

Napatech

NT4E-4T

Hardware Installation Guide

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Abstract This document explains how to install a Napatech NT4E-4T network adapter in a server.

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Preface

Style conventions

Bold typeface is used for names of, for instance, LEDs (example: **Link/Activity**). Note that bold typeface is also used in other contexts.

Abbreviations

This table explains the abbreviations used in this document.

Abbreviation	Explanation
ATX	Advanced Technology Extended
Aux.	AUXiliary
BSD	Berkeley Software Distribution
DC	Direct Current
DDR	Double Data Rate
DIMM	Dual In-line Memory Module
DN	Document Number
EMC	ElectroMagnetic Compatibility
ESD	ElectroStatic Discharge
Exp.	EXPansion
FCC	Federal Communications Commission
GND	GrouND
HW	HardWare
I	Input
LED	Light Emitting Diode
Max.	MAXimum
NT	NapaTech
O	Output
OEM	Original Equipment Manufacturer
PCB	Printed Circuit Board
PCI	Peripheral Component Interconnect
RAM	Random-Access Memory
Ref.	REference
Rev.	REVision
RoHS	Restriction of Hazardous Substances

Abbreviation	Explanation
RX	Reception/Receive
SDRAM	Synchronous Dynamic Random-Access Memory
SELV	Safety Extra-Low Voltage
SO	Small Outline
TX	Transmission/Transmit
UL	Underwriters Laboratories
USA	United States of America

References

This table shows the documents that are referenced by this document.

Ref.	Document Title
1	Napatech, NT Adapters with Napatech Driver Software, Software Installation Guide for Linux, DN-0128
2	Napatech, NT Adapters with Napatech Driver Software, Software Installation Guide for FreeBSD, DN-0164
3	Napatech, NT Adapters with Napatech Driver Software, Software Installation Guide for Windows, DN-0184
4	Napatech Time Synchronization Cables – Qualification, DN-0186
5	Napatech SDRAM Modules – Qualification, DN-0250
6	Napatech, NT Adapters with Napatech Software Suite, Software Installation Guide for Linux, DN-0379
7	Napatech, NT Adapters with Napatech Software Suite, Software Installation Guide for FreeBSD, DN-0393
8	Napatech, NT Adapters with Napatech Software Suite, Software Installation Guide for Windows, DN-0394

1 Introduction

In this document

This document contains information about port numbering, LEDs and HW installation related to the Napatech 4 x 10/100/1000 Mbit/s electrical PCI Express network adapter, NT4E-4T.

Installation by qualified personnel

An NT4E-4T network adapter is an OEM product designed for integration with another product. The end user is not intended to install this product.

Installation must be referred to qualified personnel who understand and are trained to work with server hardware. The installer must read this manual, especially [“3 Safety” on page 11](#), before attempting to install, test or use the network adapter.

Reading instructions

The document contains these chapters:

- [“1 Introduction” on page 7](#). This chapter introduces the document.
- [“2 Installation Requirements” on page 9](#). This chapter describes the requirements for installing an NT4E-4T network adapter in a server.
- [“3 Safety” on page 11](#). This chapter describes the safety issues involved when installing an NT4E-4T network adapter in a server.
- [“4 Installation Procedure” on page 15](#). This chapter describes the installation procedure.
- [“5 Technical Information” on page 19](#). This chapter contains information about LEDs and other technical specifications.

2 Installation Requirements

In this chapter	This chapter describes the system requirements for installing an NT4E-4T network adapter in a server.
Power considerations	<p>The NT4E-4T network adapter operates at 25 W without expansion adapter (NTPORT4E), which is equal to the 25 W specified for a PCI Express slot. Approximately 4.6 W is drawn from the 3.3 V supply rail, and approximately 20.4 W is drawn from the 12 V supply rail.</p> <p>Alternatively the optional auxiliary power connector (see “5.5 Optional Auxiliary Power Connector” on page 22) can be used. In this case approximately 4.6 W is drawn from the 3.3 V supply rail, approximately 14.4 W is drawn from the 12 V supply rail and approximately 6.6 W is drawn from the auxiliary power connector.</p>
PCI considerations	The PCI Express connector in which the NT4E-4T network adapter is inserted must physically be an 8-lane or a 16-lane connector.
Cooling	The network adapter must be installed only in a server having adequate cooling air flow to maintain the air temperature around the adapter at or below 45 °C during operation. Avoid installation in a slot adjacent to other high-temperature components.
Operating temperature	<p>The power consumption and thereby the heat dissipation depend on the network adapter activity. After a first installation in a new server, the ambient temperature should be verified by measurement while processing at full rate on all channels.</p> <p>Note: Failure to observe these requirements might cause intermittent operation.</p>
Transport considerations	<p>When installing the adapter in the server, you must ensure that the adapter is firmly secured in the PCI slot using the retention mechanism, for instance screw or clamp, provided in the server. In addition, you must ensure that the retention mechanism provides sufficient protection of the adapter against excessive vibration stress during transport. If the retention mechanism is not sufficient, you must consider adding extra retention or other means of preventing vibration stress.</p> <p>Caution: If these precautions are not respected, there is a risk of the adapter being damaged due to vibration stress during transport of the server.</p>

3 Safety

In this chapter

This chapter describes the safety issues involved when installing an NT4E-4T network adapter including accessories in a server.

The chapter contains these sections:

- [“3.1 Safety Procedures” on page 11](#)
- [“3.2 EMC Statements” on page 12](#)
- [“3.3 UL Statements” on page 13](#)

3.1 Safety Procedures

In this section

Protection provided by the equipment might be impaired if it is used in a manner that is not in accordance with these instructions.

The section contains these subsections:

- [“3.1.1 General Safety Precautions” on page 11](#)
- [“3.1.2 ESD Precautions” on page 12](#)

3.1.1 General Safety Precautions



Warning: Before installing the network adapter, ensure that all power is disconnected from the server in which it is to be installed.

Avertissement: Avant d'installer l'adaptateur, assurez-vous que toute alimentation est déconnectée du serveur dans lequel il est installé.

Warnung: Bevor Sie den Adapter installieren, bitte achten Sie, dass Netzstrom vom Server getrennt wird, in dem es installiert werden soll.



Caution: Some components on the network adapter will get hot during normal use. The network adapter must be allowed to cool for 10 minutes prior to handling.

Attention: Certains composants sur l'adaptateur deviennent chauds pendant l'utilisation normale. L'adaptateur doit être laissé à refroidir pendant 10 minutes avant toute manipulation.

Vorsichtshinweis: Einige Komponenten auf dem Adapter werden während des normalen Gebrauchs heiß. Der Adapter muss 10 Minuten vor Verwendung abkühlen.



Warning: There is a risk of explosion if an incorrect battery type is used.

Avertissement: Il y a un risque d'explosion si la batterie d'un type incorrect est utilisé.

Warnung: Es besteht die Gefahr der Explosion wenn einer Falscher Batterietyp verwendet wird.

3.1.2 ESD Precautions



Caution: It is essential that you fit an anti-static wrist strap and observe all conventional ESD precautions when handling the network adapter. Avoid contact with backplane components and module connectors and so on.

Attention: Il est essentiel que vous vous situez un bracelet anti-statique et observer toutes les précautions ESD conventionnelles lors de la manipulation de l'adaptateur. Éviter le contact avec les composants et connecteurs de fond de panier du module, etc.

Vorsichtshinweis: Wichtig ist, dass Sie eine Anti-statische Handgelenk verwenden und alle konventionelle ESD-Vorsichtsmaßnahmen beim Umgang mit des Adapters beobachten. Vermeiden Sie den Kontakt mit Backplane-Komponenten und Modulschlüssen und so weiter.

3.2 EMC Statements

In this section

This section concerns EMC statements.

See support.napatech.com (Support Center) for product compliance and safety documentation.

The section contains these subsections:

- “3.2.1 EMC Statement (Europe, Japan and Australia)” on page 12
- “3.2.2 EMC Statement (USA and Canada)” on page 13

3.2.1 EMC Statement (Europe, Japan and Australia)

Class B note

This equipment has been tested and found to comply with the limits for a Class B digital device for industrial use.

3.2.2 EMC Statement (USA and Canada)

FCC, Class B note

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Unauthorized use or modifications

The supplier is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment.

Unauthorized changes or modifications could void the user's authority to operate the equipment.

3.3 UL Statements

In this section

This section concerns UL (Underwriters Laboratories) statements.

See support.napatech.com (Support Center) for product compliance and safety documentation.

UL recognition

The Napatech NT4E-4T network adapter is UL recognized: UL No. E314296.

4 Installation Procedure

To install a network adapter in a server

To install an NT4E-4T network adapter in a server:

Note: An SDRAM module must be installed in the adapter to make it operational (see [“To install an SDRAM module” on page 15](#)).

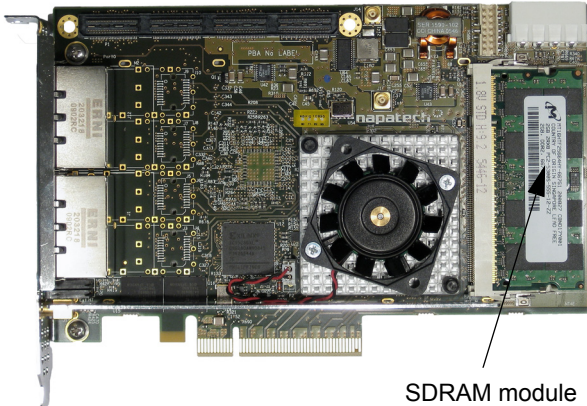
Note: The network adapter is not hot-pluggable.

Step	Action
1	Power off the server, and remove the server cover. Caution: Refer to the server documentation for correct procedure and for safety instructions.
2	Remove the network adapter from the ESD bag. Caution: Observe the ESD precautions detailed in “3.1.2 ESD Precautions” on page 12 when handling or placing the network adapter on a surface.
3	Insert the network adapter in a vacant PCI Express x8 or x16 connector, ensuring that it sits securely within the PCI Express connector.
4	Optionally connect the optional auxiliary power connector to an external power supply (see “5.5 Optional Auxiliary Power Connector” on page 22).
5	Secure the network adapter at the rear end of the server by fastening it at the top of the I/O bracket using the retention mechanism provided in the server, if applicable.
6	Connect a network device via a copper-based cable to the network adapter.
7	Replace the server cover, and power on.
8	Refer to Ref. 1 on page 6 , Ref. 2 on page 6 , Ref. 3 on page 6 , Ref. 6 on page 6 , Ref. 7 on page 6 or Ref. 8 on page 6 to install the driver for the network adapter. The adapter is now ready to operate.

To install an SDRAM module

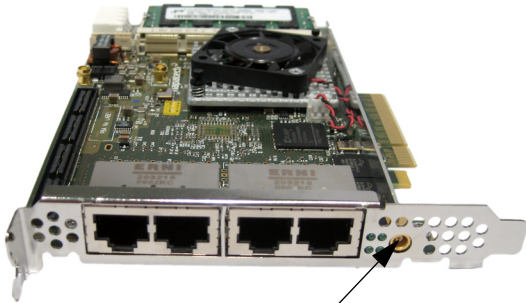
To install an SDRAM module in the network adapter:

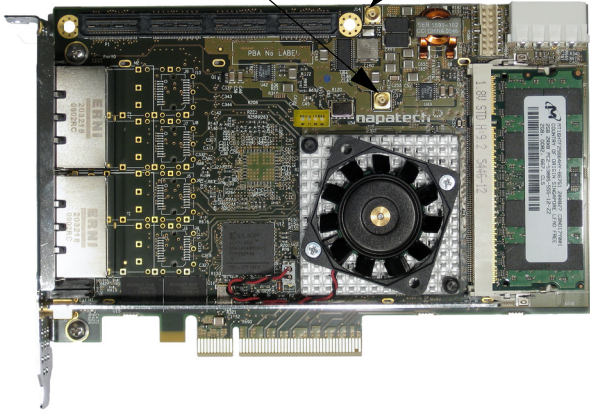
Step	Action
1	If the network adapter is installed in a server, power off the server, and remove the server cover. Caution: Refer to the server documentation for correct procedure and for safety instructions.

Step	Action
2	<p>If the network adapter is installed in a server, remove the network adapter from the PCI Express slot.</p> <p>Caution: Observe the ESD precautions detailed in “3.1.2 ESD Precautions” on page 12 when handling or placing the network adapter on a surface.</p>
3	<p>Mount the SDRAM module on the network adapter, ensuring that it clicks into a locked position.</p> 
4	Install the network adapter in the server.
5	Replace the server cover, and power on.

To connect cables for time synchronization

To connect cables for time synchronization:

Step	Action
External cables:	
1	<p>Connect the relevant time synchronization cable to the external time synchronization connector on the front plate of the network adapter.</p> 

Step	Action
Internal cables:	
1	<p>Power off the server, and remove the server cover.</p> <p>Caution: Refer to the server documentation for correct procedure and for safety instructions.</p>
2	<p>Connect the relevant time synchronization cable to one of the internal time synchronization connectors.</p> <p>Caution: Observe the ESD precautions detailed in “3.1.2 ESD Precautions” on page 12 when handling the network adapter.</p> <p>Internal time synchronization connector 1</p> <p>Internal time synchronization connector 2</p> 
3	<p>Replace the server cover, and power on.</p>

5 Technical Information

In this chapter

This chapter contains information about LEDs and other technical specifications.

The chapter contains these sections:

- [“5.1 Port Numbering” on page 19](#)
- [“5.2 LEDs” on page 20](#)
- [“5.3 DDR2 RAM Modules” on page 20](#)
- [“5.4 Battery Holder” on page 21](#)
- [“5.5 Optional Auxiliary Power Connector” on page 22](#)
- [“5.6 Time Synchronization” on page 23](#)
- [“5.7 Technical Specification” on page 24](#)

5.1 Port Numbering

In this section

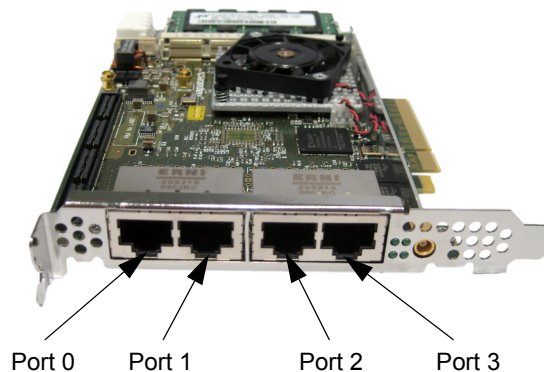
This section explains the numbering of the ports on the NT4E-4T adapters.

Port numbering

On an NT4E-4T adapter, port 3 is the one closest to the PCI Express connector, and port 0 is the one furthest away.

Illustration

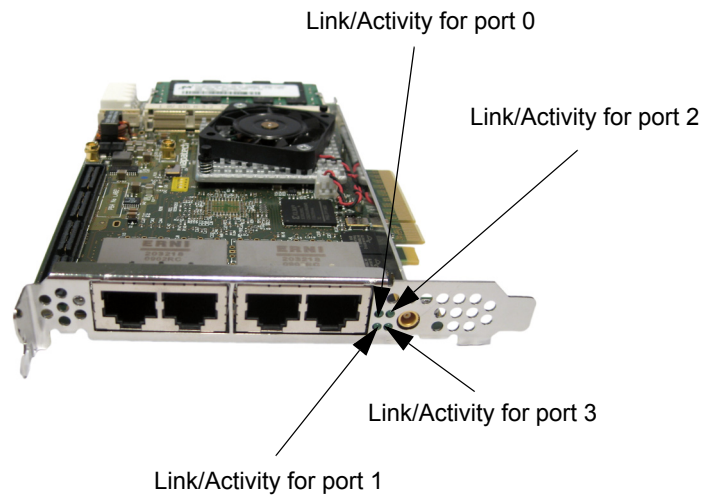
This figure shows the port numbering for an NT4E-4T adapter.



5.2 LEDs

In this section This section describes the function of the LEDs on the NT4E-4T adapter.

Illustration This figure shows the LEDs on an NT4E-4T adapter.



The function of the LEDs This table describes the function of the LEDs. There is a **Link/Activity** LED for each port as shown in the figure in [“Illustration” on page 20](#).

Name	Color	State	Condition
Link/Activity	Green	Off	The driver is not loaded, or the Ethernet link in question is down.
		On	The driver is loaded, and the Ethernet link in question is up, but there is no RX or TX traffic.
		Flashing	The driver is loaded, and there is RX or TX traffic on the Ethernet link in question.

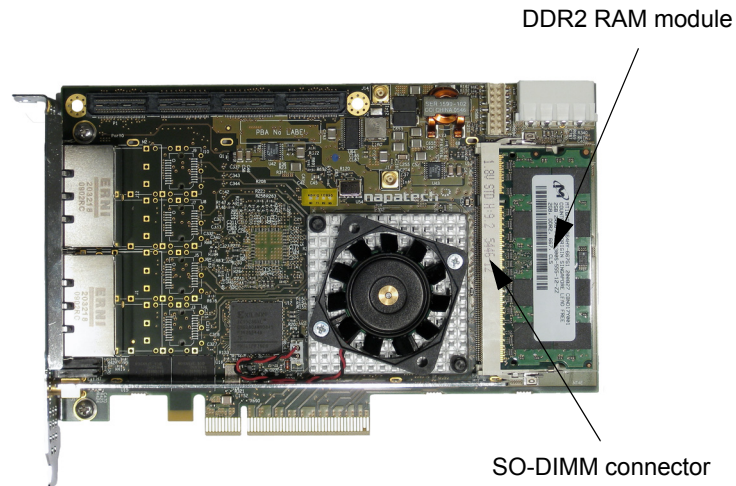
5.3 DDR2 RAM Modules

In this section This section describes the DDR2 RAM modules for the NT4E-4T adapter.

Installation A DDR2 RAM module must be installed in the standard SO-DIMM connector on the NT4E-4T adapter to make the adapter operational.

Illustration

This figure shows a DDR2 RAM module installed in the standard SO-DIMM connector on an NT4E-4T adapter.

**Qualified DDR2 RAM modules**

See support.napatech.com (Support Center) for a table of qualified DDR2 RAM modules ([Ref. 5 on page 6](#)).

5.4 Battery Holder

In this section

This section describes the use of the battery holder.

Battery holder

The battery holder is situated at the back of the adapter under the RAM modules. As the battery holder is reserved for future use there are currently no qualified batteries available. Therefore, the battery holder must not be used.

Caution: There is a risk of explosion if an incorrect battery type is used. Dispose of used batteries according to the manufacturer's instructions or your local authority procedures.

Attention: Il y a un risque d'explosion si la batterie d'un type incorrect est utilisé. Jetez les batteries usagées conformément aux instructions du fabricant ou vos procédures des autorités locales.

Vorsichtshinweis: Es besteht die Gefahr der Explosion wenn einer Falscher Batterietyp verwendet wird. Entsorgen Sie gebrauchte Batterien gemäß den Anweisungen des Herstellers oder Ihre lokale Behörde-Prozeduren.

5.5 Optional Auxiliary Power Connector

In this section

This section describes the optional auxiliary power connector.

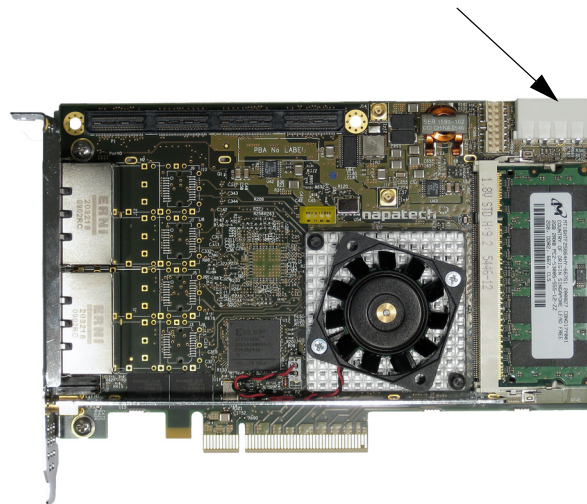
Purpose

The optional auxiliary power connector can be used for providing additional power to the adapter, if the motherboard cannot provide the 25 W required.

Illustration

This figure shows the optional auxiliary power connector.

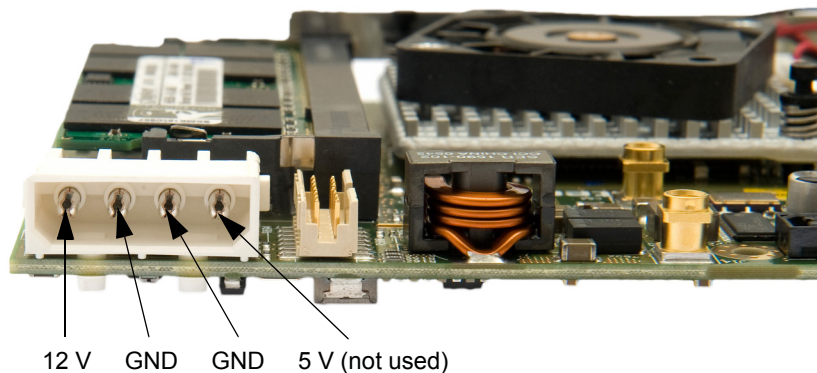
Optional auxiliary power connector



Description

The optional auxiliary power connector is an ATX hard disk power connector (Tyco Electronics 1-641737-1). This figure shows a section of the NT4E-4T adapter with an explanation of the pins on the optional auxiliary power connector.

Note: All four pins must be connected.

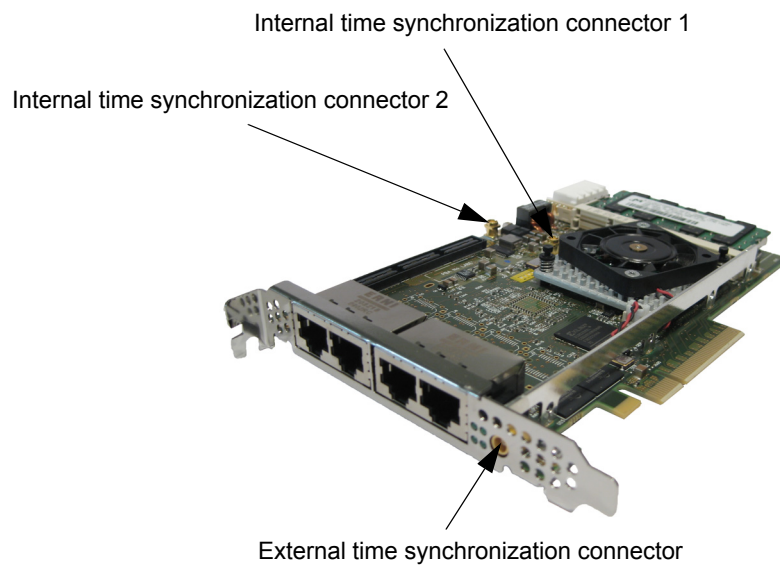


5.6 Time Synchronization

In this section This section describes connection of two NT4E-4T adapters for time synchronization.

Connecting two network adapters To time-synchronize two NT4E-4T adapters, they must be connected via a time synchronization cable. The connection between the adapters can be made internally if they are mounted in the same server by using the connectors on the PCBs or externally by using the connectors on the front plates.

Illustration This figure indicates the time synchronization connectors on an NT4E-4T adapter.



Description The time synchronization connectors are MCX female coax connectors.

Available time synchronization cables See support.napatech.com (Support Center) for a table of available time synchronization cables ([Ref. 4 on page 6](#)).

5.7 Technical Specification

In this section This section contains some technical specifications for the NT4E-4T adapter.

Electrical rating This table shows the power consumption for an NT4E-4T adapter.

Connections		Supply Voltage			Supply Current			Supply Power			
Aux. Power	Exp. bus	PCI Express		Aux. Power	PCI Express		Aux. Power	PCI Express		Aux. Power	Total Max.
		3.3 V [in V]	12 V [in V]	12 V [in V]	3.3 V [in A]	12 V [in A]	12 V [in A]	3.3 V [in W]	12 V [in W]	12 V [in W]	[in W]
No	No	3.30	12.00	–	1.4	1.7	–	4.6	20.4	–	25.0
No	Yes	3.30	12.00	–	1.7	2.0	–	5.6	24.0	–	29.6
Yes	No	3.30	12.00	12.00	1.4	1.2	0.6	4.6	14.4	6.6	25.6
Yes	Yes	3.30	12.00	12.00	1.7	1.3	0.9	5.6	15.6	10.2	31.4

The adapter is Class III equipment for supply by SELV circuits only.

Environmental condition

Environmental conditions:

- Operating temperature: 0 °C to 45 °C (32 °F to 113 °F) measured around the network adapter
- Operating relative humidity: 20% to 80%
- RoHS-compliant (see support.napatech.com (Support Center) for product compliance and safety documentation)

Network interface ports

The network adapter has 4 RJ45 ports.

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