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USER MANUAL

DuraNAS Family

Ruggedized Network Attached Storage (NAS) devices featuring Power-over-Ethernet (PoE) technology

Rev 2.0 – 5 October 2011 – DuraNAS_UserMan_EN_2.0

Trademarks

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Revision history

Revision	Description	Date
1.0	First release	22 February 2011
2.0	Complete manual review	5 October 2011

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Important user information

Please carefully read and understand the instructions in this manual before using this device.

Whenever you have any doubt regarding the operation of this device, consult this manual or contact your local Eurotech Technical Support Team (see third and fourth cover of this manual for details).

Keep this manual for future reference.

In order to lower the risk of personal injury, electric shock, fire or damage to equipment, users must observe the following precautions, as well as using good technical judgment, whenever installing or using the device.

Eurotech Spa (Eurotech) has made every effort to ensure the accuracy of this document; however, Eurotech assumes no liability resulting from any error/omission in this document, or from the use of the information contained herein.

Eurotech reserves the right to revise this document or to make changes to its content at any time without any obligation to notify any person of such revision or changes.

Alerts that can be found throughout this manual

The following alerts indicate potentially dangerous situations:

SYMBOL	MEANING
	DANGER! Information highlighting potential electrical shock hazards: • Personal injury or death could occur. • Damage to the system, connected peripheral devices, or software could occur. Appropriate safety precautions should always be used; these should meet the requirements set out for the environment that the equipment will be deployed in.
	WARNING! Information highlighting potential hazards: • Personal injury or death could occur. • Damage to the system, connected peripheral devices, or software could occur. Appropriate safety precautions should always be used; these should meet the requirements set out for the environment that the equipment will be deployed in.
	NOTE These will highlight important features or instructions.

Safety notices and warnings

Users must observe the following safety precautions during all phases of operation, service, and repair of the device. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the device.

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

The safety precautions listed below represent warnings of certain dangers of which Eurotech is aware. You, as the user of the device, should follow these warnings and all other safety precautions necessary for the safe operation of the device in your operating environment.

Do not operate in an explosive atmosphere

WARNING!
Do not operate the equipment in the presence of flammable gases or fumes. Operation of any electrical equipment in such an environment constitutes a definite safety hazard.

Antistatic precautions

WARNING!
To avoid ESD (Electro Static Discharge) damage, always use appropriate antistatic precautions when handing any electronic equipment.

Connection to power supply or other devices

DANGER!
Before applying power to the system, thoroughly review all installation, operation, and safety instructions.
Failure to install the system power supply correctly or to follow all operating instructions correctly may create an electrical shock hazard, which can result in personal injury or loss of life, and/or damage to equipment or other property

- To avoid injuries, always disconnect power and discharge circuits before touching them.
- Only start the device with a power supply that meets the requirements stated on the voltage label. In case of uncertainties about the required power supply, please contact the Eurotech Technical Support Team or the electricity authority
- Before connecting other equipment carefully read any supplied instructions
- Always disconnect the power before connecting or disconnecting cables
- Do not perform connections with wet hands
- Check any power cords for damage before use
- Use certified power cables. The power cable must meet the requirements (voltage and current) of the device.
- Position cables with care. Avoid positioning cables in places where they may be trampled on or compressed by objects placed on them. Take particular care of the plug, power-point and outlet of power cable
- Avoid overcharging any power outlets
- Only apply power to the device or connected equipment after checking that all the above conditions have been met

Installation

WARNING!

- **Verify that the mounting location can withstand the added loads caused by the addition of the device, it should be firmly secured so that it will not cause any potentially hazardous situations (e.g. falling down due to vibration or shock)**
- **Do not operate the device near heat sources or flames.**

NOTE:
If the device must be moved from one place to another with different ambient temperatures, ensure sufficient time for the temperature of the device to stabilize before repowering.

Ventilation

WARNING!
Ensure adequate ventilation to avoid overheating, Eurotech suggests the following steps:

- **When installing the device within a cabinet, rack or other enclosed space, be sure to leave sufficient space to allow adequate air circulation**
- **Do not block any ventilation openings**

Maintenance

DANGER!

- **Never open, dismantle or repair the device!**
- **For your maintenance or repair requirement please contact a qualified Eurotech engineer.**

If the device does not function correctly and you are unable to find a solution, feel free to contact the Eurotech Technical Support Team.

If the equipment does not work properly, especially if smells unusual, unplug it immediately and contact the Eurotech Technical Support Team (see third and fourth cover of this manual for details).

Cleaning

WARNING!
When you clean the device, remember to:

- **Ensure sufficient ESD protection during the cleaning process.**
- **Remove any power from the device.**
- **When cleaning an enclosed system or peripheral use a dry cloth on the external casing.**
- **With single boards, use only a low power air brush or soft bristled paintbrush.**
- **Do not use detergents, aerosol sprays, solvents or abrasive sponges.**

Life support policy

WARNING!
Users must not use Eurotech products as critical components of life support devices or systems without the express written approval of Eurotech Spa.

Warranty

Please contact your local Eurotech Sales Office for detailed warranty terms and conditions.
See the third and fourth covers of this manual for further details.

CE notice

This product has the CE labelling in accordance with the 1999/5/EC regulations.
Eurotech shall not be liable for use of its products with equipment (i.e. power supplies, personal computers, etc.) that are not CE marked.

WEEE

The information below complies with the regulations set out in the 2002/96/EC directive, subsequently superseded by 2003/108/EC. It refers electrical and electronic equipment and the waste management of such products.
When disposing of a device, including all of its components, subassemblies and materials that are an integral part of the product, you should consider the WEEE directive.

The use of the following symbol, attached to the equipment, packaging, instruction literature, or the guarantee sheet, states that the device has been marketed after August 13th 2005, and implies that you must separate all of its components when possible, and dispose of them in accordance with local waste disposal legislations:

- Because of the substances present in the equipment, improper use or disposal of the refuse can cause damage to human health and the environment.
- With reference to WEEE, it is compulsory not to dispose of the equipment with normal urban refuse; an arrangement for separate collection and disposal is essential.
- To avoid any possible legal implications users should contact the local waste collection body for full recycling information.

RoHS

This device, including all the components, subassemblies and the consumable materials that are an integral part of the product, have been manufactured in compliance with the European directive 2002/95/EC known as the RoHS directive (Restrictions of the use of certain Hazardous Substances). This directive targets the reduction of certain hazardous substances previously used in electrical and electronic equipment (EEE).

Technical assistance

For any technical questions, or if you cannot isolate a problem with your device, or for any enquiry about repair and returns policies, feel free to contact your local Eurotech Technical Support Team (see third and fourth cover of this manual for details).

Transportation

When transporting any module or system, for any reason, it should be packed using anti-static material and placed in a sturdy box with enough packing material to adequately cushion it.

Warning:
Any product returned to Eurotech that is damaged due to inappropriate packaging will not be covered by the warranty!

Device labelling

On the rear side of the device you will find a label displaying the following information:

- Model
- Serial Number
- Power Requirements

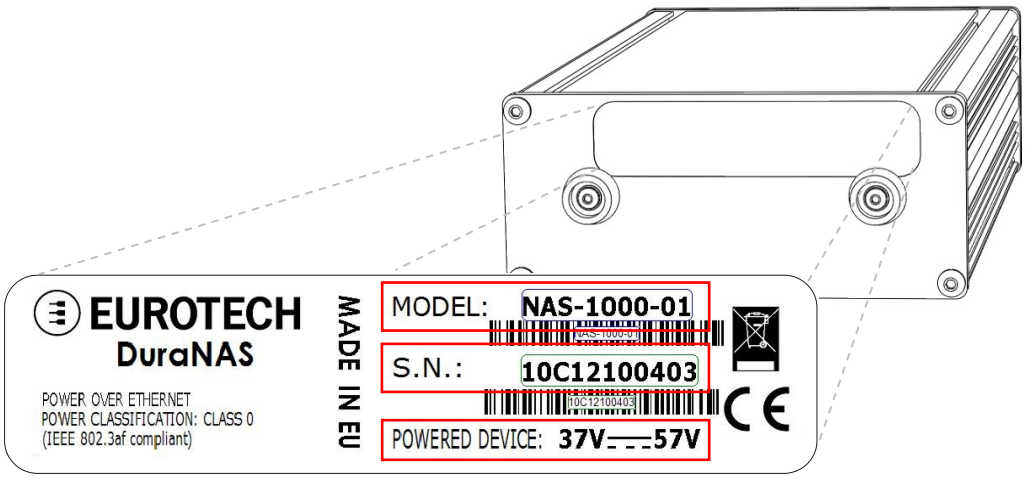

Figure 1. Label location on the rear side

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Product overview

The DuraNAS family of systems is the ideal solution when looking for robust and capable storage devices integrating Network-Attached Storage (NAS)[1] functionalities. When connected to a network, thanks to an integrated Ethernet-to-SATA controller, DuraNAS systems make available two hard disk configurations: RAID0 or RAID1. In addition, the systems are powered using Power-over-Ethernet (PoE) technology[2].

DuraNAS systems allow for different installation possibilities: they can be installed using two mounting brackets, or inserted inside a security enclosure that has a locking mechanism and allows you to install the system while avoiding unauthorized removal.

The rugged design of DuraNAS systems allows their deployment in railway applications prone to harsh environmental conditions.

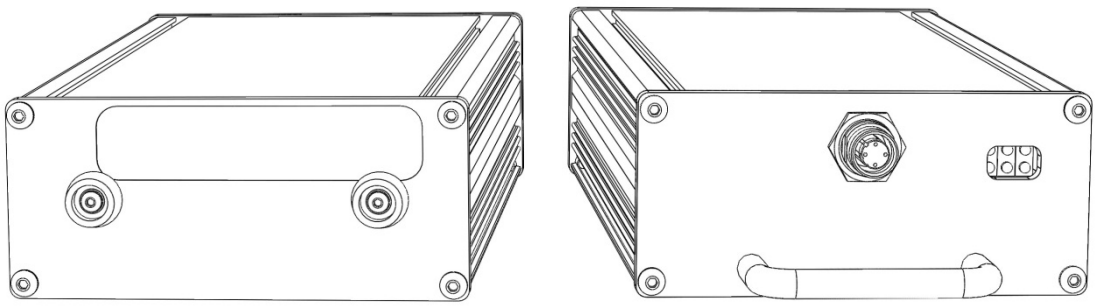


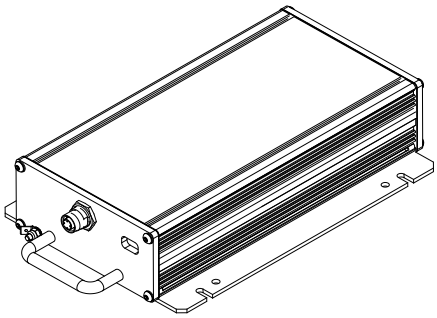
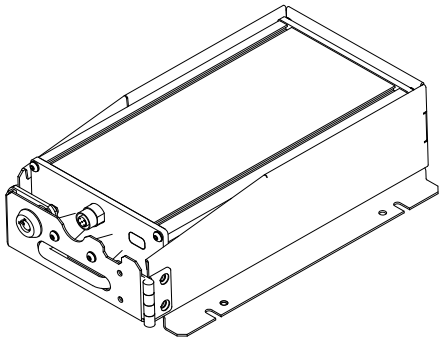
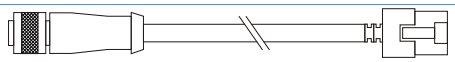
Figure 2. DuraNAS rear and front views

[1] Network-Attached-Storage (NAS) is file-level computer data storage connected to a computer network. It provides data access to heterogeneous network clients.

[2] Power-over-Ethernet (PoE) is a technology that allows the safe transfer of electrical power, along with data, to remote devices using standard CAT-5 cables within an Ethernet network. It does not require modification of existing Ethernet cabling.

Contents of the box

The following order codes are available when purchasing a system of the DuraNAS Family:

Model / Order Code	Description	Diagram
NAS-0200-00	DuraNAS POE 100 GB in RAID 1 or 200 GB aggregated HDD	
NAS-1000-00	DuraNAS POE 500 GB in RAID 1 or 1 TB aggregated HDD	
NAS-0200-01	DuraNAS POE 100 GB in RAID 1 or 200 GB aggregated HDD coming enclosed within a Key-locked Enclosure	
NAS-1000-01	DuraNAS POE 500 GB in RAID 1 or 1 TB aggregated HDD coming enclosed within a Key-locked Enclosure	
NAS-CBL-01	M12 Male to M12 Male Connection Cable (length: 2 m)	
NAS-CBL-02	M12 Male to RJ45 Male Connection Cable (length: 2 m)	

Product specifications

FEATURE	DESCRIPTION
Communication port	10/100Mbps Ethernet host interface
Storage capacity	**NAS-0200-00 and NAS-0200-01 models:** 100 GB in RAID 1 or 200 GB aggregated HD **NAS-1000-00 and NAS-1000-01 models:** 500 GB in RAID 1 or 1 TB aggregated HDD
Encryption standard	Advanced Encryption Standard (AES); 128 bit key-size
LED indicators	• Ethernet link • Ethernet activity • SATA boot failure • Early On • CPU power ON
Power Input	• Power-over-Ethernet • Powered Device: 37 to 57 V dc • Power Classification: Class 0 • (IEEE 802.3af compliant) • Power mode: A mode (phantom power on the data pairs of 100Base-TX or 10Base-TX cables)
Maximum Weight	3 Kg
Maximum Power Consumption	12 W
Overall Dimensions in millimetres (W x H x L)	**NAS-0200-00 and NAS-1000-00 models:** 171.0 x 59.5 x 285.0 **NAS-0200-01 and NAS-1000-01 models:** 171.0 x 83.0 x 293.0
Cooling Fans	Not required. Passive heat sink provided
Operating Temperature	**NAS-0200-00 and NAS-0200-01 models:** -25°C to +55°C; +70°C for 10 minutes **NAS-1000-00 and NAS-1000-01 models:** -10°C to +55°C; +70°C for 10 minutes
Storage Temperature Range	-40°C to +65°C
Relative Humidity	<95% (non-Condensing)
Environmental	IP 65 (NEMA 4X)
Compliance	• EN 50155 (Railway applications) • EN 61373 (Vibrations & Shocks) • EN 60950 (Safety) • EN 61000 (Immunity, Emission) • EN 60068 (Environmental testing)

Front panel Layout

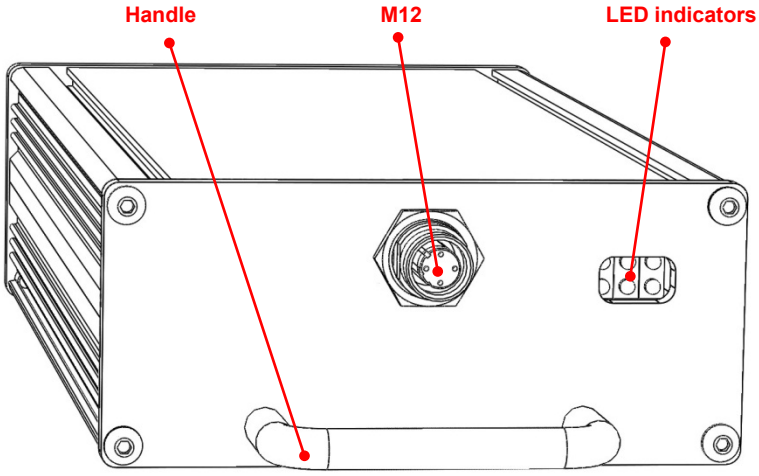
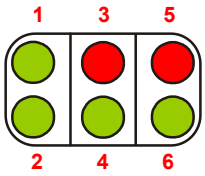


Figure 3. Front panel layout

LED indicator layout and functionality



LED #	FUNCTION
1	Ethernet link
2	Ethernet activity
3	SATA boot failure
4	CPU ready
5	Spare
6	CPU power ON

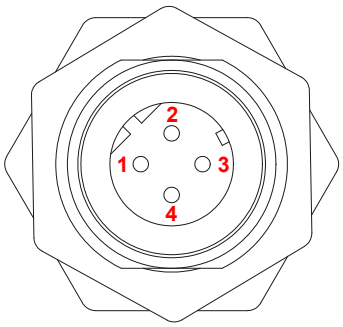
M12 connector layout and functionality

Function

- 10/100 Mbps Ethernet (ETH1) with Power-over-Ethernet with power mode A (phantom power on the data pairs of 100Base-TX or 10Base-TX cables)

Connector type:

- Female box-mounting
- Type: 4-pin, M 12, D Code
- Part #: Lumberg 0986 EFC 152



PIN #	FUNCTION	PoE
1	TX+ (Transmit Data +)	+
2	Rx+ (Receive Data +)	-
3	TX- (Transmit Data -)	+
4	RX- (Receive Data +)	-
Housing	Shield	

System installation and use

Please carefully read and understand the instructions of the chapter 'Important user information' on page 5 before using the device.

In order to lower the risk of personal injury, electric shock, fire or damage to equipment, you must observe the following precautions, as well as using good technical judgment, whenever installing or using the device described in this manual.

WARNING!
The installation of the product described in this manual can be only performed by qualified personnel and must be carried out in accordance with the standards.

WARNING!
To avoid ESD (Electro Static Discharge) damage, always use appropriate antistatic precautions (i.e.: use an antistatic wrist strap connected to ground) when handing any electronic equipment.

Unpacking

When unpacking the equipment, ensure to remove all packaging material. All ventilation openings in the chassis must be free of obstructions. Thoroughly inspect the equipment for damage that may have occurred during shipment. If such damage has occurred, further inspection of the packaging material may be necessary.

Immediately contact your local Eurotech Sales Office (see the third and fourth covers of this manual for further details) to register a claim.

Usage

The unit was intended to be used as a robust storage device, integrating Network-Attached-Storage (NAS) functionalities and taking advantage of the Power-over-Ethernet (PoE) technology.

The unit is **NOT** intended for the following functions:

Function	Examples
Vehicle direction controls	Gears, Brakes, Suspension, Active steering, Speed limitation devices Engine management
Driver positioning	Seat or Steering wheel positioning
Driver visibility	Headlight controls, Windscreen wipers
Functions related to the drivers, passengers and other road-users protection	Airbag and Safety restraint systems
Functions that could cause confusion to the driver or other road users	**Optical disturbances:** Indicator control, Brake lights, Reversing lights, Light bars for emergency system, Warning indicators, Lamps or Displays related to functions in clauses (a) or (b) that may be observed in the direct view of the driver **Acoustic disturbances:** Anti-theft alarm, Horns
Functions related to vehicle data bus functionality	Data transmission on vehicle data bus-systems, which are used to transmit data, required to ensure the correct functioning of other immunity-related functions
Functions that affect vehicle statutory data	Tachograph, Odometer

Warnings about electrical and power connections

DANGER!

- Before supplying power to the product, verify the correct installation, the order of operations to follow and safety instructions
- Power have only to be connected after the installation of the system has been completed
- Do not connect or disconnect the cables with the system or the external apparatus switched on

FAILURE TO INSTALL THE SYSTEM POWER SUPPLY CORRECTLY OR TO FOLLOW ALL OPERATING INSTRUCTIONS CORRECTLY MAY CREATE AN ELECTRICAL SHOCK HAZARD WHICH CAN RESULT IN PERSONAL INJURY OR LOSS OF LIFE, AND/OR DAMAGE TO EQUIPMENT OR OTHER PROPERTY.

WARNING!
It is the responsibility of the system integrator to ensure that all connections are compliant with relevant standards for each type of interface.

WARNING!
The degree protection on the system is only obtained by covering the connectors properly. Be careful to use cables that ensure the seal of the connector. Unused connectors have to be covered with an appropriate plug. An improper cover of the connectors may result in damage to the system and other system's components due to a leaking seal.

WARNING!
See the paragraph 'Operating characteristics' on page 24 for the power requirements of the product.
Use only cables that are appropriate to the power rating of the system.
Make sure that during installation the system maintains a proper grounding.

Installation notes

NOTE:
The device can operate in vertical, transversal and longitudinal orientations.

WARNING!
Verify that the addition of the system does not cause instability or damage to the mounting location. Firmly secure the system.
Be aware of potentially hazardous situation when mounting the system (e.g. falling down). If required, use stiffeners to reinforce the mounting area.

NOTE:
When the unit is mounted, ensure adequate clearance distance for cabling and air circulation: there must be sufficient space to connect the cables and for the maintenance operations.

WARNING!
Make sure the temperature and humidity will stay within the ranges specified in the 'Operating characteristics' paragraph on page 24.
Be aware of other devices that may raise the ambient temperature in the installation area, also the radiated heat of the system itself.

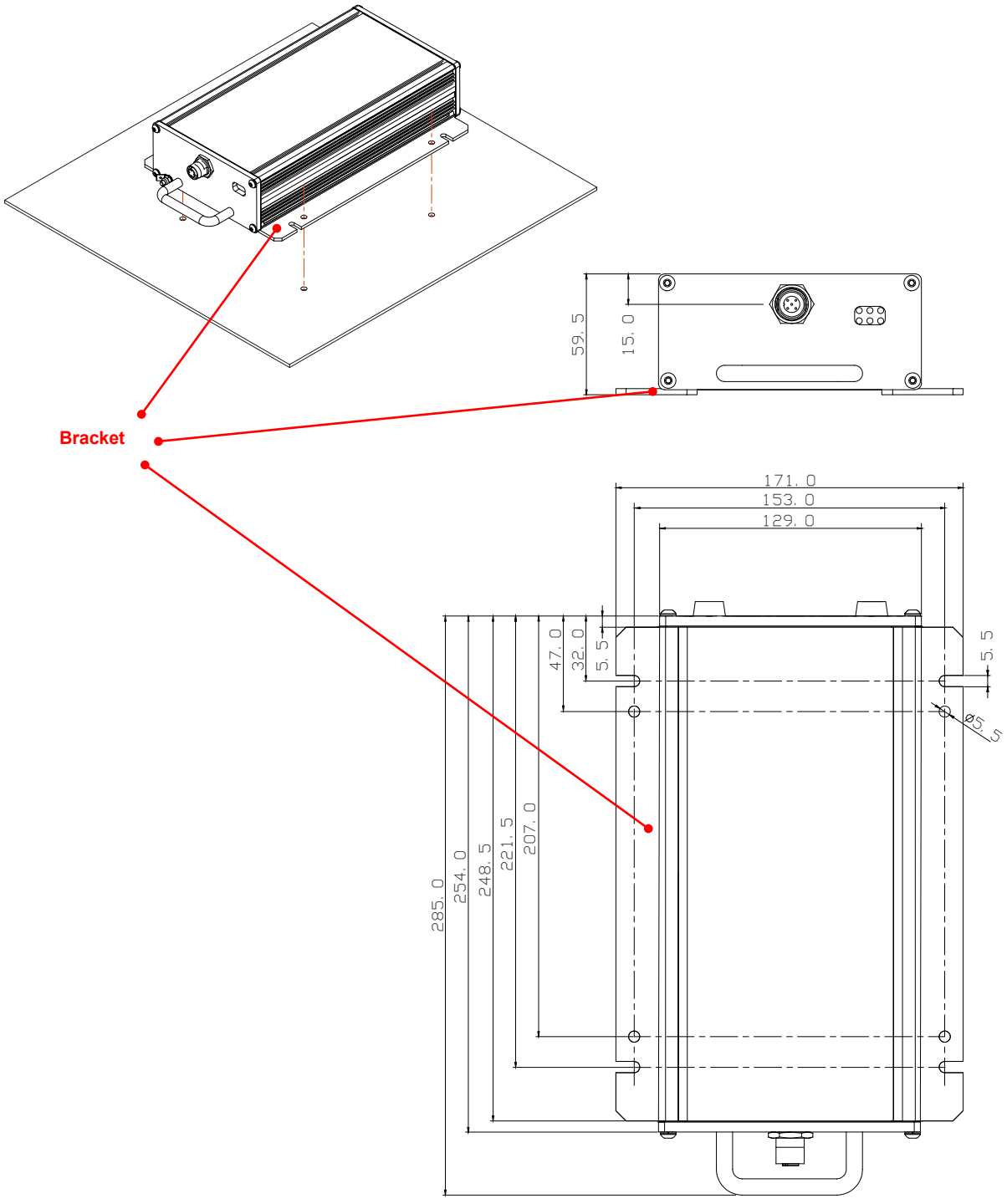
Installation procedure

According to the DuraNAS model there are two methods of installation:

- NAS-0200-00 and NAS-1000-00: installation can be made using the two mounting brackets attached to the DuraNAS system
- NAS-0200-01 and NAS-1000-01: installation can be made using the two mounting brackets attached to the key-locked enclosure

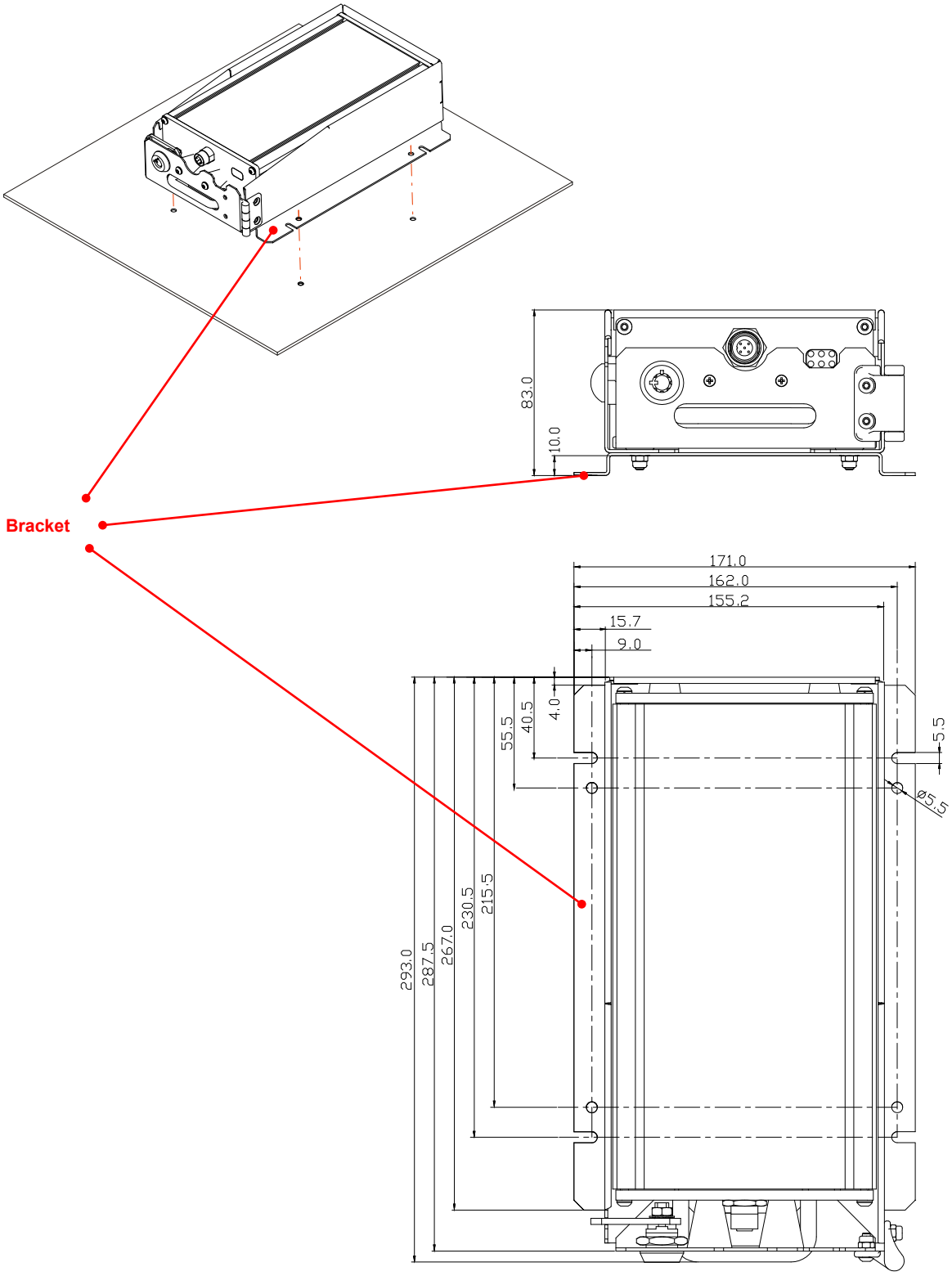
How to install the NAS-0200-00 and NAS-1000-00 models

NAS-0200-00 and NAS-1000-00 models come provided with two mounting brackets attached the system. Four M5 screws and washers can be used to secure the brackets in place.



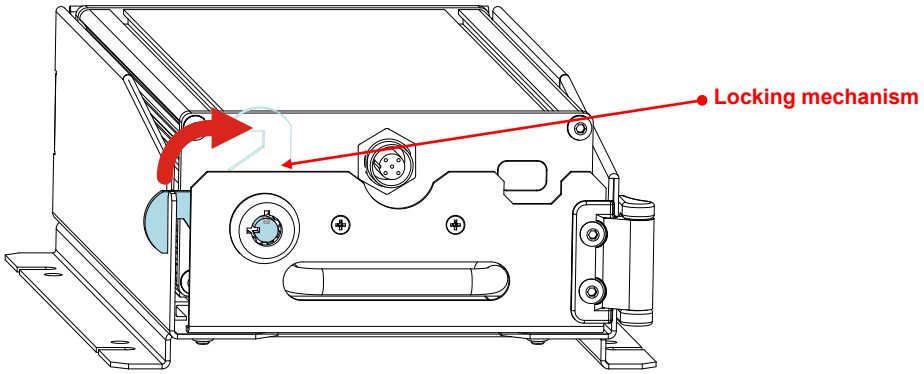
How to install the NAS-0200-01 and NAS-1000-01 models

NAS-0200-01 and NAS-1000-01 models come enclosed within a key-locked enclosure provided with two mounting brackets. Four M5 screws and washers can be used to secure the brackets in place.

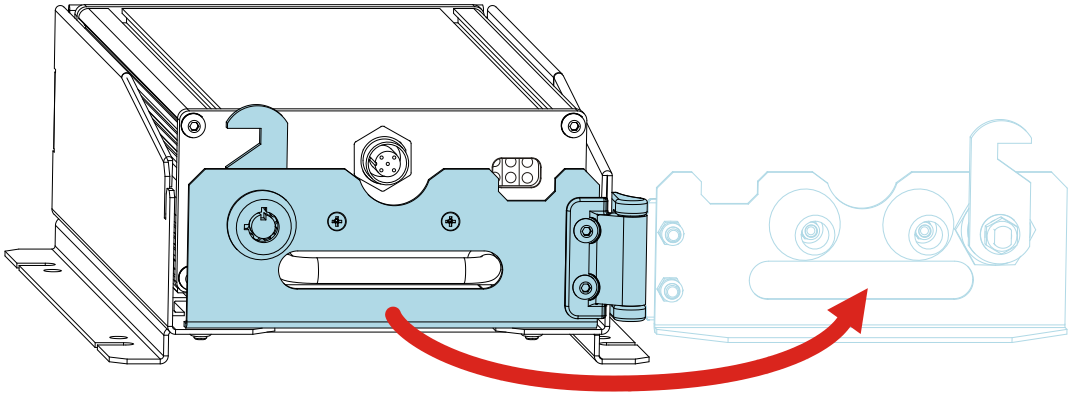


How to release the system from the key-locked enclosure

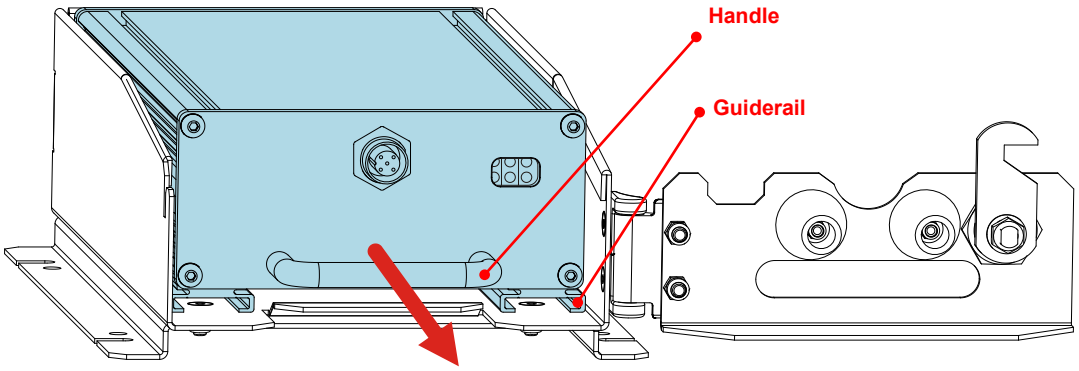
1. Open the latch of the locking mechanism using the key provided



2. Open the security door



3. Pull the handle and slide the system from the enclosure



How to reinstall the system in the key-locked enclosure

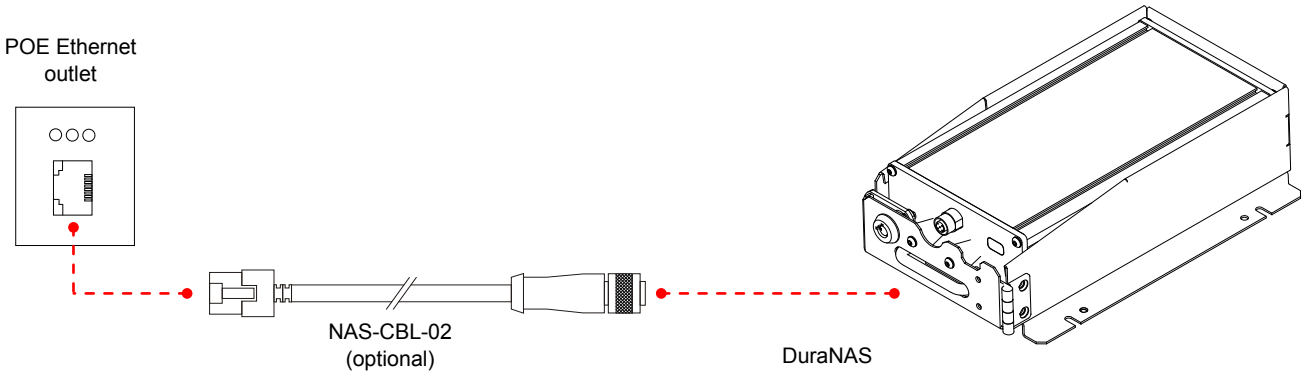
1. The security door must be open
2. Using the handle slide the system along the guiderails to insert it into the enclosure
3. Close the security door and close the latch of the locking mechanism

How to connect the system to the PoE Ethernet

The DuraNAS has to be connected to a PoE Ethernet network via connector M12 using a specific cable (not supplied) complying with the Power-over-Ethernet standards. The PoE power mode is supported in “mode A” only (phantom power on the data pairs of 100Base-TX or 10Base-TX cables)

Once the DuraNAS is connected to the PoE Ethernet, it immediately turns itself ON.

EXAMPLE OF CONNECTION



How to access the DuraNAS

Before you begin

A PC can be used to easily access the DuraNAS.
Before you begin:

1. Ensure that your DuraNAS is properly connected to the POE Ethernet
2. Make sure your computer's IP address is on the same subnet as the DuraNAS
3. You must have either a Windows PC or a Linux PC
4. If you are using firewall software on the PC connected to the DuraNAS device, it could be necessary to temporarily shut it down, as this may cause issues when connecting to the DuraNAS.

Supported network protocols

The DuraNAS supports the following protocols:

- SMB/CIFS (Samba)[3]
- NFSv2 and NFSv3[4]

How to access the DuraNAS

The DuraNAS has the following IP address set by default at: 192.168.0.71.
It is possible to access the DuraNAS using one of the two following ways:

- Mapping a network drive using the folder: 192.168.0.71.
  In this way you will have automatic access to the disk contents
- Using an internet browser and enter the *NAS Manager* for device configuration at the following address: http://192.168.0.71.

[3] SMB/CIFS: Server Message Block / Common Internet File System. Samba is a free software re-implementation of SMB/CIFS
[4] NFS: Network File System

Hardware Encryption

Hardware encryption is available on the DuraNAS.

Disk encryption is performed using the AES-LRW tweakable narrow-block encryption technology that features two 256-bit keys (equivalent to two strings of 32 characters).

For further information refer to the Application Note An0077 (http://www.eurotech.com/DLA/AN/An0077.pdf)

Physical characteristics

Operating characteristics

Electrical operating characteristics

The system meets the IEEE 802.3af PD specifications.

CHARACTERISTIC	MINIMUM	NOMINAL	MAXIMUM
Input Voltage range	37 V dc	48 V dc	57 V dc
Power Consumption			12 W

Environmental specifications

Temperature

CHARACTERISTIC	MODEL	MINIMUM	MAXIMUM	NOTES
Operating Temperature Range	NAS-0200-00	-25 °C	+55 °C	+70°C for 10 minutes
	NAS-0200-01	-25 °C	+55 °C	+70°C for 10 minutes
	NAS-1000-00	-10 °C	+55 °C	+70°C for 10 minutes
	NAS-1000-01	-10 °C	+55 °C	+70°C for 10 minutes
Storage temperature range	All	-40 °C	+65 °C	

Vibration

The mechanical strength of the unit must meet the requirement of the category 1 class B defined in EN 50155.

EMC

Immunity and Emissions must meet the requirements defined in EN 50155 standard.

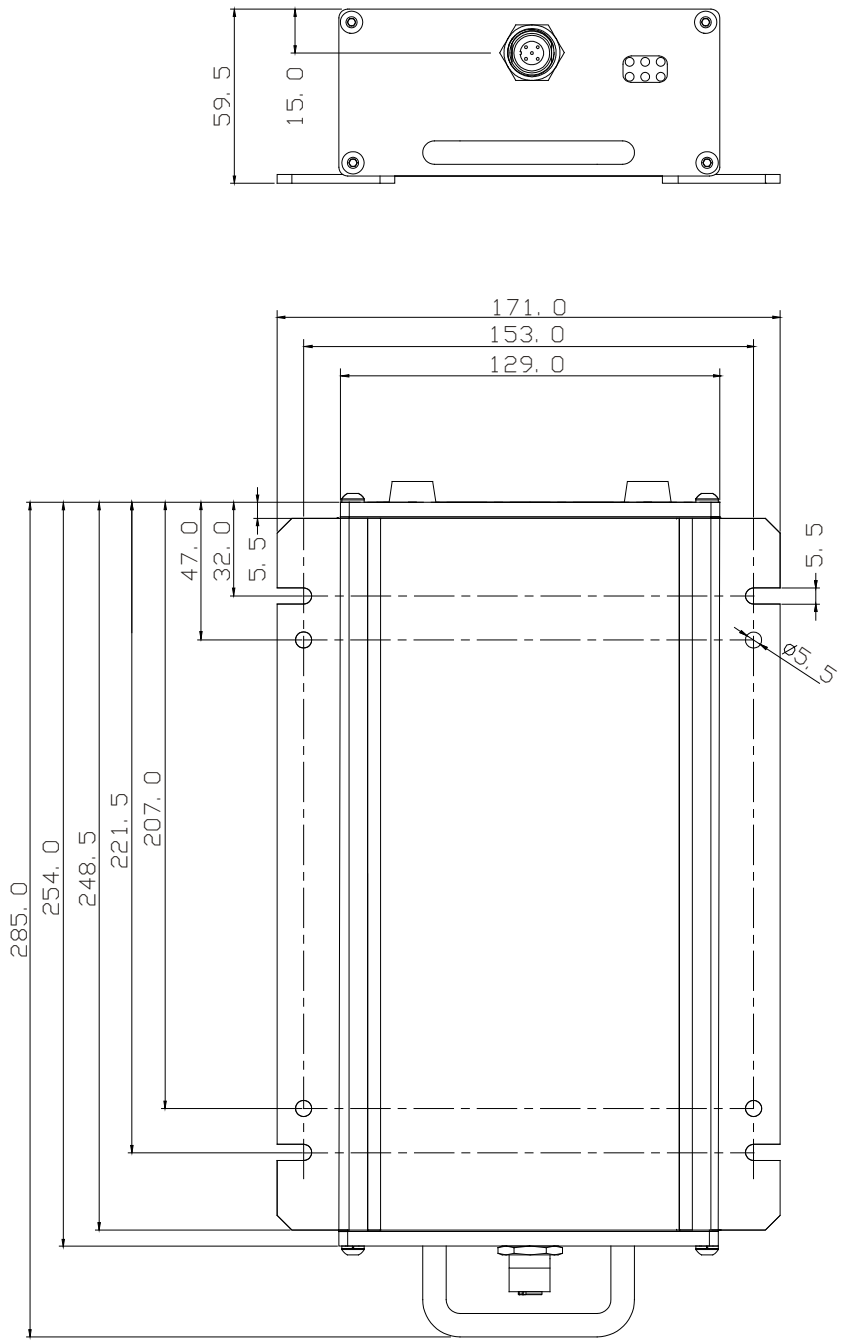
Power supply

The power supply must meet the requirements defined in IEEE 802.3af with power mode supported in “mode A” only (phantom power on the data pairs of 100Base-TX or 10Base-TX cables).

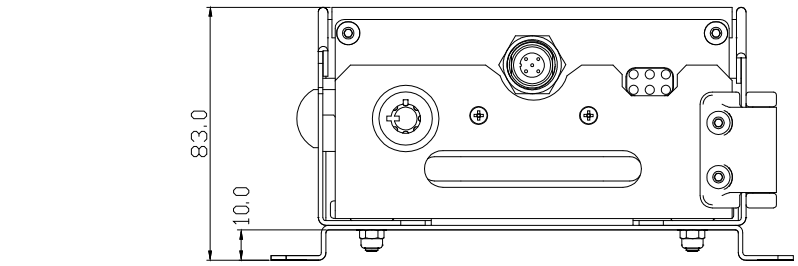
Mechanical characteristics

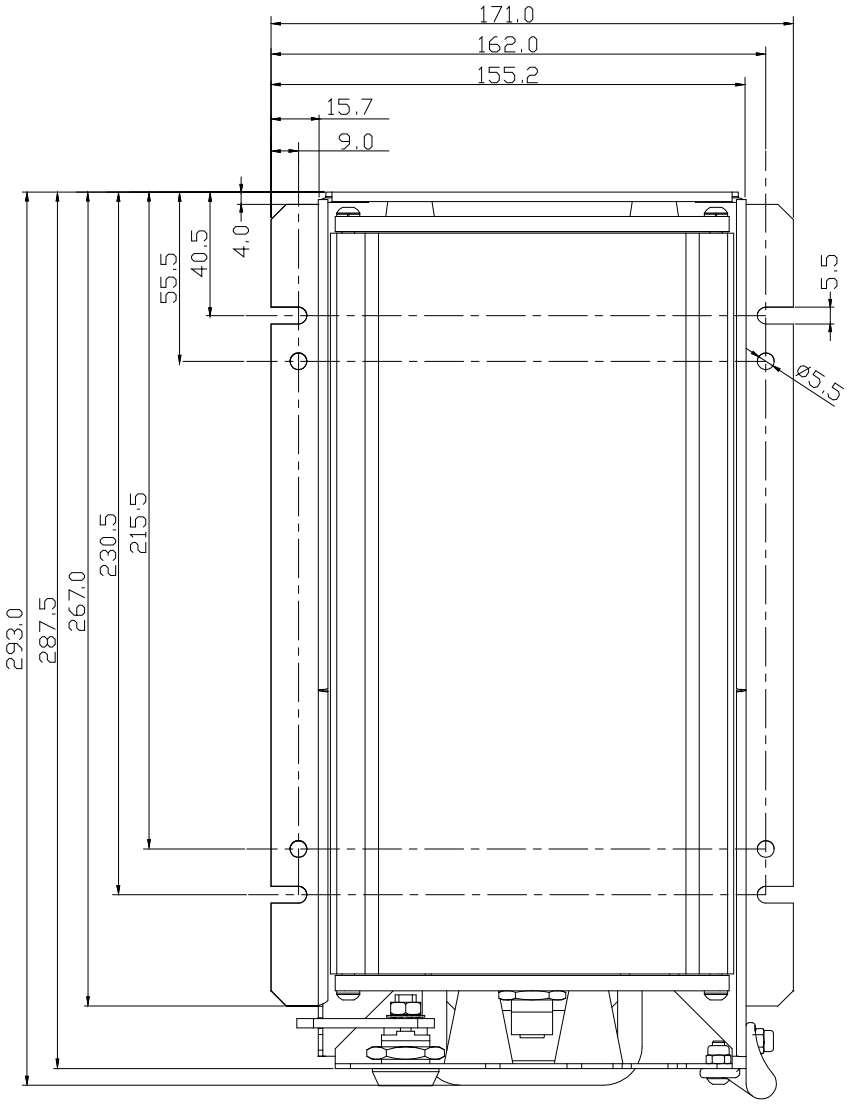
Note: All dimensions are in millimetres unless otherwise stated.

NAS-0200-00 and NAS-1000-00 models



NAS-0200-01 and NAS-1000-01 models





Qualification and certification

Test	Standard followed	Restriction	Type	Routine
Visual inspection	EN 50155 Section 12.2.1		*	*
Performance test	EN 50155 Section 12.2.2	Nominal voltage: 48 Vdc (802.3af compliant) Low limit: 37 Vdc High limit: 57 Vdc Interruption: Class 1 (no interruptions)	*	*
Cooling test	EN 50155 Section 12.2.3 (EN60068-2-1 test Ac)	Class T1: -25°C (HDD not powered below -10 °C)	*	-
Dry heat test	EN 50155 Section 12.2.4 (EN 60068-2-2 test Bd)	Class T1: +55°C (+70° for 10 min.)	*	-
Emission enclosure port	EN 50155 Section 12.2.7.3 EN 50121-3-2 EN 55011	Performance criteria A Scanned over the frequency range: 30MHz to 1GHz	*	-
Fast transient	EN 50155 Section 12.2.8.1 EN 50121-3-2 EN 61000-4-4	+- 2 KV on Ethernet cable Performance criteria: A	*	-
Immunity to conducted disturbances, inducted by radio-frequency fields.	EN 50121-3-2 EN 61000-4-3	Test executed on Ethernet cable from 0.15 MHz to 80 MHz Performance criteria: A	*	-
Radiated, radio-frequency, electromagnetic field immunity test	EN 50121-3-2 EN 61000-4-3	Field strength 20V/m from 80MHz to 1GHz, 10V/m from 1.4GHz to 2.1GHz and 5V/m from 2.1GHz to 2.5GHz. Performance criteria: A	*	-
Electrostatic discharge	EN 50121-3-2 EN 61000-4-2	Contact discharges +-6KV, air discharges +-8KV Performance criteria: A	*	-
Random vibrations	EN 50155 Section 12.2.11 EN 61373 (ed. 2000) Section 8	Category 1 Class B	*	-
Simulated long life testing	EN 50155 Section 12.2.11 EN 61373 (ed. 2000) Section 9	Category 1 Class B	*	-
Shocks	EN 50155 Section 12.2.11 EN 61373 (ed. 2000) Section 10	Category 1 Class B	*	-
Safety	EN 60950	Essential constraints defined in the standard	*	-

* Performed
- Not performed

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Notes

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