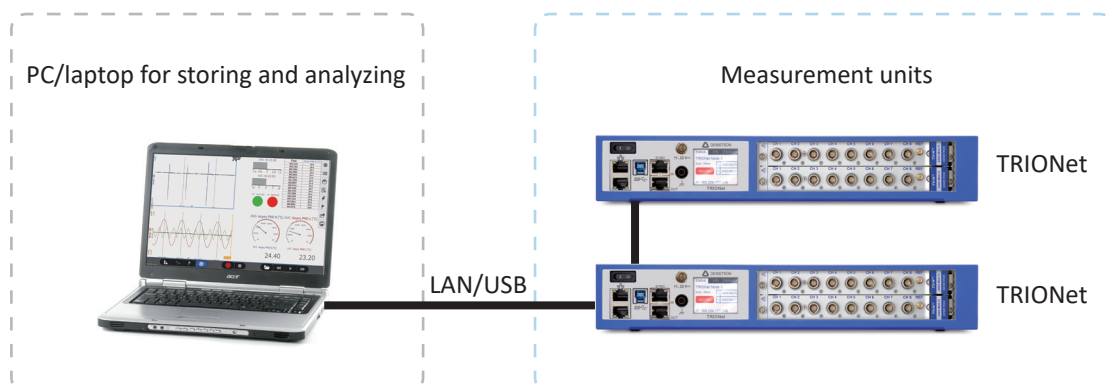


Fig. 1: Connection overview

---

# PREFACE

## Scope of delivery



1 x TRIONet

1 x external AC power supply

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

1 x LAN cable (2 m, 6 ft)



---

# TABLE OF CONTENTS

<b>Preface</b> .....	<b>3</b>	Info tab.....	19
<b>Thank you!</b> .....	<b>3</b>	Net tab .....	19
<b>Intended use</b> .....	<b>3</b>	Reset IP .....	20
<b>System overview</b> .....	<b>3</b>	<b>TRION-SYNC-BUS interface</b> .....	<b>20</b>
<b>Scope of delivery</b> .....	<b>4</b>	<b>USB 3.0 interface connector</b> .....	<b>21</b>
<b>General information</b> .....	<b>7</b>	<b>Gigabit Ethernet LAN connectors</b> .....	<b>21</b>
<b>Environmental considerations</b> .....	<b>7</b>	<b>Locking mechanism and release button</b> .....	<b>22</b>
<b>Problematic network stacks</b> .....	<b>7</b>	<b>Fans</b> .....	<b>22</b>
<b>Warranty information</b> .....	<b>7</b>	<b>Installing a TRION module</b> .....	<b>23</b>
<b>Legal information</b> .....	<b>7</b>	<b>Power supply</b> .....	<b>24</b>
Restricted rights legend .....	7	<b>Connecting TRIONet to laptop/PC</b> .....	<b>25</b>
Legal disclaimer.....	7	Install TRION package.....	25
<b>Printing history</b> .....	<b>8</b>	Connect TRIONet to laptop/PC via USB 3.0 or Gigabit Ethernet.....	26
<b>Safety</b> .....	<b>9</b>	Setting up your TRIONet with DEWETRON Ex- plorer (static IP, DHCP, node name).....	35
<b>Safety instructions</b> .....	<b>9</b>	<b>Installation of OXYGEN measurement software</b> ...40	
General safety instructions .....	9	<b>Setting up TRIONet in OXYGEN</b> .....	<b>42</b>
Electrical safety instructions .....	10	<b>Synchronization of multiple TRIONet units</b> .....	<b>44</b>
Ambient safety notices.....	10	Synchronization setup in OXYGEN.....	44
Safety notices during operation .....	11	TRION-SYNC-BUS.....	44
<b>Standards and norms</b> .....	<b>11</b>	Synchronization examples.....	44
<b>Typographic conventions</b> .....	<b>11</b>	<b>Connect CPAD2/3 modules to TRIONet</b> .....	<b>45</b>
Safety and warning notices .....	11	<b>Maintenance and service</b> .....	<b>49</b>
Notices .....	12	<b>Service interval</b> .....	<b>49</b>
Symbols.....	12	<b>Cleaning</b> .....	<b>49</b>
<b>System setup</b> .....	<b>13</b>	<b>Firmware upgrade</b> .....	<b>49</b>
<b>Key facts</b> .....	<b>13</b>	Perform a firmware upgrade.....	49
<b>System specifications</b> .....	<b>13</b>	Create USB drive for firmware upgrade .....	51
<b>Dimensions*</b> .....	<b>14</b>	Updating firmware files on existing USB drive .	54
<b>Connections and ports</b> .....	<b>15</b>	Perform a remote update w/o a USB drive .....	56
<b>TRION(3) modules compatibility</b> .....	<b>16</b>	<b>Service and repairs</b> .....	<b>58</b>
<b>TRION series modules overview</b> .....	<b>17</b>	<b>Calibration</b> .....	<b>58</b>
Analog modules .....	17	<b>Support</b> .....	<b>59</b>
Digital modules .....	17	<b>Training</b> .....	<b>59</b>
Dedicated modules .....	18	<b>Troubleshooting</b> .....	<b>60</b>
<b>Touchscreen display</b> .....	<b>18</b>	<b>Certificate of conformity</b> .....	<b>62</b>
Status tab .....	18		

▼

---

# TABLE OF CONTENTS

Notes

## 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](http://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

#### Restricted rights legend

Use Austrian law for duplication or disclosure.

DEWETRON GmbH  
Parkring 4  
8074 Grambach  
Austria

TRION and OXYGEN are trademarks of DEWETRON GmbH.

Any other trademarks and registered trademarks are acknowledged to be the property of their owners.

#### Legal disclaimer

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

---



# GENERAL INFORMATION

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.

## Printing history

Refer to the page bottom for printing version.

Copyright © DEWETRON GmbH

This document contains information which is protected by copyright. All rights are reserved. Reproduction, adaptation, or translation without prior written permission is prohibited, except as allowed under the copyright laws.



## 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 be 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

### NOTICE

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

### INFORMATION

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

## Symbols



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



Indicates hazardous voltages.



Observe precautions for handling electrostatic sensitive devices.



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



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



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



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



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



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



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



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



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

## System setup

### Key facts

- ▶ Small, distributable data acquisition front-end
- ▶ 2 slots for user exchangeable TRION series modules
- ▶ USB 3.0 or Gigabit Ethernet connection to notebook or desktop
- ▶ Touchscreen on front panel
- ▶ 4 slots for TRION/TRION3 acquisition series modules

### System specifications

<b>TRIONet</b>	
Data acquisition	2 slots for TRION acquisition modules <sup>1)</sup>
Quasi static channel expansion	CPAD via TRION-CAN or TRION-MULTI (no EPAD)
LAN	2 x 10/100/1000BASE-TX Gigabit Ethernet
LAN configuration	DHCP or Static IP
USB	USB 2.0; USB 3.0
Synchronization	TRION-SYNC-Bus up to 100 m between nodes
System bandwidth	90 MB/s with one connected TRIONet (up to 50 MB/s with more than one)
Display	Status display with touchscreen
Cooling	2 temperature controlled ultra silent fans
Isolated power supply	
– Rated input voltage	10 to 32 V <sub>DC</sub> (9 to 36 V <sub>DC</sub> )
– Power consumption	15 W without modules, totally equipped max. 55 W
– External power supply (incl.)	100 to 240 V <sub>AC</sub> ~50 to 60 Hz / 65 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)
<b>Vibration test (EN 60068-2-6)</b>	
Shape	Sine
Frequency range	10–150 Hz
Acceleration	2 g
Sweep rate	1 oct./min.
Duration test in 3 directions	20 cycles

Tab. 1: System specifications TRIONet

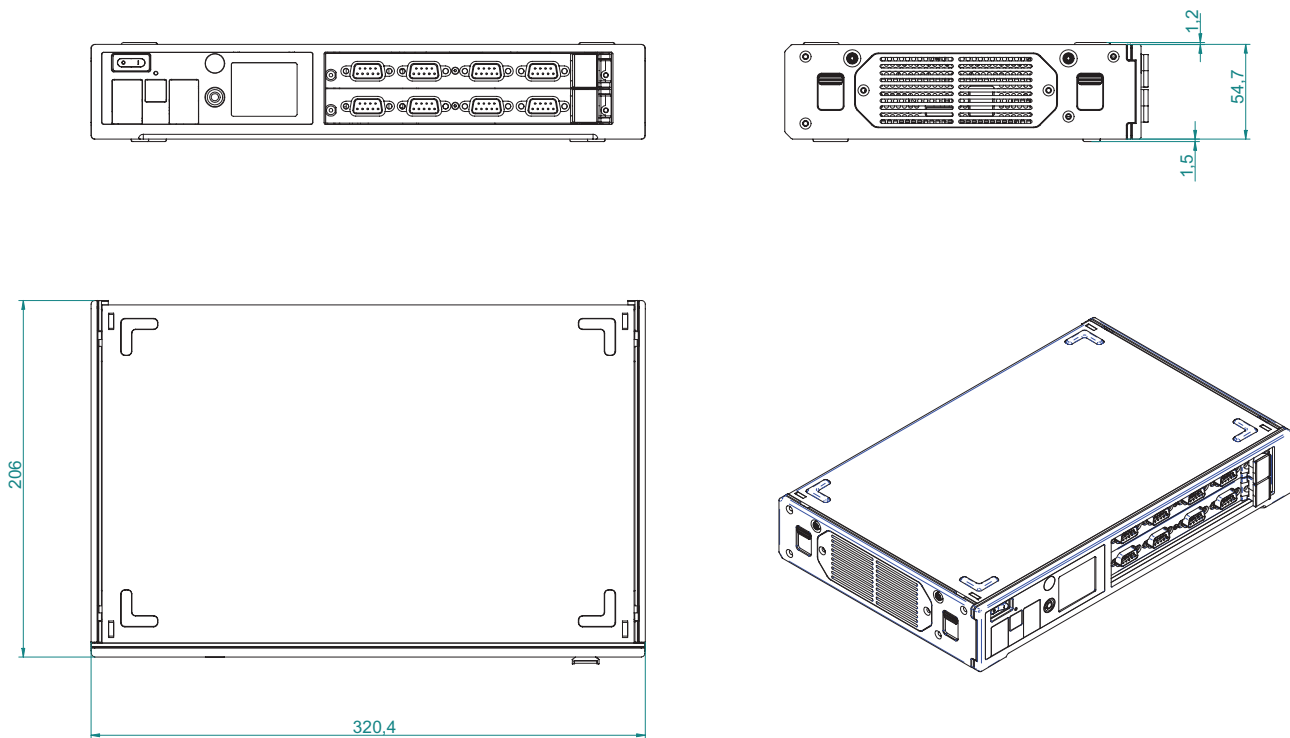
# SYSTEM SETUP

TRIONet	
<b>Shocktests; EN 60068-2-27</b>	
Pulse form	Half-sine
Acceleration amplitude	30 g
Duration	11 ms
Direction	Test in 3 axis, 3 shocks in each axis and direction
<b>Random vibration test; EN 60721-3-2; Class 2M3</b>	
Shape	Random
Frequency range	10–200 Hz
Power spectral density	1 m/s <sup>2</sup> /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 TRIONet

1) TRION3 modules are not supported.

## Dimensions\*



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

Fig. 2: Dimensions TRIONet

## Connections and ports



Fig. 3: TRIONet front view

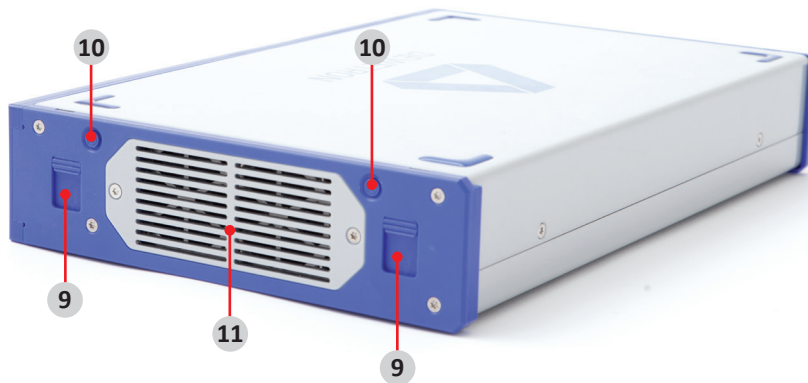




Fig. 4: TRIONet right side view

- |   |  |
|---|--|
| 1. USB 3.0 interface connector (Type B)           | 7. Touchscreen display                   |
| 2. Power supply input connector (LEMO EGG.1B.302) | 8. TRION series module slots             |
| 3. Power-on switch                                | 9. Locking mechanism for stacking units  |
| 4. Gigabit Ethernet interface                     | 10. Release button for locking mechanism |
| 5. TRION-SYNC-BUS interface                       | 11. Fans                                 |
| 6. Chassis terminal                               |  |

### INFORMATION

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

# SYSTEM SETUP

No.	Element	Description
1.	USB interface connectors	The TRIONet is equipped with a USB 3.0 interface (type B) to connect to a laptop or PC. For details see <a href="#">USB 3.0 interface connector on page 21</a> .
2.	Power supply input connector LEMO EGG.1B.302	 Input range 11...32 VDC (external AC/DC power supply included). For details see <a href="#">Power supply on page 24</a> .
3.	Power-on switch	The power-on switch is used to switch on the system.
4.	Ethernet LAN connector	The TRIONet supports Gigabit Ethernet interface ports for connecting the device with a laptop/PC or daisy-chaining multiple units with standard RJ45 connector. For details see <a href="#">Gigabit Ethernet LAN connectors on page 21</a> .
5.	TRION SYNC-BUS	The TRIONet is equipped with two additional TRION-SYNC-BUS interface connectors for daisy-chaining multiple TRIONet units. For details see <a href="#">TRION-SYNC-BUS interface on page 20</a> .
6.	Chassis terminal	 For some kind of measurements, it is necessary to provide the system with an additional ground connection.
7.	Touchscreen	The integrated touch screen display of the TRIONet shows all relevant information straight on the device. For details see <a href="#">Touchscreen display on page 18</a> .
8.	TRION series module slots	Slots for 2x TRION series modules. <b>INFORMATION</b> TRION3 series modules are not supported. For details see <a href="#">TRI-ON(3) modules compatibility on page 16</a> .
9.	Locking mechanism	The TRIONet comes with a nifty locking mechanism if you want to stack your units. For details see <a href="#">Locking mechanism and release button on page 22</a> .
10.	Release button	Release button for locking mechanism. For details see <a href="#">Locking mechanism and release button on page 22</a> .
11.	Fans	2 temperature-controlled ultra silent fans are installed on the right side of the TRIONet. For details see <a href="#">Fans on page 22</a> .

Tab. 2: Connections and ports TRIONet

## TRION(3) modules compatibility

Supported modules		Not supported modules
TRION-2402-MULTI	TRION-VGPS	TRION-FLEXRAY
TRION-1620-ACC/LV	TRION-TIMING	TRION-MIL1553
TRION-2402-V	TRION-CAN	TRION-MA4
TRION-1603-LV	TRION-1820-POWER	TRION-1810-HV-8
TRION-2402-dSTG	TRION-PSU-15W	TRION-1628-AO
TRION-2402-dACC	-	TRION-ARINC429
TRION-1802/1600-dLV-32	-	TRION3-1810M-POWER-4
TRION-CNT	-	TRION3-1810-SUB-8
TRION-DI-48	-	TRION3-18xx-MULTI
TRION-BASE	-	TRION-EtherCAT-1-SLAVE

Tab. 3: Supported and not supported TRION modules


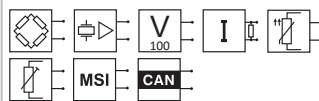
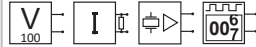



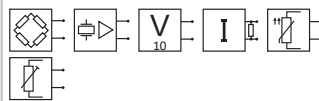
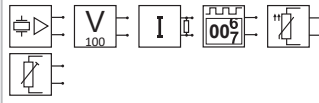

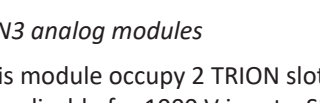


## INFORMATION

TRION3 series modules are not supported.

## TRION series modules overview

### Analog modules





ANALOG modules		Channels	Sample rate per channel	Resolution	Isolation	Connector type
TRION-2402-MULTI		4 or 8	200 kS/s	24 bit	yes	D-SUB, LEMO 0B
TRION-1620-ACC		6	2 MS/s	24 bit >1 MS/s: 16 bit	yes	LEMO 1B, BNC
TRION-1620-LV		6	2 MS/s	24 bit >1 MS/s: 16 bit	yes	LEMO 1B, BNC
TRION-2402-V <sup>1)</sup>		4 or 8	200 kS/s	24 bit	yes	Safety banana
TRION-1603-LV		6	250 kS/s	16 bit	yes	BNC, LEMO 1B
TRION-2402-dSTG <sup>1)</sup>		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
TRION-1802-dLV		16 or 32	200 kS/s 100 kS/s	18 bit 24 bit	no	D-SUB
TRION-1600-dLV		16 or 32	20 kS/s	16 bit	no	D-SUB

Tab. 4: TRION/TRION3 analog modules

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

### Digital modules

DIGITAL modules		Channels	Sample rate per channel	Resolution	Isolation	Features
TRION-CNT		6	800 kS/s	80 MHz	yes	6 channel advanced counter
TRION-DI-48		48	2 MS/s	500 nsec	yes	48 highspeed digital IN
TRION-BASE		-	2 MS/s	80 MHz	no	Basic IO card with simple IIRIG sync and 2 counter

Tab. 5: TRION digital modules

# SYSTEM SETUP

DIGITAL modules	Channels	Sample rate per channel	Resolution	Isolation	Features
TRION-VGPS-V3	-	2 MS/s	0.01 km/h <10 cm	no	100 Hz GNSS receiver for automotive applications
TRION-TIMING-V3	-	2 MS/s	12.5 nsec	no	Applies precision absolute time to measured data
TRION-CAN	4	1 MBit	-	yes	D-SUB

Tab. 5: TRION digital modules

## Dedicated modules

DEDICATED modules	Channels	Sample rate per channel	Resolution	Isolation	Features
TRION-CAN	4	1 MBit	-	yes	D-SUB
TRION-1820-POWER	8 (4 U/4 I)	2 MS/s	≥18 bit	yes	Safety banana, D-SUB

Tab. 6: TRION dedicated 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.

## Touchscreen display

The integrated touchscreen display of the TRIONet 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.

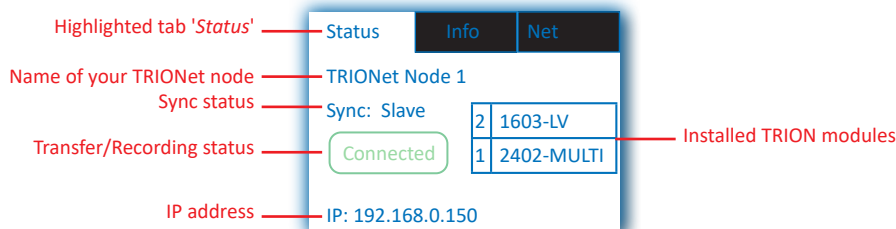


Fig. 5: Status tab

#### ► Highlighted tab 'Status'

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

► Name of your TRIONet node

The name of the TRIONet node is shown here and can be changed with the DEWETRON Explorer. For more information see [Setting up your TRIONet with DEWETRON Explorer \(static IP, DHCP, node name\) on page 35](#).

► Sync status

The actual sync status of the TRIONet. 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, DS7 etc.)
- Active: Measurement active
- Record: Measurement active and recording

► IP-address: Shows the current IP address. The IP address can be set to static or DHCP.

For more information see chapter [Setting up your TRIONet with DEWETRON Explorer \(static IP, DHCP, node name\) on page 35](#).

## 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.

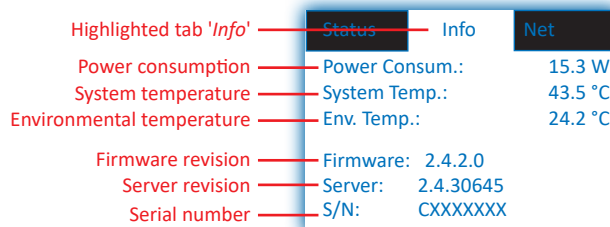


Fig. 6: Info tab

## Net tab

The 'Net' display tab shows the network settings of the TRIONet device itself and the client if connected. In this tab there is also the possibility of resetting the IP address of the TRIONet.

For more information on how to change IP address and subnet mask see [Setting up your TRIONet with DEWETRON Explorer \(static IP, DHCP, node name\) on page 35](#).

Details regarding ZeroConf IP address can be found in [ZeroConf \(Zero Configuration Networking\) and link-local addresses on page 27](#).

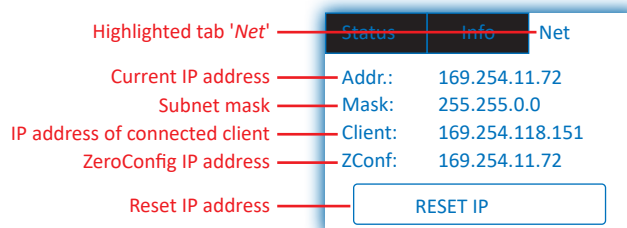


Fig. 7: Net tab

# SYSTEM SETUP

## Reset IP

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

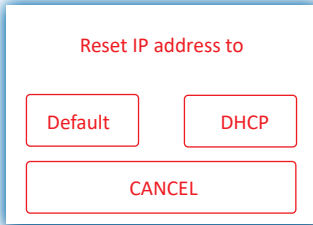


Fig. 8: Reset IP

- ▶ Default: This will reset the IP address of the TRIONet to default 192.168.0.150.
- ▶ DHCP: Choose 'DHCP' if the TRIONet 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 TRIONet will switch automatically to a fallback address called '*Link-Local IP address*'.

Refer to [ZeroConf \(Zero Configuration Networking\) and link-local addresses on page 27](#) for more details.

## TRION-SYNC-BUS interface

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

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

Tab. 7: 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 TRIONet units in stacked configuration, cable length approx. 0.2 m. Other cables on request.



### NOTICE

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

## USB 3.0 interface connector

The TRIONet 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 TRIONet has one LED displaying following statuses:

<b>GREEN (stable)</b>	Link active
<b>YELLOW (stable)</b>	USB3.0 is in use

Tab. 8: LED indication

### Optional cables

#### ► USB 3.1 Type-C to type-A adapter

This USB adapter enables the connection between the TRIONet 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.



### NOTICE

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

## Gigabit Ethernet LAN connectors

The TRIONet supports Gigabit Ethernet interface ports for connecting the TRIONet 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 TRIONet have two LEDs displaying following statuses:

<b>GREEN (stable)</b>	Link active
<b>YELLOW (stable)</b>	1GB speed is in use

Tab. 9: LED indication

### Optional cables

#### ► TN-DCHAIN-SET-0.2

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



# SYSTEM SETUP

## NOTICE

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

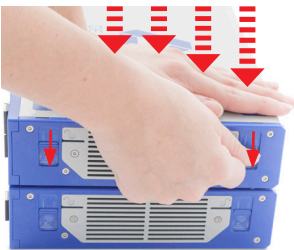
## Locking mechanism and release button

The TRIONet comes with a nifty locking mechanism if you want to stack your units. To stack two or more TRIONet 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 TRIONet units are now locked or unlocked respectively.

## Fans

On the right side of the TRIONet 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.



## Installing a TRION module

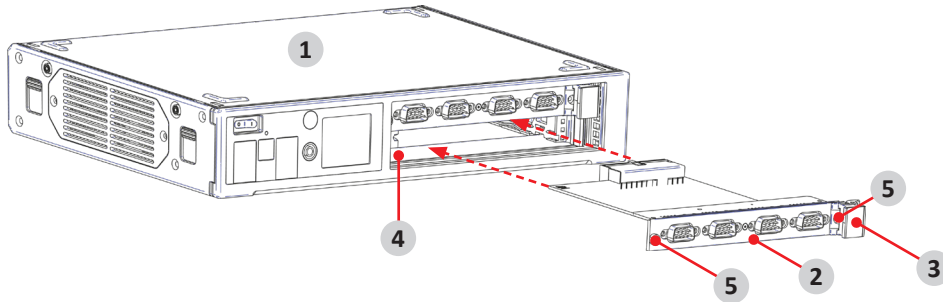


Fig. 9: Installing a TRION module

- |                            |                    |
|----------------------------|--------------------|
| 1. TRIONet chassis         | 4. Module guides   |
| 2. TRION series module     | 5. Mounting screws |
| 3. Injector/ejector module |                    |

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

1. ⚠ Take proper ESD precautions to avoid any damage to the unit.
2. Power off and unplug all connected cables including sensors from the TRIONet 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 TRIONet 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.

# SYSTEM SETUP

## Power supply

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

65 W AC/DC power supply	
Input	
– Rated input voltage	100...240 V <sub>AC</sub> (max. 90 ... 264 V <sub>AC</sub> )
– Input frequency	50...60 Hz
Output	
– Power	65 W total
– Voltage	24 V (max. 8.3 A)
Protection	
– Over voltage	yes
– Short circuit	yes
– Overcurrent	yes
Environment	
– Temperature	Operating: 0 to 40 °C / storage: -20 to 80 °C
– Humidity	Operating: 20 % RH to 80 % RH / storage: 10 % RH to 90 % RH

Tab. 10: Specifications external 65 W AC/DC power supply

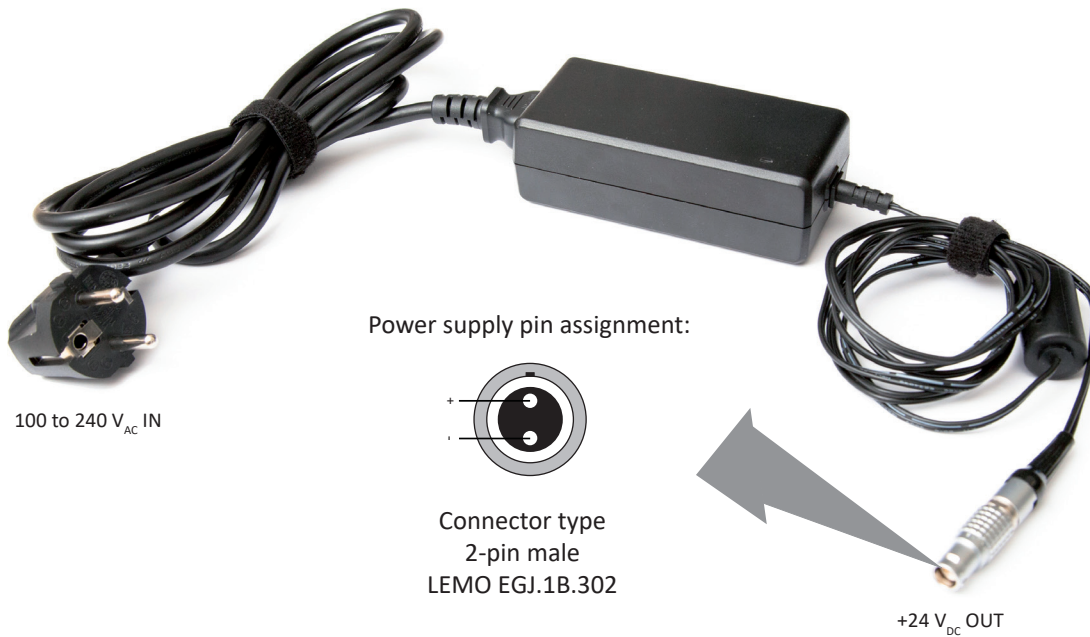


Fig. 10: Details external W AC/DC power supply



## Connecting TRIONet to laptop/PC

To connect your TRIONet 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 TRIONet 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 TRIONet 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 TRIONet.

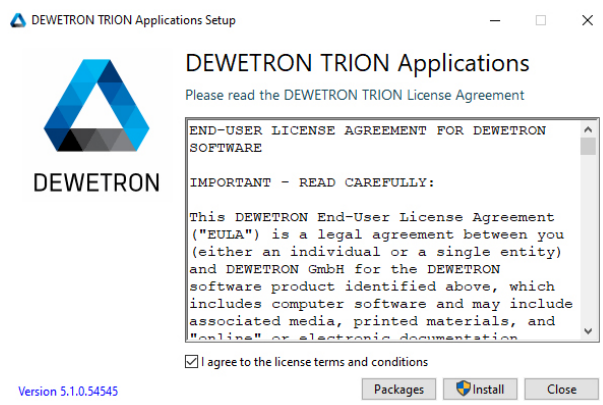
To install this package proceed as follows:

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.

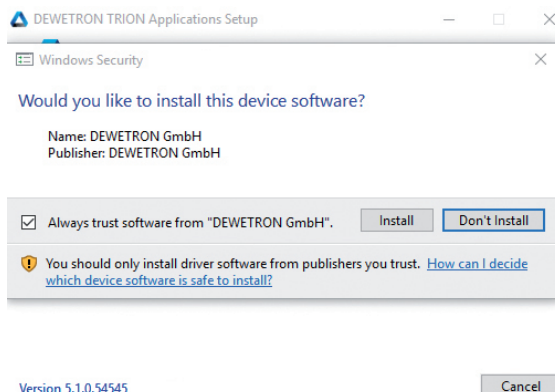
**NOTICE** Do not connect your TRIONet with your laptop/PC before this package has been installed on your laptop/PC.

**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 'Install'.



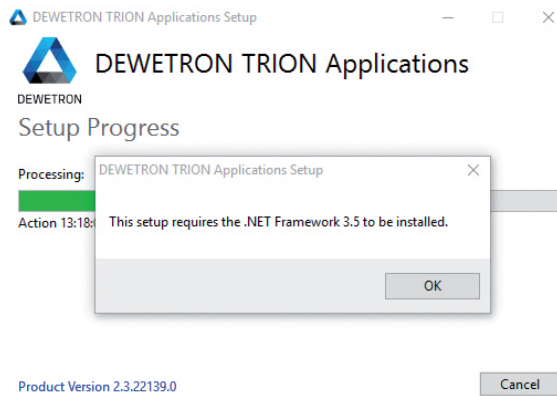
4. Hit 'Install'. Optionally check 'always trust software from DEWETRON GmbH'.



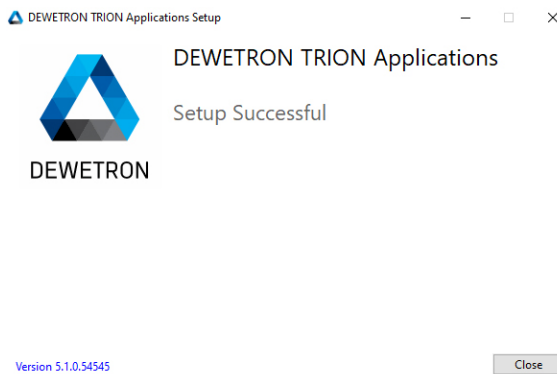
# SYSTEM SETUP

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.

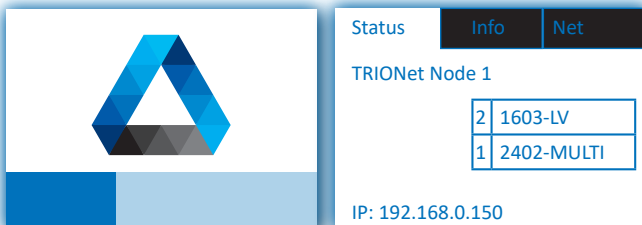


The TRION package has now been installed.

## Connect TRIONet to laptop/PC via USB 3.0 or Gigabit Ethernet

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

1. Connect the TRIONet 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 TRIONet is ready to go.



4. Now connect the TRIONet via desired interface to your laptop/PC.

TRIONet 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 TRIONet 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 TRIONet 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 TRIONet 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

- ▶ TRIONet 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

### INFORMATION

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.

# SYSTEM SETUP

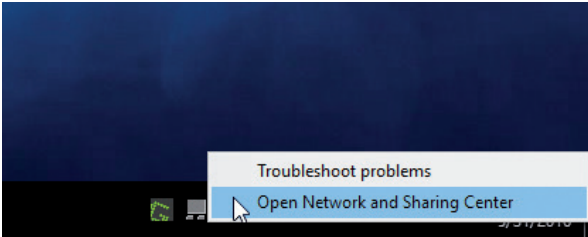
## ZeroConf via USB3.0

If the TRIONet 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:

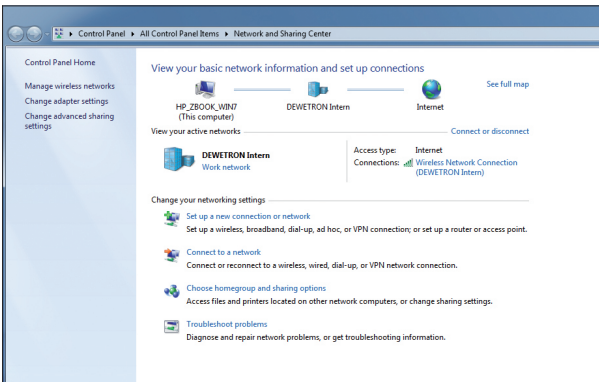
1. Right click on the network icon at the bottom right of your taskbar and select 'Open Network and Sharing Center'.

WINDOWS 7 + WINDOWS 10

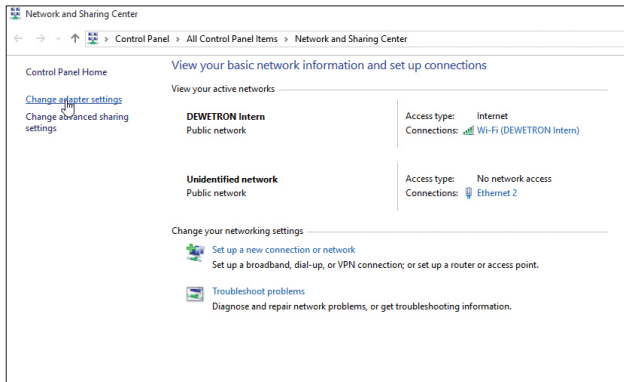


2. Click on 'Change adapter settings' on the left.

WINDOWS 7



WINDOWS 10

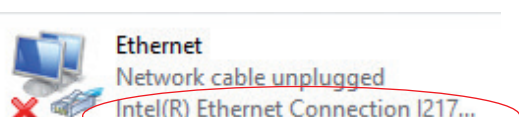


3. If installed correctly the adapter has to be listed as 'ASIX AX88179 USB 3.0 to Gigabit E...'

WINDOWS 7 + WINDOWS 10



WINDOWS 7 + WINDOWS 10



## 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 TRIONet will not connect to the laptop/PC. DEWETRON offers USB 3.0 cables for your TRIONet in perfect length.

If WINDOWS fails to install the ASIX AX88179 driver automatically, refer to [Manually USB 3.0 to Gigabit Ethernet driver installation of host PC \(static IP\) on page 33](#).

### ZeroConf via Cat6 Ethernet cable

If the TRIONet is connected via Cat6 Ethernet cable (included in the kit) to the Laptop/PC, ZeroConf will automatically assign the TRIONet 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 TRIONet.

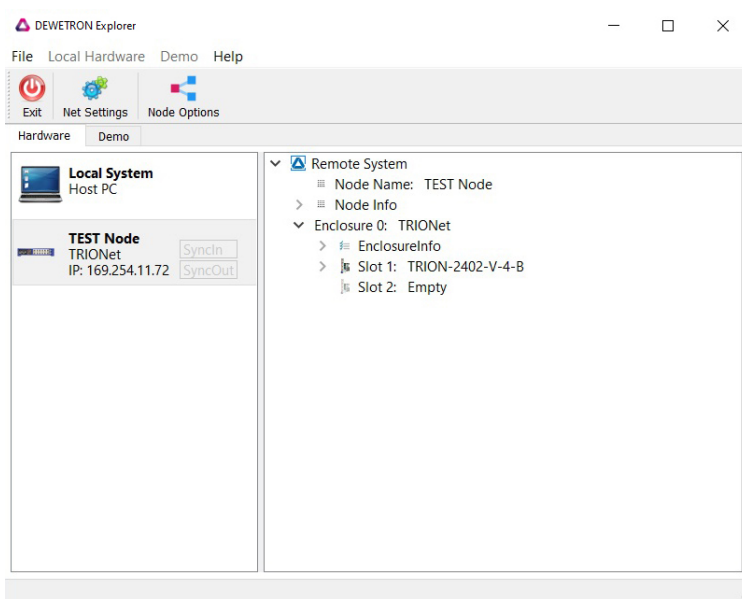


Fig. 11: Check ZeroConf status

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

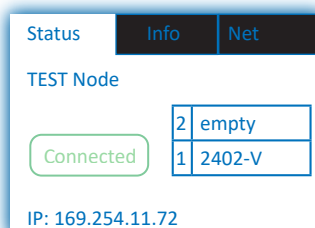


Fig. 12: Green 'Connected' symbol on the status display.

# SYSTEM SETUP

## INFORMATION

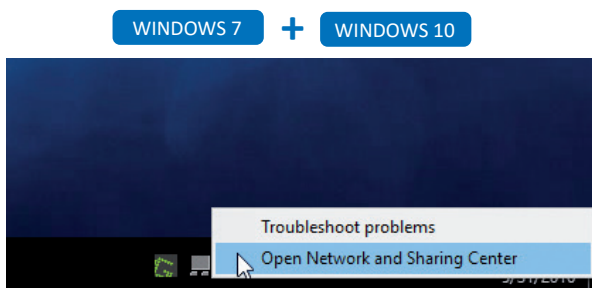
Make sure to use the USB 3.0 cable provided with your system! If the original cable gets lost, replace it with a cable of the same length or less than 2 meters (< 6 ft.!) The total length of the cable must not exceed 2 m (6 ft.), otherwise the TRIONet will not connect to the laptop/PC. DEWETRON offers USB 3.0 cables for your TRIONet 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)'.

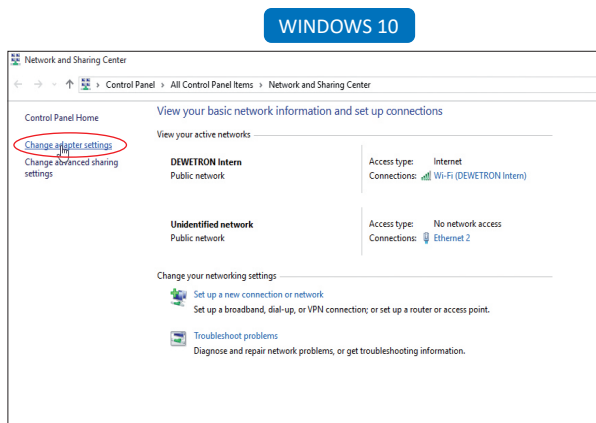
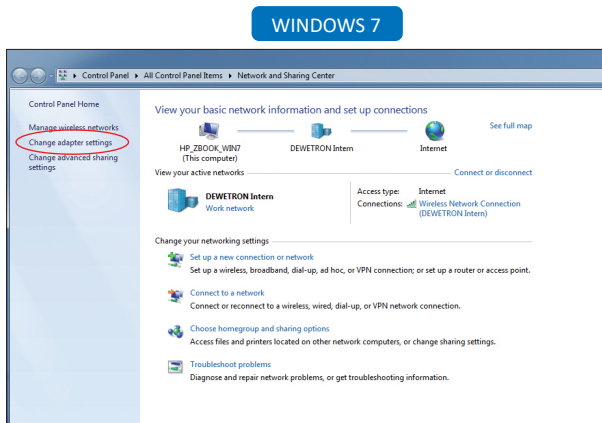
### Manually setting up Gigabit Ethernet connection of host PC (static IP)

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

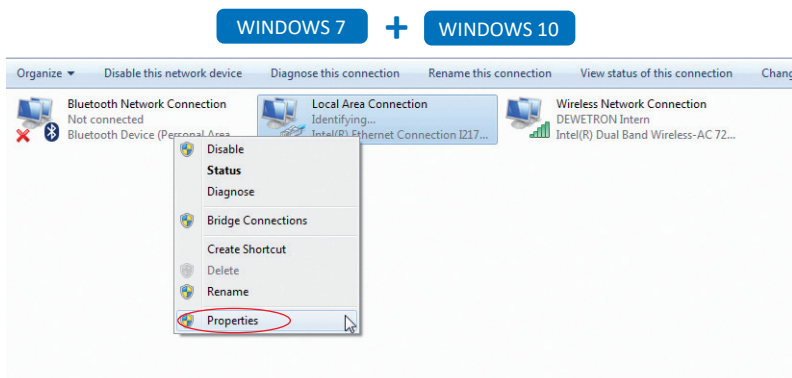
1. After the TRIONet has been connected via Gigabit Ethernet cable (included in the kit) to the laptop/PC, right click on the network icon at the bottom right of your taskbar and select 'Open Network and Sharing Center'.



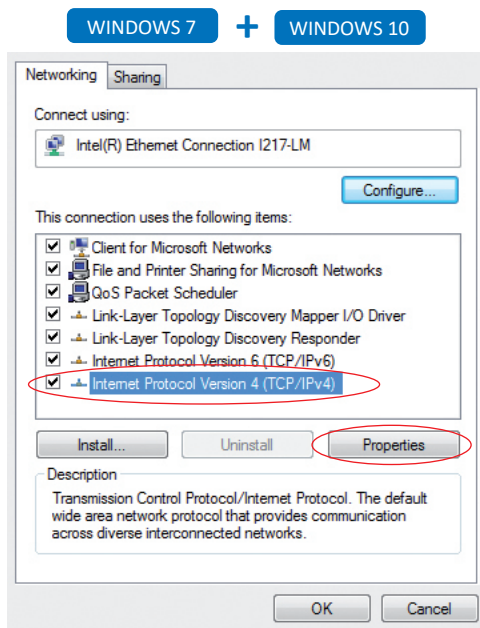
2. Click on 'Change adapter settings' on the left.



3. Right click the adapter where the TRIONet is connected and select 'Properties' from the menu.

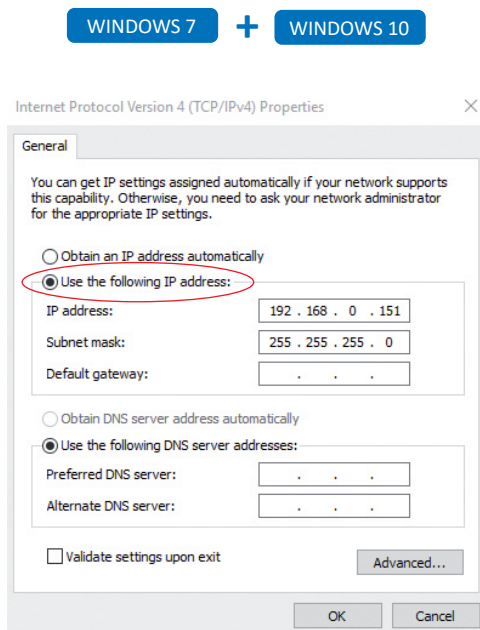


4. Select 'Internet Protocol Version 4 (TCP/IPv4)' and click on 'Properties' afterwards.



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

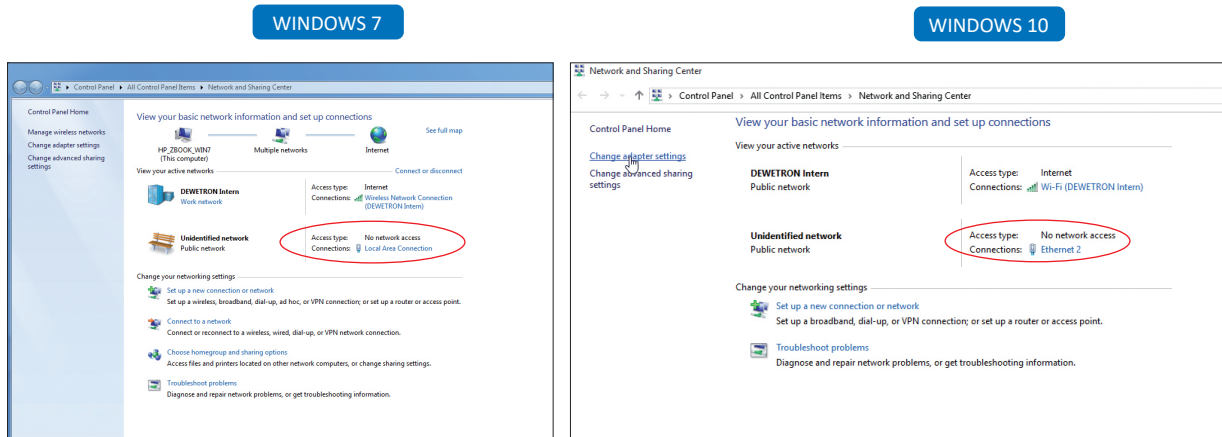
The **default IP** address of the TRIONet is: **192.168.0.150**. DNS servers are not required.



# SYSTEM SETUP

## 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.

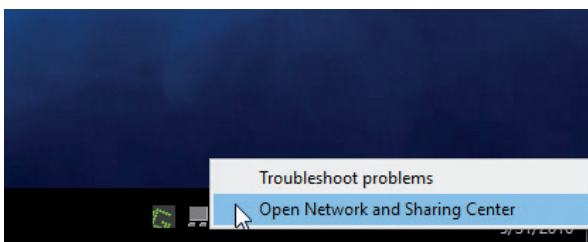
The host PC has now been manually set up with a Gigabit Ethernet connection.

### Manually setting up USB 3.0 connection of host PC

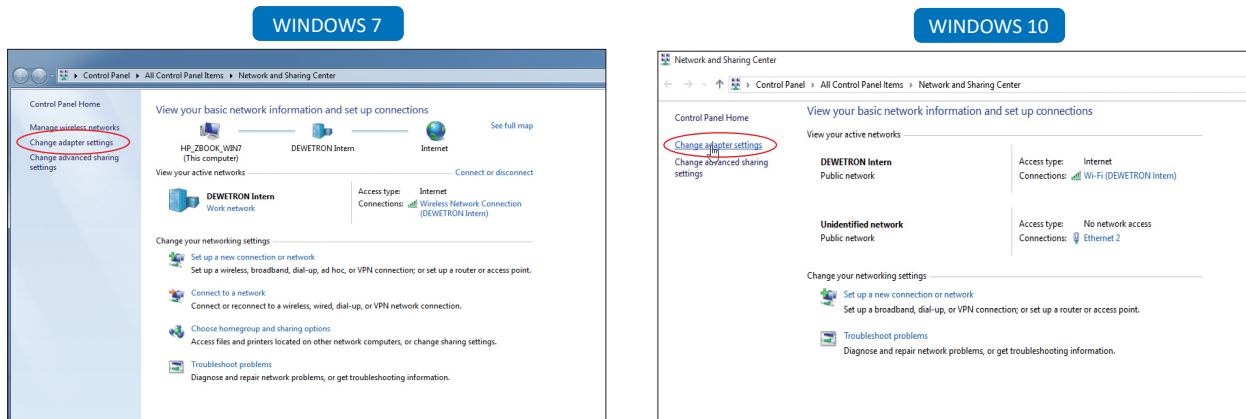
After the TRIONet has been connected via USB 3.0 cable (included in the kit) to the laptop/PC, WINDOWS will automatically detect a new hardware and install the corresponding USB 3.0 to Ethernet adapter driver (ASIX AX88179) **when connected to the internet.**

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

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

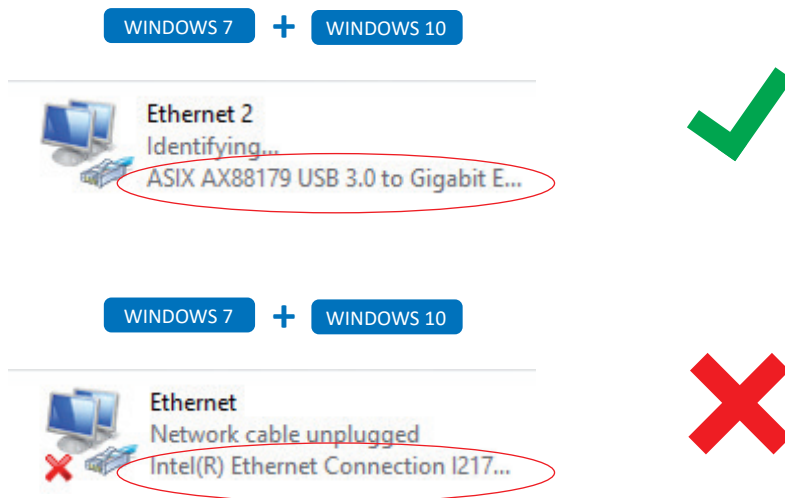


2. Click on 'Change adapter settings' on the left.





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



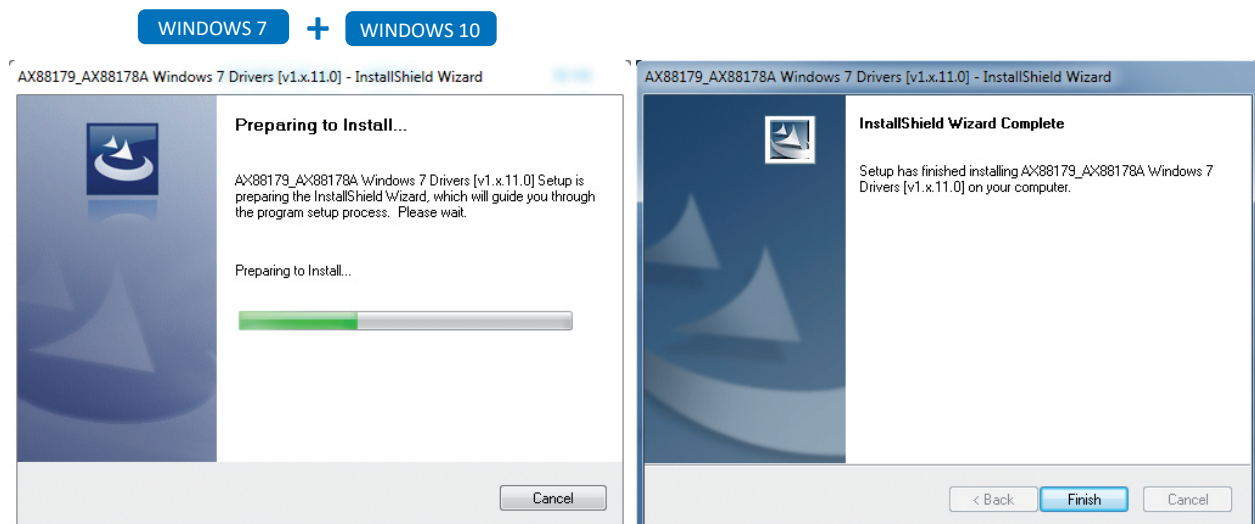
## INFORMATION

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 TRIONet will not connect to the laptop/PC. DEWETRON offers USB 3.0 cables for your TRIONet in perfect length.

## 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=pltemdetail&PitemID=131;71;112>

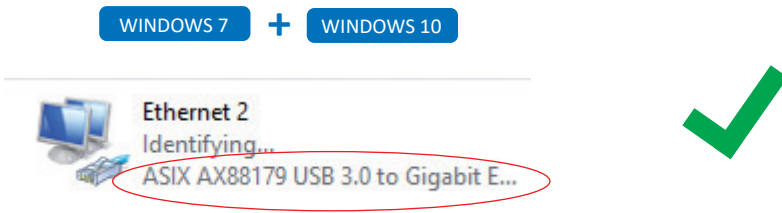


To check if the drivers have been installed correctly, proceed as follows:

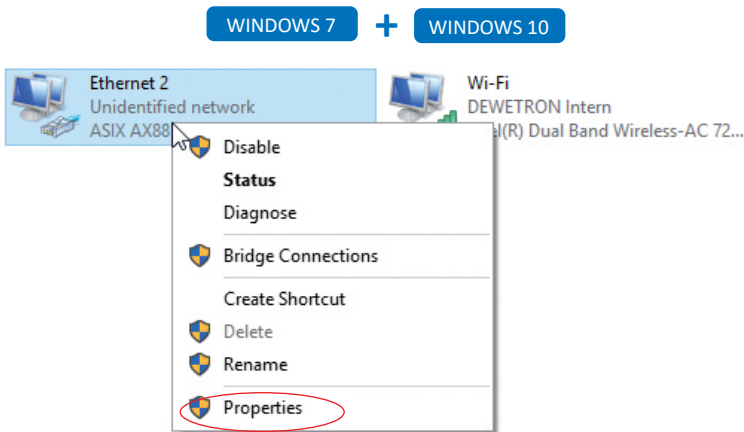
1. Right click on the network icon in the bottom right of your taskbar and select '*Open Network and Sharing Center*' > '*Change adapter settings*'.

# SYSTEM SETUP

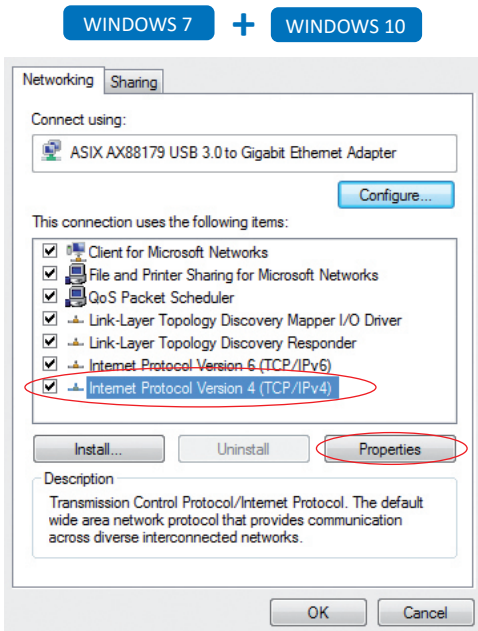
2. If installed correctly the adapter has to be listed as 'ASIX AX88179 USB 3.0 to Gigabit E...'



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



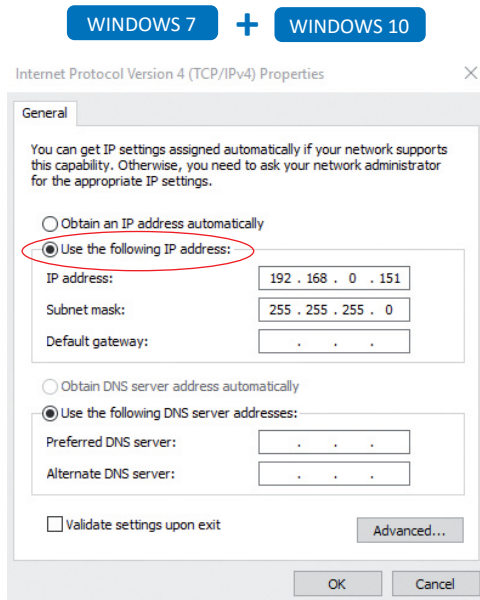
4. Select 'Internet Protocol Version 4 (TCP/IPv4)' and click on 'Properties' afterwards.



5. Check 'Use the following IP address:' and use an IP address within the same range as the TRIONet (e.g. 192.168.0.151). The actual IP address of the TRIONet is shown on the status display.

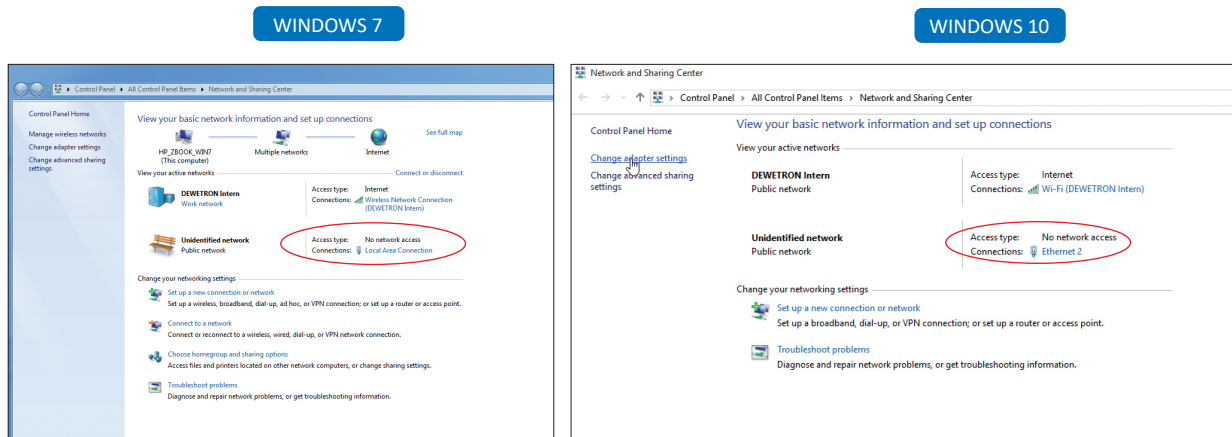
6. Use the following subnet mask: **255.255.255.0**.

The **default IP** address of the TRIONet 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.

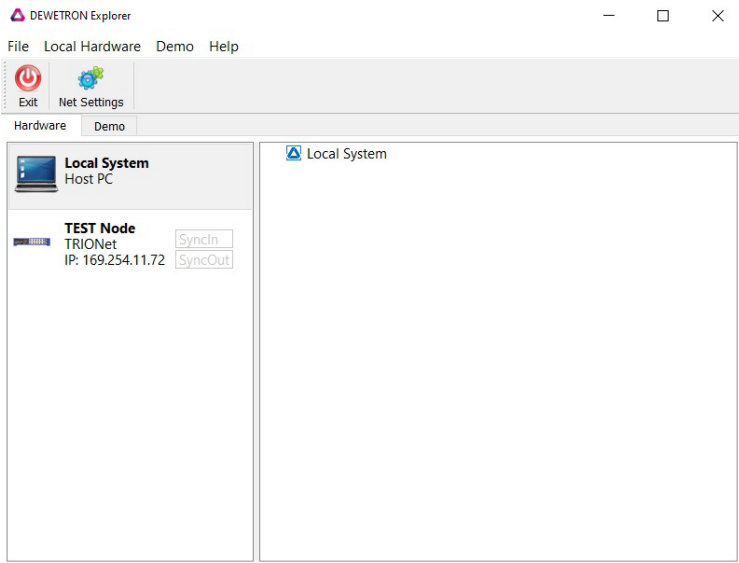
## Setting up your TRIONet with DEWETRON Explorer (static IP, DHCP, node name)

To set up the TRIONet with the DEWETRON Explorer proceed as follows:

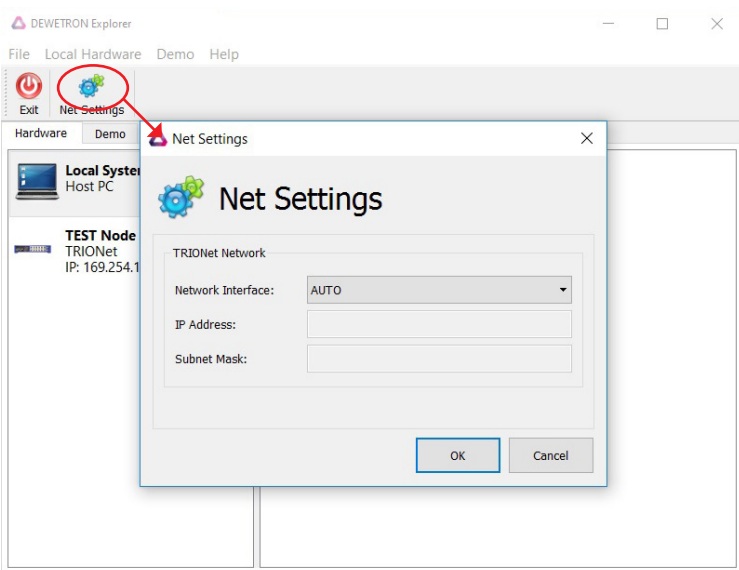
1. After connecting the TRIONet with your laptop/PC via desired interface, start the DEWETRON Explorer which has been installed with the TRION package, usually via 'Start' > 'All programs' > 'DEWETRON' > 'DEWETRON Explorer' or just type 'DEWETRON Explorer' in the search bar.

# SYSTEM SETUP

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

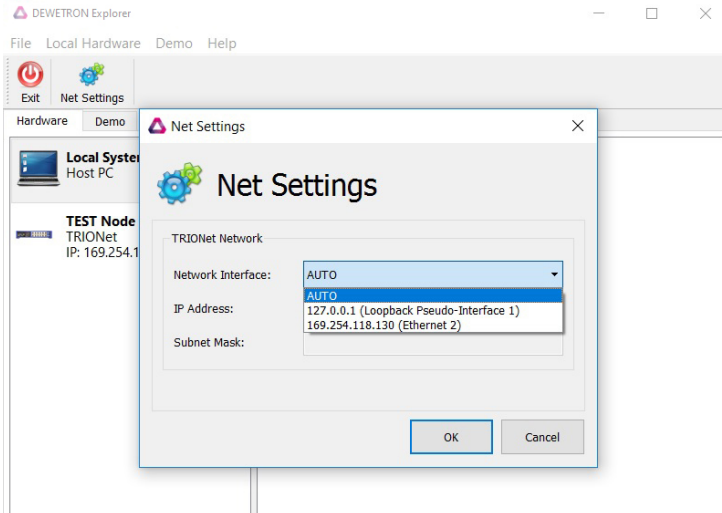


If the systems are not in the same IP address range, select the 'Local System' and click on 'Net Settings' from the menu bar. The following screen will pop up:

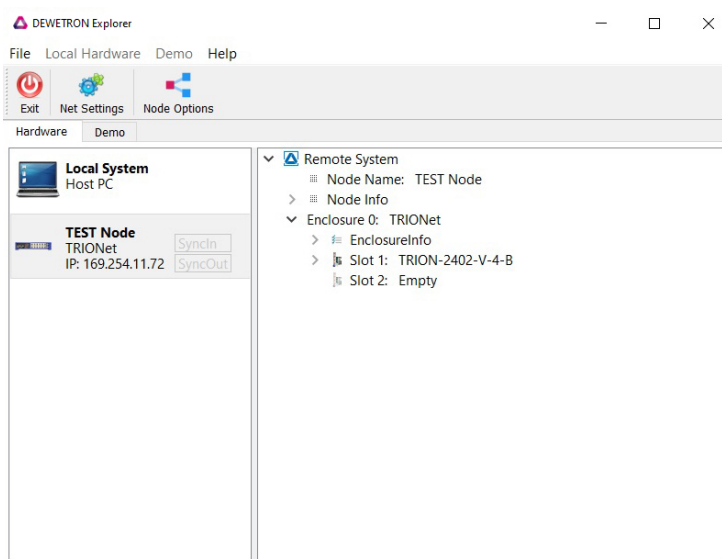


2. Choose 'AUTO' from the dropdown menu and hit 'OK' afterwards.

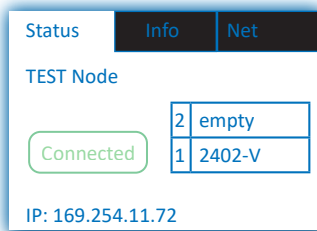
The DEWETRON Explorer will scan all Ethernet adapters and choose the corresponding adapter automatically. It is also possible but not recommended to manually select the adapter.



3. Now the TRIONet 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...).

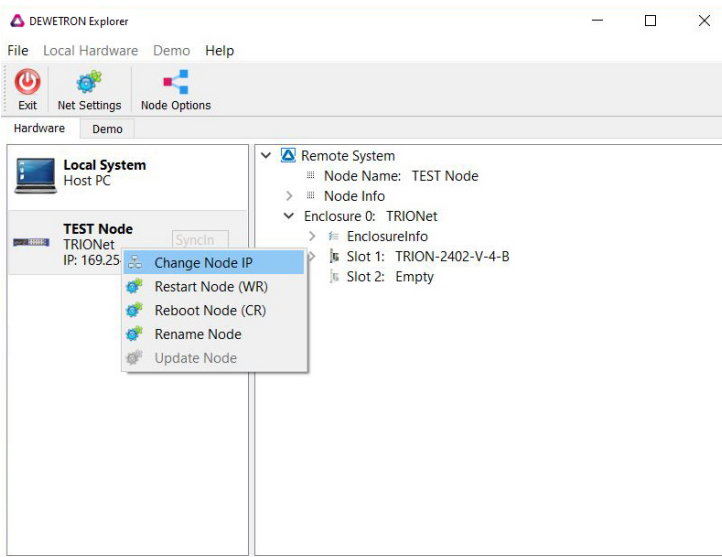


4. Also, the status display of the TRIONet will now show a 'connected' symbol. When deselecting the TRIONet in the DEWETRON Explorer, the 'connected' symbol will disappear from the status display of the unit.

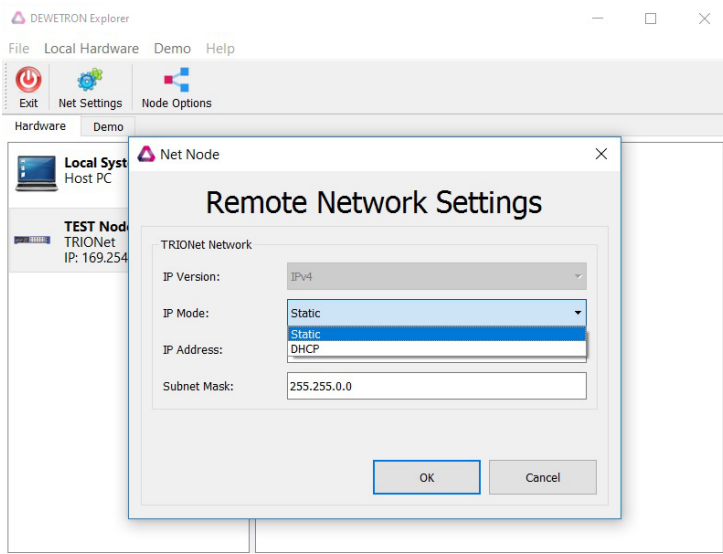


# SYSTEM SETUP

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



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



## INFORMATION

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

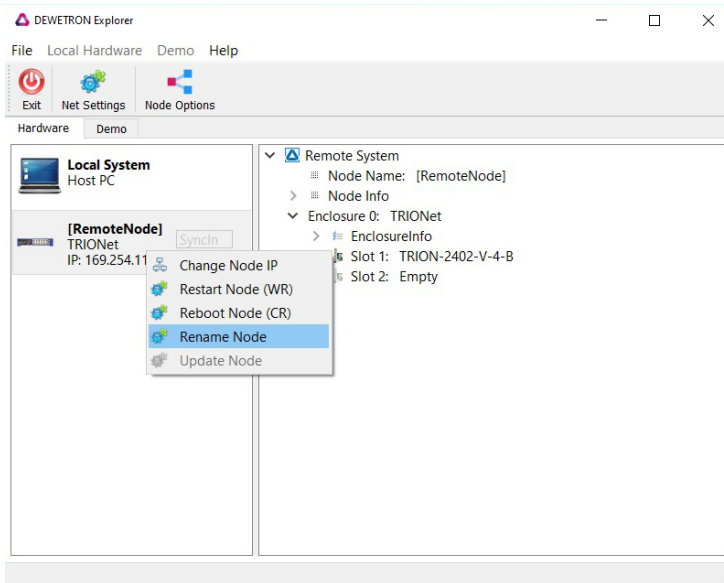
## INFORMATION

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 TRIONet.

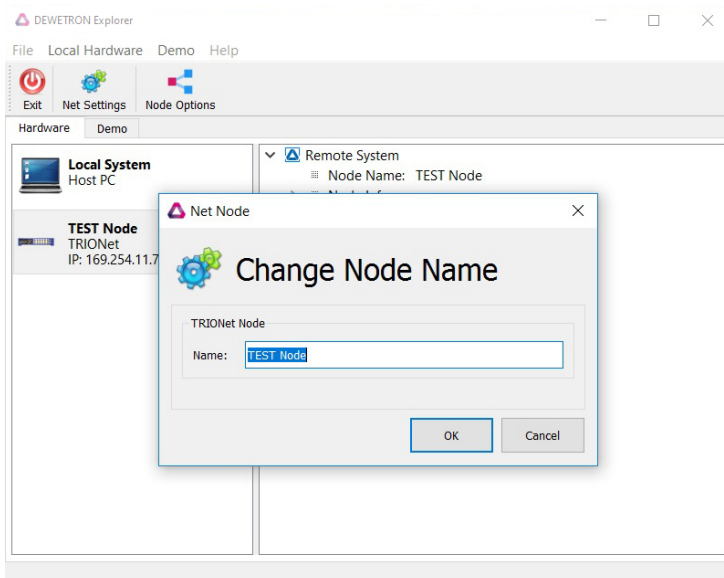
## NOTICE

DO NOT change the IP address while measuring.

- To change the name of the Node select and right-click the system and choose 'Rename Node' from the menu.

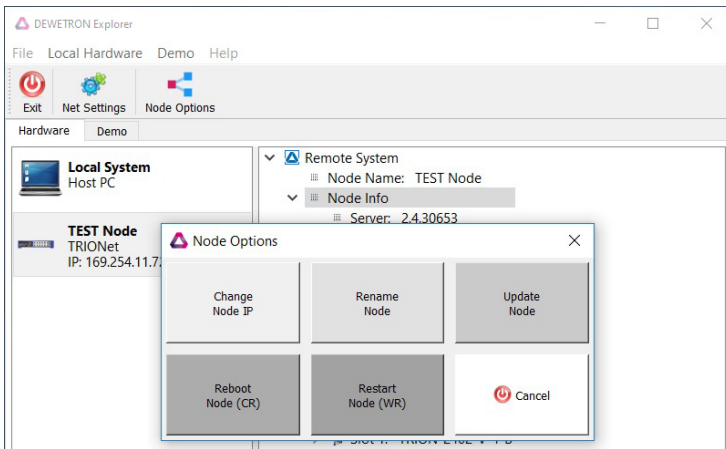


- Type in a new name for your system and hit 'OK'. The name will also automatically update on the status display of the unit.



# SYSTEM SETUP

10. These options are available also by selecting the system node and clicking on 'Node Options' from the menu bar.

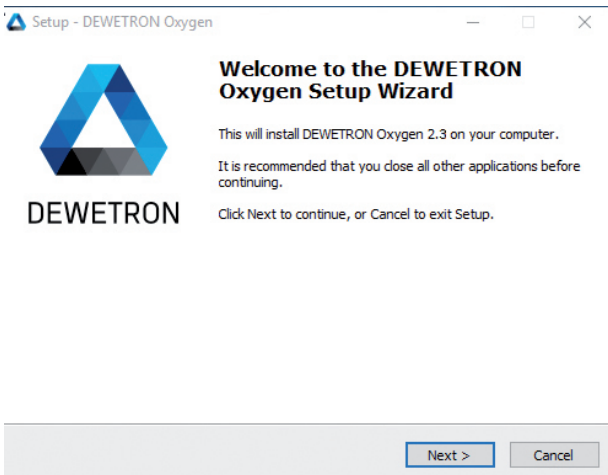


TRIONet has now been set up with the DEWETRON Explorer.

## Installation of OXYGEN measurement software

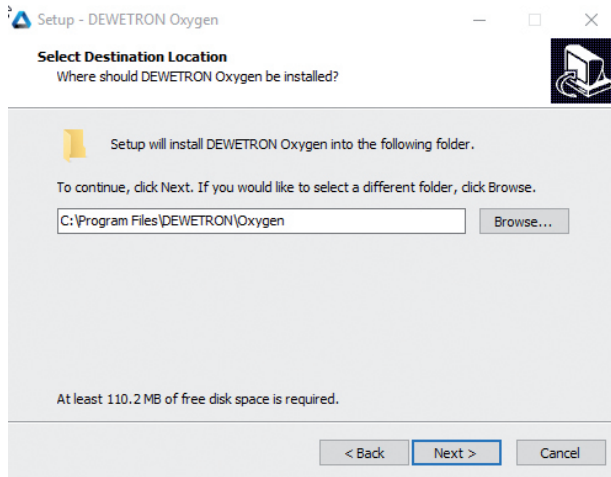
Install the OXYGEN measurement software as follows:

1. Start the OXYGEN installation by plugging in the DEWETRON installation media USB stick shipped with your TRI-ONet 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.

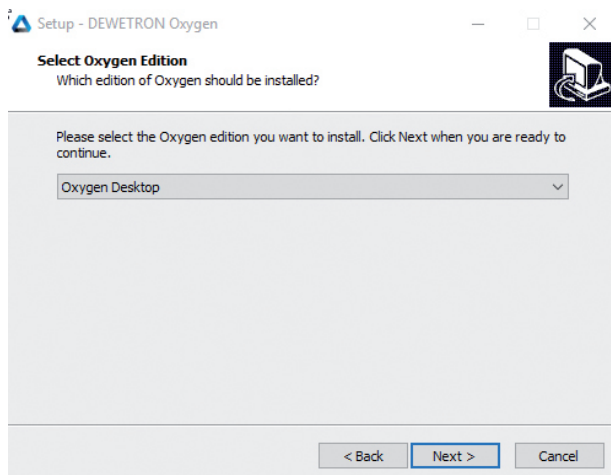




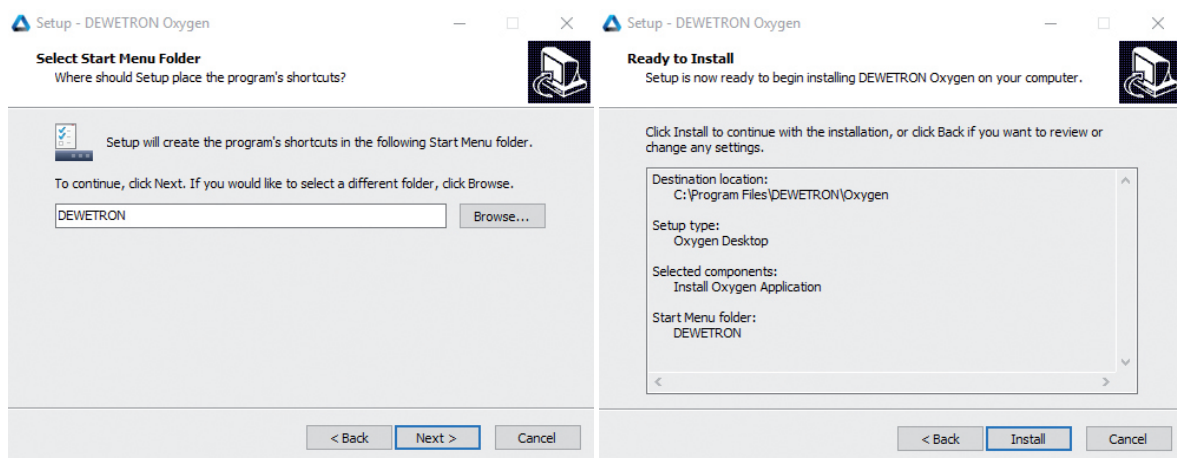
### 3. Select the destination location.



### 4. Select 'OXYGEN Desktop' as OXYGEN edition.

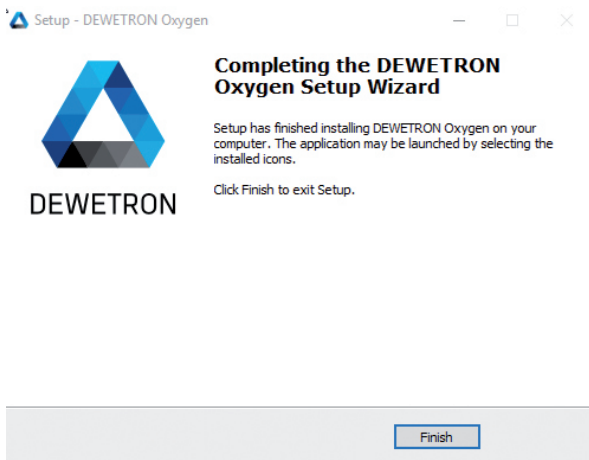


### 5. Select the start menu folder.



# SYSTEM SETUP

## 6. Finish the installation.



OXYGEN has now been successfully installed to your laptop/PC.

## Setting up TRIONet in OXYGEN

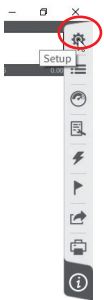
Set up TRIONet in OXYGEN as follows:

1. After successfully connecting your TRIONet 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.

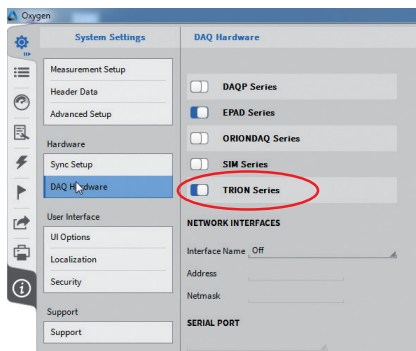
When you first start OXYGEN in some cases a Windows Firewall prompt will pop up blocking the software. Make sure to allow access through the firewall by clicking on 'Allow access'.



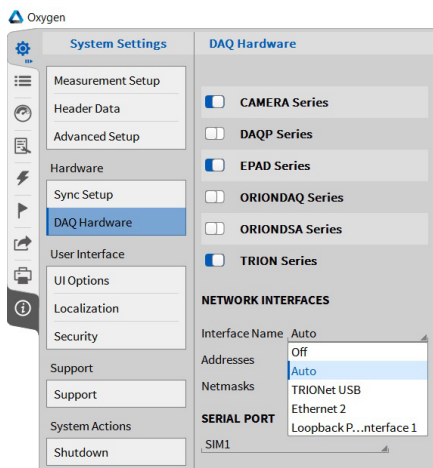
3. In OXYGEN double click the setup icon or drag it to the left side to expand to full view.



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

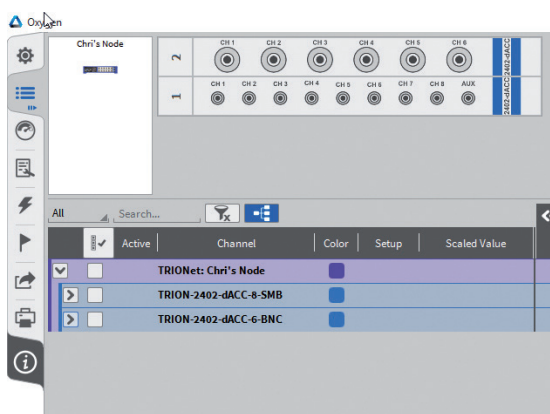


5. Choose 'Auto' from the 'Network Interfaces' drop-down menu. This will scan all ethernet ports and automatically detect the TRIONet device.



6. The IP address of the adapter is shown in the field below.
7. Switch to 'Channel list' will display the TRIONet and installed modules.

If there is no TRIONet 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 [Connecting TRIONet to laptop/PC on page 25](#); otherwise move to [Troubleshooting on page 60](#).



You now have successfully setup your TRIONet in OXYGEN.

# SYSTEM SETUP

## Synchronization of multiple TRIONet units

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

### Synchronization setup in OXYGEN

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

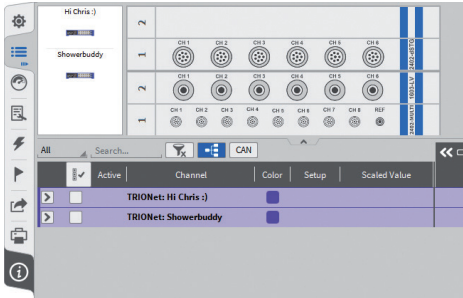


Fig. 13: Detection of TRIONet units

### TRION-SYNC-BUS

The TRION-SYNC-BUS (SYNC IN, SYNC OUT) is used to synchronize two or more TRIONet 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.

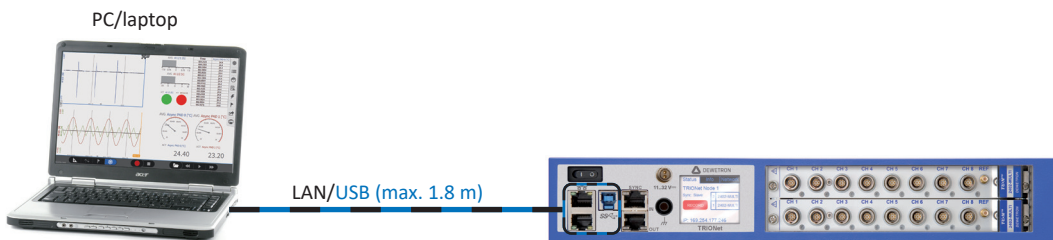
	SYNC OUT	SYNC IN
RED (stable)	Clock detected	Clock detected / Receiving clock
GREEN (stable)	Acquisition running	Acquisition running

Tab. 11: LED indication

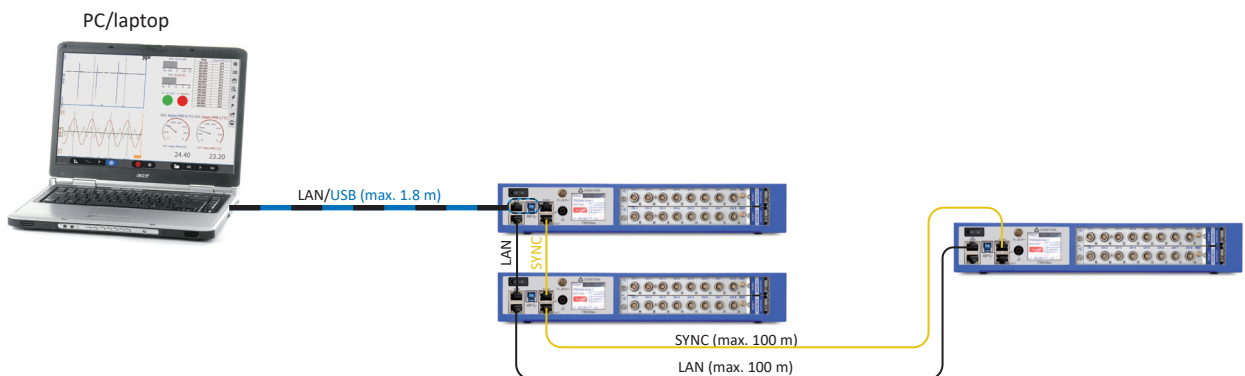
Depending on the usage of the SYNC I/O (input or output) the LED indicates if the system clock is available or received correctly from another system. The green LED indicates that the acquisition is running. If the acquisition stops the LED will be off.

## Synchronization examples

### Single TRIONet configuration



## Multiple TRIONet configuration



### INFORMATION

- ▶ 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 TRIONet

With the flexibility of TRION series modules, it is possible to connect any CPAD2/CPAD3 modules directly to your TRIONet. 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.

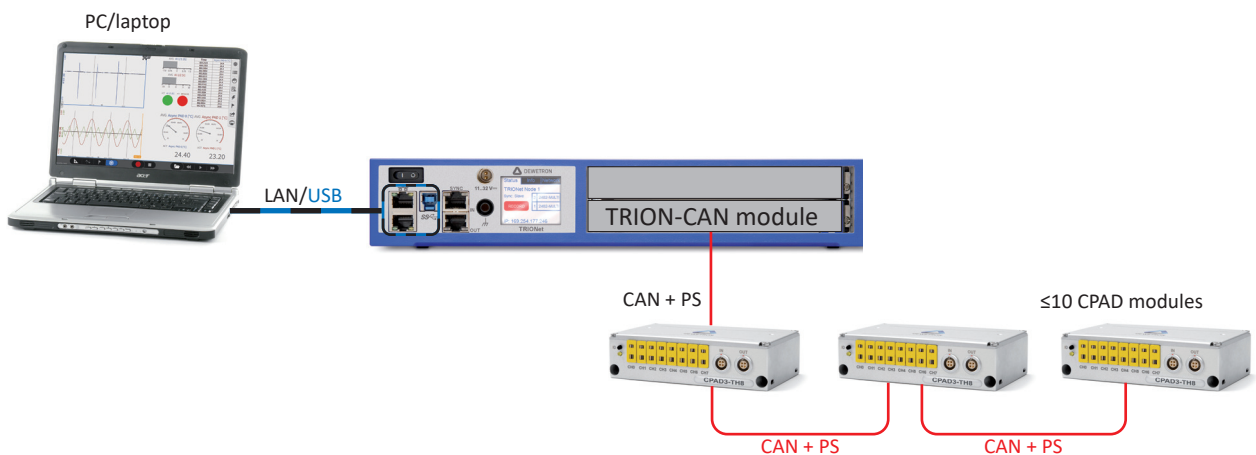


Fig. 14: Connection laptop, 1x TRIONet, CPADs via TRION-CAN

# SYSTEM SETUP

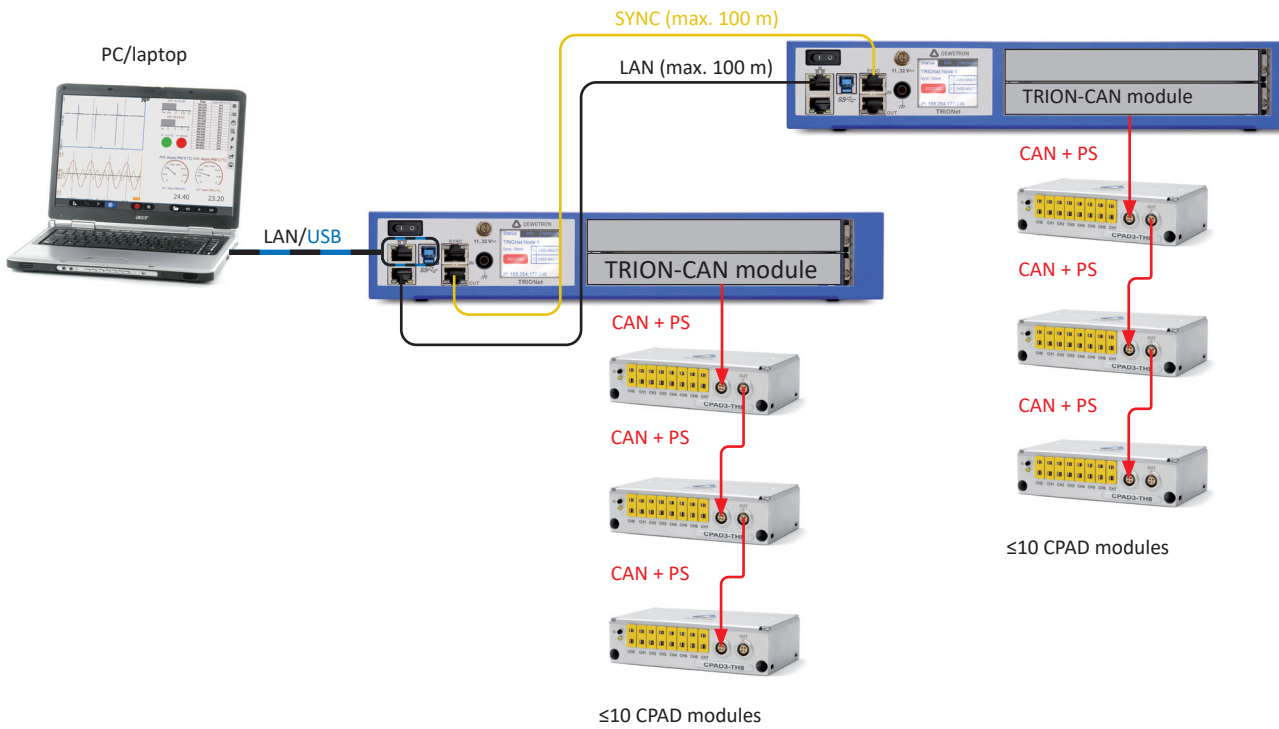


Fig. 15: Connection laptop, 2x TRIONet, CPADs via TRION-CAN

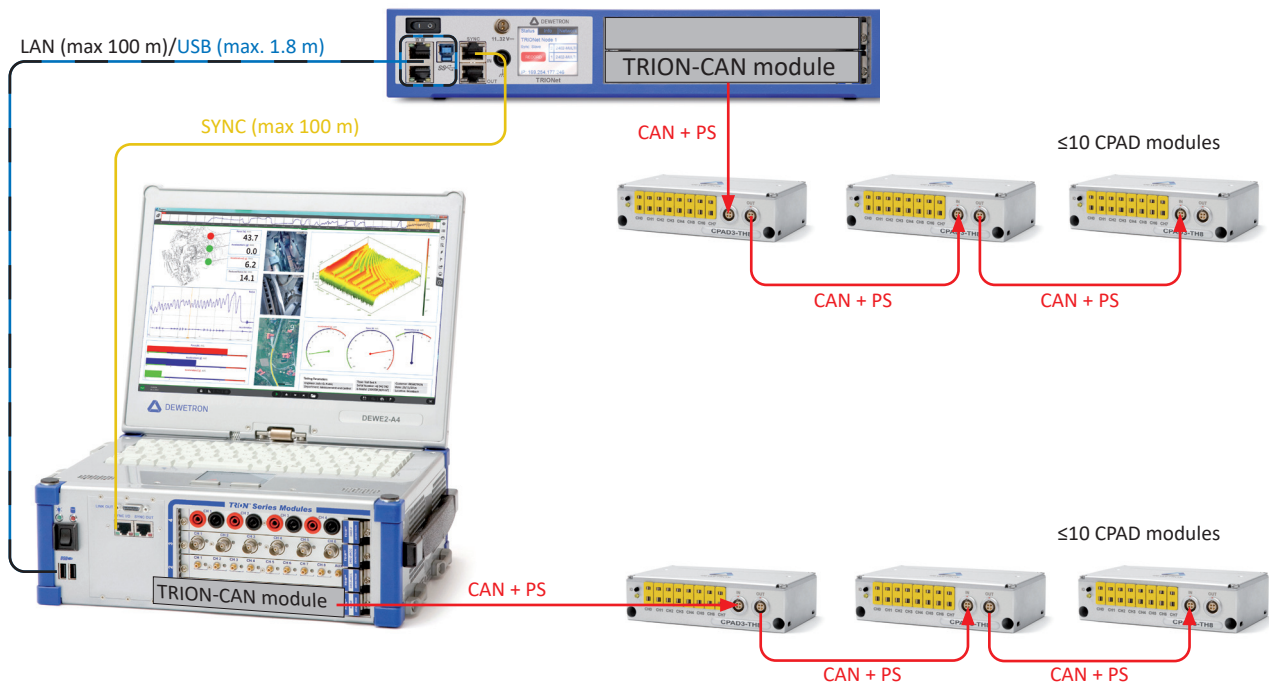


Fig. 16: Connection DEWE3-A4, 1x TRIONnet, CPADs via TRION-CAN

# SYSTEM SETUP

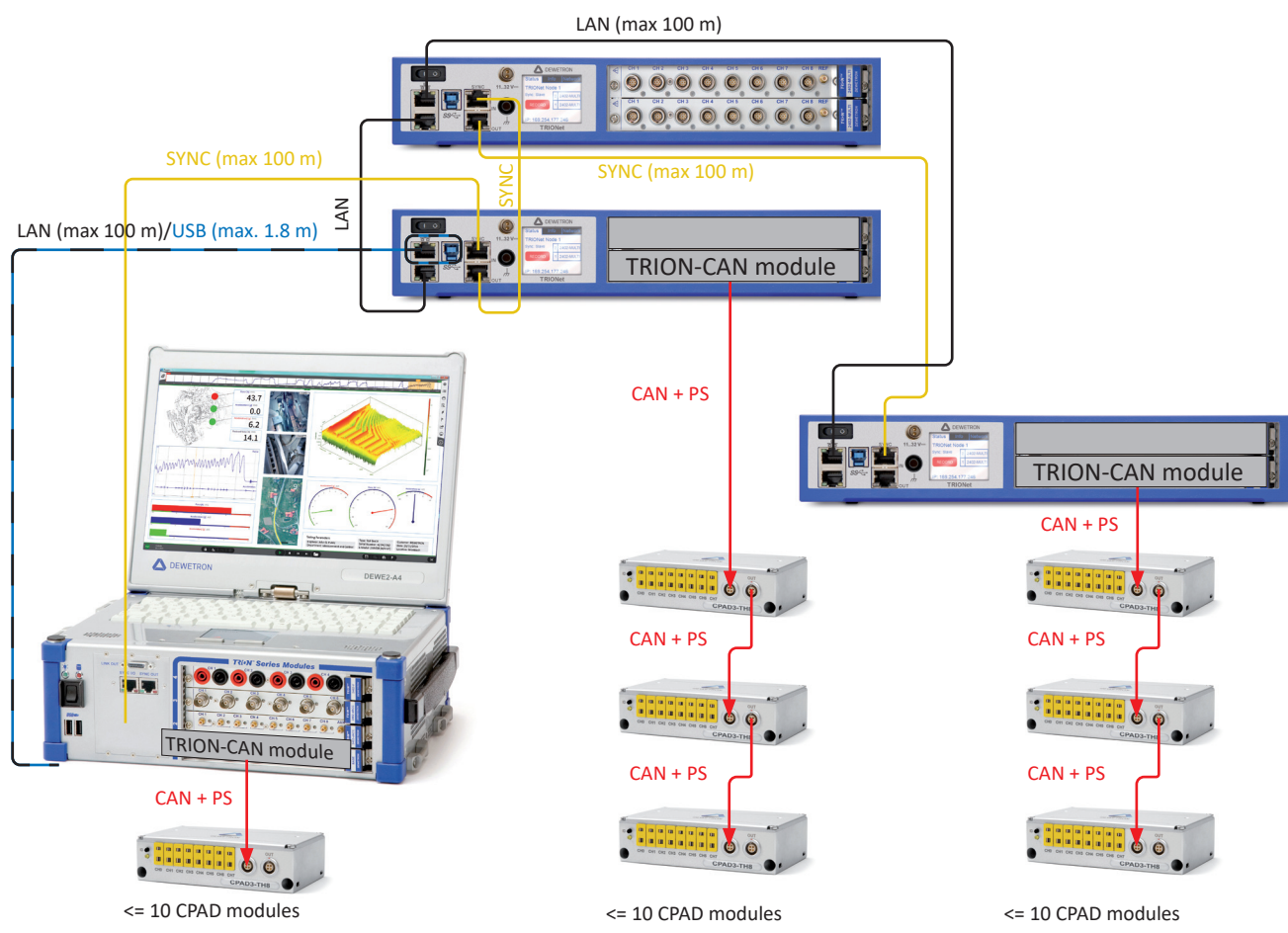


Fig. 17: Connection 1x DEWE3-A4, 3x TRIONet, CPADs via TRION-CAN

For the following examples a **TRION-MULTI** module is required. A TRION-MULTI module can drive up to **1x CPAD2/CPAD3 module directly**. If more than one CPAD2/CPAD3 modules are used an **additional power supply** via a split cable is required.

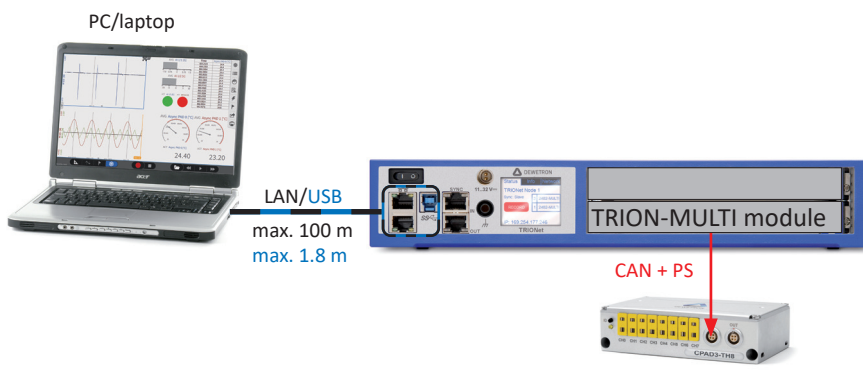


Fig. 18: Connection laptop, 1x TRIONet, CPAD via TRION-MULTI

# SYSTEM SETUP

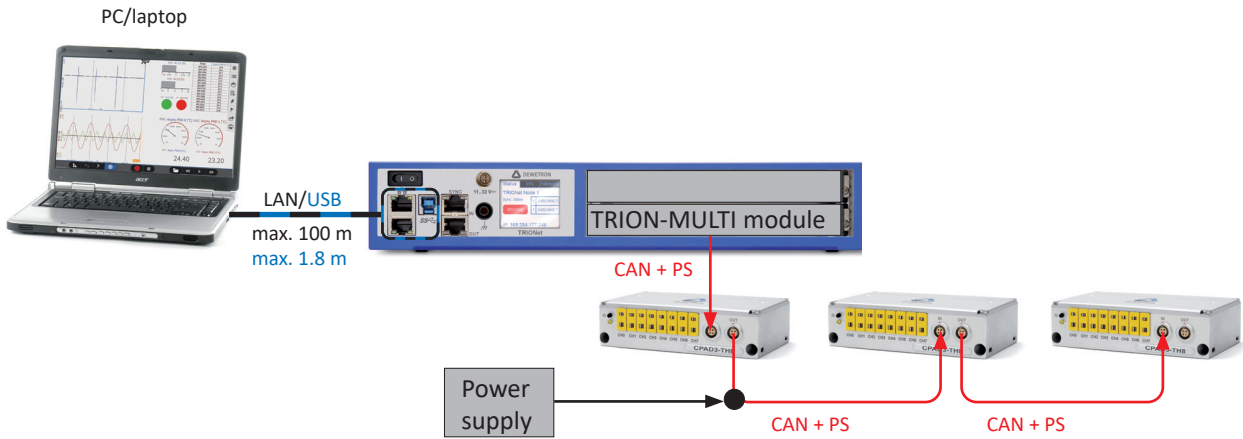


Fig. 19: Connection laptop, 1x TRIONet, CPADs via TRION-MULTI

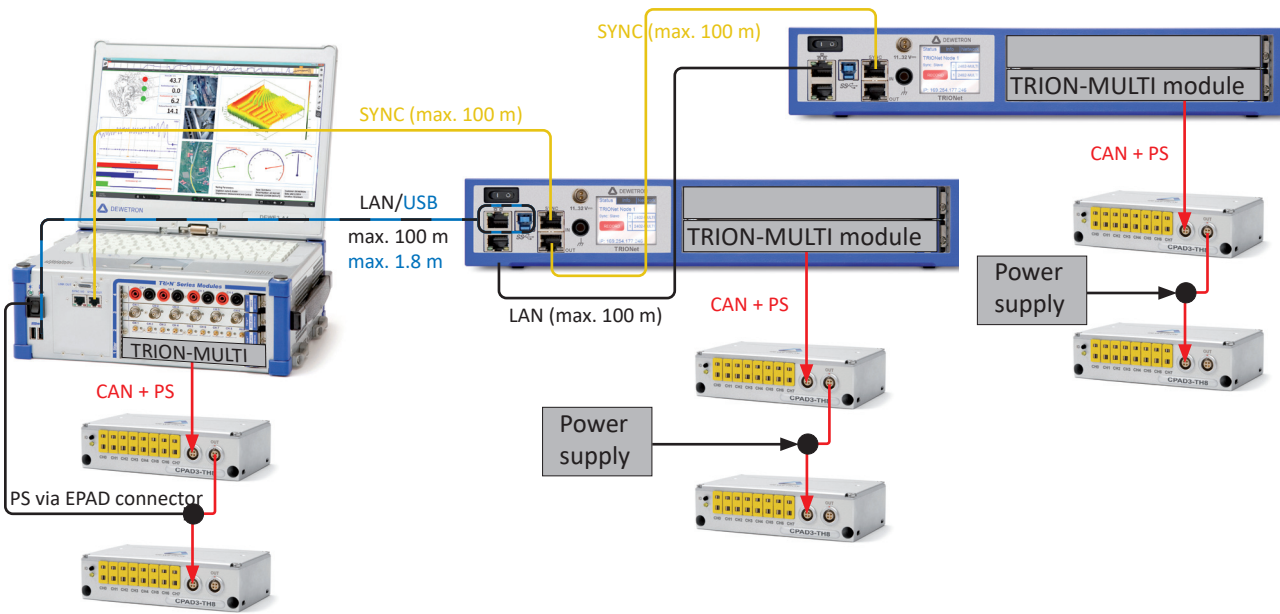


Fig. 20: Connection DEWE3-A4, 2x TRIONet, CPADs via TRION-MULTI



## 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.



## Firmware upgrade

### Perform a firmware upgrade

#### Requirements

- ▶ TRIONet
- ▶ 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.



# MAINTENANCE AND SERVICE

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. Plug in 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 TRIONet 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 !!"***



# MAINTENANCE AND SERVICE

**“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 TRIONet. 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 revision	Firmware: 2.4.2.0	
	Server: 2.4.30645	
	S/N: CXXXXXXX	

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 TRIONet.

### 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.

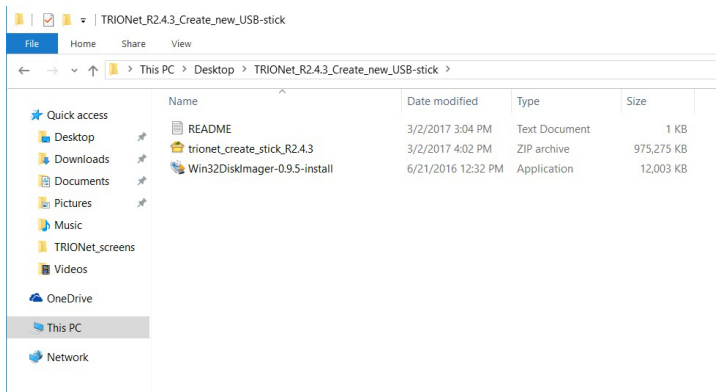
Firmware	
TRIONet Firmware R2.4.3: Create new USB update stick 01_TRIONet_R2.4.3_Create_New_USB_stick.zip (54.68 MB) md5: 868f98b63d9592780913e29c3f6d	Version: R2.4.3 ReleaseDate: 2017-03-02 Show notes <input type="checkbox"/> Edit
TRIONet Firmware R2.4.3: Update files for existing USB stick 02_TRIONet_R2.4.3_Update_existing_USB_stick.zip (274.62 MB) md5: 9794453c0561c0511886690e0b2a5c0f9	Version: R2.4.3 ReleaseDate: 2017-03-02 Show notes <input type="checkbox"/> Edit
▶ Manuals	
▶ TRIONet Brochure	

2. Extract the downloaded archive using [Zip](#) 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:

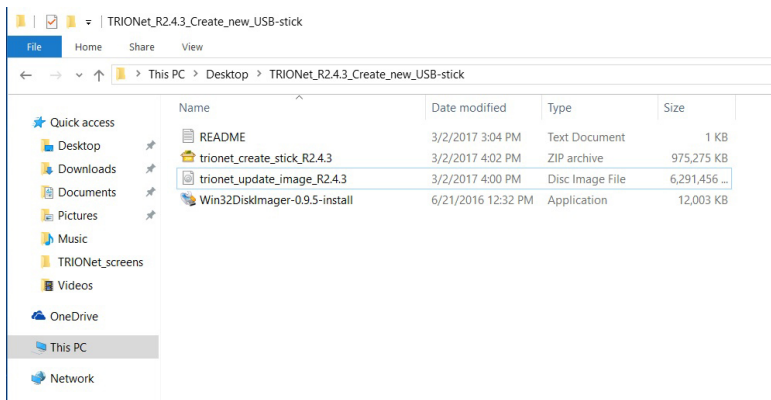
- **trionet\_create\_stick\_R2.x.x.img**
- **win32DiskImager-x.x.x-install.exe**
- **README.txt**

# MAINTENANCE AND SERVICE

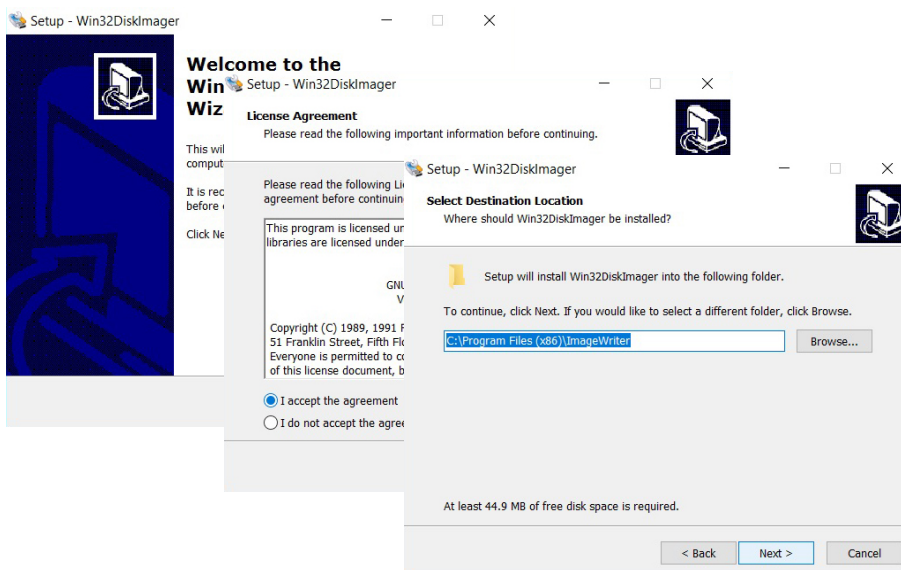


3. Extract the '*trionet\_create\_stick\_R2.x.x.zip*' in the same folder. After extracting following files should be available:

- **trionet\_create\_stick\_R2.x.x.zip**
- **trionet\_update\_image\_R2.x.x.img**
- **win32Diskmager-x.x.x-install.exe**
- **README.txt**

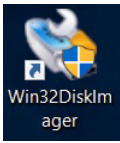


4. Run Win32DiskMager-x.x.x-install.exe (if not already installed). The install wizard will guide you through the installation process.



# MAINTENANCE AND SERVICE

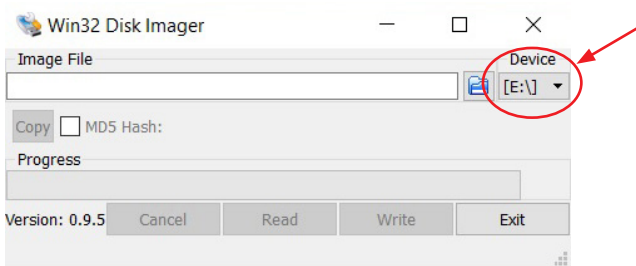
5. Plug in an empty USB drive and remember the drive letter which is automatically assigned by Windows (e.g. 'E:\').



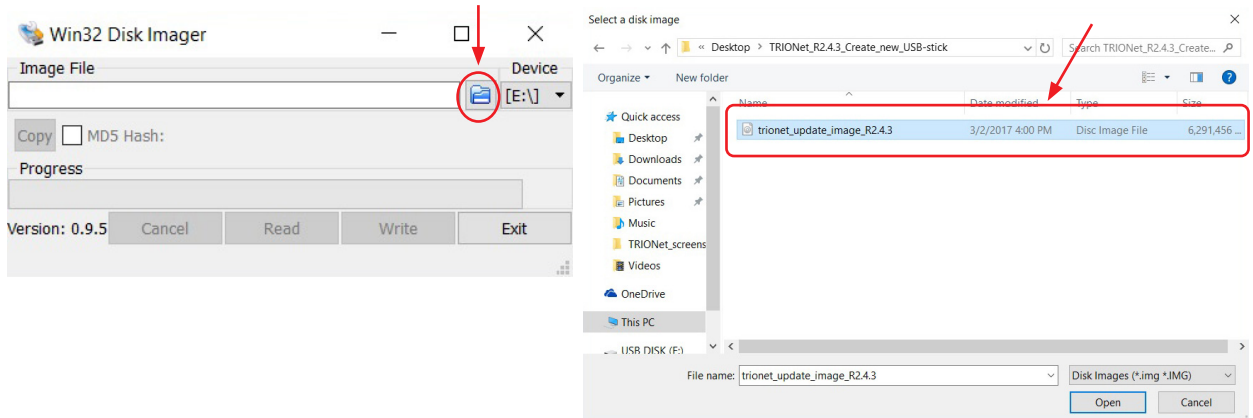
6. Run Win32DiskImager.exe as administrator by right clicking the icon on the desktop and select '*Run as administrator*'.

7. Choose the USB drive by selecting the associated drive letter from the '*Device*' dropdown menu (e.g. 'E:\').

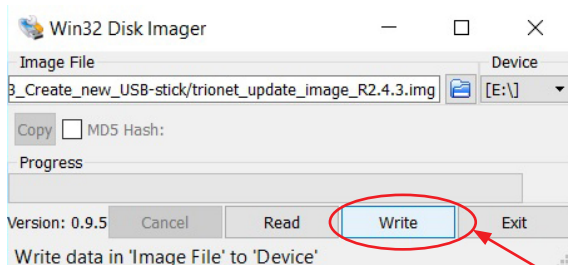
Usually Win32DiskImager automatically detects plugged-in USB drives but double check if the associated drive letter is selected correctly. Win32DiskImager will not list any hard drives.



8. Browse and select the image file which has been extracted in step 3 (*trionet\_update\_image\_R2.x.img*) by clicking the folder icon.



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

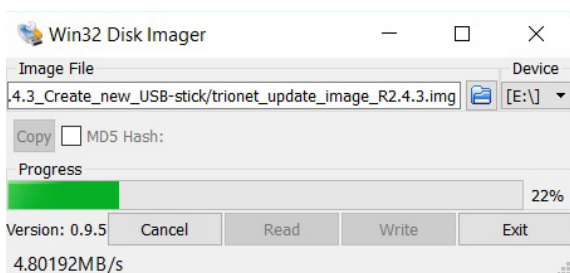


10. Check the target device and confirm overwrite by clicking '*Yes*'.

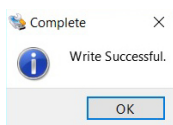
# MAINTENANCE AND SERVICE



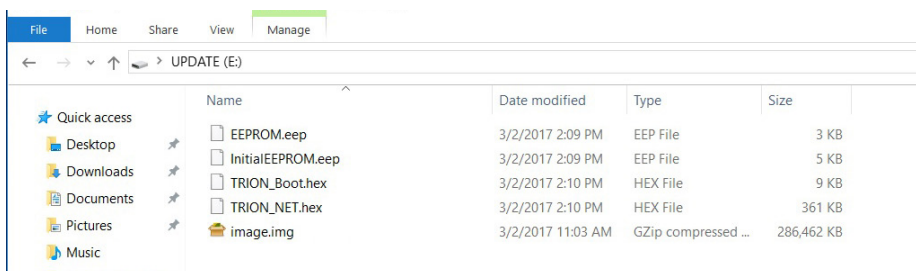
11. The writing progress starts.



12. The writing progress has been finished.



13. 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 TRIONet.

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

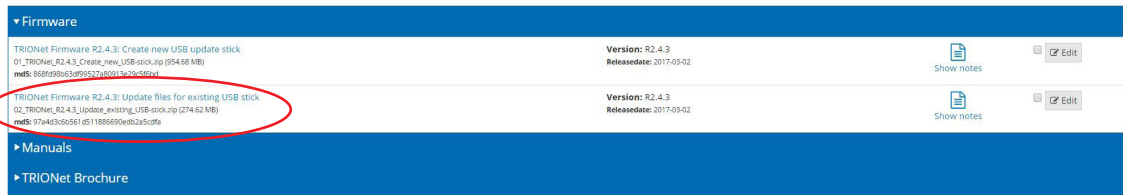
## Updating firmware files on existing USB drive

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 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. Log in or sign up a new account by clicking the 'Register' button on the top right.

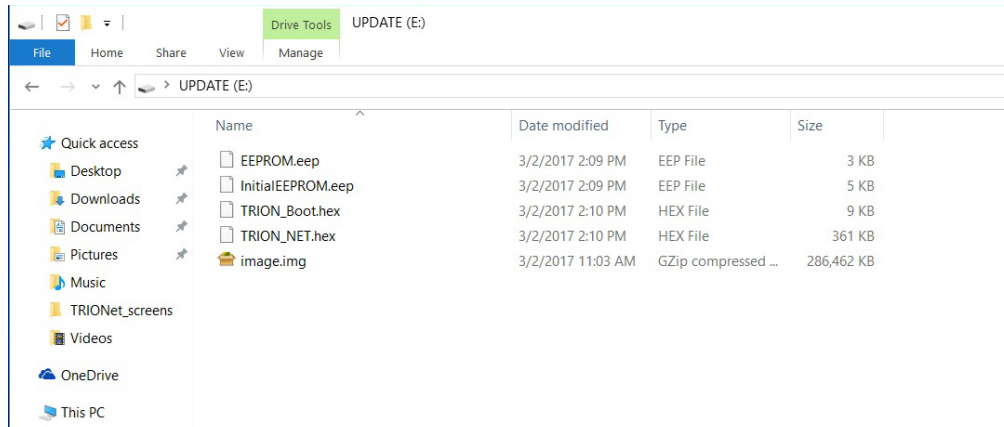
# MAINTENANCE AND SERVICE



2. Extract the downloaded archive using [Zip](#) 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:

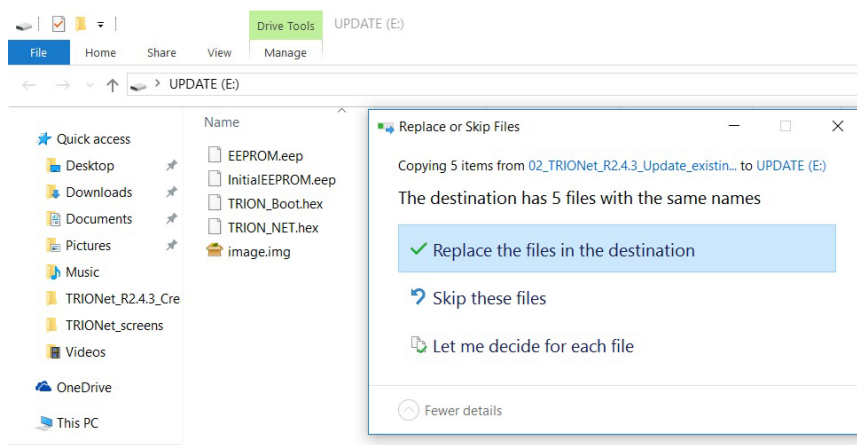
- **EEPROM.eep**
- **InitialEEPROM.eep**
- **TRION\_Boot.hex**
- **TRION\_NET.hex**
- **image.img**



**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 TRIONet.

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.

# MAINTENANCE AND SERVICE

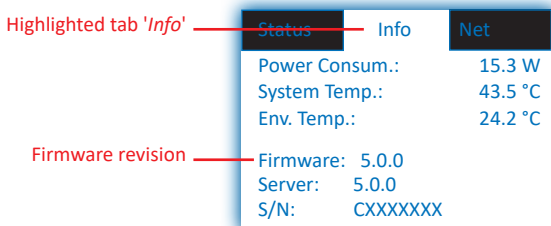
## Perform a remote update w/o a USB drive

The next steps will describe on how to update the firmware files on your TRIONet without the needs of a USB drive (requires Firmware 5.0 or newer).

### Requirements

- ▶ TRIONet connected to your laptop/PC
- ▶ Firmware 5.0 or higher installed on your TRIONet
- ▶ Firmware files for TRIONet (download at: <https://ccc.dewetron.com/pr/trionet>, login required)
- ▶ 5 minutes of time

1. Check the firmware by tapping the Info tab on your screen on your TRIONet.



**INFORMATION** To perform a remote firmware update of your TRIONet, 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](#)).

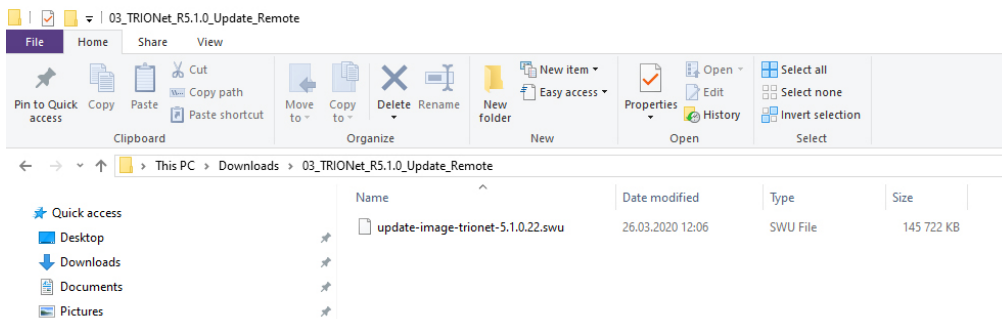
2. Go to <https://ccc.dewetron.com/pr/trionet> and download the 'R5.x.x Remote Update' archive. You have to be logged in to download the files. Login or sign up a new account by clicking the 'Register' button on the top right.



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-trionet-5.x.x.xx.swu



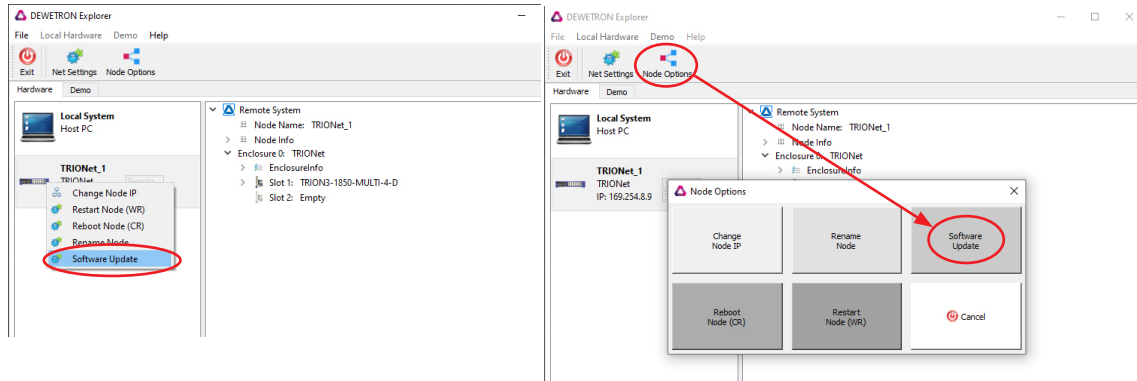
4. At this point at the latest, connect your TRIONet to the laptop/PC and start the DEWETRON Explorer which has been installed with the TRION package, usually via 'Start' > 'All programs' > 'DEWETRON' > 'DEWETRON Explorer' or just type 'DEWETRON Explorer' in the search bar.



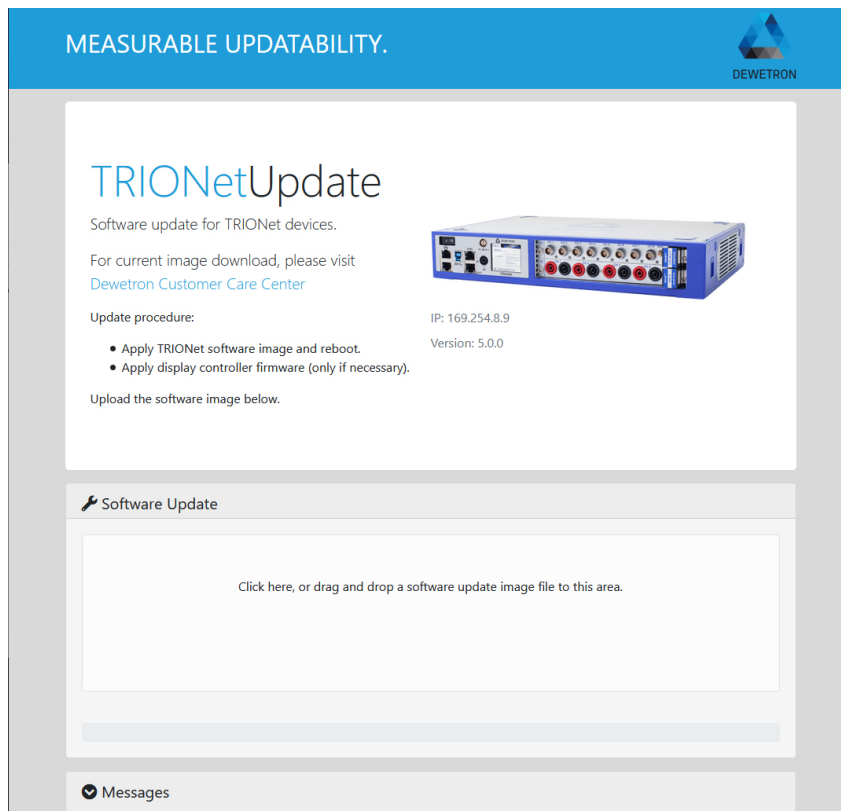
# MAINTENANCE AND SERVICE

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

To initiate a firmware update either right-click on your TRIONet 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 TRIONet. 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-trionet-5.x.x.xx.swu** file to the designated area. You can also simply click that area and browse your .swu file.



# MAINTENANCE AND SERVICE

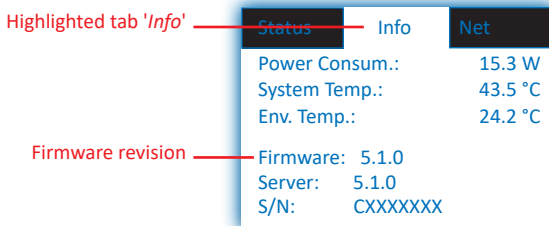
During the update process, the display will show the following message:

**"Update started.  
Do not power off"**



7. After the update process the TRIONet 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.



## 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.

### 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.

---

# MAINTENANCE AND SERVICE

## 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](mailto: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](mailto: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

## Troubleshooting

**TRIONet cannot be detected if connected to laptop/PC with USB 3.0 at all.**

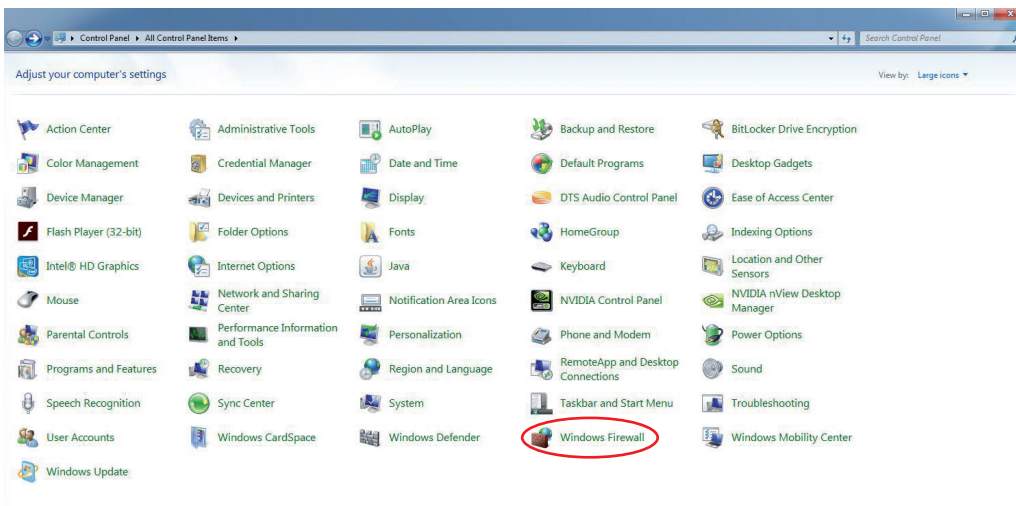
- ▶ Check your USB cable for damages.
- ▶ Check if plugged-in properly into TRIONet as well as Laptop/PC.
- ▶ Check overall cable length. The cable length must not exceed 1.8 m (6 ft)! If you are using a USB 3.0 Type-C adapter, do not exceed overall cable length of 1.8 meters (6 ft) and check if the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

**Two TRIONet units are daisy-chained and implemented into an existing company network. Only one TRIONet 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 TRIONet units or using a network switch is not possible.

**TRIONet 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.



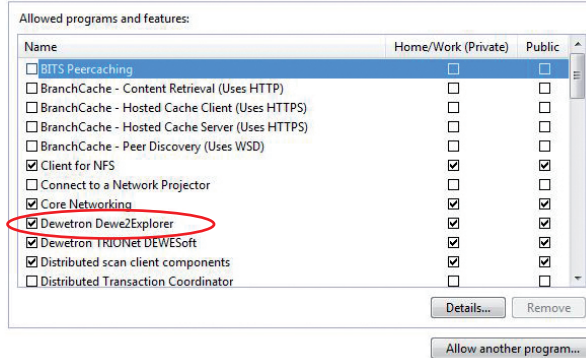
- ▶ Allow access to following programs:
  - DEWETRON Explorer
  - OXYGEN - DEWETRON measurement application

#### Allow programs to communicate through Windows Firewall

To add, change, or remove allowed programs and ports, click Change settings.

What are the risks of allowing a program to communicate?

Change settings

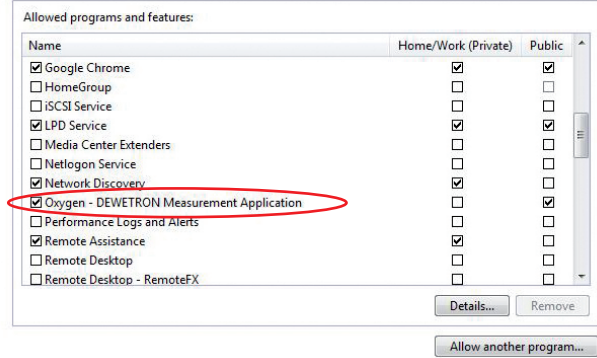


#### Allow programs to communicate through Windows Firewall

To add, change, or remove allowed programs and ports, click Change settings.

What are the risks of allowing a program to communicate?

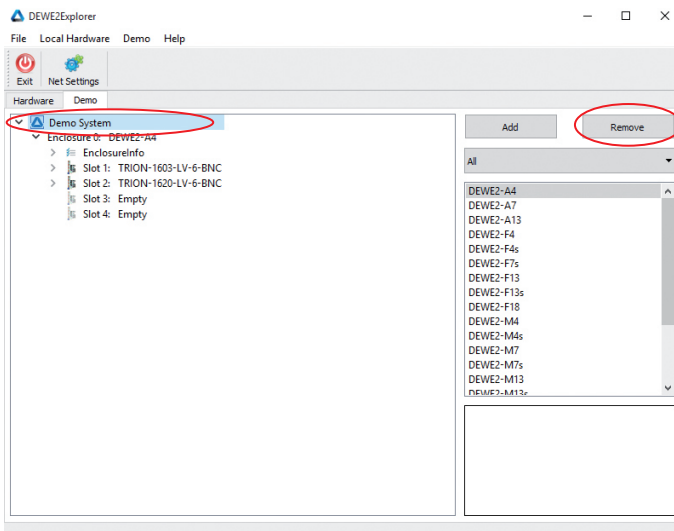
Change settings



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

### Two or more TRIONet 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 TRIONet 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

## Certificate of conformity



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

**TRIONet**

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:

<b>L V E M C</b>	<b>Safety</b>	IEC 61010-1:2010, Pol. deg. 2	
	<b>Emissions</b>	EN 61000-6-4	EN 55011 Class B
	<b>Immunity</b>	EN 61000-6-2	Group standard

Graz, June 01, 2016

Place / Date of the CE-marking

Ing. Thomas Propst / Manager Total Quality

---

# CERTIFICATE OF CONFORMITY

Notes