NEXCOM International Co., Ltd.

Network and Communication Solutions

Desktop Telecom Appliance

DTA 1600

User Manual

NEXCOM International Co., Ltd.
July 2026

www.nexcom.com

Contents

PREFACE

Copyright

Disclaimer

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Acknowledgements

DTA 1600 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

This section provides the FCC compliance statement for Class B devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

This equipment has been tested and verified to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2011/65/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force in to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2013 will be RoHS compliant. They will use the usual NEXCOM naming convention.

Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."
- Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Safety Precautions

1. Read these safety instructions carefully.

2. Keep this User Manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.

7. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by skilled person.

14. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.

15. Do not place heavy objects on the equipment.

16. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.

17. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

    "ATTENTION: Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebus les batteries usagées selon les instructions."

18. This equipment is not suitable for use in locations where children are likely to be present.

    Cet équipement ne convient pas à une utilisation dans des lieux pouvant accueillir des enfants.

19. Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.

    Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.

20. Use certified and rated Laser Class I for Optical Transceiver product.

Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
   - Product name and serial number
   - Detailed information of the peripheral devices
   - Detailed information of the installed software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wordings of the error messages

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.

2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

Conventions Used in this Manual

Warning:
Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.

Caution:
Information to avoid damaging components or losing data.

Note:
Provides additional information to complete a task easily.

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Package Contents

Before continuing, please verify the contents of the product package. The items included are listed in the table below.

Item	Part Number	Name	Description	Qty
1	6023309081X00	CABLE EDI:232091081804-RS	COM PORT. DB9 FEMALE TO RJ45 8P8C L:1800mm	1
2	5044440031X00	RUBBER FOOT KANG YANG:RF20-5-4P	19.8x18x5.0mm	4
3	7400036022X00	POWER ADAPTER LITEON:PA-1360-32B1	36W 12V/3A 71.5x43.5x44.5mm	1

Ordering Information

Refer to the list below for the ordering information.

Barebone

DTA 1600 (P/N: 10TA0160000X0)

MediaTek® MT7988A CPU, 4 cores, 4 x 1GbE RJ45 switch, 1 x 10GbE SFP+, 1 x 2.5GbE RJ45 ports, fanless, 1 x 36W 12V DC-in power adapter

Chapter 1: Product Introduction

Overview

Front

Rear

Key Features

- MediaTek® MT7988A processor, 4 cores, 6.3W
- Onboard DDR4, default 4GB
- eMMC 32GB onboard
- 1 x 10GbE SFP+ port
- 1 x 2.5GbE RJ45 port
- 4 x 1GbE RJ45 switch port
- 1 x USB 3.2, Type-A
- TPM 2.0 onboard
- Fanless design
- NEXBOOT® (dual-layer OS failover)

Hardware Specifications

Processor

- MediaTek® MT7988A CPU, 4 cores *(A73), 6.3W, (up to 1.8GHz)

System Capabilities

- TPM 2.0 onboard
- NEXBOOT® (dual-layer OS failover)

Memory

- Onboard DDR4, default 4GB (3200 MT/s)

Storage

- eMMC 32GB onboard
- NOR Flash 32MB onboard

I/O Interface External

- Button: Reset
- Slider switch: NEXBOOT®
- LED: PWR/SYS/BYPASS/NEXBOOT®
- 1 x USB 3.2 port, Type-A
- 1 x Console port (RJ45)
- 1 x 10GbE SFP+ port
- 1 x 2.5GbE RJ45 port
- 4 x 1GbE RJ45 switch port

Power Input

- DC 12V (36W) input

Mechanical

- Chassis dimension: 165 mm (W) x 134.5 mm (D) x 34 mm (H)
- Package dimension: 226 mm (W) x 220 mm (D) x 173 mm (H)
- Net weight: 0.58 kg
- Gross weight: 1.34 kg

Environment

- Ambient with air flow 0.5m/s: 0°C~40°C
- Storage temperature: -20°C~80°C
- Relative humidity: 10%~90% non-condensing Certifications

Certifications

- CE/FCC class B

Operating System

- OpenWRT 21.02

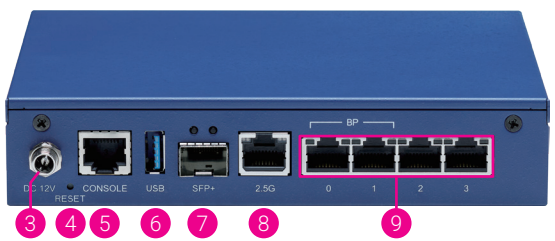
Software Development Kit

- OpenWrt SDK

Knowing Your Device

Front Panel

Rear Panel



1. **LED indicators**
2. **NEXBOOT® dip switch**
3. **Power input**
4. **Reset pinhole button**
5. **RJ45 debug (UART) console port**
   Console access is required for initial debugging or recovery procedures.
6. **USB 3.2 Gen 1 Type-A**
7. **10Gbps SFP+ port for uplink**
8. **2.5Gbps RJ45 port for uplink**
9. **1Gbps RJ45 ports for internal LAN**
   LAN0 and LAN1 support BP(Bypass) mode, allowing hardware-level link continuity in the event of software failure or power loss. By default, Bypass mode is set to standard NIC. For detailed information on Bypass mode configuration, please contact the NEXCOM support team to obtain the relevant documentation.

LED Indicators

- This section describes the status of LEDs used in the system. Note that the LED behavior may vary depending on firmware customization.
- The NEXBOOT® LED indicates which disk partition is currently booting or running. By default, the NEXBOOT® LED is disabled. For detailed information on NEXBOOT® LED status indications and instructions on how to enable the NEXBOOT® function, please contact NEXCOM support team to obtain the relevant documentation.
- Bypass mode ensures LAN0 ↔ LAN1 connectivity even during system failure.

LED	Status	Description
PWR	Steady green	Powered or rebooting
	Steady orange	System is off but in standby power mode (S5-like)
SYS	Steady orange	Reserved for customization
	Steady green	System has booted to the Linux command line
	Off	No power
		Reserved (default: Off)
NEXBOOT®	Blinking green	Booting the primary disk
	Steady green	Primary disk boot is successful
	Blinking orange	Booting the secondary disk
	Steady orange	Secondary disk boot is successful
	Green and orange LEDs alternating	Fatal Error (all disks failed)
	Corresponding LED staying solid on	Completing OS boot
	Off	System Off (S5)
BP (Bypass)	Steady green	Normal mode (software-controlled)
	Steady orange	Hardware-level bypass mode active
	Off	Port disconnected or inactive

Reset

- Press and hold the reset button for more than one second, then release it to trigger a software-defined reset event.
- Press and hold the reset button for more than four seconds, then release it to trigger a hardware reset.
- In the S5 state (power off):
  Press and release the button to trigger a wake event.
  Press and hold for one second to enter the S0 (power on) state.

Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the DTA 1600 motherboard.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers screwdrivers
  - A grounding strap
  - An anti-static pad
- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.
- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:

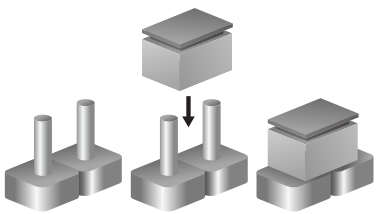
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

Jumper Settings

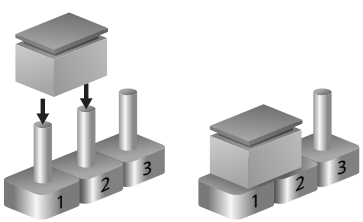
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is open.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)



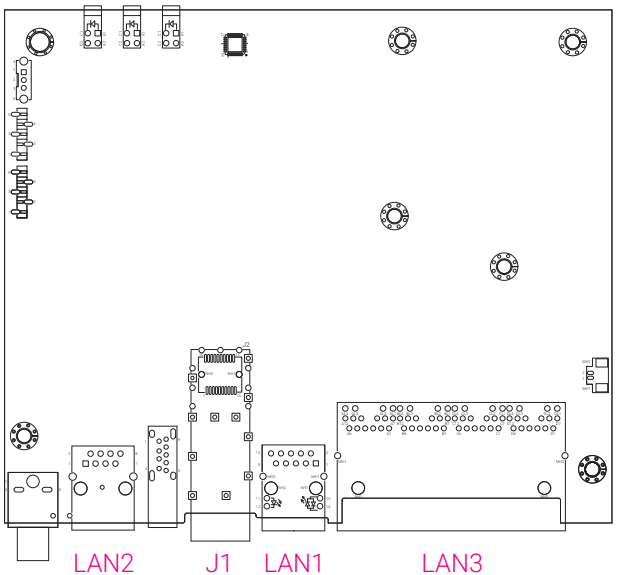
Three-Pin Jumpers: Pins 1 and 2 are Short



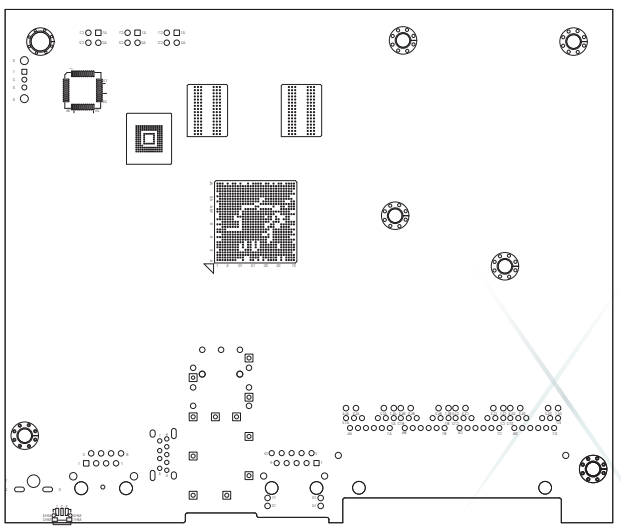
System Main Motherboard Overview

The image(s) below illustrate the layout and locations of the motherboard's connectors, headers, and jumpers. Pin assignments referenced in the following section are highlighted in pink.

Top View



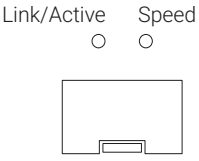
Bottom View



I/O Interfaces

SFP+

Connector location: J1

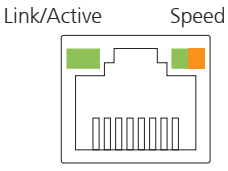


Link/Active	Status
Steady green	Link established
Blinking green	Data traffic

Speed	Status
Steady green	10Gbps network link
Off	No transceiver module detected or no link

2.5Gbps RJ45 Port

Connector location: LAN1

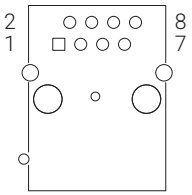


Link/Active	Status
Steady green	Link established
Blinking green	Data traffic

Speed	Status
Steady green	2.5Gbps network link
Steady orange	1Gbps network link
Off	100/10Mbps or no link

Console RJ45 Port

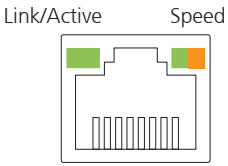
Connector location: LAN2



Pin	Definition
1	NA
2	NA
3	Console_UART1_TXD
4	GND
5	NA
6	Console_UART1_RXD
7	NA
8	NA
NH1	NC
NH2	NC
MH1	CGND
MH2	CGND

1Gbps RJ45 Ports

Connector location: LAN3

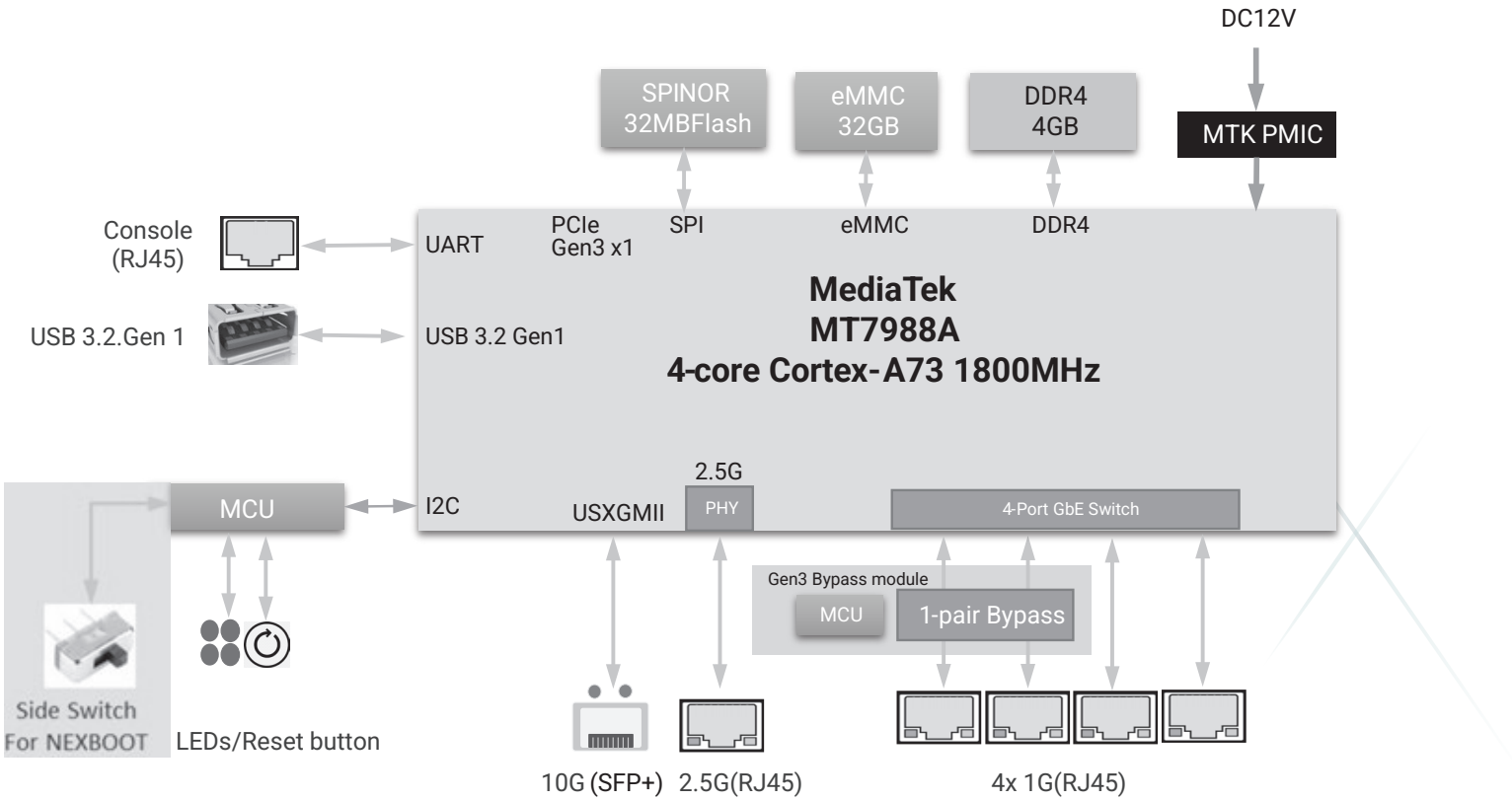


Link/Active	Status
Steady green	Link established
Blinking green	Data traffic

Speed	Status
Steady green	1Gbps network link
Steady orange	100/10Mbps network link
Off	No link

Block Diagram

Main Board



Chapter 3: System Software and Access Guide

OS Information

The DTA1600 is a high-performance embedded networking platform running OpenWrt 21.02 with Linux kernel version 5.4.281. It is built upon the MediaTek® MT7988A SoC and is enhanced with a customized Software Development Kit (SDK) from MediaTek.

To ensure robust performance and long-term stability for production environments, MediaTek replaces several upstream OpenWrt components with SoC-specific implementations. These include optimized drivers for Ethernet, USB, Wi-Fi, and other low-level subsystems tailored to the MT7988A architecture. This deep integration maximizes hardware capabilities and ensures better stability and performance compared to generic OpenWrt distributions.

In addition to MediaTek's SoC-level optimizations, NEXCOM further refines the platform through board-level customization, advanced initialization flows, and the inclusion of utility enhancements for industrial and enterprise-grade use cases. NEXCOM's value-added integrations include performance tuning of I/O interfaces, enhancements to thermal and power management, and additional system diagnostics and monitoring support.

Together, the combination of MediaTek's SoC-level SDK and NEXCOM's system-level improvements results in a reliable, extensible platform that remains compatible with the broader OpenWrt ecosystem while offering enhanced usability, performance, and readiness for deployment in demanding environments.

This approach leverages the modularity and transparency of OpenWrt while delivering a finely tuned, hardware-optimized system that is ready for both customization and immediate production use.

Network Device Name

- **eth0 (CPU Internal Port)**

The eth0 interface represents the internal CPU Ethernet port connected to the switch chip.

- **lan0 ~ lan3 (LAN Switch Ports)**

These are the physical LAN switch ports on the device, typically labeled LAN0 through LAN3. Each port is a DSA switch port and can be configured as an independent interface.

lan0 and lan1 support Bypass Mode, allowing hardware-level link continuity in the event of software failure or power loss.

- **eth1 (WAN Port)**

The eth1 interface corresponds to the WAN Ethernet port, supporting 2.5G speeds for uplink connectivity.

- **eth2 (SFP+ Port)**

The eth2 interface corresponds to the 10G SFP+ fiber uplink port for high-speed network backhaul.

Login Details

- By default, the system uses the root account without a password.
- You can access the system via serial console or SSH, depending on your network setup and configuration.
- No login prompt will appear on the web interface until a password is set.

Command Line Operations

- Basic operations such as network configuration, software management, and system customization can be performed through the command-line interface (CLI).
- For detailed usage instructions and best practices, please refer to the official OpenWrt user guide: https://openwrt.org/docs/guide-user/start

Chapter 4: System Maintenance

Debug Console

1. To access the debug console, connect your PC to the DTA 1600 using an RJ45-to-Serial Port console cable. Refer to the image below.

2. On your PC, select the desired COM port and apply the settings shown below to initiate a serial session with the DTA 1600.
   - UART Settings:
     115200 baud, 8 data bits, no parity, 1 stop bit (8-N-1), no flow control
   - Terminal Software:
     Use a serial terminal application such as PuTTY, TeraTerm, or minicom

Image Upgrade

- To upgrade the image files on the DTA1600, connect an Ethernet cable from your PC or upgrade host to LAN port 2 or 3 of the device.
- For detailed upgrade procedures, including image format and commands, please contact the NEXCOM support team.

Appendix A: NEXBOOT® User Guide

Introduction

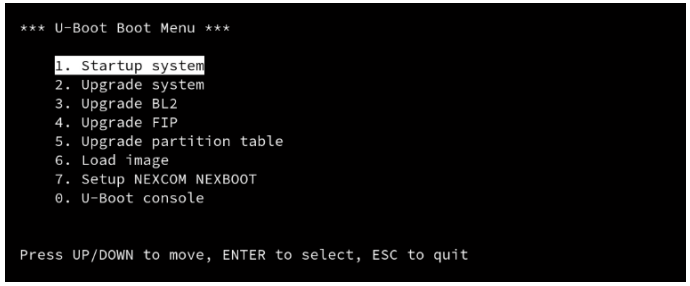
NEXBOOT® is an advanced boot management feature designed to improve system reliability and reduce downtime. It provides dynamic boot control and automatic failover mechanisms, ensuring that the system can recover from disk failures without manual intervention. NEXBOOT® supports multiple boot strategies:

- **Failover Mode:** Switches to backup disks when the primary disk fails.
- **Round Robin Mode:** Alternates boot attempts between primary and secondary disks.
- **Force Golden Mode:** Boots exclusively from the Golden disk using a hardware switch.

NEXBOOT® Getting Started

Accessing the Setup Menu

1. During system boot, enter the U-Boot menu.



2. When the MCU is functioning normally, you will see the option **"Setup NEXCOM NEXBOOT"**.

3. Select this option to configure the following parameters:

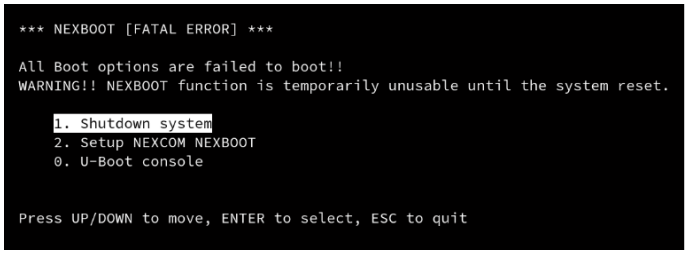
Setting	Description	Constraints
NEXBOOT®	Enable or disable NEXBOOT®	Boolean (enabled / disabled)
Mode	Boot mode	0 = Failover, 1 = Round Robin
Timeout length	Boot attempt duration	15 - 645 seconds, increments of 15
Primary disk	Main boot disk	Format: mmc/usb<disk_num>_p<partition_num>
Secondary disk	Backup disk (optional)	Same format as primary disk
Golden disk	Golden disk (optional)	Same format as primary disk

Error Handling

If an invalid value is entered, the system displays an error message and prompts the user to re-enter the value.

Fatal Error

If all specified disks fail to boot, the system enters Fatal Error state and shows a warning menu:



Select the appropriate option according to the requirements. The available menu options are as follows:

- Shutdown system
- Setup NEXCOM NEXBOOT®
- U-Boot console

If no option is selected and the user enters the U-Boot console (Ctrl+C or Esc), the system remains in the Fatal Error state. Switching modes without selecting an option also keeps the system in the Fatal Error state.

NEXBOOT® Mode

Failover Mode

- Default boot from Primary disk.
- If boot fails after timeout, triggers WDT timeout and switches to Secondary disk or Golden disk.
- If all disks fail, the system enters a Fatal Error state.

Round Robin Mode

- Alternates boot attempts between Primary and Secondary disk.
- If both disks fail, the system attempts to boot from Golden disk.
- If all disks fail, the system enters a Fatal Error state.

Force Golden Mode

Force Golden Mode ensures that the system always boots from the Golden disk, regardless of other disk statuses or previous boot results. This mode overrides the normal failover and round robin logic.

Enabling Force Golden Mode

Use the physical switch located on the board to toggle between:

- Dynamic Mode (normal NEXBOOT® logic)
- Force Golden Mode (Golden disk only)

System Behavior on Mode Change via DIP Switch

Force Golden → Dynamic:

- NEXBOOT® initializes and resumes normal boot logic.

Dynamic → Force Golden:

- The system boots exclusively from the Golden disk.
- If no Golden disk is configured, the system enters the Fatal Error menu.

Notification

- USB hubs are not supported for USB boot devices.
- If the boot device configuration changes (e.g., a USB is removed or replaced), NEXBOOT® must be reset before continuing test.