napatech

Hardware Installation Guide

NT4E2-4-PTP

Installation and Specifications

This document explains how to install a Napatech NT4E2-4-PTP accelerator in a server.

DN-0484 Rev. 9

Intellectual property rights

This document is the property of Napatech. The data contained herein, in whole or in part, may not be duplicated, used or disclosed outside the recipient for any purpose other than to conduct business and technical evaluation. This restriction does not limit the recipient's right to use information contained in the data if it is obtained from another source without restriction.

Disclaimer

This document is intended for informational purposes only. Any information herein is believed to be reliable. However, Napatech assumes no responsibility for the accuracy of the information. Napatech reserves the right to change the document and the products described without notice. Napatech and the authors disclaim any and all liabilities.

Trademark notice

Napatech is a trademark used under license by Napatech A/S. All other logos, trademarks and service marks are the property of the respective third parties.

Copyright statement

Copyright © Napatech A/S 2015. All rights reserved.

Modification History

This document has been updated as follows:

Rev.	Date	Comment
1	2013-04-15	Initial version.
2	2013-05-28	Updated power values. A number of minor changes have been made.
3	2013-06-03	A number of minor changes have been made.
4	2013-12-03	Changes have been made in Section 5.2. A number of minor changes have been made.
5	2014-01-02	A number of minor changes have been made.
6	2014-01-30	Changes have been made in Chapter 4. A number of minor changes have been made.
7	2014-05-19	The document has been reformatted. A few minor changes have been made.
8	2014-11-10	Minor structural changes.
9	2015-04-21	'Technical Information' chapter renamed 'Specifications'. Hardware Specification moved from the 'Technical Specification' manual into 'Specifications' chapter in this manual. Mention of 2GD software installation removed.

Contents

1 Introduction....6

2 Installation Requirements....7

3 Safety....8

3.1 Safety Procedures....8

3.1.1 General Safety Precautions....8

3.1.2 ESD Precautions....8

3.2 Recycling Information....9

3.3 EMC Statements....9

3.3.1 EMC Statement (Europe, Japan and Australia)....9

3.3.2 EMC Statement (USA and Canada)....9

3.4 UL Statements....10

4 Installation Procedure....11

4.1 Install an Accelerator in a Server....11

4.2 Plug In an SFP Module....12

4.3 Connect External Cable for Time Synchronization....12

4.3.1 Connect External Time Synchronization using PTP-SMA Time Synchronization Adapter....13

4.3.2 Connect External Time Synchronization using PTP-SMA/RJ45 Time Synchronization Adapter....13

4.4 Connect Internal Cables for Time Synchronization....13

5 Specifications....15

5.1 Accelerator Performance....15

5.2 Network Interface....15

5.3 Host Interface....16

5.4 Physical Dimensions....16

5.5 Environment....16

5.6 Mean Time Between Failure (MTBF)....17

5.7 Electrical Rating....17

5.8 Port Numbers....18

5.9 External LEDs....18
5.9.1 System LED....18
5.9.2 Activity LEDs....19
5.9.3 External Time Synchronization LED....19
5.10 Internal LEDs....20
5.10.1 Internal Time Synchronization LEDs....20
5.11 Optional Auxiliary Power Connector....20
5.11.1 Male Datamate Connector....21
5.11.2 ATX hard disk power connector....21
5.12 Time Synchronization....22
5.12.1 Tyco Industrial Mini Connector....22
5.12.2 MCX Female Coax Connector....22
5.13 RAM Bank....22

Back Matter....23
Style Conventions....24
Abbreviations....25
References....27

1 Introduction

In this document

This document contains information about port numbering, LEDs and hardware installation related to the Napatech 4 × 1 Gbit/s SFP PCIe Gen2 accelerator, NT4E2-4-PTP.

Installation by qualified personnel

A Napatech accelerator 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 Safety on page 8, before attempting to install, test or use the accelerator.

2 Installation Requirements

Power considerations

The NT4E2-4T-PTP accelerator operates at 22.8 W, which is below the 25 W specified for a PCI Express slot. Optionally, the optional auxiliary power connector can be used (see Optional Auxiliary Power Connector on page 20) can be used.

See Electrical Rating on page 17 for details on power consumption.

PCI considerations

The PCI Express connector in which the accelerator is inserted must physically be an 8-lane or a 16-lane connector.

Cooling

The accelerator must be installed only in a server having adequate cooling air flow to maintain the air temperature around the accelerator at or below 45 °C during operation. Avoid installation in a slot adjacent to other high-temperature components. The front plate must not be blocked to prevent the fan from sucking air to the cooling system.

Operating temperature

The power consumption and thereby the heat dissipation depend on the accelerator 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.

Note: Failure to observe these requirements might cause intermittent operation.

Transport considerations

When installing the accelerator in the server, you must ensure that the accelerator 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 accelerator 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.

Caution: If these precautions are not respected, there is a risk of the accelerator being damaged due to vibration stress during transport of the server.

3 Safety

In this chapter

This chapter describes the safety issues involved when installing the accelerator including accessories in a server.

This chapter contains the following sections:

- Safety Procedures on page 8
- Recycling Information on page 9
- EMC Statements on page 9
- UL Statements on page 10

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.

3.1.1 General Safety Precautions

Warning: Before installing the accelerator, 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 tout alimentation est déconnecté 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 accelerator will get hot during normal use. The accelerator must be allowed to cool for 10 minutes prior to handling.

Avertissement : Certains composants sur l'adaptateur devient chaud pendant l'utilisation normale. L'adaptateur doit être laissé à refroidir pendant 10 minutes avant toute manipulation.

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

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 accelerator. Avoid contact with backplane components and module connectors and so on.

Avertissement : 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. Eviter le contact avec les composants et connecteurs de fond de panier du module, etc.

Vorsicht: 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 Modulanschlüssen und so weiter.

3.2 Recycling Information

This symbol indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the office where you purchased the product.

3.3 EMC Statements

In this section

This section concerns EMC statements.

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

3.3.1 EMC Statement (Europe, Japan and Australia)

Class A note

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

Warning: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

3.3.2 EMC Statement (USA and Canada)

FCC, Class A 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 A digital device, pursuant to part 15 of the 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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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.

3.4 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 accelerator is UL recognized: UL No. E314296.

SFP modules

For information on which SFP modules can be used with the accelerator according to the UL qualification, see DN-0191 on support.napatech.com (Support Center).

4 Installation Procedure

This chapter contains the following sections:

- Install an Accelerator in a Server on page 11
- Plug In an SFP Module on page 12
- Connect External Cable for Time Synchronization on page 12
- Connect Internal Cables for Time Synchronization on page 13

4.1 Install an Accelerator in a Server

Context

The accelerator 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 accelerator from the ESD bag. **Caution:** Observe the ESD precautions detailed in ESD Precautions on page 8 when handling or placing the accelerator on a surface.
3	Insert the accelerator in a vacant PCI Express ×8 or ×16 connector, ensuring that it sits securely within the PCI Express connector.
4	Optionally connect the optional auxiliary power connector to an additional power supply outlet (see Optional Auxiliary Power Connector on page 20).
5	Secure the accelerator 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	Plug in the desired SFP module (see Plug In an SFP Module on page 12).
7	Connect a network device via a fiber optic cable to the accelerator.
8	Replace the server cover, and power on.
9	Install the driver for the accelerator. For information on installing a 3GD driver, see • Linux: DN-0379 • FreeBSD: DN-0393 • Windows: DN-0394

Result

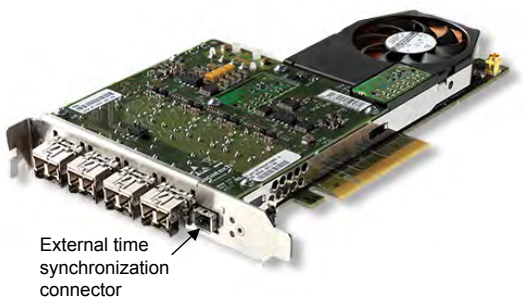
The accelerator is now ready to operate.

4.2 Plug In an SFP Module

Step	Action
1	If you want to avoid exposure to laser light, power off the server.
2	Plug in the SFP interface module, make sure that the latch is firmly secured, and connect the fiber optic or copper-based cable, if applicable. **Note:** For a information on which SFP modules can be used with the accelerator according to the UL qualification, see DN-0191 on support.napatech.com (Support Center). **Caution:** To avoid exposure to laser light, do not remove the protective plugs on the SFP modules until the fiber optic cables are to be connected. Retain and replace the plugs if the cables are removed. **Avertissement :** Pour éviter l'exposition à la lumière laser, ne pas enlever les bouchons de protection sur les modules SFP jusqu'à ce que les câbles à fibres optiques doivent être connectés. Retenir et remplacer les bouchons si les câbles sont enlevés. **Vorsicht:** Zur Vermeidung der Exposition zum laser-Licht, entfernen Sie nicht die schützende Stecker auf die SFP-Module, bis die Glasfaserkabel angeschlossen sind. Behalten Sie und ersetzen Sie die Stecker zu, wenn die Kabel entfernt werden.
3	Power on the server.

4.3 Connect External Cable for Time Synchronization

Step	Action
1	Connect the relevant time synchronization cable to the external time synchronization connector on the front plate of the accelerator.



4.3.1 Connect External Time Synchronization using PTP-SMA Time Synchronization Adapter

Step	Action
1	Connect the PTP-SMA time synchronization adapter to the external time synchronization connector on the front plate of the accelerator.
2	Connect the relevant time synchronization cable to the time synchronization adapter. For a information on available time synchronization cables, see DN-0186 on support.napatech.com (Support Center).

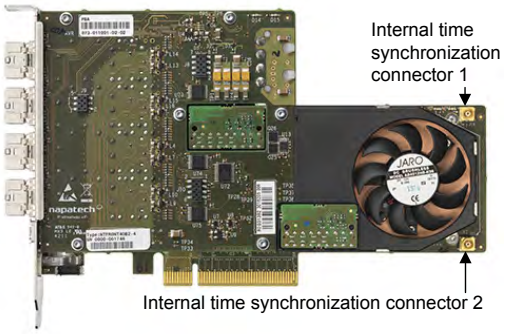
4.3.2 Connect External Time Synchronization using PTP-SMA/RJ45 Time Synchronization Adapter

Step	Action
1	Connect the PTP-SMA/RJ45 time synchronization adapter to the external time synchronization connector on the front plate of the accelerator.
2	Connect the relevant time synchronization cable to the time synchronization adapter. For a information on available time synchronization cables, see DN-0186 on support.napatech.com (Support Center).

4.4 Connect Internal Cables for Time Synchronization

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.

Step	Action
2	Connect the relevant time synchronization cable to the internal time synchronization connectors 1 or 2.



Caution: Observe the ESD precautions detailed in ESD Precautions on page 8 when handling the accelerator.

3	Replace the server cover, and power on.

5 Specifications

This sections details the technical specification of the Napatech Accelerator.

This chapter contains the following sections:

- Accelerator Performance on page 15
- Network Interface on page 15
- Host Interface on page 16
- Physical Dimensions on page 16
- Environment on page 16
- Mean Time Between Failure (MTBF) on page 17
- Electrical Rating on page 17
- Port Numbers on page 18
- External LEDs on page 18
- Internal LEDs on page 20
- Optional Auxiliary Power Connector on page 20
- Time Synchronization on page 22
- RAM Bank on page 22

5.1 Accelerator Performance

Accelerator	Capture Rate	PCIe Performance
NT4E2-4-PTP	4 Gbit/s (line speed, zero packet loss from 64-byte to 10,000-byte frames)	Up to 25 Gbit/s

5.2 Network Interface

Accelerator	IEEE standard	Type of Physical interface	Number of Physical interfaces
NT4E2-4-PTP	IEEE 802.3 10 Mbit/s / 100 Mbit/s / 1 Gbit/s Ethernet	SFP	4 ports

SFP modules

For a information on which SFP modules can be used with the accelerator according to the UL qualification, see DN-0191 on support.napatech.com (Support Center).

5.3 Host Interface

Host Interface

Characteristic	Description
Bus type	PCI Express Gen2
Bus width	8-lane
Bus speed	5 GT/s
PCIe controller	Based on a PCI Express IP core integrated in the FPGA
Data transfer mode	Memory write or memory read transactions
Data width	Support for 32/64-bit addressing and data width
MAX_PAYLOAD_SIZE	Maximum transaction layer packet (TLP) size of 128 or 256 bytes
Interrupt	Support for Message Signaled Interrupts (MSI) or legacy interrupts

5.4 Physical Dimensions

Accelerator	PCIe Length	PCIe Height	PCIe Width
NT4E2-4-PTP	1/2-length	Full-height	Single-slot

PCIe standard dimensions

This list shows the PCIe standard dimensions:

- 1/2-length: 167.65 mm (6.600 inches)
- Full-height: 111.28 mm (4.381 inches)
- Single-slot:
  - Top: 14.47 mm (0.570 inches)
  - Bottom: 2.67 mm (0.105 inches)

5.5 Environment

Environment

Characteristic	Description
Operating temperature	0°C to 45°C (32°F to 113°F) measured around the accelerator
Operating relative humidity	20% to 80%
Compliances	• PCI-SIG® • CE (EU) • CB • RoHS • REACH • cURus(UL) • FCC (USA) • CSA (Canada) • VCCI (Japan) • C-TICK (Australia)

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

5.6 Mean Time Between Failure (MTBF)

MTBF

Accelerator	MTBF	Standard
NT4E2-4-PTP	202,929 (23 years)	According to RIAC-HDBK-217Plus

5.7 Electrical Rating

Electrical rating

This table shows the power consumption for an NT4E2-4-PTP accelerator including 4 × 1000GBASE SFP modules.

Aux. Power	Supply Voltage				Supply Current				Supply Power				
	PCI Express		Aux. Power Main	Aux. Power Front	PCI Express		Aux. Power Main	Aux. Power Front	PCI Express		Aux. Power Main	Aux. Power Front	Total Max.
	3.3 V [in V]	12 V [in V]	12 V [in V]	12 V [in V]	3.3 V [in A]	12 V [in A]	12 V [in A]	12 V [in A]	3.3 V [in W]	12 V [in W]	12 V [in W]	12 V [in W]	[in W]
No	3.30	12.00	–	–	1.1	1.6	–	–	3.6	19.2	–	–	22.8
Main	3.30	–	12.00	–	1.1	–	1.6	–	3.6	–	19.2	–	22.8
Front	3.30	12.00	–	12.00	1.1	1.3	–	0.2	3.6	16.0	–	2.9	22.5
Main + Front	3.30	–	12.00	12.00	1.1	–	1.3	0.2	3.6	–	16.0	2.9	22.5

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

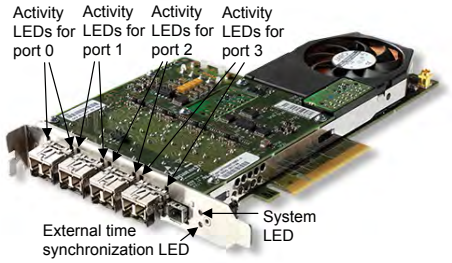
5.8 Port Numbers

Port Numbering

Port 0 is to the far left when looking at the accelerator from the front side. Port numbers increase by one as you move right.

Accelerator	Port numbers	Location
NT4E2-4-PTP	0, 1, 2 and 3	

5.9 External LEDs

Accelerator	LEDs	Location
NT4E2-4-PTP	System LED on page 18 Activity LEDs on page 19 External Time Synchronization LED on page 19	

5.9.1 System LED

System LED

State and Color	Condition
Off	The power is off.
Constant red	During start-up: Power is on. The accelerator is checking the power supplies.
Flashing red	After start-up: The power is on. There is a fatal hardware error. An entry is created in the hardware log.
Constant yellow	During start-up: The power is on. The power supplies are working.
Flashing yellow	There is a new entry in the hardware log.
Constant green	The FPGA is loaded, and the system is running.

5.9.2 Activity LEDs

Activity LEDs

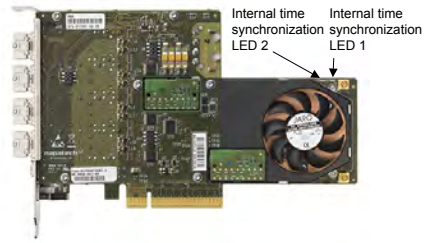
State and Color	Condition
Off	The driver is not loaded, the ethernet link is down or the port is disconnected.
Constant green	The driver is loaded and the ethernet link is up, but there is no RX or TX traffic.
Flashing green	The driver is loaded and there is RX or TX traffic on the ethernet link.

5.9.3 External Time Synchronization LED

External time synchronization LED

State and Color	Condition
Off	No driver is loaded, or no valid PPS or NT-TS signal is detected or generated on the SMA port of the external time synchronization connector and the Ethernet link on the PTP port is down.
Constant yellow	The Ethernet link on the PTP port is up.
Flashing green synchronous with the PPS or NT-TS pulse	The Ethernet link on the PTP port is down and the following condition is fulfilled: When the SMA port of the external time synchronization connector is configured as a: • PPS or NT-TS input connector: A driver is loaded, and a valid PPS or NT-TS signal as relevant is detected. • PPS or NT-TS output connector: A driver is loaded, and a PPS or NT-TS signal is generated.
Yellow with flashing green synchronous with the PPS or NT-TS pulse.	The Ethernet link is up. When the corresponding time synchronization connector is configured as an: • PPS or NT-TS input connector: A driver is loaded, and a valid PPS or NT-TS signal as relevant is detected. • PPS or NT-TS output connector: A driver is loaded, and a PPS or NT-TS signal is generated.

5.10 Internal LEDs

Accelerator	LEDs	Image
NT4E2-4-PTP	Internal Time Synchronization LEDs on page 20	

5.10.1 Internal Time Synchronization LEDs

Internal time synchronization LEDs

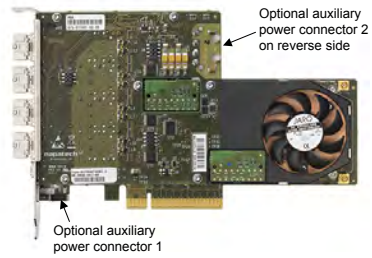
State and Color	Condition
Off	No driver is loaded, or no PPS or NT-TS pulse is detected or generated.
Flashing green synchronous with the PPS or NT-TS pulse	When the corresponding time synchronization connecter is configured as an: • Input connector: A driver is loaded, and a valid PPS or NT-TS signal is detected. • Output connector: A driver is loaded and a PPS or NT-TS signal is generated.

5.11 Optional Auxiliary Power Connector

Purpose

An optional auxiliary power connector must be used for providing additional power to the accelerator, if the motherboard cannot provide the required power. For electrical ratings, see Electrical Rating on page 17

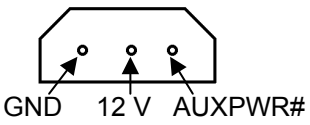
Optional auxiliary power connector

Accelerator	Connector Type	Location
NT4E2-4-PTP	1. Male Datamate Connector on page 21 2. ATX hard disk power connector on page 21	

5.11.1 Male Datamate Connector

Male Datamate connector

The optional auxiliary power connector is a male Datamate connector (Harwin Electronics M80-8820342).

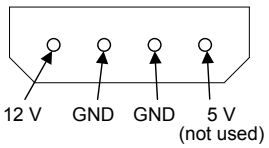


5.11.2 ATX hard disk power connector

ATX hard disk power connector

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-4 accelerator with an explanation of the pins on the optional auxiliary power connector.

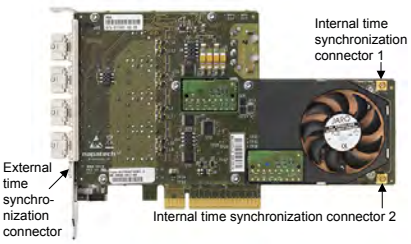
Note: All four pins must be connected.



5.12 Time Synchronization

Connecting two accelerators

To time-synchronize two accelerators, they must be connected via a time synchronization cable. The connection between the accelerators 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.

Accelerator	Time Synchronization Connectors	Location
NT4E2-4-PTP	External: Tyco Industrial Mini Connector on page 22 Internal: MCX Female Coax Connector on page 22	

Available time synchronization cables

For information on available time synchronization cables, see DN-0186 on support.napatech.com (Support Center).

5.12.1 Tyco Industrial Mini Connector

Tyco Industrial Mini connector

Supported input and output:

- PPS/TTL level in 50 Ω
- NT-TS

5.12.2 MCX Female Coax Connector

MCX Female Coax connector

Supported input and output:

- PPS/TTL level in 50 Ω
- NT-TS

5.13 RAM Bank

Accelerator	Flash	Memory	Memory details
NT4E2-4-PTP	Supports two boot images	2 GB DDR3 RAM	Standard 64-bit DDR3-1866 RAM bank

Back Matter

The back matter contains these sections:

Style Conventions 24
Abbreviations 25
References 27

Style Conventions

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

Abbreviations

Abbreviation	Explanation
ATX	Advanced Technology eXtended
Aux.	AUXiliary
C	Celsius
DDR2	Double Data Rate version 2
DN	Document Number
EMC	ElectroMagnetic Compatibility
ER	Extended Range
ESD	ElectroStatic Discharge
F	Fahrenheit
FCC	Federal Communications Commission
Gbit/s	Gigabit per second
Gen	GENeration
GND	GrouND
HW	HardWare
LED	Light Emitting Diode
LR	Long Range
MCX	Micro CoaXial
No.	Number
NT	NapaTech
OEM	Original Equipment Manufacturer
PCI	Peripheral Component Interconnect
RAM	Random-Access Memory
Rev.	REVision
RX	Reception/Receive
SDRAM	Synchronous Dynamic Random-Access Memory

Abbreviation	Explanation
SELV	Separated Extra-Low Voltage
SFP	Small Form-factor Pluggable
SO-DIMM	Small Outline Dual In-line Memory Module
SR	Short Range
TX	Transmision/Transmit
UL	Underwriters Laboratories
V	Volt
W	Watt
ZR	80-km range ER

References

Document Number	Explanation
DN-0186	Napatech Time Synchronization Cables – Qualification
DN-0191	Napatech Pluggable Modules 1 Gbit/s – Qualification
DN-0379	Napatech, NT Accelerators with Napatech Software Suite, Software Installation for Linux, Software Installation Guide
DN-0393	Napatech, NT Accelerators with Napatech Software Suite, Software Installation for FreeBSD, Software Installation Guide
DN-0394	Napatech, NT Accelerators with Napatech Software Suite, Software Installation for Windows, Software Installation Guide

Index

A

Abbreviations 25
Acronyms 25
Activity LED 19
Adapter 13
    for time synchronization 13
ATX hard disk power connector 21
Australia 9
    EMC statement 9
Auxiliary power connector 20–21
    description 21
    purpose 20
Available time synchronization cables 22

B

Bold typeface 24
    use of 24
Bus speed 16
Bus type 16
Bus width 16

C

Cables 12–13
    for time synchronization 12–13
Canada 9
    EMC statement 9
Capture rate 15
Class A note 9
Compliances 17
Connecting cables for time synchronization 12–13
    using PTP-SMA time synchronization adapter 13
    using PTP-SMA/RJ45 time synchronization adapter 13
Connectors 22
    Time synchronization 22
Cooling 7

D

Data transfer mode 16
Data width 16
Definitions 25
Dimensions 16
Disposal 9
Durability 17

E

Electrical rating 17
Electrostatic discharge 8
EMC statement 9
    Canada 9
    USA 9
EMC statements 9
    Australia 9
    Europe 9
    Japan 9
Environment 17
ESD precautions 8
Europe 9
    EMC statement 9
External LEDs 18
External Time Synchronization LED 19

F

FCC 9
    Class A note 9
Flash 22

H

Height 16
Host Interface 16
    NT20E2 16
    NT20E2-PTP 16
    NT40E2-1 16
    NT40E2-4 16
    NT4E2-4-BP 16
    NT4E2-4-PTP 16
Humidity 17
    relative 17

I

IEEE standard 15
Installation 11–12
    Network Accelerator in a Server 11
    SFP module in a network accelerator 12
Installation procedure 11
Installation requirements 6–7
Internal LEDs 20
Internal Time Synchronization LEDs 20
Interrupt 16

J

Japan 9
    EMC statement 9

L

LEDs 18–20
    Activity 19
    External 18
    External Time Synchronization 19
    Internal 20
    Internal Time Synchronization 20
    System 19
Length 16

M

Male Datamate connector 21
MAX_PAYLOAD_SIZE 16
MCX Female Coax Connector 22
Mean Time Between Failure 17
Memory 22
Modifications 9
    unauthorized 9
MTBF 17

N

Network Interface 15
NT20E2 16
    Host Interface 16
NT20E2-PTP 16
    Host Interface 16
NT40E2-1 16
    Host Interface 16
NT40E2-4 16
    Host Interface 16
NT4E2-4-BP 16
    Host Interface 16
NT4E2-4-PTP 16
    Host Interface 16

O

Operating relative humidity 17
Operating temperature 7, 17
Optional auxiliary power connector 20–21
    description 21
    purpose 20

P

PCI considerations 7
PCIe controller 16
PCIe height 16
PCIe length 16
PCIe performance 15
PCIe standard dimensions 16
PCIe width 16
Performance 15
Physical dimensions 16
Physical interface 15
Plugging in an SFP module in a network accelerator 12
Port numbers 18
Power connector 20–21
    description 21
    purpose 20
Power considerations 7
PTP-SMA time synchronization adapter 13
PTP-SMA/RJ45 time synchronization adapter 13

R

RAM bank 22
Recycling 9
Referenced documents 27
References 27
Requirements 6–7

S

Safety 8
    general precautions 8
Safety procedures 8
SFP modules 10, 12
    plugging into a network accelerator 12
SMA time synchronization adapter from PTP 13
SMA/RJ45 time synchronization adapter from PTP 13
Specification 15
Standard dimensions 16
Style conventions 24
System LED 19

T

Temperature 7, 17
    operating 7
Time synchronization adapters 13
Time synchronization cables 12–13, 22
    availability 22
Time Synchronization Connector 22
Time synchronization connectors 22
Time Synchronization Connectors 22
Transport considerations 7
Tyco Industrial Mini Connector 22

U

UL recognition 10
UL statements 10
Unauthorized use or modifications 9
USA 9
    EMC statement 9
Use 9
    unauthorized 9

W

Width 16