Nano-N3281

Desktop Network Security Appliance

Technical Support Documentation

Document Version:	1.0
Date:	February 2026
Product:	Nano-N3281
Platform:	14th Gen Intel® Core™ Processor
Classification:	Network Security

IWILL Technology | WhatsApp: **+852 914 61951**

United Kingdom
www.iwilltech.co.uk
support@iwilltech.co.uk

MENA Region
www.iwillmena.com
support@iwillmena.com

Portugal & Spain
www.iwill.pt
apoyo@iwill.pt

Poland
www.iwill.pl
wsparcie@iwill.pl

Denmark
www.iwill.dk
stotte@iwill.dk

Bulgaria
www.iwill.bg
support@iwill.bg

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1. Product Overview

The Nano-N3281 is a desktop network security appliance purpose-built for firewall, VPN gateway, SD-WAN, and network security applications. Its multiple Ethernet ports and fanless design make it ideal for deployment as a dedicated security appliance at the network edge.

1.1 Key Features

• Fanless Aluminum Design

• 14th Gen Intel® Core™ Processor

• 8 Intel 2.5G LAN Ports

• (1 × Intel i226-LM, support vPro, 7 × Intel i226-V)

• 1 × HDMI, 1 × DP, 1 × Type-C, 3 display

• Support M.2 (NVME)+2.5-inch HDD/SSD+WIFI+4G

1.2 Target Applications

The Nano-N3281 is suitable for Firewall, VPN, Network Server, Network Security, Router etc..

1.3 Package Contents

Verify the following items are included in the package:

Item	Qty	Description
Power Adapter	1	Suggestion 12V 10A
Power Cord	1	CN, US, UK, EU etc.
Qualified certificate	1	Neutral
Warranty card	1	Neutral
VESA Bracket	1	Standard

NOTE: If any item is missing or damaged, contact IWILL Technology support immediately at support@iwilltech.co.uk.

2. Hardware Specifications

Complete technical specifications for the Nano-N3281.

SYSTEM	
Model	Nano-N3281
Processor	14th Gen Intel® Core™ Processor
Memory	2 × DDR5 5600 SODIMM, Max. 64 GB
BIOS	AMI EFI BIOS
Graphics	Intel® Graphics
Display Ports	1 × DP Resolution up to 4096x2160@60Hz 1 × Type-C
Storage	1 × M.2 2280, 1 × 2.5-inch HDD/SSD 1 × M.2 2280 M-Key (NVME protocol, PCIe 4.0 ×4) 1 × M.2 2230 E-key (PCIe and USB/CNVio2)
Expansion	1 × M.2 3052 (2242) B-key (USB 3.0 signal, 4G/5G), external SIM Card Slot
Ethernet	1 × Intel i226-LM 100/1000/2500M LAN Ports, support Intel vPro (LAN1)
OS Support	Windows 10, Windows 11, Linux, iKuai, pfSense
I/O PORTS	
Ports	1 × DP 4 × USB 3.2 1 × RJ45 COM Port (suppor console) 1 × SIM Card Slot 1 × DC-In 8 × Intel 2.5G LAN Ports (1 × Intel i226-LM support vPro, 7 × Intel i226-V) 7 × Intel i226-V 100/1000/2500M LAN Ports
POWER & OTHER	
Power Input	DC 12V
Other Functions	TPM2.0 Secure Encryption
DISPLAY & TOUCH	
Resolution	up to 4096x2160@60Hz
ENVIRONMENT	
Operating Temp.	0■ ~ 40■ (Commercial HDD), -20■ ~ 50■ (Industrial SSD), surface air flow
Humidity	5% ~ 95% (non-condensing)
Certifications	CE, CCC, FCC Class A, RoHS
MECHANICAL	
Dimensions	170 × 140 × 58 mm
Weight	1.36 kg

3. I/O Interfaces & Connectivity

3.1 Front Io

Connector	Description
1	1 × DP
4	4 × USB 3.2
1	1 × RJ45 COM Port (suppor console)
1	1 × SIM Card Slot
1	1 × DC-In

3.2 Rear Io

Connector	Description
8	8 × Intel 2.5G LAN Ports (1 × Intel i226-LM support vPro, 7 × Intel i226-V)
7	7 × Intel i226-V 100/1000/2500M LAN Ports

Ethernet / LAN

• 1 × Intel i226-LM 100/1000/2500M LAN Ports, support Intel vPro (LAN1)

> **WARNING:** Always power off the unit and disconnect all power sources before connecting or disconnecting any internal components.

4. Mechanical Dimensions

All dimensions are in millimeters (mm).

Parameter	Value
Overall Dimensions	170 × 140 × 58 mm
Weight	1.36 kg

> **NOTE:** For detailed technical drawings with mounting hole positions, contact IWILL Technology at support@iwilltech.co.uk.

5. BIOS Configuration

The Nano-N3281 uses AMI EFI BIOS. Access the BIOS setup by pressing **DEL** or **F2** during the POST screen at boot.

5.1 Entering BIOS Setup

1. Connect a USB keyboard to the unit.

2. Power on the system.

3. Press **DEL** or **F2** repeatedly as the splash screen appears.

4. The AMI EFI BIOS setup utility will load.

5.2 Important BIOS Settings

Setting	Location	Description
Boot Order	Boot Tab	Set primary boot device (SSD, USB, PXE)
Power On After Power Loss	Advanced > ACPI	Set to [Power On] for automatic startup on power restoration
Wake-on-LAN	Advanced > Network	Enable for remote wake capability over LAN
TPM 2.0	Security Tab	Enable Trusted Platform Module for secure boot and encryption

> **NOTE:** BIOS menu paths may vary between firmware revisions. If a setting is not found, check adjacent menus or consult IWILL Technology support.

5.3 BIOS Reset

Method 1 (Keyboard): Enter BIOS setup and press **F9** to load optimized defaults, then **F10** to save and exit.

Method 2 (CMOS Reset): Power off, disconnect power, open the chassis, locate the CMOS clear jumper on the motherboard, short for 5 seconds, then remove.

6. Operating System Installation

6.1 Supported Operating Systems

OS	Notes
Windows 10	64-bit (21H2+). Recommended for most deployments.
Windows 11	64-bit. Requires TPM 2.0 enabled in BIOS.
Linux	Ubuntu 22.04+, CentOS, or compatible distributions.

6.2 Installation via USB

1. Prepare a bootable USB drive with the desired OS image (use Rufus, balenaEtcher, or dd).

2. Insert the USB drive into an available USB port.

3. Enter BIOS (DEL/F2) and set USB as the first boot device.

4. Save and restart. The OS installer should load from USB.

5. Follow on-screen instructions. Select the internal drive as the install target.

6. After installation, re-enter BIOS and restore the internal drive as primary boot device.

6.3 Driver Installation

Windows 10/11 should automatically detect most hardware via Windows Update. For chipset, graphics, and LAN drivers, download the latest versions from Intel's support site or contact IWILL Technology for the driver package.

> **NOTE:** For firewall/router deployments with pfSense, OPNsense, or similar BSD-based OS, verify Intel LAN controller compatibility with the chosen software version before installation.

7. Network & Firewall Deployment

7.1 Supported Firewall / Router Software

Software	Type	Notes
pfSense	Firewall / Router	FreeBSD-based. Verify Intel NIC compatibility.
OPNsense	Firewall / Router	Fork of pfSense with modern UI.
Untangle	UTM Gateway	Linux-based unified threat management.
VyOS	Network OS	Linux-based routing platform.
Ubuntu/Debian	Linux Router	With iptables/nftables for custom setups.

7.2 Typical Network Topology

With 1 LAN ports, the Nano-N3281 can be deployed as a multi-segment firewall. A common configuration assigns Port 1 as WAN (internet uplink), Port 2 as LAN (internal network), and remaining ports as DMZ, guest network, or additional WAN for failover.

7.3 Console Port

The unit includes a serial console port (RJ45 or DB9) for out-of-band management. Connect via a serial terminal (PuTTY, minicom) at 115200 baud, 8N1.

8. Expansion Module Installation

8.1 Available Expansion Slots

• 1 × M.2 3052 (2242) B-key (USB 3.0 signal, 4G/5G), external SIM Card Slot

8.2 Installation Procedure

1. Power off and disconnect all power sources.

2. Remove the chassis access panel screws.

3. Locate the target expansion slot on the motherboard.

4. Insert the module at a 30° angle and press down until it clicks into the retaining clip.

5. If applicable, connect antenna pigtail cables to the module's U.FL connectors.

6. Replace the access panel and secure with screws.

> **WARNING:** Always use ESD protection (grounding strap) when handling internal expansion modules. Static discharge can permanently damage components.

8.3 Storage Installation

• 1 × M.2 2280, 1 × 2.5-inch HDD/SSD

• 1 × M.2 2280 M-Key (NVME protocol, PCIe 4.0 ×4)

• 1 × M.2 2230 E-key (PCIe and USB/CNVio2)

9. Mounting Guide

9.1 VESA / Desktop Mounting

The Nano-N3281 supports VESA mounting (check rear panel for mounting hole pattern). Use M3 or M4 screws as appropriate — do not exceed the maximum thread depth.

WARNING: Ensure adequate ventilation around the unit. Do not block the heatsink fins or ventilation openings.

10. Maintenance & Troubleshooting

10.1 Routine Maintenance

• **Heatsink Cleaning:** Periodically blow out dust from the heatsink fins using compressed air.

• **Connector Inspection:** Check connectors for damage or corrosion, especially in harsh environments.

• **Firmware Updates:** Check with IWILL Technology for BIOS updates that may improve stability.

10.2 Troubleshooting Guide

Symptom	Possible Cause	Solution
No power / no LED	Power adapter disconnected or faulty	Verify DC input voltage. Try a different adapter.
No display output	Display cable loose or BIOS setting	Reseat display cable. Check BIOS display settings.
LAN port not linking	Cable or driver issue	Try different cable/port. Verify driver in OS. Check BIOS LAN enable.
System freezes	Memory or storage issue	Reseat RAM. Test with known-good SSD. Enable watchdog.
Overheating	Blocked heatsink or high ambient temp	Clean heatsink. Ensure adequate airflow.
Boot loop	Corrupted BIOS or OS	Reset BIOS to defaults (F9). Reinstall OS.

11. Warranty & Support

11.1 Warranty Coverage

The Nano-N3281 is covered by a standard manufacturer warranty. The warranty covers defects in materials and workmanship under normal use conditions. It does not cover damage from misuse, unauthorized modifications, or exposure beyond rated specifications.

11.2 Technical Support

IWILL Technology provides worldwide technical support through regional offices:

Region	Website	Email
United Kingdom	www.iwilltech.co.uk	support@iwilltech.co.uk
MENA Region	www.iwillmena.com	support@iwillmena.com
Portugal & Spain	www.iwill.pt	apoyo@iwill.pt
Poland	www.iwill.pl	wsparcie@iwill.pl
Denmark	www.iwill.dk	stotte@iwill.dk
Bulgaria	www.iwill.bg	support@iwill.bg

WhatsApp: +852 914 61951

11.3 RMA Process

To initiate a return for repair or replacement, contact IWILL Technology support at the regional office nearest to your location with your product serial number and a description of the issue.

Appendix A — Order Information & Accessories

A.1 Order Configurations

Configuration	Description
Nano N3281 CPU Specification	Nano N3281 CPU Specification
Configuration 1 Intel® Core™ Ultra 5 125	Configuration 1 Intel® Core™ Ultra 5 125U Standard I/O
Configuration 2 Intel® Core™ Ultra 7 155	Configuration 2 Intel® Core™ Ultra 7 155U Standard I/O

A.2 Included Accessories

Item	Qty	Specification
Power Adapter	1	Suggestion 12V 10A
Power Cord	1	CN, US, UK, EU etc.
Qualified certificate	1	Neutral
Warranty card	1	Neutral
VESA Bracket	1	Standard

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apoyo@iwill.pt

Poland
www.iwill.pl
wsparcie@iwill.pl

Denmark
www.iwill.dk
stotte@iwill.dk

Bulgaria
www.iwill.bg
support@iwill.bg