NETAŞ Server

Safety Precaution

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Revision History

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HİZMETE ÖZEL - INTERNAL

Contents

HİZMETE ÖZEL - INTERNAL

About This Manual

Purpose

This manual describes the safety precautions that you must know before you use products developed by NETAŞ. The safety precautions include the information about hazard symbols, personal health and safety, and product safety.

Intended Audience

This manual is intended for all persons who need to use NETAŞ equipment, for example, the engineers who install, commission, or maintain the equipment. To reduce personal injuries and system damage, all the related engineers must master the safety precautions described in this manual.

What Is in This Manual

This manual contains the following chapters and appendixes.

Chapter 1, General Safety Precautions	Describes general security precautions.
Chapter 2, Hazard Symbols	Describes the hazard symbols related to personal health, equipment safety, and environment safety on the equipment and in this manual.
Chapter 3, Personal Health and Safety Information	Describes the safety precautions related to personal health and safety.
Chapter 4, Product Safety Information	Describes the safety precautions related to product safety.

Conventions

This manual uses the following conventions.

	Danger: indicates an imminently hazardous situation. Failure to comply will result in death or serious personal injury.
	Warning: indicates a potentially hazardous situation. Failure to comply can result in death or serious personal injury.
	Caution: indicates a potentially hazardous situation. Failure to comply can result in moderate or minor personal injury.
	Notice: indicates equipment or environment safety information. Failure to comply can result in equipment damage, data loss, equipment performance degradation, environmental contamination, or other unpredictable results.
	Note: provides additional information about a topic.

HİZMETE ÖZEL - INTERNAL

HİZMETE ÖZEL - INTERNAL

Chapter 1
General Safety Precautions

Safety Precautions

Note

To reduce the possibility of personal injuries, carefully read this manual before using the equipment. If you have any questions about safety, you should immediately consult your supervisor or contact the local NETAŞ office.

To ensure the safety of persons and equipment, observe all the safety precautions described on equipment labels and in this manual when installing, operating, and maintaining the equipment developed by NETAŞ.

The "**Caution**", "**Warning**" and "**Danger**" items in the manual do not represent all the safety precautions that must be observed. They are only supplements to the local laws and regulations.

Local Laws and Regulations

When operating the equipment, observe local laws and regulations. The safety precautions in this manual are only supplements to local laws and regulations.

Personnel Requirements

All personnel who use NETAŞ products must meet the following requirements:

- Only well-trained personnel are allowed to install, configure, operate, and maintain NETAŞ products.
- Only the personnel authorized by NETAŞ CORPORATION are allowed to replace or modify NETAŞ equipment, parts, or software.
- Report any potential safety problems to the person in charge before using NETAŞ products.

Personal Safety

Observe the following precautions to prevent personal injuries:

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- Remove items of jewelry, such as rings, necklaces, and watches because they can catch on moving parts. Metal jewelry items are conductors that can result in electric shock.
- Always wear appropriate Personal Protective Equipment (PPE) when working.
- Pay attention to the hazard labels and caution or warning information on products. Never cover or remove the labels or information.
- Only use the tools described in instructions.

Product Safety

Observe the following precautions prevent the equipment from being damaged:

- When replacing parts, place the parts, screws, and tools safely to prevent them from dropping into operating fans.
- Never lift a board or unit by pulling the cables on it.
- Never disconnect a connector by pulling the cables on a board or unit.
- Do not block or cover the vents when the equipment is in operation
- Always use a proper tool to tighten the screws when installing a panel.
- After installing and replacing the equipment, remove empty packaging material from the equipment site.

HİZMETE ÖZEL - INTERNAL

Chapter 2 Hazard Symbols

Hazard Symbols on Equipment

For a description of the hazard symbols related to personal health and safety on the equipment, refer to Table 2-1.

Table 2-1 Hazard Symbols on Equipment

Hazard Symbol	Symbol Name	Meaning
	Laser hazard class	This symbol prompts the operator to avoid exposing his or her eyes and skin to the laser source.
	Microwave radiation	This symbol indicates that there are microwave emission devices, prompting the operator to avoid direct exposure to radiation.
	Over-temperature warning	This symbol is attached to the surfaces of a device that may cause burns due to a high temperature, prompting the operator not to touch the hot surfaces during the operation and maintenance of the device to avoid burns.
	Protective ground	This symbol is near the protective grounding terminal of the equipment, from which the grounding cable of the equipment is connected to the external grounding bar.

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Hazard Symbol	Symbol Name	Meaning
	No live-line working	This symbol prompts the operator not to insert or remove a component into or from the equipment when the equipment is powered on.
 or 	Rotating fan	This symbol is silkscreened on or attached to the panel of a fan box, prompting the operator to keep his or her fingers away from the fan.
	Current leakage	This symbol prompts the operator to ground the equipment before powering it on; otherwise, personal injuries or equipment damage may occur due to current leakage.
	Electric shock	This symbol is near a dangerous voltage, indicating that a risk of electric shock may occur if the operator directly contacts the voltage or indirectly contacts the voltage in the damp air.
	Air filter cleaning	This symbol prompts the operator to clean the air filter on a regular basis.
	ESD protection	This symbol is near the ESD wrist strap seat of the equipment, indicating that an ESD wrist strap must be worn during the operation of the equipment.
	Electrostatic sensitivity	This symbol indicates that the operator cannot operate the equipment until he or she wears the ESD clothing, ESD gloves, or ESD wrist straps.

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Hazard Symbols in NETAŞ Manuals

For a description of the hazard symbols related to personal health and safety, equipment safety, and environment safety in NETAŞ manuals, refer to Table 2-2.

Table 2-2 Hazard Symbols in NETAŞ Manuals

Hazard Symbol	Symbol Name	Meaning
	Danger	This symbol indicates an imminently hazardous situation. Failure to comply will result in death or serious personal injury.
	Warning	This symbol indicates a potentially hazardous situation. Failure to comply can result in death or serious personal injury.
	Caution	This symbol indicates a potentially hazardous situation. Failure to comply can result in moderate or minor personal injury.
	Notice	This symbol indicates equipment or environment safety information. Failure to comply can result in equipment damage, data loss, equipment performance degradation, environmental contamination, or other unpredictable results.

HİZMETE ÖZEL - INTERNAL

Chapter 3
Personal Health and Safety Information

Table of Contents

3.1 Electric Shock Hazards

An electric shock hazard refers to a hazard at a voltage equal to or above 42.4 V peak or 60 V DC within the contact area of one hand.

DANGER

Improper electrical installation can result in fire, electric shock, or explosion that is likely to be fatal.

DANGER

When the core of a power cable contacts a conductor, electric arcs or electric sparks may occur and result in fire or eye injury.

Warning

Avoid direct or indirect contact with parts connected to the main power supply because this is likely to be fatal.

Comply with the following operation requirements to prevent electric shocks:

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Note

Power supply installation must be carried out according to applicable local laws and regulations.

- Only qualified electricians are allowed to install or modify electrical equipment.
- Always shut off the power supply before connecting or disconnecting a power cable.
- Avoid direct or indirect contact with parts connected to the main power supply.

3.2 Energy Hazards

Warning

A short circuit between adjacent electrodes of a power supply with a high current or a circuit with high capacitance may cause a fire or personal injury.

Some NETAŞ products contain energy storage devices with high energy levels, for example capacitors and inductors, which store electrical energy even when switched off. Only professional maintenance personnel are allowed to maintain such products.

3.3 Fire Hazards

DANGER

Do not expose the equipment to combustible or explosive gases or fumes, or operate the equipment in such an environment. Failure to comply can result in fire and personal injury.

Warning

If a fire occurs and is out of control, evacuate the building or equipment site immediately. Raise the nearest fire alarm, or call the emergency number. Do not re-enter a burning building under any circumstances.

Comply with the following operation requirements to prevent fire hazards:

- All flammable or volatile liquids must be stored in approved and properly labeled cans or containers.
  All aerosol cans and flammable solvents should be stored in NFPA (or equivalent) approved metal cabinets. Alternatively, flammable materials may be stored 30 feet away from the building.
- Storage of chemicals should conform to the hazardous substance policy, that is, incompatible chemicals should be separated.
- Keep floor and aisle space clean and free of obstacles. Use non-flammable cleaning agents whenever possible.
- Remove empty packaging material and installation debris from the equipment site.
- Make sure that there is an adequate number of functional carbon dioxide fire extinguishers for electrical fires at the equipment site.

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3.4 Heat Hazards

Warning

When the equipment is operating, some parts of the equipment reach high temperatures. Contact with these parts may cause scalds.

CAUTION

The temperatures of the heaters and near the vents of the heaters are high. Contacting the heaters or approaching the vents may cause scalds.

Comply with the following operation requirements to prevent heat hazards:

- If you need to contact a high-temperature part, you must wear protective clothes, or power off the equipment and wait until it is cool.
- Never contact the heaters or the hot air of the heaters, or approach the vents of the heaters.

3.5 Mechanical Hazards

A mechanical hazard refers to a hazard that is caused by sharp edges or rotating blades in equipment.

Warning

Device instability (such as a fall of a device) may cause personal injuries.

Warning

Damaged power tools or improper use of power tools may cause personal injuries.

CAUTION

Sharp edges or corners of the equipment may cause cuts when you operate or move the equipment.

CAUTION

The equipment may have components operating at a high speed, for example, a fan. Putting your fingers or tools into a rotating fan may cause personal injuries or damage to the equipment.

Comply with the following operation requirements to prevent mechanical hazards:

- Do not place the equipment on the ground with a tilt angle greater than 10° from the horizontal.
- Do not use damaged tools.

HİZMETE ÖZEL - INTERNAL

- Use tools strictly according to their instructions. Power off the tools when they are not in use.
- Wear protective clothes and gloves when operating or moving the equipment.
- In most cases, two persons are required to carry a chassis. It is forbidden to carry a heavy chassis by one person. When moving the chassis, keep your back straight and move smoothly to avoid sprains.
- Never put your fingers or any tools into a rotating fan until the fan is powered off and stops rotating.

3.6 Laser Hazards

Warning

Bare optical fibers or connector ports emit laser that is invisible to naked eyes. The power density of the laser is very high. Staring at or being exposed to the laser may cause serious personal injuries.

Comply with the following operation requirements to prevent laser hazards:

- Only specially-trained personnel are allowed to use laser.
- Always wear goggles when working with laser or optical fibers.
- Switch off the laser source before disconnecting a fiber connector.
- Do not look directly at or keep your eyes close to the end of an optical fiber before the laser source is switched off.
- Avoid laser radiation when opening the front door of the optical transmission system.

3.7 RF Radiation Hazards

CAUTION

An operating RF device generates RF radiation that may injure human bodies exposed too much to the radiation. Limits on RF leakage are specified in national and international standards, regulations or guidelines.

l personnel who are responsible for installing and maintaining RF transmitting equipment must have sufficient knowledge about RF safety. They must have been trained to be aware of potential risks of RF exposure. During the installation and operation, comply with the following operation requirements to prevent RF radiation hazards:

- All personnel entering an Electromagnetic Energy (EME) controlled area must know how to reduce potential exposure to RF radiation.
- All personnel who will be required to wear PPE must know how to use the PPE correctly.

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- Switch off transmitting antennas, or reduce their output power to a safe level when operating or working near these antennas.
- If RF exposure cannot be reduced to a level within the occupational exposure limits, appropriate personal safety monitoring equipment must be used.
- Never operate transmitters without taking protective measures.
- Do not operate base station antennas in an equipment room.
- Broken or disconnected RF cables can result in exposure levels exceeding specified safety limits. Repair or reconnect such cables before starting work.

3.8 Other Hazards

Heavy Object Lifting

Warning

Unqualified connections may cause heavy objects to fall, and the falling heavy objects may cause serious or even fatal personal injuries.

Comply with the following operation requirements when lifting heavy objects:

- Personnel operating lifting equipment must be qualified.
- Wear a safety helmet.
- Do not move under a jib or lifted objects.
- Only qualified personnel are allowed to connect loads to lifting equipment with a sling.

Working at Heights

Warning

When working at heights, prevent objects from falling.

Working at heights means that working at heights above 2 m (including 2 m) of reference planes. Comply with the following operation requirements when working at heights:

Note

Comply with local laws, regulations, and guidelines.

- All personnel working at heights must be specially-trained and certificated.
- Take appropriate safety measures, for example, wearing a helmet and safety belt.
- One or more protection systems must be used.
- Do not throw objects from heights to the ground, or throw objects from the ground to heights. Use ropes, cradles, aerial lift vehicles, or cranes to transport objects.

HİZMETE ÖZEL - INTERNAL

- Do not place scaffolds, springboards, or other sundries on the ground below an aerial working area.
- Never stay under or pass through an aerial working area.
- Antenna poles, ladder bolts (step bolts), and derrick masts are not structural components. Do not use them to fix protective devices.
- Never slide down directly from a tower by using ropes.
- Remove scaffolds from the top to the bottom after the work is completed. Do not remove upper and lower scaffolds at the same time. When removing a part of scaffolds, prevent other parts from collapsing.

Battery

Warning

Improper replacement of batteries may cause danger such as bruises, electric shocks, fires, and explosions.

Comply with the following requirements when operating batteries:

- In most cases, batteries are large and heavy, so mechanical tools should be used to facilitate transport.

  Note

  Read the precautions related to battery transportation carefully before operating the batteries.

- Avoid battery short circuits caused by metallic objects.
- The lead acid batteries may give out inflammable gases. Place the batteries in ventilated and fireproof places.
- Replace a battery with the same model. Otherwise, there may be a risk of explosion!
- The batteries must be disposed following the instructions on them. Never throw batteries into fire.

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Chapter 4
Product Safety Information

Table of Contents

4.1 Equipment Transportation

The following precautions must be observed during equipment transportation:

- During equipment transportation, do not remove the outer packing that prevents the equipment from being scratched or damaged.
- If the equipment is temporarily placed, cushioning materials, such as cartons, must be used at the bottom of the equipment to protect the equipment from being directly scratched, knocked, or touched by other objects.
- When moving the equipment on site, use protective materials (such as foam or cardboard) to protect the equipment at the touch points.
- When hoisting the equipment, pull the equipment carefully to protect its surface from being damaged due to collisions with other objects.

4.2 Batteries

Battery Temperature

Notice

Overtemperature can result in deformation, damage, and electrolyte spill.

Check lead-acid batteries for signs of overheating. When the temperature of a lead-acid battery is above 60 °C, check whether there are electrolyte spills. If so, dispose of the spills properly and immediately.

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Electrolyte Spills

Notice

Electrolyte spills erode metal objects and boards and cause equipment damage.

When electrolyte spills occur, absorb and neutralize the spilled liquid by using the absorbent and neutralizer specified by the battery manufacturer. Typical neutralizers are as follows:

- Sodium bicarbonate (baking soda): $NaHCO_3$
- Sodium carbonate (soda): Na_2CO_3

4.3 Optical Module Handling

Comply with the following operation requirements when operating optical modules during the commissioning:

- Before using an Optical Time Domain Reflectometer (OTDR) to check optical lines, notify the person on duty in the peer end equipment room to remove the measured fibers from the optical boards.

  Notice

  In most cases, if optical fiber attenuation is high, an OTDR is used to locate the fault. If the optical fibers are not disconnected, the optical boards of the equipment can be destroyed by strong light emitted by the OTDR.

- If an SDH analyzer or data analyzer is used to test an optical module, the input optical power of the optical module must not exceed the overload point. The input optical power should be 5 dB lower than the overload point.

  Notice

  If the input optical power of an optical module is higher than its overload point, the laser is prone to damage.

- In a self-loop test of an optical module, use an optical attenuator. Do not directly connect the output end to the input end.
- When operating fiber pigtails, flanges, connectors, or instruments, use fiber pigtail caps, flange covers, and connector caps to prevent the optical interfaces from dust, foreign objects or external force.
- The bending radius of 2 mm-diameter and 3 mm-diameter fiber bundles and cannot be less than 30 mm and 40 mm respectively.

HİZMETE ÖZEL - INTERNAL

4.4 Electrostatic Protection

Electrostatic Protection in Equipment Operations

Notice

Static electricity generated by human bodies and between clothes and the equipment may damage electrostatic-sensitive components of the equipment, such as a Large Scale Integration (LSI) circuit.

Comply with the following operation requirements to prevent static electricity:

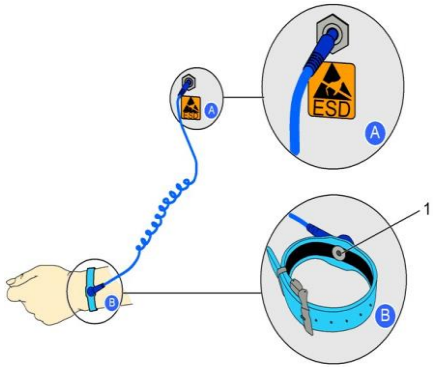
- Make sure that the equipment is correctly grounded.
- Before operating the equipment, make sure that the metal buckle of the ESD wrist strap is in good contact with your skin. Make sure that the other end of the wrist strap is plugged into the ESD jack on the equipment ( ), as shown in Figure 4-1.
- When the ESD wrist strap is in good condition, the resistance of the system ranges from 0.8 MΩ to 1.2 MΩ.

Note

Generally, an ESD wrist strap has a service life of two years. It should be replaced when the resistance is out of the range.

- The ESD wrist strap cannot prevent the ESD that occurs when your clothes contact a board. Avoid contacts between boards and clothing.

Figure 4-1 Wearing ESD Wrist Strap



1. Metal buckle

Electrostatic Protection in Equipment Storage and Handling

When storing or handling circuit boards or other parts, use the original package or other antistatic materials for electrostatic protection. Failure to comply can result in equipment damage.

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4.5 Spare Parts Safety

Environmental Requirements for Spare Parts

To ensure the storage safety of spare parts, the spare parts warehouse must meet the following requirements:

- Warehouse temperature range: -15 ℃ to 45 ℃.
- Warehouse humidity range: 30% to 70%.
- The warehouse is an enclosed area where doors, windows, and roofs cannot be opened. The warehouse should be windproof, waterproof, and sunproof.

Regular Inspection of Spare Parts

To ensure the quality of spare parts, spare parts must be sent to NETAŞ for inspection in accordance with the following principles (for any questions, please contact 800-830-1118):

- The spare parts that require inspection include boards and devices, but do not include cables, installation accessories, and structural components.
- The spare parts that have been stored for more than one year but less than three years should be inspected once a year. The spare parts that have been stored for more than three years but less than six years should be inspected once a year or half a year.
- For the spare parts affected by package damage, dropping, impact, water, or moisture during the storage period, inspection is required without the need of considering the storage time.

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Glossary

DC

- Direct Current

EME

- Electromagnetic Energy

ESD

- Electrostatic Discharge

LSI

- Large Scale Integration

NFPA

- National Fire Protection Association

OTDR

- Optical Time Domain Reflectometer

PPE

- Personal Protective Equipment

RF

- Radio Frequency

SDH

- Synchronous Digital Hierarchy

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